The Vital Role of Environmental Logistics in the Development of Circulation Economy

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[Abstract]: Environmental Logistics is the integrated use of logistics resources. It is the optimization of "economy-ecology-sociality" logistics cost and benefit and also a Symbiotic cycle of logistics pattern. The resources revolution patterns of enterprise interior production processes include green design, green choices of material, green working procedures and green packing. And the resources pasting patterns among enterprises are the supplier, the manufacturer and the seller —supply chains —who have the correlated benefit and should implement the union integration transportation pattern. The environmental logistics is the strut system of resources revolution for circulation economy development: the allocation and value increment of logistics resources; the transformation and value increment of logistics resources; as well as the value delivers and value realization of logistics resources. The environmental logistics is the way of maximum reducing operation cost that must be taken. The environmental symbiotic cycle of logistics could realize the exterior cost of circulation economy into interior control. The circulation economy request the environmental logistics' information promotion, integrated transformation and system innovation. The logistics industrial garden is the high-level shape of environmental logistics development.

[KEYWORDS]: Environmental Logistics, Circulation Economy, Logistics Industrial Garden

1. the Basic Features of Environmental Logistics

During the implementation process of the sustainable developmental strategy, environmental logistics as well as the function in the circulation economy development has arouse the economical scholars' interest day by day. Nowadays, the definition of

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logistics has the difference of broad sense and narrow sense. The narrowly viewpoint defines logistics as pure transportation or delivery, and in reality just renames the former transport company as logistics company. The broad viewpoint calls all economic activities as logistics, including all supply - production - sale active links. We believed that, the understanding of logistics could neither be excessively narrow nor excessively broad. Logistics is the pasting process happened in the economic activities such as the material supply, the production processing, stores and transportation, sale and consumption as well as the recycling processing. This meant that logistics exists in the entire economic activity and process. However, we also cannot sum up all economical processes as logistics process. Logistics refers particularly to the working procedure during which resources shift and the disposes from some economical pitch point to another and it needs the specific labor department and the personnel undertaking the function of material pasting in the entire economic activity.

The traditional idea of logistics purely emphases realization of material pasting between the time and spatial and the appraisal of efficient logistics is the realization of material disposition in the different spatial as quickly as possible. However, just as all economic activities bring exterior influence to the resources and the environment, logistics activity is bringing the more and more profound influence too. For instance, the different transport means as well as the energy consumption degree influence differently to the resources and the environment. Moreover, the unreasonable layout of logistics storage, which creates circuitously flow, both wasted the consumption of logistics resource and took up excessively logistics time and space. In recent years, people gradually discovered that logistics process further extended to the worn out goods recycling etc. after the expense domain. Thus it causes the people to reconsider the traditional non- long-enduring flow and proposes the new development pattern of environmental logistics

At present the scholars define the environmental logistics separately from clean production and green supply chain etc. We believed that, the clean production, the green supply chain etc. All regard the environmental logistics from the microscopic angle. Although all has its truth, it is only analyzed from the technical stratification plane. In fact, the environmental logistics has three different movement systems from macroscopic, central and microscopic stratification planes. Simultaneously, it manifests synthetically the basic principle of sustainable development from the ways of resources utility, bidirectional influence of resources and environment and economical growth way.

Therefore, we induct the basic characteristic of environmental logistics as follows:

(1) Environmental logistics is the integrated use of logistics resources

Generally believed, the fundamental mode of environmental logistics to the resource conservation is the resources decrement. But, the pure decrement can only be realized through reducing of logistics distance or improving transport means and cannot solve the resource conservation and usage question basically. But the integrated use of logistics resources is fundamentally changed the flows movement pattern. For instance, the appearance of the third party logistics and the four party logistics may integrate different enterprise materials in the same time and same space, achieving logistics resources sharing. The development of third party logistics, namely enterprises specially engaged in logistics which provide service for the supplier or the consumer, may consider the logistics rationalization from a higher wider angle, simplify the delivery link and carry on the reasonable transportation. And it is also advantageous to the reasonable usage and disposition of logistics resources in a more widespread scope, avoiding the questions such as the occupation of own fund, the transportation low efficiency, tedious delivery link, the enterprise burden aggravation and the urban pollution intensification etc. The appearance of specialized logistics enterprise could reduce the freight vehicle quantity and thus alleviate the logistics to the urban environment pollution pressure.

