

Comparative Analysis of Environmental Accounting Information Disclosure of Chinese and Japanese Enterprises

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Abstract

With the rapid development of economy, environmental pollution is becoming more and more serious, people are paying more and more attention to global warming and environmental pollution, and the impact of enterprises on the environment is gradually being paid attention to. In this context, corporate environmental accounting has started to be promoted. Since pharmaceutical industry belongs to one of the heavy pollution industries, this paper selects Daiichi Sankyo Japan Ltd. and Guangzhou Baiyunshan Pharmaceutical Group Co., Ltd. to compare and analyze the environmental accounting information disclosure status of the two enterprises using the comparative analysis method, hoping to learn from the successful experience and suggest improvements to the development of environmental accounting for enterprises in China.

Keywords

Environmental Accounting; Information Disclosure; Pharmaceutical Industry; Comparison between China and Japan.

1. Introduction

In recent years, the evaluation of companies has not been limited to the financial results of business activities, but is also be affected by non-financial factors. Corporate Social Responsibility (CSR) activities are also one of them. CSR refers to the social responsibility that a company assumes when carrying out organizational activities. From considerations to employees, consumers, investors, and the environment, to contributions to society, etc., appropriate considerations must be made on the basis of a wide range of contents. Decision-making. Environmental accounting refers to the company's goal of sustainable development, maintaining a good relationship with the society, and the purpose of effectively promoting environmental protection methods and performance, understanding the environmental protection costs and effects in corporate activities, and using quantitative measurements as much as possible (Currency unit or unit of measure). The popularization of corporate environmental accounting is not only conducive to reducing the environmental pollution caused by the company, but also conducive to the organization and financial integrity of the company itself, and can achieve a win-win goal.

With the rapid development of the domestic pharmaceutical industry, the pharmaceutical manufacturing industry has become one of the main industries of A-share listed companies. As of the end of February 2021, there were 260 pharmaceutical manufacturing companies in my country, accounting for 6.19% of the total number of A-share listed companies. Due to the large amount of pollutants emitted by the pharmaceutical industry and the difficulty of governance, it has become a key target of government environmental supervision in recent years. The "Notice on Launching Special Actions to Remediate Illegal Pollutant Discharging Enterprises in 2013 to Ensure the Health and Environmental Protection of the People" issued in May 2013 has included pharmaceutical manufacturing companies as one of the key targets for investigation

and remediation. The new "Environmental Protection Law" that came into effect on January 1, 2015 has increased the penalties for corporate violations, and has created a higher environmental protection threshold for pharmaceutical manufacturing companies.

The public hazards caused by the discharge of cadmium-containing wastewater in Japan from 1955 to 1977 attracted widespread attention to corporate environmental pollution. This was an opportunity to introduce CSR and actively develop environmental accounting. Today, Japan is not only the country with the most widespread use of corporate environmental accounting in Asia, but also one of the leading countries in the world. In the author's opinion, the Japanese corporate environmental accounting-related legal system, the degree of standardization of environmental accounting information disclosure, and the popularization of awareness among the people are all worth learning and reference.

Therefore, this paper selects the representative Japanese company Daiichi Sankyo Co., Ltd. and my country's representative company Guangzhou Baiyunshan Pharmaceutical Co., Ltd. to conduct a comparative analysis of environmental accounting information disclosure, find the gaps, and propose corresponding countermeasures to promote the development of environmental accounting in China.

2. The Basic Situation of Environmental Accounting in China and Japan

2.1. Japan

Japan is located in East Asia, surrounded by the sea, with a relatively small land area, relatively scarce natural resources and very dependent on imports. At the same time, due to its highly developed economy, it needs a lot of natural resources, so Japan attaches great importance to the protection of domestic natural resources and the environment.

Japan's four major public hazards, the "Minamata Disease", "Niigata-Minamata Disease", "Itai-itai Disease" and "Yokichi Asthma" that occurred in Japan over the past century, have given rise to an opportunity for society to attach great importance to the impact of companies on the environment. Japan introduced CSR in 1997; released the first edition of "Environmental Accounting Guidelines" in 1999, which was called the first year of Japan's environmental accounting in 1999; issued "Guidelines for the Introduction of Environmental Accounting Systems" and "Guidelines for Environmental Reporting" in 2000 "Guidelines", that year, 45.9% of listed companies produced and disclosed corporate environment-related content; afterwards, the "Environmental Accounting Guidelines" was revised in 2005.

