

Research on Green Logistics Development at Home and Abroad

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Abstract—green logistics was proposed in the early 1990s, since then, the governments, the academia and the business community around the world has paid a lot of attention to it. Green logistics is based on the sustainable development, resource conservation and environment friendly. It can help us to deal with the relationship effectively between the logistics development, environmental protection, and make the economic interests, social interests and environmental interests unity. At present, the development of the green logistics in China is still relatively backward. In order to accelerate the development of the green logistics in China and improve its quality, this paper collected and collated some successful practices and experience of other countries by the methods of the literature analysis and summarizes. Combined with the national conditions of china, this paper proposed some suitable measures and recommendations, and they will have the actual significance to improve the logistics level.

Index Terms—green logistics, sustainable development, ecological economy, green production, green consumption

I. INTRODUCTION

With the rapid development of social economy and the greatly enhance of the human material civilization, the resources on the earth have been dwindling, and the living environment of human beings is facing with more and more threats. In this context, a wave of "green wave" is raised in the global in 1990s, and green movement are infiltrating to all areas. Modern logistics industry is the backbone of national economies, and its comprehensive and relevance are strong. With the emergence of new economic, such as information economy and network economy, the logistics has been given new knowledge, new technology and new management thought, and logistics industry has developed to the direction of the specialization and scale. But with the increase of the amount of logistics, changes of logistics management and large scale of the logistics facilities and tools, the influence of the logistics system on the ecological environment has become more and more serious. To solve this problem, the concept of "green logistics" was born in some developed countries. At present, green logistics is still a full new concept, and it is lack of

mature theoretical system, but the social and economic value it appears is enormous.

II. THE CONCEPT OF GREEN LOGISTICS

Green logistics is a new topic proposed in the 90s of the 20th century. As well as the concept of the logistics, there hasn't a mature definition for the green logistics so far. The scholars at home and aboard have different descriptions on the concept of the green logistics.

H.J.Wu and S.Dunn thought that the green logistics was a logistics system responsibility to our environment, and it included not only the green forward logistics process, from the acquisition of the raw material, production, packaging, transportation, warehousing and finally the arrival to the end user, but also the reverse logistics of the waste recovery and disposal[1]. The Reverse Logistics Executive Council rose in a paper: the green logistics attempts to measure and minimize the ecological impact of logistic activities.

"Green logistics", written by Bjorn N.Petersen and Palle Petersen, published in Danmark, define the green logistics as the eco-management of the forward logistics and the reverse logistics.

"Logistic term", published in the year of 2001 in china, definite that green logistics is to reduce the harm to environment in the process of logistics, at the same time, to purify the logistic environment and take fully advantage of the logistics resource.

ChunYu Xia, JianSheng Li, working in the Northeast University, thought in their published works "Green logistics": Green logistics is aiming at reducing the environmental pollution, reducing resource consumption, using the advanced logistics technology to plan and implement the transport, storage, packing, loading and unloading, circulation processing and other logistics activities, and it is a green economy management process which is connecting green supply body and demand body, and overcoming effective and rapid green goods and the service flow which is hindered by space and time.

Changqiong Wang, working in Wuhan University of Science and Technology, defined in his "Green logistics": Green logistics is a process which is aiming at reducing

the environmental pollution and reducing resource consumption, through advanced logistics technology and facing to the environmental management ideas, to plan, control, manage and implement the logistics system.

Ning Gu listed eight elements of green logistics , and intensified resources, green transportation, green storage, green packaging ,green loading and unloading, green distribution processing, green information collection and management and waste recycling[2].

Shepherd and Gunter presented the latest taxonomy of performance measures in general and classify them as quantitative or qualitative; by what they measure (cost and non cost); by their strategic, operational or tactical focus and the process they are related to in logistics integration process[3] .

Aronsson and Brodin also discussed that a commonly suggested performance measure of the logistics systems' environmental performance is emissions in their comprehensive literature review [4].

Abdelkader Sbihi and Richard W. Eglese described the green logistics as following: Green Logistics was

concerned with producing and distributing goods in a sustainable way, taking account of environmental and social factors [5].

Jiaqing Sun thought life cycle assessment (LCA), whose major application field was marketing, was mainly used for quantitative analysis and comparison of environmental impact of alternative products [6].

