The Establishment of Green Logistics System Model

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Abstract: At present, China's logistics industry is a relatively young industry. Not only the supporting logistics infrastructure and the compatibility are relatively poor, the logistics technology and equipment is far behind the advanced country, but also the green level of logistics is lack of improper supervision and information technology and so on, It caused serious environmental pollution and waste of resources, With the rise of the Green Logistics activities through the world, the environmental protection standards are continuous improvement. To enhance our country's comprehensive competitiveness and the sustainable development capacity in logistics industry, Our green logistics system must be considered from an overall and from a macro perspective to layout the framework of Green Logistics System, In this paper, in accordance with the "system view", divides the overall framework of the Green Logistics as four parts which are integrated green logistics transport system, green logistics information system, green logistics supply chain system and green logistics management and supervision system.

Keywords: Green Logistics, Information Systems, Supply Chain, Infrastructure

1 Introduction

At the 21st century, with China's social and economic development, the logistics industry as a large consumption of energy, fuel as well as huge noised and emissions of serious damage to the environment, both to meet the consumers needs and creating a commodity effectiveness utility in time and space, at the same time, which goals are conflict with the emphasis on maintaining the natural ecological balance and protection of natural resources, In this development process, which underlines a strong external diseconomies, "Sustainable development" has become a problem. In the present the growing awareness of environmental protection and natural resources in the context of declining, Building a environmental symbiosis green logistics system have become a inevitable development of modern logistics, as well as a very important part of promote socio-economic sustainable development society. In accordance with the ultimate goal of green Logistics, to explore the law of development of logistics activities, and to build a green logistics system based on the scientific development concept, these field have become an important issue in our modern logistics industry.

"Green Logistics" includes two aspects of the meaning: On the one hand the green logistics are these operations in all process of environmental performance (behavior), on the other hand the green logistics refers to through the effective logistics operational mechanism or see logistics activities as a carrier to improve and achieve organizational or social environment performance (behavior), Correspondingly, so naturally, there are two aspects of green logistics management meanings: first one is against itself the environmental factors in logistics activities and management in environmental behavior. In other words, In achieving the lowest logistics cost not only must achieve a satisfactory service level towards users, at the same time, but also need to protect human health and ecological environment away from the harm impact of logistics activities. second, the meaning is through the activities of logistics planning, organization, coordination and controlling in a series of management activities to improve and enhance the environmental performance and satisfy the organization and social purpose.

Constructing an environment symbiotic green logistics system is a inevitable trend in developing of a modern logistics. Green Logistics both has a social value and economic value, and its ultimate goal is "sustainable development". Based on the logistics activities have impacts on the society environment and economics sustainable development, so the green logistics system must include green management,
green information systems, green supply, green production, green transportation, green distribution, green packaging, green distribution processing and waste recycling and so on. So we must take the corresponding countermeasures to build all-round development of the scientific system of Green Logistics.

2 Green Logistics System Model

The concept in developing green logistics should be viewed as an interconnected system. It is not only the logistics operator’s the main problems who faced in developing, which is also the government and the public’s problems who faced with. Green Logistics completion requires the close cooperation of many parts such as government, public, corporate and so on. If only emphasis on one or two sides of these main parts in the whole system, the green logistics may not be achieved.

The so-called system architecture, refers to the system’s the external and internal environment as well as the components in itself. Green logistics system is not an isolated system, which needs exchange information and energy with the outside world. So, building a green logistics system is a large integrated system. In this paper, the green logistics system can be divided into five both interlinked and antagonistic parts, which structure shown in Figure 1.

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Figure 1 Green Logistics System Framework Model

In the framework of the model of Green Logistics System, among these various subsystems there have many connects and mutual restraints associated with each other. However, all subsystems in the green logistics system model have the different positions and role, in this paper will make a describe in the next.