Table 1. Corporate environmental accounting import and disclosure ratio of listed companies in Japan, 2010-2017

Years	Percentage of listed companies that have introduced environmental accounting	Percentage of listed companies that produce and make public environmental reports
2010	39.3%	56%
2011	41.1%	59.5%
2012	49.5%	71.1%
2013	51.8%	69.4%
2014	45.2%	65.4%
2015	41.1%	59.9%
2016	38.7%	57.8%
2017	50.8%	71.6%

(Data source: Ministry of the Environment of Japan "Environmentally Friendly Company Activities")

As a method of environmental accounting information disclosure, corporate environmental reports are used by most companies worldwide. Japan's listed companies issuing environmental reports accounted for 71% of the total number of companies, ranking the top in the world and the first in Asia. According to the "Environmentally Mild Corporate Action Survey" issued by the Japanese Ministry of the Environment each year, it can be confirmed that Japanese listed companies have introduced environmental accounting and the production and publication of environmental reports by Japanese listed companies. The contents are shown in Tables 1 and 2.

Table 2. Ratio of companies passing ISO14001 in Japan, 2017-2020

Years	Rate of ISO14001 in Japan
2017	45.41%
2018	47.66%
2019	44.56%
2020	43.2%

(Data source: Ministry of the Environment of Japan "Environmentally Friendly Company Activities")

2.2. China

Chinese scholars first began to study environmental accounting in the 1990s, but it did not attract the attention of the government and most people, and the environmental protection laws and regulations were not perfect, which led to the relatively backward development of environmental accounting in my country. In the 1990s, the only laws related to environmental protection in my country were the Water Pollution Prevention and Control Law, the Environmental Protection Law, the Solid Waste Pollution Prevention and Control Law, the Environmental Noise Pollution Prevention and Control Law, and the Marine Environmental Protection Law.

In the 21st century, my country's economic development has grown rapidly, and a large number of factories have appeared, which has led to aggravation of environmental pollution problems. The Songhua River's major water pollution in the century, the Yangdian dead fish incident in Hebei Province, and the Taihu Lake water pollution incident have caused an endless stream of incidents of environmental pollution caused by enterprises' disorderly discharge, which has caused the people and the government to attach great importance to environmental protection. Various ministries, commissions and bureaus including the State Environmental Protection Agency have carried out environmental protection actions to clean up illegal polluting enterprises, and investigated and dealt with a large number of illegal polluting enterprises. The original environmental protection laws have been revised and improved, and a considerable number of new environmental protection laws and regulations have been formulated. Up to now, there are more than 30 national environmental protection laws and regulations, and various provinces, autonomous regions, and municipalities have also formulated relevant local laws and regulations. Among them, the "Social Responsibility Clause" was added to the "Company Law" revised by the Central Government in 2006. Under this pressure, my country's listed companies and central enterprises have begun to actively disclose CSR reports, which has accelerated the process of my country's environmental accounting information disclosure. According to a survey conducted by my country's "WTO Tribune" Corporate Social Responsibility Development Center, the number of companies that disclose CSR information in my country has increased from 32 companies in 2006 to 631 companies in 2009.

Since 2012, the China Association of Environmental Journalists has issued the "Evaluation Report on Environmental Responsibility Information Disclosure of Listed Companies in China" every year, which counts the number of companies that have issued relevant environmental responsibility reports, social responsibility reports, and sustainability reports among listed companies on the Shanghai and Shenzhen stock markets. data. According to the latest "Evaluation Report on Environmental Responsibility Information Disclosure of Listed Companies in China (2019)", as of 2019, among the 3939 companies listed on the Shanghai and Shenzhen stock markets in China, a total of 1,006 companies have issued effective related environmental responsibilities. Reports, social responsibility reports, and sustainability report samples accounted for 25.54% of all listed companies, an increase of 78 companies from the previous year.