Although the experts and scholars' descriptions at home and abroad on the green logistics are different, they points out the essence of green logistics that is the sustainable development of the logistics. Combined with the experts and scholars, this paper presents the definition of green logistics as follows:

Green logistics can inhibit the damage of the logistics to the environment during the logistics process, achieve the purification to the logistics environment, and make the best use of logistics resources [7]. Based on the concept of sustainable development, this paper gives a constitute system diagram of green logistics (Figure 1) [8].

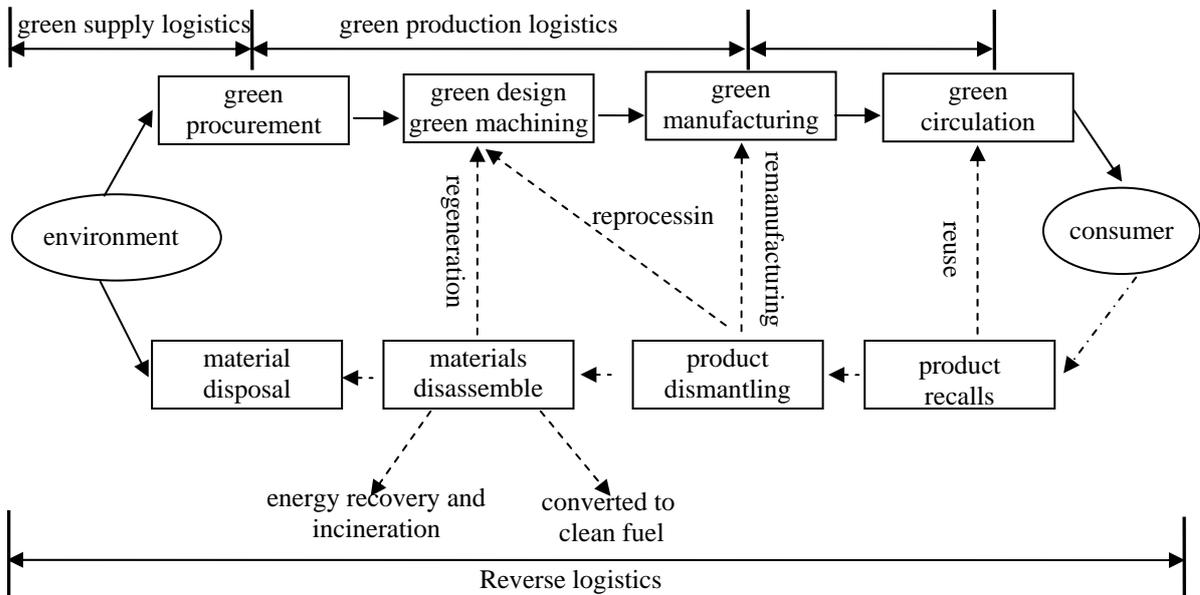


Figure 1. Green logistics system

III. DIFFERENCES BETWEEN GREEN LOGISTICS AND TRADITIONAL LOGISTICS

The differences between traditional logistics and green logistics are as shown in Table 1.

TABLE I.
DIFFERENCES BETWEEN GREEN LOGISTICS AND TRADITIONAL LOGISTICS [9]

	traditional logistics	green logistics
ultimate goal	To achieve high efficiency of logistics as the ultimate goal, and to the environmental degradation as the cost.	To achieve sustainable development as the ultimate goal of, and to logistics technological progress and innovation as the basis. While pursuing of logistics efficiency, eliminates gradually the impact of the logistics process to the environment.
actors	Only to the logistics business itself as the actors, it's difficult to realize the integration and optimal allocation of the resources	The actors not only include logistics enterprise itself, but the manufacturing and retail enterprises in the upstream and downstream of the supply chain. Therefore, the actors can achieve effectively synergy, integrate the existing resources, reduce the waste of resources, and improve resource utilization.

IV. GREEN LOGISTICS DEVELOPMENT ANALYSIS IN ABROAD

This paper summarizes and analyzes the green logistics development of Germany, the United States and Japan. Green logistics is relatively well-developed in the three countries. This study can suggest a direction for the green logistics development in china.

A. Germany

The logistics capability in Germany is ranked first in the world, and it represents the development direction of the global logistics industry. At the same time, Germany's green logistics also has a leading position in the world.

