Construction and Operation of Logistics Parks: Insights from Bremen`s Experience

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Abstract—Logistics parks have made tremendous contributions not only to freight industry but also to the urban development and social benefits. We took German logistics and logistics parks as an illustration. Firstly, we introduced the definition and the status quo of German logistics and logistics parks, especially the development characteristics of the Bremen logistics park. Then we summarized both domestic and international theoretical researches on the relationship between government and logistics parks. By reviewing the practice of logistics parks in China, we pointed out the challenges and existing problems based on the actual situation of logistics development in China. At last, we put forward the relevant suggestions, which are beneficial to the development of logistics parks in China.

1. INTRODUCTION
As an important part of modern service industry, logistics greatly impacts the national economy. Logistics parks are the key hubs of various logistics service functions, which have attracted high attentions from many governments throughout the world[1]. For China, the theoretical exploration and practice of logistics parks began with the proposal of Shenzhen Pinghu Logistics Base in 1999, and then China entered a period of planning and construction of logistics parks.

Compared with developed countries and regions, the planning and construction of logistics parks in China has started relatively late but developed rapidly. There are some prominent problems emerging, such as irrational planning and irregular development[2]. In this context, experiences from developed countries may provide the inspiration for the management and construction of logistics parks in China. According to the World Bank’s Logistics Performance Index, Germany is the global logistics leader, ranking first in 160 countries for three consecutive times. For logistics park construction and operation, Germany can be taken as a good case.
2. **Status Quo of German Logistics and Logistics Parks**

2.1. **German Logistics**

Logistics has always been the backbone of Germany's booming economy, and has occupied an important position in the European market. As the top three industries, logistics industry has got a good performance in the year of 2018, with an output value of 279 billion euros and 4.7 billion tons of goods shipped. In recent years, the employed population in logistics industry is about 3 million, accounting for about 19% of the total employed population in Germany. The turnover in value of German logistics industry represents about 1/4 of the whole Europe, which is equivalent to the sum of the logistics turnover of France and the United Kingdom.

Germany has always been an active international trade participant, a leader of technological innovation, and with a central geographic location in an expanded European market. Besides, Germany has formed a perfect vocational education system and well-developed transportation infrastructure network. All of the mentioned factors contribute to the fact that Germany is a benchmark for all countries that desire to get advantages in logistics[3].

2.2. **Logistics Parks in Germany**

Logistics parks are not only the nodes of transportation infrastructure network, but also the interchange points for different commercial operations. Germany has successfully developed its own logistics park pattern, shaping the Europe logistics and spreading the world[4].

Logistics park, has not yet got a common terminology worldwide, and it can be namely as logistics centre, freight village, logistics node, distribution centre and so on[5]. This paper supports the definition from Deutsche GVZ-Gesellschaft mbH (DGG), who represents the common interests of logistics parks in Germany and European Union. According to DGG, logistics parks are the physical existence where different transport modes work together to move cargo, where different transport services occur, where different commercial aims realize among transport companies, industrial companies and trading companies.

In 1985, the first logistics park in Germany was established in Bremen, which is a city located in northern Germany. Eight years later, a national construction plan of logistics parks was firstly proposed by the federal railway department, and supported by the local governments. Although the plan was targeted for rail transport, 28 logistics parks with multimodal functions had been written into the first plan. In 1993, DGG founded in Bremen. In 1994, the Bremen logistics park accepted a mail processing centre by Deutsche Post. In 1995, the second plan expanded the number of logistics parks, from 28 to 39, which connected the Germany as a whole net. In 2001, DGG participated in the formulation of some regulations on the construction of logistics parks by the federal transport department. In 2002, the plan of logistics parks was adopted by the German transport network plan.

Over the past few years, most of the planned 39 logistics parks in 1995 have become reality, and 33 logistics parks have established. In 2001, DGG had its first new member in Austria. As the high-performing physical interfaces, logistics parks have not only gained considerable importance, but also supported the supply chains connecting procurement and sales activities[6].

3. **Analysis of the Bremen Logistics Park**

3.1. **Overview**

The initial idea of the establishment of the Bremen logistics park came from the transport managers who hoped to shift forwarders from narrow and expensive town centres to outside estates. The Bremen regional administration realized this vision by changing the former agricultural area into a commercial area. In 1985, the first 6 enterprises settled in, and now the Bremen logistics park has attracted about 190 enterprises with about 8000 employees.

The Bremen logistics park has direct road and rail access, only 3 km to the seaport and 6 km to the airport[7]. The advantages in location makes the Bremen logistics park produce a combined transport
terminal with a capacity of 230000 loading units, which not only links between long-haulage and last mile transportation, but also makes 24 hours operation possible. As an important logistics transfer base in Europe, the Bremen logistics park provides diverse logistics services including shipment, warehousing, refueling, vehicle maintenance and so on.

3.2. Role of governments
The Bremen logistics park has achieved great benefits both economically and socially. And some literature has estimated that the input-output ratio of the park is about 1:6, with an investment of 102 million euros, and the realized benefit is 610 million euros[8]. There are many factors contributing to the success of the Bremen logistics park, and one of these factors is the positive role of governments. Both the central and local governments work together to promote the development of logistics parks.

Frist of all, the central government develops the national transport infrastructures, and adopts the plan of logistics parks. Therefore, these logistics parks get the advantage in external connection, and easy to handle freight traffic effectively.

Secondly, the local government has carefully conducted the site selection and decided the park functions. During the preliminary decision period, Bremen’s government organized logistics enterprises, freight associations and property developers to jointly conduct demand research and feasibility analysis, in order to choose a best place both economically and ecologically.