Table 3. Percentage of listed companies issuing environment-related reports in China, 2012-2019

Years	Percentage of listed companies in China issuing environment-related reports
2012	18.2%
2013	26%
2014	27.1%
2015	26.62%
2016	26.21%
2017	24.59%
2018	26.01%
2019	25.54%

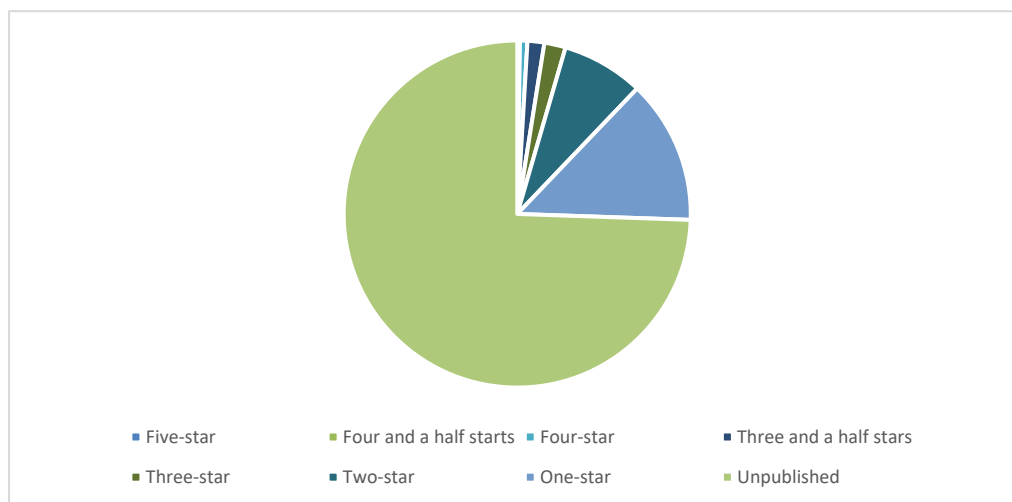


Figure 1. Distribution of environmental information ratings of listed companies in China in 2019

(Data source: "Evaluation Report on Environmental Responsibility Disclosure of Chinese Listed Companies")

As shown in Table 3, the percentage of companies issuing relevant reports in my country fluctuates between 25%-28% of the total number of companies throughout the year, and there is no obvious upward trend. In 2019, companies that did not disclose environmental responsibility information exceeded the total number of listed companies. Seventy percent of the related reports issued by companies are mostly one-star or two-star. It can be seen that most of the listed companies in our country have a very weak awareness of environmental

responsibility, and there is still a long way to go for the development of environmental accounting for enterprises in our country.

Table 4. Ratio of companies passing ISO14001 in China, 2017-2020

Years	Ratio of companies passing ISO14001 in China
2017	10.37%
2018	10.146%
2019	9.885%
2020	13.4%

(Data source: China Certification and Accreditation Administration Annual Report)

2.3. Summary

According to the comparison between Table 1 and Table 4, it can be seen that the proportion of listed enterprises that issue environmental accounting reports in China is still small. In addition the environment ministry action research for moderate enterprise to the environment of "making public environmental report of the listed companies accounted for" data China association of environmental journalists released a year compared to the standard of the evaluation of environmental responsibility information disclosure of listed companies in China report statistics object "publishing environment related reports of the listed companies accounted for". The ratio of listed companies that released environment-related reports is stricter and more accurate.

ISO14001 is an international standard for environmental management system certification issued by the International Organization for Standardization. Since 2007, my country has ranked first in the world in terms of the number of ISO-certified companies. In 2018, my country's ISO14001 certified companies accounted for 54.4% of the total number of ISO14001 certified companies in the world, while Japan's ISO14001 certified companies ranked first Second in the world, 6.5% of the total number of ISO14001 certified companies in the world. Although the number of companies that have obtained ISO14001 certification in my country far exceeds Japan and even the world, according to the Japanese Ministry of the Environment "Environmentally Mild Corporate Action Survey" and the data published in the annual report of the China National Certification and Accreditation Administration The ratio of the total number of enterprises is only one-fourth that of Japan.

3. Comparative Analysis of Environmental Accounting Information Disclosure Cases of Chinese and Japanese Enterprises

3.1. Case Company Profile

(1) Overview of Guangzhou Baiyunshan Pharmaceutical Group Co., Ltd.