3 The Establishment of an Integrated Green Transport System

Green transport system is mainly in order to reduce traffic congestion, reduce pollution, promote social harmony and save the transport costs. Integrated transport is a complex product when human society and the transportation system developing into a certain stage. In market economy society, at the one hand the various modes of transport through a competitive provide quality transport service for national economy and people’s everyday living, however on the other hand, excessive competition between modes of transport will bring a huge waste of transport resources, such as duplication and waste of resources, etc. Therefore, establishment of an integrated system of green logistics infrastructure is the basis system for the entire green logistics system.

Any transport system is a combination of point, line and plane, so, in order to have a rational planning of the comprehensive green logistics infrastructure system we must put all three factors together. The relationship among them as shown in Figure 2 below:
3.1 Unified planning to construct of an integrated transport hub

Comprehensive regional transportation hub of plays an very important role in integrated green transport system, which is a backbone in connecting of road network and an inter-city transport corridor, so it have a direct impact on overall efficiency of transport systems. Therefore, the construction of an integrated transport hub should be under the principle of the systems engineering conception, which refer to must take information and intelligent as the goal and using modern management as a mean to reasonably organize the sea, land, air and various means of transportation. When selection an integrated transport hub location must try to avoid duplication, In ensuring of hub station's service coverage at the same time we must premise of minimizing the environmental impact from transport hub.

3.2 Take the full advantages of various means of transport

When face of the choice of different transport means, we should take full comparative advantages of water such as transport large freight volume, small footprint, low energy consumption, small pollution and fasten construction of waterway as one of the cargo distribution and transportation systems in major shipping ports.

3.3 Strengthen coordination of the various means of transport and establishment of environment-friendly integrated transport network

We should adjust the structures of integrated transport network and under the principle of saving resources, establishing a environment-friendly transport system, to promote build an integrated green transport system. In accordance with the principle of local conditions to optimize the allocation of transportation resources, and speed up the formation of convenient, smooth, efficient, environmental protection of integrated green transportation system.

4 Green Logistics Information System

We must establish a platform for information dissemination and sharing, because a perfect information system can provide the green logistics system’s members the real-time information and a precise monitor on very process of logistics activities such as the logistics members can achieve a real-time information and monitoring on product packaging, storage, transportation, distribution processing, loading and, handling, etc, in order to comply with the requirements of environmental development and will facilitate the implementation of environmental logistics decision-making. As shown in Figure 3 green logistics information system mainly consists of eight modules, next the paper will introduce them respectively.
Figure 3 Green Logistics Information System Structure

(1) Green Packaging Control System: Promoting production departments using as simple as possible and biodegradable material to product package, also in the circulation process, we should take some measures to achieve the rationalization result in packing, at the same time combination of others green system evaluation indicators to monitor and control the enterprise's products packaging.

(2) Green transport control system: When adopting of green transport control system we can take systematic measures to evaluate the activities causing goods damaged during transport and environmental pollution, etc. through the green transport control system.

(3) Green Warehouse Control System: Green Warehouse Control System is one of a series of system to monitor any non-green in warehouse sub-factors

(4) Green process control systems: Green processing system is a system to monitor productions from product places to final consumption places, and according to the need of implement packaging, segmentation, measurement, assembly, affixing price label, affixing brand label, commodity inspection and other parts we can take those parts under the green process system control.

(5) Green load and unload control system: Right across the transportation and logistics facilities, we must using this system to control activities which occurred in the transportation, storage, packaging or carrying of goods and so on.

(6) Green logistics evaluation system: Green logistics evaluation system which mainly includes four aspects: the environmental performance logistics system, resource performance logistics system, economic performance logistics system, technical performance of logistics systems.

(7) Green Logistics Management Decision Support System: this system the key goal is to establish various models of green logistics to give the members involved logistics the optimized decision-making and choices.