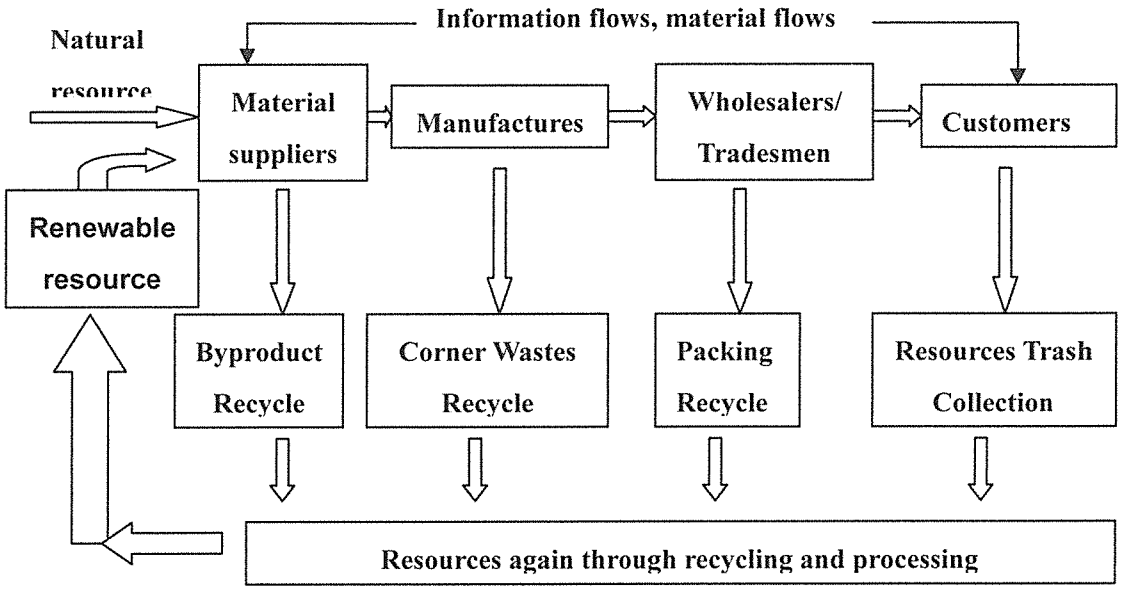

Figure1 Recycling Logistics System

(2) Environmental logistics is the optimization of "economy-ecology-sociality" logistics cost and benefit

The traditional logistic pattern computes the pure economic cost and benefit, namely as long as the logistics brings bigger benefit than cost; it is thought to be beneficial. In fact, logistics cost and benefit could all be displayed separately as the economic, the ecological and the social cost as well as the economic, the ecological and the social benefit. But the ecological and the social cost and benefit are often displayed through the externality and are not included in the logistics enterprise' cost accounting. For instance the air transportation certainly does not consider the ecological and social cost brought by the airplane noise to the inhabitant lives around the airport. Environmental logistics needs three-dimensional analyses to the logistics cost and benefit and realizes the optimization of three dimensional cost and benefit.

(3) Environmental logistics is a symbiotic cycle of logistics pattern

Environmental logistics emphasizes the general interest and the long-term benefit. And it also emphasizes omni-directional attention to environment and coexistence of environment and economy development. For instance, logistics process of closed circuit may realize the castoff reuse and the green containerized transportation and the green packing could reduce the packing material pollution to the environment.

2. The Main Patterns of Environmental Logistics

2.1 The Resources Revolution Patterns of Enterprise Interior Production Processes

2.1.1 Green Design

The green design is also called environmental design, face to the environment design, namely starting the endeavor of improving environment and pollution prevention from the product design. Introduce 3R (Reduce, Reuse, Recycling) design thought to the phase of product development directly, highly survey the entire life cycle of production from sustainable development, and first consider the environmental attributes such as detachability and recyclability etc. While satisfying the environment goal, guarantee the product physical items like basic performance, the service life and the quality etc that make the general influence the production and its manufacture process to the environment and the resources consumption decrease to the smallest.