Guangyao Baiyunshan was founded in 1997, its full name is Guangzhou Baiyunshan Pharmaceutical Group Co., Ltd., and its headquarter is located at the eastern foot of Baiyun Mountain, Guangzhou. In the first quarter of 2021, the revenue is 20 billion yuan, and the net profit is 1.627 billion yuan. It is one of the largest pharmaceutical enterprise groups in the country. At the same time, it is ranked 184th in the 2021 Fortune China 500 list. Guangyao Baiyunshan aims at the responsibility concept of "Guangyao Baiyunshan, with love for the world", pursues sustainable development strategy and management, and has issued an independent social responsibility report every year since 2008. Guangyao Baiyunshan is not only excellent in product quality, but also excellent in social responsibility and corporate

environmental information disclosure, and it is in the forefront of most other companies in my country.

(2) Overview of Daiichi Sankyo Co., Ltd.

Daiichi Sankyo Co., Ltd. (hereinafter referred to as Daiichi Sankyo) was formed by the merger of Daiichi Pharmaceutical and Sankyo Pharmaceuticals in 2005, and is headquartered in Nihonbashi, Tokyo. In 2021, the revenue is 54.043 billion yuan, and the net profit is 4.267 billion yuan. It ranks 4th in the revenue and profit rankings of Japanese pharmaceutical companies in 2021, and ranks 614th in the 2020 Forbes Global 2000 list. A well-known multinational pharmaceutical group within the scope. Japan's Daiichi Sankyo introduced environmental accounting in the year of merger in 2005. Although it is relatively late to other Japanese companies, it has formed a very complete environmental accounting system. Environmental data manuals are issued every year and reviewed by a third party.

3.2. Comparison of Environmental Accounting Information Disclosure Basis

(1) Comparison of the basis for environmental accounting information disclosure

Table 5. Comparison of the basis of environmental accounting disclosure in Daiichi Sankyo and Guangyao Baiyunshan, Japan

	Daiichi-sankyo Japan	Guangyao Baiyunshan
Earliest disclosed year	2005	2008
Basis of preparation	GIR "Sustainability Reporting Guidelines 3.1"	China State Council's "Framework for the Preparation of Corporate Environmental Reports"
	Ministry of the Environment of Japan "Environmental Report Guidelines"	Shenzhen Stock Exchange "Guidelines on Social Responsibility of Listed Companies"
		the State Environmental Protection Administration of China "Guidelines for the Preparation of Enterprise Environmental Reports"
Environmental laws and regulations	More than 700 environmental laws and regulations	More than 20 environmental laws and regulations
Disclosure Location	Official Website - Sustainable Development - Promotion of Environmental Management - Environmental Report - Environmental Data Book	CSR Report
Third Party Review	Third-party opinion of Japan Research Institute, Inc.	/

It can be seen from Table 3 that the earliest disclosure of environmental accounting data by Daiichi Sankyo was in 2005, only 3 years earlier than Guangyao Baiyunshan. The compilation of Japan's Daiichi Sankyo Environmental Data Sheet is based on the "Sustainability Reporting Guidelines Version 3.1" promulgated by the international organization GRI (Global Reporting Initiative) and the "Environmental Reporting Guidelines (2012 Edition)" promulgated by the Ministry of the Environment of Japan , And Guangyao Baiyunshan is based on my country's "Corporate Environmental Report Preparation Guidelines", "Listed Companies' Social Responsibility Guidelines" and "Corporate Environmental Report Preparation Guidelines". The disclosure of information is more in line with globalization. From the difference in the number

of national environmental protection laws and regulations that the two companies can rely on, it can be seen that my country's environmental protection laws are not as perfect as Japan, and the requirements for corporate environmental accounting information disclosure are not strict enough. In addition, Japan's Daiichi Sankyo's environmental data book can be easily found on the company's official website or the "Environmental Report Collection" of the Ministry of Economy, Trade and Industry of Japan, while the CSR report of Guangyao Baiyunshan should be found on the key quantitative indicator database website. It is inconvenient for people to obtain relevant information. Finally, Japan's Daiichi Sankyo's environmental data book is reviewed by the Japan Research Institute Co., Ltd. for third-party review and comments, while the CSR report of Guangyao Baiyunshan does not involve a third party, and is completely calculated, compiled, and published by the company itself.