- Establish the transport network of low-carbon emissions. According to the research, throughout the logistics links, the road transport is the largest part of carbon emissions. In order to reduce carbon emissions, they transport mainly by train or ship in German. They already have a perfect network for the transport by rail and ship, and already have more than 50 logistics villages [10].
- Collaborative transport mode of the green intermodal. Intermodal is the means that operators take at least two different modes of transport to transport. Green intermodal is the means that operating vehicles must meet the environmental requirements and the driver must know the energy saving technologies. Dates show that the green intermodal transport mode is slower one day than the road transport, but carbon emissions reduce by 70%. Moreover, using energy saving equipment, government will give

some corresponding subsidies. Energy saving driving training to the drivers can save fuel 10-20%. In addition, Germany's medium and small enterprises often have their own advisory team, and they can provide the most scientific design for establishing the green intermodal mode of their own.

- Use the leasing widely. The logistics enterprises

logistics system	Only considers the forward logistics from resource extraction to product and consume, and neglects the reverse logistics that the waste materials, recycling of renewable resources formed	It has the circular characteristics. It can consider the green aspects of the forward logistics, but also consider the reverse logistics system of green in the supply chain, including the recycling of the waste of resources, the recycling of the waste materials, the collection of the resource waste and so on
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in Germany use commonly the leasing of transportation. According to the latest survey, transport trucks on the road in Germany almost 80% are leased. The government usually gives some financial support about the highway charges, and the government will have the corresponding subsidies to the leasing vehicles.

- The perfect green logistics training model. Germany pays more attention to the green awareness propaganda to the customer and trains the staff. And the training is mandatory, that is, all the company employees must participate. According to the survey, its advanced modular logistics training model is composed of more than 300 modules, involving more than 5,000 types of logistics.
- Advanced green logistics technologies. Germany pays more attention to the R&D of green logistics technology; meanwhile, Germany is the world's largest exporter of green logistics technology. In 2006, German exports of green technology have close to 100 million Euros, and increases more than 20% than 2005. Germany pays more attention to the application of scientific and technological means and the use of computer information, for example, from the GPS to the team's information management and to the ultimately track positioning systems. The help of the computer information management to logistics companies is obvious. In addition, the German commonly used removable container, so that idle rate of the trucks can be reduced by 30% to 40%, which greatly improve the use efficiency of trucks.

B. The United States

The United States is one of the first countries developing the logistics industry in the world. According to the statistics, there are five U.S company in the top ten logistics companies in the world [11]. In the economic and social environment of the logistics highly developed, the U.S. government constantly adjusts the macroeconomic policy to ensure green logistics

development promote the development of socio-economic development. The United States in its 2025 "National transportation science and technology development strategy" set the overall objective that transportation industrial structure or transportation science and technology progress is as follows: "to establish safe, efficient, adequate and reliable transport system, its scope is international, form is comprehensive, characterize is intelligence, and the nature is environment-friendly [12]".

- Green supply chain management. Implementing green management to the supply chain is a kind of environmental protection and ecological management from the supply of raw materials, purchasing, production, use, consumption, to waste recycling, reuse of the whole process. The core of management is to make the whole supply chain harmonization in environmental management, and make the environment and green [13]. Green supply chain management has been begun in the United States in 1999.
- Pay more attention to reverse logistics. When developing environmental policy objectives, the environmental analysis experts in U.S usually to "minimize the impact on the environment" as the target. They advocate usually the policy and strategy, such as minimizing resource consumption, wasting reduction and improving environmental quality, and so on. In the US, many companies have established reverse logistics management systems, aiming at product returns, repair and waste recovery. They take the initiative to extent their responsibilities in order to enhance their competitiveness. For example, the IBM Company set up a global recycling service center in the late 90s, responsible for the worldwide recall of all products business. IBM donates the recalled products to charity, making them service to society, conserving resource, or uses them in the production after being processed to reduce production costs. According to statistics, there are 120,000 auto recyclers in U.S. and their annual turnover is several billion dollars, it is a profitable industry.
- Use green packaging. In 1960s, the United States began to pay more attention to packaging and environmental protection. The several reasons ensure the green packaging in the United States implement smoothly.

The perfect legal protection: The U.S. government mandatory recycles packaging waste and promotes the use of renewable resources by formulating laws and regulations, environmental advocacy and the R&D of the green new materials and so on. By 1988, 21 states in the United States had enacted laws and regulations to restriction and prohibition the use of certain plastic packaging products.