2.1.2 Green Choices of Material

The green choices of material' theoretical basis is that supply chain green efficiency

is much bigger than the terminal governance efficiency, and the supply chain green benefit may obtain the enlargement in the following supply chain link, therefore when in the choice of product material, the enterprises must choose these with fewer energy consumption, high resources utility, little pollution to the environment and easier recycling materials during the entire life cycle process including the preparation, the processing, reusing and even discards recycles processing. And enterprises should set up the idea of "the environment cost" so as to initiate the brand-new way of material choice.

2.1.3 Green Working Procedures

The green working procedures are the modern making modes of considering the negative influence of environment and resources use efficiency synthetically. It means the concrete manufacture processes or processing courses of the products. Green working procedures refer to the process during which the thought of green design will be turned into the final products, mainly including green craft, green production equipment, green environment and green management. Green making requires saving energy and resource prominently more than the conventional method and at the same time avoiding or reducing the danger to the human body to the maximum extent.

2.1.4 Green Packing

The green packing refers to the packing material and packing way which tallies with saving the resources and protecting environment. The green packing way mainly includes: promote the production department using simplified and degraded packing and send new packing material and packing appliance. The tendency is the high function of packing material, which realizes many kinds of packing functions with fewer materials.

2.1.5 Green Matching Deliveries

Restrain the danger to the environment happened during the deliveries such as the increasing of fuel oil consumption sharply, the aggravation of resources waste, the intensification of air and rejected pollution and the municipal transportation jams etc. Realize the purification of logistics environment.

2.2 the Resources Pasting Patterns Among Enterprises — Supply Chain

The behavior main body of environmental logistics in central view contains the supplier, the manufacturer and the seller in the supply chain. As supply chain the resources pasting patterns among enterprises, the supplier, the manufacturer and the

seller who have correlated benefit should implement the union integration transportation pattern. The union integration transportation is the systematization transport mode which takes unit loading system as a medium, effectively and ingeniously combines each kind of transport means, in order to maintain the unit cargo condition from senders to receivers. The transport mode transformation may reduce the total driving quantities including changes to railroad, marine and the air transportation. Effective uses of vehicles could reduce the movement of vehicles and enhance the efficiency of matching delivery. For example, reasonable plan for mesh point and matching delivery center, the optimization of matching delivery route, advocating matching delivery together and enhancing round-trip shipment rate etc.

The compound integrated transportation refers to one way of carriage of goods with multi- links, multi- sectors and multi- transport means mutually linked up, on the ground of absorbing the advantages of basic transport mode such as railroad, automobile, ships and the airplane etc. and organically unifying them. This kind of transportation links each kind of tool by container so as to achieve the promotion of compound direct shipment. And just because of using container in the entire journey, it may reduce the packing expenditure, packing material pollution and the damage and loss to goods in transported process. The superiority of compound integrated transportation also displayed in: on the one hand it has overcome the individual transport mode inherent flaw so that it guarantee the optimization and efficiency of transportation process in the whole; on the other hand, looking from the logistics channel, it has effectively solved the merchandises' separation in production and marketing space and time due to various market environment difference of the geography, climate, infrastructure construction etc. and eventually promotes close integration between the production and marketing as well as the effective revolution of enterprise production and management.

Matching together delivery, taking the delivery demand as an object within city certain region, is the purposeful and intensive delivery carried on artificially. It is coordinated matching delivery by small and medium-sized enterprise within the identical business or identical region. Matching together delivery - the unified collection and delivery of goods - may obviously reduce goods to flow and effectively eliminate interlocks transportation to alleviate the traffic congestion condition. And enhance the goods transport efficiency inside the city so as to reduce the idling rate. It is also advantageous to enhance delivery service level and reduce the logistics cost, making

enterprise stock level greatly to reduce, even realize "zero" stocks.

2.3 the Provision, Production and Marketing Resources Pasting Patterns Between Regions

The logistics patterns interior enterprise and between enterprise mainly emphases to the intercommunity, compound and intensity of resources pasting. Because the above two kinds of form occur in the identical enterprise interior or between different enterprises in the identical region, the space certainly is not the primary restriction factor for logistics cost. But when it comes to logistics pattern of enterprise between regions, besides considering the above two kinds of logistics pattern factors, it is importantly needed to consider the influence of space length between regions to logistics cost. For instance, in order to reduce the logistics cost caused by space length to minimum, it is better for those that are not suitable for long-distance transportation to seek stick card production partner in the sale ground, establish strategic alliance relations with the local enterprise and replace logistics with personnel flow, technical flow and funds flow.