(2) Comparison of environmental accounting information disclosure content

Table 6. Disclosure of environmental accounting by Daiichi Sankyo Japan

	2016	2017	2018	2019	2020
Water consumption(thousand cubic meters)	10986	10311	9867	8894	7926
Discharge volume (thousand cubic meters)	9934	9856	9476	8797	7789
Waste generation (t)	20610	14682	14684	17371	17362
PRTR substance (t)	3182	1278	1798	2301	2063
Electricity (kWh)	190635000	179783000	171119000	162682000	154008
Kerosene (L)	258000	278000	320000	276000	228000
Diesel fuel (clear oil) (L)	1000	5000	1000	1000	1000
Diesel fuel (heavy oil) (L)	3000	11000	10000	0	0
Natural gas (ten thousand cubic meters)	3570	3298.8	3120.3	2867.8	2436
Carbon dioxide (t)	176732	165933	156323	144204	130572
Liquefied natural gas (t)	0	0	0	0	0
Liquefied petroleum gas (t)	11	10	10	10	7
Gasoline (L)	2559000	2685000	2582000	2434000	1879000
Nitrogen oxides (t)	48.9	36.4	40.6	45.4	43.1
Sulfur oxides (t)	0.3	0.2	0.6	0.8	0.8

Although Japan's Daiichi Sankyo introduced environmental accounting only three years earlier than Guangyao Baiyunshan, Japan's Daiichi Sankyo has formed a complete environmental accounting information disclosure system since the year of introduction, and past data are clearly displayed on the official website. When displayed, everyone can simply find all environmental accounting data of the company in previous years. However, because the environmental accounting information disclosure system of Guangyao Baiyunshan is still not perfect, the information and data released every year will be adjusted, and the CSR report is not displayed on the official website of the company, so the data and data of environmental accounting-related information are quite Too many blanks. Compared with Japan's Daiichi

Sankyo, the classification of environmental accounting-related data released by Guangyao Baiyunshan is more accurate, such as wastewater discharge. Guangyao Baiyunshan is divided into industrial wastewater discharge and office and domestic wastewater. Waste is also divided into two categories. Pharmaceutical waste and waste, other hazardous waste and general industrial waste. Although Japan's Daiichi Sankyo's classification of relevant data is not as accurate as Guangyao Baiyunshan, the amount of data disclosed is larger and more diverse than Guangyao Baiyunshan.

Table 7. Disclosure of environmental accounting by Guangyao Baiyunshan

	2016	2017	2018	2019	2020
Gasoline (L)	43125	274463	389223.3	412645.38	419207.94
Diesel (L)		471993	429664.22	495769.12	636915.14
Coal (t)	1611	11931	0	0	0
Natural gas (ten thousand cubic meters)	111.19	1475	1940.89	1866.48	
Purchased steam (t)	3218	16605	5019.43	8845.94	20490.97
Purchased electricity (kWh)	114866517	109594800	118528016	103635035.2	129487369.0
Comprehensive energy consumption tec (t)				86740.14	
Nitrogen oxides (t)	68.35	24.59	20.14	15.72	14.6
Sulfur dioxide (t)	7.44	5.42	4.85	3.45	1.3
Total water consumption (t)	3064795		3493349.95	3323766.3	2659499.29
Industrial wastewater (t)		2528752	1637646.8	1776125.6	1696459.47
Office domestic wastewater (t)			461596.11	455132.49	537530.19
Ammonia nitrogen emission (t)		3.33	10.86	10.88	3.03
Pharmaceutical waste products and waste drugs (t)			224.07	284.85	287.03
Other hazardous waste (t)			549.63	1010.85	189.96
General industrial waste (t)			2844.71	1797.73	2553.00

3.3. Problems in the Disclosure of Environmental Accounting Information of Chinese Enterprises

(1) Relevant laws and regulations are not perfect

The Ministry of the Environment, the Japanese supervision agency responsible for protecting the natural environment, preventing pollution problems, and countermeasures against waste, has made great efforts to improve Japan's environmental protection and environmental

accounting system, and has formulated a lot of laws and regulations to improve environmental protection and regulations. The problem of corporate environmental pollution has given Japan a legal basis for environmental protection issues.