Thirdly, Bremen’s government purchased rural undeveloped lands at a low price during the project launching period. By completing the construction, Bremen’s government sold the cultivated lands to logistics enterprises at special rates, and got compensation through future taxes. Logistics activities require substantial amounts of land, and Bremen’s government helps to reduce the land cost[9].

Fourthly, governments attaches great importance to environmental issues. During the planning period, the site selection is aimed to separate logistics operations from urban areas, in order to reduce the urban traffics, carbon emissions and noise pollutions. Besides, the more environmentally friendly modes including rail and water transports are involved in the whole supply chain.

4. RELATED RESEARCHES

4.1. Governments and logistics development
Many studies have shown that governments have played active roles in developing logistics industry, which is believed to contribute to jobs and economics[10]. Governments take measures in various ways, in order to lead logistics industry to develop healthily and rapidly. They are the investors of transport infrastructure, which makes the goods flow possible[11]. They are the promoters of new technologies, which improves the modernization of logistics industry[12]. They are the protectors of natural environment, which enables the sustainable development[13].

In short, there are usually two forms of governments’ interventions in logistics industry, namely financial measures and non-financial measures. To support logistics parks, both of the above measures can be applied, including subsidy, capital investments, fiscal incentives, policymaking, regulation, and so on.

4.2. Governments and logistics parks
Through Dominance Effect, Multiplier Effect and Polarization-Diffusion Effect, the construction of logistics parks has an obvious positive correlation with economic growth, which causes governments willing to provide various supports. Besides, large initial investment, long payback period and lacking business profit, gives governments enough reasons to invest on logistics parks[14].

Not only German government invests to speed up the construction of logistics parks, but many developed countries follow this method. An example comes from Japan. The largest logistics park is called Hoping Island Commodity Center, and 70% of the construction cost is borne by the Japanese central government, 20% by the Tokyo local government, 10% by the enterprises.
Some Chinese researchers have conducted case studies. By quantitative analysis, it comes to the result that every single yuan invested by the construction of the logistics park will have a 16.7 yuan contribution equivalent in its GDP[15].

5. INSIGHTS FOR CHINA’ LOGISTICS PARKS

5.1. Problems
According to the fifth China`s logistics park survey report in 2018, which has been published by China Federation of Logistics and Purchasing, 1638 logistics parks came into the sample of this survey, an increase of 35.37% from 1210 according to the fourth survey in 2015. The actual total investment of each logistics park under construction and operation is 1.45 billion yuan on average, however the investment on informationization and equipment only accounted for an average proportion of only 8.2% of the total[16]. The survey report also pointed out that 80.2% of logistics parks took the highway as the main transport mode, and with 10.9% using the railway, 4.2% using the inland river. From the perspective of development pattern, 57.7% of the above logistics parks were planned by governments and invested by enterprises, and 40.2% were self-developed by enterprises. The above information can be found in Tab. 1.

| Year | Number of logistics parks | Actual investment of each logistics park (billion yuan) | Ratio of highway as transport mode (%) |
|------|---------------------------|-------------------------------------------------------|---------------------------------------|
| 2015 | 1210                      | 1.09                                                  | 81.0                                  |
| 2018 | 1836                      | 1.45                                                  | 80.2                                  |

Although present logistics parks in China have played an active role in promoting cargo transport, achieving economic growth, and realizing sustainable development, some defects still exist. The first problem is about clarifying the relationship between logistics industry and city development. When logistics parks contribute to the economic benefits, they are facing the risk of moving away from city centers due to the environmental issues. The second problem is the lacking of multiple mode transportation, especially the inability of railways to enter the ports. Thirdly, the average level of logistics facility standard is low, which has become the shortcoming and limited the efficiency. The last one is about the respective responsibilities between governments and enterprises. And it is needed that governments should strengthen investments on logistics facilities.

Both the central and local governments make policies to promote the development of logistics parks in China. The above analysis of the Bremen logistics park on construction and operation, may provide the ideas for China’s governments to adopt concepts and apply technologies.

5.2. Suggestions
Firstly, collaborative works between the central and local governments are required. China central governments may pay more attentions on national layout planning, and provide subsidies for infrastructure construction. Local governments need to supply land at an appropriate price, in order to reduce the cost of logistics enterprises at project initial period.

Secondly, an overall awareness is needed to understand that the integration of logistics and urban sustainability will benefit for each other[17]. The improvement of logistics competence will not only facilitate cargo flow, but also support the development of other industries, increase consumption and expand employment.

Thirdly, multimodal freight facilities are recommended to apply in logistics parks. Integrated transportation is an effective way to improve transportation efficiency and reduce logistics costs.
Besides, to increase the use of other more environmentally friendly modes, like waterways and railways, will enhance the sustainability of logistics parks.

Fourthly, the supports from governments could be more ingenious. In recently ten years, Chinese central governments have provided some subsidies for the construction of logistics parks. However, the above support is not enough. A package of supporting methods, including direct investment, credit loans, land replacement and so on, are needed.

Last but not the least, the outbreak of the new coronary pneumonia epidemic has made us aware of building up more flexible supply chains, and the development of logistics parks must keep up with this requirement, which is believed to ensure the safety of the economics.

6. CONCLUSIONS
German logistics development has been taken as an illustration to reveal the relationship between government and logistics parks. Based on the actual situation of logistics development, Chinese governments should take more active roles in the above suggested aspects.

The year of 2020 is the time for making China’s 14th Five-Year Plan Development Strategy, and logistics industry has entered a new era of high-quality development. The promotion of logistics parks will require not only learning from foreign experience, but also adhere to China's national conditions.

The outbreak of the new coronary pneumonia epidemic has made us further aware of the supporting role of logistics in the economy and society. And logistics parks at strategic locations become more important than ever. The importance of logistics parks in transshipment and distribution is further revealed. It requires both logistics enterprises’ efforts and governments’ supports.

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