3. The Environmental Logistics is the Strut System of Resources Revolution for Circulation Economy Development

3.1 Environmental Logistics Industry Value Chain

3.1.1 the Allocation and Value Increment of Logistics Resources

Because environmental logistics is the integrated use of logistics resources, it makes the utilization rate of logistics resource enhance greatly. Environmental logistics carries on reasonable layout of resources allocation effectiveness for the time and space, thus it will make the value of supply chain increased under the condition that don't increase the resources devotion.

3.1.2 the Transformation and Value Increment of Logistics Resources

The workers, through various special and purposeful labors, make use of certain technique means and work still to consume materialized labor and live labor, thus transform the work into the resources development, use and product production. In the green production line, through the process of closed circuit compound circulation economy, the resources may obtain the reuse and the wastes are droved by unceasingly recycling, which make the utilization of unit resources enhance doubly and realize the value increment.

3.1.3 The Value Delivers and Value Realization of Logistics Resources.

The value is delivered and realized through various material flow and energy flow which are formed along with the economical process. And the value realization of logistics resources is realized through market sale. Its realization mechanism is displayed that:

Because the environmental logistics makes product of individual value lower than the similar product of society mean value, but the merchandise sale price is according to the society mean value, therefore, the above-mentioned products also defer to the society mean value to carry on the sale. Thus there is extra value exceeding the individual value and this is the reason that the environmental logistics value propagates and carries out.

3.2 the Role of Environmental Logistics in Circulation Economy

3.2.1 the Environmental Logistics is the Way of Maximum Reducing Operation Cost that must be taken

The product, from production to be sold, the manufacture process only takes up 10%, nearly 90% of the time is spent on the logistics process of storage and transport, loading and unloading, load separately, reprocessing and information processing. Therefore, the logistics specialization has no doubt laid the foundation of reducing the cost. But current logistics is still the operation pattern of high invests big logistics or low invests small logistics. Environmental logistics emphasizes the way of low invests big logistics. Obviously, environmental logistics is not only the ordinary logistics of saving and reducing, it pays more attention to the green and the energy conservation, few pollution it brings. You can not estimate what it brings to the saving of producing operation cost.

3.2.2 the Environmental Symbiotic cycle of Logistics and the Interior Control of Circulation Economy Exterior Cost

This kind of logistics management system establishes on the foundation of protecting environment and maintaining the ecological equilibrium. It changes the unilateral relations between original economy development and logistics as well as the expense life and logistics. During suppressing the harm caused by traditional straight-line logistics to the environment, environmental logistics adopts brandy-new manner and idea that are harmoniously together with the environment. Through designing and establishing an annular circulation logistics system, it enables the worn

out matter which has achieved the final part of the traditional logistics backflow to the normal logistics process. Generally the backflow of this worn out matter is called reverse logistics.

3.3 the Request of Circulation Economy to Environmental Logistics Development Patterns

3.3.1 the Circulation Economy Request the Environmental Logistics' Information Promotion

Positively developing and using modern logistics technology as well as accelerating logistics information construction, is advantageous to realize dynamic track management of logistics operation information and guarantee the level and quality of logistics service, which finally enhances the efficiency and benefit of logistics. In the aspect of logistics information construction, the adoptable logistics information technology involves the electronic data exchange(EDI), the point of sales in time information management(POS), the enterprise resource planning(ERP), the bar code and recognition system, the wireless application communication(WAP) as well as Internet technique(WEB), the electronic ordering system(EOS), the information network technology, the supply chain management system(SCM), the global position system(GPS), and the geography information system(GIS) etc.

Logistics is not only the space shift of commodity; it also includes the collection, reorganization, storage and use of the correlated information. The environmental logistics requests that all the information collected, reorganized and stored are green, and are utilized promptly to logistics so as to promote it further green. Use the advanced technology, strengthen the information construction and construct the network platform for environmental logistics development. Through the channel of electronic commerce, network technology development changes the logistics channel from original "pyramid" to "flat", effectively reducing purchase cycle, saving massive circulations cost.