The implementation of environmental labeling system: By 1988, there had been 36 states in the United States implementing the environment through joint identification system by joint legislative. The main

approach was: to promote the use of "green flag" or "renewable signs" in some plastic containers or packaging, to tell consumers which can be regenerated to use. These practices make the legal regulation of the United States about green packaging achieve remarkable 1 result. A market survey of the United States display: due to the impact of green packaging, people's consumption habits have gradually changed. More and more consumers want to use recycled paper board packaging and hope the packing can be marked with the symbol of recycled 100%.

Packaging industry improves continuously the green program: At present, the packaging industry in the US mainly uses two kinds of green programs: First, a 15% annual reduction in consumption of raw materials; Second, the utilization of packaging products for recycling is at least 20%. Many states have passed legislation to determine the recovery of packaging waste fixed, and formulated any company can apply for tax exemption as long as certain provisions of the recycling packaging waste utilization. Through these regulations, the United States in the recycling containers has made remarkable achievements, the amount of carton packaging recycling up to 4 million tons each year, and they can be reused after being treated.

R&D of new environmentally friendly packaging materials: Some companies and research institutions in the U.S. develop and introduce continuously new environmentally friendly packaging materials. For example, scientists in the US have invented a low-cost, environmentally friendly fast-food packaging materials, and this material is made of wheat straw fiber and wheat starch, this kind box can be completely degraded, and has good insulation properties; Hewlett-Packard has developed 12 type PC in the beginning of this century, each of which has only 3 screws, and it is convenient and easy to disassemble the computer to upgrade the maintenance update.

- Use advanced green technology. General corporate in the US use many advanced technologies during the logistics, such as transportation, distribution, packaging and so on. These advanced technologies include electronic data interchange (EDI), time production (JIT), distribution planning, green packaging, and so on. They can provide strong technical support and protection for the green logistics activities [14].

C. Japan

In 1956, Japan comprehensive imported a modern logistics management concepts from the United States, since then, the logistics industry has been as the lifeline of economic development of Japan, and the green logistics has been paid more attentions. The government of Japan and enterprises attach great importance to green logistics management. In 2009, Japan referred to build internationally competitive logistics market, and create to reduce the environmental load of the logistics system and a recycling society in the latest revision of the "integrated logistics facilities policy framework". Japan ensures the

implementation of green logistics mainly through the following aspects.

- Government formulates the relevant system. The government in Japan provides not only the specific planning and strong financial support to the green logistics, but also a good system of protection for the development of green logistics industry. In 1960s, the Japanese government began to attach importance to adjust the flow policy and formulate related functions of the regulations for the development of logistics. For example, proposing distribution facilities focus to move from the city center to outlying areas, to improve city traffic flow of skills, and to maintain the flow; implementing the "two kinds logistics law" to regulate the behavior of motor transport undertakings; imposing a lower emissions regulations of truck allow travel; drafting special legal protection to ensure the implementation of green packaging; developing the specific standards to control the problem of excessive vehicle emissions of carbon dioxide; implementing the relevant laws and regulations to encourage the recycling of resources, and so on.
- Government formulating the target value of green logistics. In order to reduce the load of the logistics to the environment, Japan introduced specifically some specific target value of green logistics implementation, such as utilization of pallets of goods, the residence time of the goods stay in place, and so on. In 1989, Japan proposed three green logistics promoting objectives in 10 years target. They were: emission standards of the nitrogen compounds reduced the 3% to 6%, particulate matter emits reduced by 6%, and the sulfur components in gasoline decreased 10%. In 1992, the government of Japan announced limit law of the car nitrogen dioxide, and provided for 5 type truck allowing enterprises to use. At the same time, the government mandatory implement the regulation of the standards for low emission vehicles to travel of the in the specific metropolitan area; Up to 1993 year, except for some trucks, the enterprise must undertake the obligations of updating the old vehicles, and using new vehicles complying with environmental standards. In 2010, they developed the target that the utilization of the railway and maritime transport in long distance cargo transportation enhanced to 50% [15].
- Composite transport energy transport system. To address global warming, air pollution, traffic congestion, and energy constraints, and so on, the Japanese government and logistics industries actively in the implement the mode switch in transport, for example, to change the traditional way of the main motor transport, using the less impact on the environment by the railways and mainly in the form of maritime transport, shipping methods, within the city distribution system and adopt a common energy-saving drive. In particular, the implementation of a variety of transport modes and flexible way of converting the complex transport, play a road, rail and ocean shipping to their respective advantages to conduct various forms of combined transport of goods.
- Construct vein logistics system. Logistics system is equivalent to the human blood circulation system, which is made of arterial and venous. Arterial logistics refers to the logistics, begin obtain the raw materials from natural, through the semi-finished, products manufactured, and by the wholesale, retail and other circulation until the consumers. It is the equivalent of the arterial system of human blood circulation. Venous system is the logistics that from the consumer to the supplier or other materials recovery are upstream of the logistics channel, the equivalent of the venous system of human blood circulation. By constructing a complete venous logistics system, to promote the recovery and utilization of various wastes, conserve natural resources and develops renewable resource recycling (Figure 2).
- Green logistics cooperation. In order to improve the logistics efficiency, Japan has set up a "green logistics cooperation conference", and used to send grants and developed carbon dioxide emissions calculation methods to improve cargo owners and logistics coordination and cooperation among enterprises. In addition, to promote the development of green logistics cooperation, Japan has developed the overall program to guide the efficiency of city logistics city logistics of the operation. By promoting the logistics network facilities integrated and distribution business efficiency, to reduce environmental impact and improve the regional activity [16].