Although my country's State Council and other relevant departments have also formulated a considerable number of environmental protection related laws, through a comparative analysis of the situation in Japan, it can be found that there are still many gaps in my country's environmental protection laws, and the relevant laws and regulations are updated, The revision work progressed slowly, the enforcement of relevant laws was not strict enough, and the punishment was insufficient. The problems of insufficient legislation and lax enforcement still need to be resolved.

(2) Insufficient awareness of environmental protection

Since the four major public hazards in the last century had an extremely bad impact on Japan, and the shadows they caused were deeply etched in everyone's mind, the whole country of Japan paid special attention to environmental protection.

With the rapid development of our country's economy, our people are paying more and more attention to the standard of living. However, the awareness of environmental protection is still insufficient, and there are still many behaviors such as throwing garbage, dumping sewage, and using large amounts of disposable products. Only about 30% of listed companies publish environmental reports, and a large proportion of employees and even management personnel in companies do not know the concept of environmental accounting.

(3) Incomplete supervision system related to environmental accounting

Through the comparative analysis of the environmental accounting-related supervision systems of the two countries, it can be concluded that the environmental accounting supervision system of our country is not perfect enough, so that the environmental accounting information disclosure of enterprises is scattered. Among the companies in my country that publish effective samples of relevant environmental responsibility reports, social responsibility reports, and sustainability reports, most of the companies' accounting, production, and publication are done independently by their own companies, and the content completed by the companies based on their own interests is unfair and unfair. Comprehensive possibilities.

3.4. Suggestions on Improving Corporate Environmental Accounting Information Disclosure

(1) Improve relevant laws and regulations

China can learn from the relevant experience of more advanced countries in the development of environmental accounting, such as learning from Japan's environmental accounting Guidelines, unified definition of environmental accounting and related content and listing cases of environmental accounting in private enterprises; Every year, the government makes statistics on the popularization and introduction of enterprise environmental accounting and makes it uniformly public on the government website; For example, relevant guidelines such as Japan's Environmental Protection Cost Guide are issued. Environmental protection cost refers to the cost used by enterprises to restrain environmental pollution caused by enterprise activities, which is defined by the government and the specific calculation method of environmental protection cost. The above content is conducive to the enterprise environmental accounting information disclosure and the unification of the content.

At the same time of perfecting relevant laws, since the current laws in China punish enterprises' environmental pollution lightly, law enforcement and punishment can be strengthened, and special relevant departments should be set up to supervise the authenticity, standardization and unity of enterprises' environmental accounting information disclosure. On the other hand, we can give rewards to enterprises that actively disclose corporate environmental accounting

information while strengthening the punishment. The establishment of corresponding reward mechanism is conducive to improving the enthusiasm of enterprises.

(2) Improve the overall awareness of environmental protection

A special department or person in charge may be set up inside the enterprise to promote environmental protection; According to the survey data of the Ministry of Environment of Japan, 78.3% of Japanese listed companies conducted environmental education for their management and staff in 2018 and 80.7% in 2017. It is very necessary to regularly carry out publicity activities on environmental protection knowledge and environmental accounting information disclosure knowledge. It is beneficial to enhance the importance of environmental accounting information disclosure of enterprises as a whole and improve the awareness of enterprise managers of environmental accounting concept.

In 2020, the Engel coefficient of China's national residents reached 30.2%, which has reached the level of wealth. We should seize this opportunity to improve the overall awareness of environmental protection, strengthen publicity, and promote the concept of environmental accounting to enterprises and citizens, laying a good foundation for future development.

(3) Standardize the supervision system of environmental accounting

Standardizing and perfecting the environmental accounting related supervision system can start from promoting the development of third-party examination institutions. The government can formulate the third party environmental accounting review benchmark, unified the third party of enterprise environmental accounting review standards and review content. And unified certification of enterprise environmental accounting third-party certification institutions, through the certification of professional third-party institutions can be more objective and fair to complete the audit of environmental accounting, to ensure the quality of the report, but also to facilitate government management. Furthermore, special environmental accounting audit institutions can be set up or support to promote the development of external environmental accounting review institutions, responsible for the audit of enterprise environmental accounting, verification of the authenticity of relevant reports and evaluation of enterprise environmental accounting, outlook and so on.

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