5 The Establishment of Green Supply Chain System

Construction of green supply chain is a material basis for the implementation of green logistics system, Green supply chain create a green environment for green logistics sustainable development, and pave a green channel towards to green logistics, as well as support and promote development of green logistics. Only concern on the true sense of the supply chain green processes and grasp the essence of green supply chain and start from reducing pollution and conserving resources, the supply chain management can achieve a real sense of the green operation, and get the substance environmental level, so ultimately achieve sustainable development.
As shown in Figure 4, the green supply chain model, which through specialized collection centers, it acceptance damaged returns, stock returns or end of life and discarded products from the supply chain’s downstream members such as consumers, retailers and distributors, if needed it can centralize recycling products and do some value recovery activities. The series of processing activities in value recovery activities either independently completed by the original manufacturer, or it can be completed by other companies. After the recovery value of the used parts or renewable resources can enter a old product chain, and may also expand into other product chain. In this green supply chain management system model, which collecting and recycling of waste that have been generated in manufacture, and connecting the traditional supply chain forward logistics with the reverse logistics reasonably, all the ting together form a cycle-based logistics system. In this condition, The resources in supply chain can be unified management and unified re-used, it ensured closely co-ordinate and efficient operation among members such as the upper, middle or lower of the supply chain, and enhanced the competitive advantage of supply chain, as well as can be cooperate with other supply chain to minimize the waste materials. Construction green supply chain- based logistics system should be follow the three levels: First, the supply chain enterprise must take measures to reach to green standards; Second, forming a common inter-firm green Platform and its network of green supply chain; The third is to extend the production chain and do best of reverse logistics, as well as enhance the feedback mechanism.

6 Green Logistics Management and Supervision System

6.1 Establish a modern government logistics management system

The implementation of green logistics is not only a matter of company, but also must from the perspective of government to strengthen management of the existing logistics system, and build a framework for green logistics management system to restrain the behavior of enterprises. From view of non-green factors that affect the logistics to management the key processes that affecting the implementation of green logistics. This paper argues that the main management must including these following aspects:

1. The management of pollution Sources, According to Air Pollution Control Act to regulate the emissions of waste, and refer to the NO\textsubscript{2} emissions amount from motor vehicles to restrict the types of vehicle on the road, to promote the use of eligible vehicles and promote the control of the vehicle noise.
2. Guiding the using of different means of transportation, Government should guide the rationalize using of different transport means, and encourage enterprises to select the appropriate mode of transport, With
taxes or administrative policies to improve the efficiency of company in the logistics and the pollution. Using common goals to improve the cooperation efficiency among supply chain enterprises, besides construction of logistics center can make a co-ordination among various enterprises which will can not only reduce pollution but also cut cost.

3. In order to control the traffic flow, the Government's main task is responsible for the construction of roads, and making a whole plan of road and railway development, modernize traffic control systems, Develop rules to control road parking activities, etc.

6.2 Consumer's monitoring toward green logistics system

Consumers have their own requirements for green productions, Green requirements is due to inherent human physiological mechanisms towards natural environment and ecology dependence. In the real market, the green requirement which has capacity to pay will convert into the green demand. Consumer demand for green production is a key drive for company taking measure in green logistics. With this strength, consumers play an important role in the green logistics management. First, the consumer’s green consumption patterns promote company implementation of environmental green logistics management. Second, Consumer behavior by consumers through the green requirement force enterprises to self-Logistics Management. In addition, consumers demanded the Government to formulate green logistics management rule through the public voice of green consumption.

7 Conclusion

Establishment of green logistics system, which requires that first establishing of prefect logistics hardware infrastructure, and software infrastructure (such as government and consumer’s supervision, laws and government regulations) to guaranteed. Through the establishment of Green Logistics System Architecture, we from the whole view to select the major component of green logistics, Including the Green Logistics Information System, Integrated transport system in Green Logistics, Green Logistics monitoring system, Green Logistics System, Green logistics supply chain system, etc. In this paper it analysis from different point of view of the process and means in implementing green logistics, so it can be give company and government the theoretical guidance in implement green logistics.

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