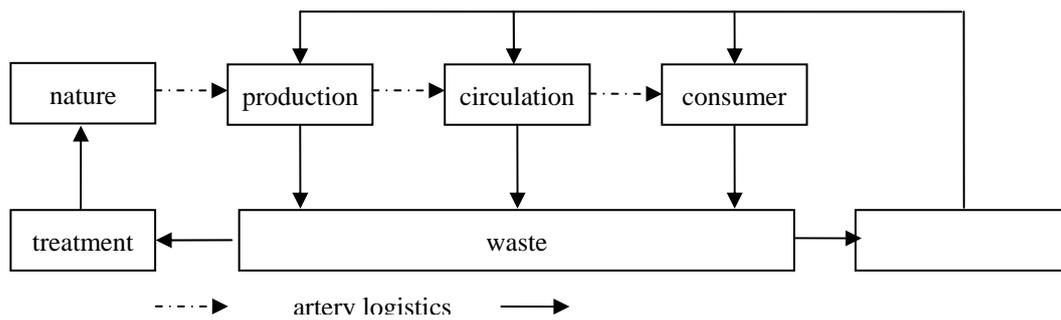


Figure 2. Logistics system diagram

V. THE ENLIGHTENMENT OF GREEN LOGISTICS ABROAD TO CHINA

A. Establish the Concept of Green Logistics

Establishment and development of Green Logistics is the effective convergence of the green production and green consumption. The whole society must establish the concept of green logistics. Firstly, the government must take all measures to vigorously promote and advocate the green logistics, so that people insight into the concept of green logistics, green logistics to create a favorable environment; Secondly, enterprises should organize staff to join in training in time, change the traditional concept of employees, and establish a full new logistics concept, encourage their employees to green procurement, green production, green marketing, green logistics, green finance, etc; Finally, the consumer should strengthen constantly their awareness of green consumption, and use this awareness to stimulate enterprises' green action.

B. Accelerate Infrastructure Construction

Compared to the countries with developed logistics, there are many deficiencies of the current logistics level in china in the basic platform construction, , such as transport, storage facilities, upgrading is not timely, distribution processing, logistics and information services, inventory management, logistics, cost control and other logistics value-added services equipment a lot lacking.. We can start from the following aspects:

- We should carry out the rational planning and overall design to the existing logistics infrastructure to improve the efficiency and make their comprehensive performance play [17].
- Rebuild logistics infrastructure and make them macro-coordination and functional integration strengthen.
- Expand the investment scale of the transport infrastructure, and increase the construction intensity of road, rail, water, air, pipelines and urban facilities distribution.
- Strengthen the interface of various transport modes, accelerate the improvement of integrated transport network, and develop greatly multimodal transport [18].

C. Develop Multimodal Greatly

It is difficult for a single transport mode to efficiently complete the transportation task perfectly. Road, rail, water, air and other modes of transport have their own time and space characteristics. Therefore, enterprises should combine with the characteristics of a variety of transport modes, select the best combined transport program according to the principle of reducing pollution, improving the efficiency and effectiveness, and build a logistics and transport networks of energy-saving, environmental protection, efficient [19].