3.3.2 the Circulation Economy Request the Environmental Logistics' Integrated Transformation

Speed up the science and technology transformation about the environmental logistics. The establishment of the third party logistics and technical innovation, introduction and technological transformation to logistics flow, link and various facilities instruments could enhance the enterprise' business ability and technical level,

at the same time reduce the energy consumption and the damage to goods maximally. Improve the environmental protection ability so as to prevent duplicate pollution and implement the integrated matching delivery in order to advance logistics intensified development. Based on the tendency of small batch and high frequency for logistics matching delivery demand, it is advantageous of enhancing the efficiency and benefit of logistics matching delivery.

From the microscopic aspect, through the implementation of integrated matching delivery, the enterprise may obtain such advantage as below: Achieving the economical scale of matching delivery could enhance the logistics efficiency and reduce the enterprise business cost; Without investing massive funds, equipment, land, and manpower etc. may save the enterprise resources; Expand the market scope and eliminate the original closing sale network, constructing the coexistence and co-prosperity environment. Seen from the entire society's angle, the realization of integrated matching delivery may reduce the total quantity of social vehicles stream and the obstructing transportation phenomenon of unloading cargo in bustling streets, improving transportation condition; Centralized processing could effectively enhance the vehicles' loading rate, saving logistics processing space and human resources.

The logistics supply chain service is an item of huge system cross local, department and profession. Logistics enterprise all hope to handle more matters for the customer, enter more logistics service link. But the resources belonging to various enterprises are limited after all. For each other benefit, on the foundation of fully excavating core ability oneself, several enterprises owning different essential resources should take advantage of technology and information network to carry on cooperation with the related enterprise on the supply chain, developing hypothesized management and implementing strategic alliance. Expand to synthetic logistics to form developmental strategy with gradually develop, fan out from point to area and complete a link into multi- links which creates the competitive advantage.

3.3.3 the Circulation Economy Request the Environmental Logistics' System Innovation

According to the fulfillment of the developed country, government's rules and regulations to logistics system concentrates on three aspects. That is take place source structure, traffic volume structure and transportation flow structure. The structure of takes place source mainly manages about the source of environment problem. According to current logistics system, the main logistics form of producing environmental problem is the popularization of truck. Because the enlargement of logistics quantity and

development of delivery service causes the truck in transit to increase and the truck in transit increasing must lead to the air pollution aggravated. Traffic volume structure mainly means developing the guidance function of government to push enterprises conversion from self-use car conveyance toward business-use truck conveyance. Develop integrated matching delivery and establish modernized logistics information network etc. in order to realize the efficiency of the logistics finally. Among them how the small and medium-sized enterprises improve logistics efficiency should be the point of government's structure. The main purpose of transportation flow structure is to reduce traffic jam and improve delivering efficiency through the establishments of central wreath forms road and the parking rules and regulations as well as the realization of highly traffic control.

In the advance of enterprises implementing green supply chain management, the government can have the important function of both sides. On the one side, draw up environmental protection law laws and regulations, restrain from the behavior of enterprises' endanger to environment and ecosystem. On the other side, issue the corresponding policy to encourage carrying on green supply chain management. Our country policy planning about environmental protection lags obviously behind the economy development. Although our country has draw up some "green" policies about enterprise's operation, most of them are controlling for the end, in addition that the legislation lags behind and enforcing the law is not strict enough, so its policy efficiency can't meet the demands of sustainable development far. Therefore, the government department should, according to the method of the developed country, make green management policy and support measure specimen and cure concurrently and in the light of the progressive principle, first choose the profession have already implemented the green supply chain management abroad. Then implement progressively to the bigger influential and co-operational trade and export quantum heavy but easier to suffer from green barrier trade etc.

Positively construct the environmental resources database. Data sharing is the premise and guarantee of realizing the whole optimism of supply chain. The green supply chain management of data sharing contains the green manufacture technology, green conveyance, green product patent, green material, green management technology etc. domestic and abroad. Purely dependence upon some single enterprise or several enterprises is very difficult to carry out all green information collection and reorganization. Moreover along with the development of the society and the enterprise,

the exterior is possible to put forward a new environment request to the supply chain management at any time. So the government or the correlated organization should construct the environmental resources database positively, providing essential information and intelligence support for the green supply chain management.

Optimize the management system from "software" and strength the environmental education and talented people development. In view of the situation that the operation of our country modern logistics crosses over different trades and regions and management belongs to the different department lacking unified leadership, we should first build up a necessary government coordinate mechanism, unifying management activities with the system. Then establish a logistics section definitely in the current government apparatus reform, completely planning the logistics development.