D. Establish Green Logistics Recycling Network System

Constructing advanced and comprehensive recycling green logistics network system of renewable resources is making information technology marry to recycling logistics industry. The aim is improving resource utilization and constructing a saving society. The measure is good to transform economic growth pattern, achieve sustainable development. Establishing green logistics recycling system changes the one-way flow characteristics of traditional logistics, and it is the key ring making green logistics and circular economy as closed-loop system [20].

E. Green Logistics Mechanism Innovation

The development practice of the green logistics in Western developed countries has proved: Green Logistics can form gradually the environmental industry by the market mechanism. Therefore, in order to ensure the smooth development of green logistics, we need optimize purposefully all relevant factors combination of green logistics, and offer innovative activities in the form of operating mechanisms to form and enhance the power of the green logistics system running evolution (Figure 3) [21].

F. Industry-university-research Cooperation, Develop High Technology

The development of the green logistics can not without innovation and use of the high technology. The economic and environmental goal pursuit green logistics pursuits will be difficult to achieve without the input of the advanced technology.

If the logistics enterprises blindly emphasize the production capacity, but neglect the innovation capacity,

it could make the logistics industry be in the low-end of the high technology industry's and value chain for a long time, and their core technologies and legitimate interests could always be controlled by others.

Therefore, the government, enterprises, research institutions and institutions of higher collage must be closely coordinated, accelerate the establishment technological innovation system of enterprises-mainstay, market-oriented and industry-university-research cooperation, and guide and support the innovative elements gather into enterprises, promote scientific and technological achievements to convert to practical productive forces, and promote the innovation and development of green logistics in china[22]. High-tech

innovation and development is inseparable from the support of all levels of government, our government at all levels should increase high-intensity R & D investment to ensure that enterprises, research institutions and universities have sufficient R & D funding. Logistics technology development through high-density, high value-added logistics services, protection of the environment and the low carbon economy achieving the goal; by developing high-tech, foster a new round of technological innovation, efforts to address the transport of the noise, pollution, gas emission, traffic jams and waste production and improper handling of life and many other issues, and create a new situation of innovation and development of green logistics.

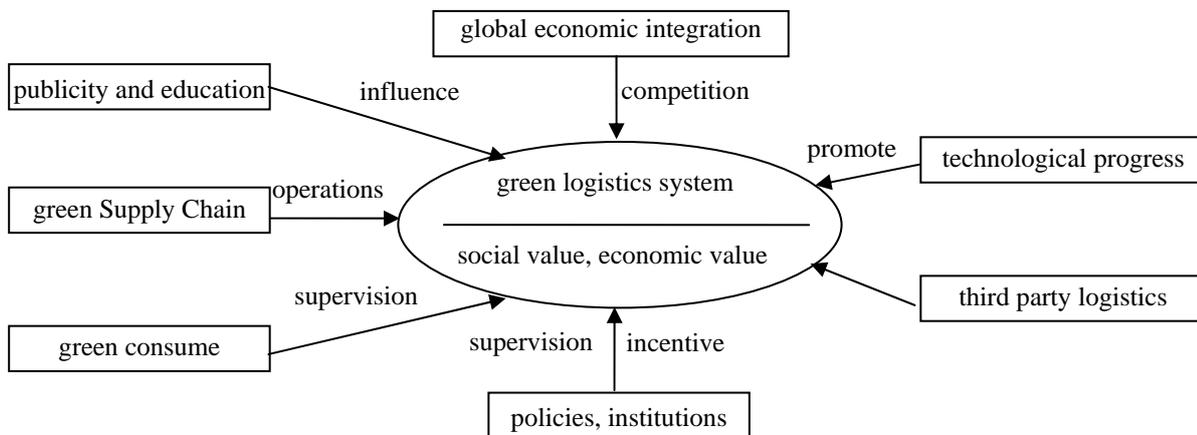


Figure 3. Mechanism models of green logistics

G. Professional Green Logistics Personnel Training

Promoting the development of green logistics needs solid theoretical guidance, perfect hardware facilities and scientific support of logistics technology, and these are inseparable from the professional training. Therefore, training and bringing up a large number of logistics personnel familiar to green theory and practice is urgent. We should vigorously develop high quality and complex logistics personnel by universities, businesses and community resources. They should possess the following qualities:

- They should have a strong management desire and challenge spirit, and have the basic qualities of hard working, honest integrity and effective communication.
- They should have a broad base of knowledge, and master the knowledge of international trade and customs clearance, storage and transportation, financial cost management, security management and legal.
- They should understand not only the logistics technology, but also the logistics economy, not only familiar with the logistics management technology, but also master the supply chain process, familiar to software programs, e-commerce technology and information technology systems.
- They should fully grasp the transport, storage, packaging, handling, distribution processing

and information services and other basic skills [23].

ACKNOWLEDGMENT

The authors wish to thank two logistics and supply chain research scholars, Chengjiao Li and Rongzhun Cui. This work was supported in part by a grant from 2011 Harbin University of Science (HLJGYCX2011-007) and Technology graduate student Innovation scientific research fund project and Heilongjiang Province Natural Science Fund Project (G201108).

REFERENCES

- [1] Wu H J, Dunn. Environmentally responsible logistics systems [J]. International Journal of Physical Distribution and Management, 1995, 25(2):21-25.
- [2] Ning Gu. Study on Operation Mode of Green Logistics[c]. Intelligent Human-Machine Systems and Cybernetics, 2010 2nd International Conference in Dalian.
- [3] C. Shepherd, H. Gunter measured supply chain performance, and determined current research and future directions [J]. International Journal of Productivity and Performance Management, 2006: 124-139.
- [4] .H. Aronsson, M. Brodin. The environmental impact of changing logistics structure [J]. The International Journal of Logistics Management, 2002, 17(3): 113-127.
- [5] Abdelkader Sbihi, Richard W. Eglese. Combinatorial optimization and Green Logistics [J]. A Quarterly Journal of Operations Research, 2007, 5(2): 99-116.

- [6] Jiaqing Sun. Research on the Model of Transportation Mode Selection Based on Green Logistics[C]. Wireless Communications, Networking and Mobile Computing, October, 4th in 2008, International Conference in Dalian.
- [7] Yulan Tian. A comparative study on green logistics [J]. Logistics technology, 2008 (5): 131-132.
- [8] Zhao Shi. The basis of circular economy development of the modern Green Logistics. shanxi science and technology [J]. 2010,(25) : 4.
- [9] Huihui Xiao. Green Logistics in China under the new situation the development of countermeasures [J]. Business china. 2010, (5):195.
- [10] Jurgen. Germany's Green Logistics [J]. China Logistics and Purchasing, 2010,(22):78.
- [11] Rongying Li. Comparison and Implications for China [J]. Enterprise Vitality, 2007,(8):16.
- [12] Guo Ji, Hui Liang. The development of green logistics in foreign countries. China water transport newspaper, 2010-5-10.
- [13] Fang Yang, Feiyang Zhang. The development of green logistics experience abroad [J]. 2010: (22):142.
- [14] Modern. Logistics Research Center of Tsinghua University Graduate School. Green logistics development abroad and the gap to china [J]. Science and technology, 2010, (5): 19.
- [15] Gang Weng, Xu Jiang. Japanese green logistics development and its enlightenment [J]. Market Logistics, 2011, (1): 17.
- [16] Xiaopeng Zheng. Japan logistics development situation and policy. Modern logistics, 2008, (5):42.
- [17] Huijuan Yang. Green logistics development in China Problems and Solutions [J]. Cooperative Economic and Technology, 2011, (2): 7.
- [18] Zhao. Shi The basis of circular economy development of the modern green logistics [J]. Shanxi Science and Technology. 2010, 25(4):2-3.
- [19] Anxia Zhang, Fuwei Wu, Shuaijing Wu. Power of Green Logistics and measures of implementation [J]. Logistics Technology.2010, (8):68.
- [20] Guangming Xue. Construction of green logistics network for renewable resources. Shanghai Economy [J].2010, (9):37-39.
- [21] Honglin Chen. The mechanism of the development of green logistics Innovation [J]. Economist, 2010, (8):23.
- [22] Ya Gao. Logistics management the innovative development way of the Pearl River Delta [J]. Environmental Logistics, 2010, (12):17.
- [23] Weitao Song. Developing green logistics to promote sustainable economic development [J]. Modern Economic Information.2010, (19):171.

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