4. the Logistics Industrial Garden is the High-level Shape of Environmental Logistics Development.

The logistics industrial garden is the city logistics function district which carries on the relative concentration construction and development with the aim at the pitch point logistics organization management, having the economy development property. At the same time, it is also the economic function area having an industry development property, carrying on the reduction of logistics cost, enhancement of logistics operation and the improvement of enterprise service relevant of circulation processing, the raw material purchase and easier direct connection consumption with production etc. according to related logistics service facilities.

The logistics industrial garden is the place of concentrated space layout of many kinds of logistics facilities and different types of logistics enterprise. And it is the logistics assembly point of certain scale and comprehensive service function. The construction of logistics industrial garden is advantageous to realize the specialization and scale of logistics enterprises so that develop their overall superiority and the supplementary superiority

The logistics industrial garden lets originally logistics resources dispersed in different place, different department integrate together, which reduces the resources disposition cost of entire society and promotes economy movement efficiency. This is the center question always needing consideration when the logistics industrial gardens are planned.

The construction of logistics industrial garden needs detailed investigation and inspection. Understood the productivity layout, logistics present condition and the possibility of various conveyances link up. Never start hastily or make logistics industrial garden construction as the government "the image project". Plan and construct the logistics industrial garden market needed. When it comes to the position of logistics industrial garden, principles as followed should be considered as far as possible: One is tightly near the harbor, airport, railroad marshalling yard, close to the highway network; Two is approaching to the convenient entry and exit of the trunk highway; Three is tightly near industrial garden area; Four is making full use of existing logistics facilities; Five is taking full consideration of soil-rent, ecosystem environment etc. and at the same time giving dual attention to enough development space .

The programming construction of logistics industrial garden should insist the government master plan plus support construction and the enterprise independent management with market operation. The government master plan is to carry on essential sign examination to the garden construction, avoiding repeated construction and garden construction of short-term behavior. The government support construction is to give the unified programming construction of logistics industrial garden essential support. For instance, give logistics industrial garden construction the needed support like transportation facility as land, road, railroad, communication etc. The enterprise independent management refers to the enterprise going into the garden operate independently and pay taxes according to regulations. Construct the corresponding storehouse, dump site, workshop and provide related machine equipments and ancillary facilities according to oneself management. The enterprise market operation means the logistics enterprises take the customer demand as center, tightly stick to the market and carry on the reorganization towards enterprise' property, personnel, and service. Form the service system that adapts with the market demand; strengthen the service consciousness of modern logistics industry.

The function of logistics industrial garden construction towards economic development is first displayed in the large-scale investment and the implementation of infrastructure construction items which will surely leads the local economy growth and causes the value increment of urban center area land; simultaneously logistics industrial garden' perfect logistics infrastructure and complete logistics service function can effectively support the industrial economy development, guaranteed the logistics

efficiency and level for economical development.

The construction of logistics industrial garden, embarking from the city overall benefit, solve the city function disorder, alleviate the municipal transportation hustle, reduce the environment pressure and open up new land near main transportation trunk highway at the combination of suburb and countryside, which greatly improves the municipal transportation environment. On the function, logistics industrial garden is first the logistics service organization and logistics management that covers the logistics core connotation. Compared with the traditional freight transportation center, it is characteristic of high technology and high-efficiency. Therefore, the logistics industrial garden construction pushes the construction of city circulation channel consumedly.

In the development of logistics industrial garden, the government plays the pivotal role in master plan and support construction as well as macroeconomic regulation and control aspect. We should give full play to the government master plan and the macroeconomic regulation and control, provides the powerful policy support. First, the government side should analyze and consider comprehensively the transportation, market, demand, environment, policy, scale, whole fixed position of logistics industrial garden etc. on the basis of overall considering the transportation skeleton line and main hub programming. Plan the spatial layout, ground scale and the future development of logistics industrial garden so as to guarantee the urban layout rationality. Secondly, through the active investment subsidy and relevant tax fee income, the government department should enlarge the direct investment to the infrastructure of logistics industrial garden, especially the investment strength of the municipal services facilities in the garden. Provide the preferential policy and encourage society to invest construction and manage the logistics infrastructure. The government should positively support research and development activities that have something to do with the development of logistics industrial garden.