

Discussion on Green Port Construction of Tianjin Port

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Abstract—Green port is the trend of port development in the world. Green port construction is important for sustainable development of Tianjin Port. This paper discussed the content of green ports, analyzed the significance, actualities and problems of green port construction of Tianjin Port, and put forward measures to promote the green port construction of Tianjin Port. The paper will be helpful to green port construction in the future.

Keywords—green port; construction; measure; Tianjin Port

I. INTRODUCTION

As an important part of transport system and an opening window towards the world, ports can play an important role in regional economy development. In the future, it will be more and more important in the comprehensive transport system. According to the developing situation of ports in our country, its great development will be an inevitable trend in a long period in the future, with the construction work from which environment and resource might be suffered^[1]. So far, many international ports of developed country have paid their attention to environmental protection and green ports planning.

II. CONTENT OF GREEN PORT

Port is a conventional word which includes a typical conflict between human act ion and environment. Port and environment are of influence each other. Port programming, design and operation constructed must adapt to these factors in the future. At present, both domestic and foreign ports have respectively proposed the notions of “eco-ports”, “green ports”, “environment-friendly ports” and others concepts of green ports, and actively conduct green port construction, which have aroused public concern. But it has not reached an authoritative and detailed definition of green port.

This paper argues that green ports should be based on balance between the environmental impact and economic interests and be sustainable ones that are not at the expense of irreversible environmental change. Green ports should take economic and environmental benefits into account, not to take environment as the expense, pay attention to environmental protection and eco-friendly development, save resources and energy in the process of development, strengthen environmental management, construct ecological civilized ports and accelerate sustainable development of natural- economic-social harmonious model^[2].

Green port is the latest trend in contemporary port development and the optimal model, which symbolized a landmark change in human’s idea. Green port should be comprehensive and organic combined ports integrated social, economic, cultural, environmental and other factors. Green ports advocate social stability and civilization, rapid economic development and harmonious environment. The basic and most profound element is harmony between man and nature. The including good quality of the environment, economical and efficient resource, good ecological attributes and sound environmental management are to achieve economic efficiency, social civilization, sustainable development of the ports and ecological development of the ports.

III. SIGNIFICANCE OF GREEN PORT CONSTRUCTION OF TIANJIN PORT

Tianjin Port is the largest comprehensive trading port in north China. Building green port in tianjin, through improvement of environmental quality, improvement of resource utilization and so on, can be achieved in economic development and environmental development of Tianjin Port^[3].

A. The Necessity of Eco-city and District Building

As an important part and core strategic resource of Tianjin Binhai New Area, Tianjin Port is one of the major leading industries in Tianjin urban economic development and the Binhai New Area, which is also the key part of the ecological zones construction of Tanggu, Binhai New Area and Tianjin. Therefore, the green port construction of Tianjin Port can promote and ensure the goal of building eco-Tianjin, eco-Binhai New Area.

B. The Necessity of Sustainable Development of Tianjin Port

With the development of Binhai New Area, Tianjin Port will also accelerate its development. Owing to the current regional development and disordered exploitation of marine resources, increasing environmental pressure of Tianjin port and coastal waters, environmental issues are highlighting and environmental pollution is growing severe. Green port construction of Tianjin Port aims at controlling environmental pollution and ecological destruction from the source, protecting aquatic resources in the Bohai Bay and the ecological environment of Tianjin Port to achieve scientific

development, harmonious development and sustainable development of Tianjin Port.

IV. ACTUALITIES AND PROBLEMS OF GREEN PORT CONSTRUCTION OF TIANJIN PORT

A. Actualities of Green Port Construction of Tianjin Port

Environmental protection of Tianjin Port began in the 1970s, when the main task was initial forestation, "three wastes" treatment and abatement of smoke and dust of boiler, stove and other combustion equipment, environmental monitoring, as well as some of the early environmental infrastructure of the port. In the 1990s, 20th century, with the improving national environmental standards and growing Tianjin port cargo throughput, particularly gradually expanded scale of coal into the sea, the work of environmental protection in Tianjin Port has shown the characteristics of heavy and difficult. In the past 20 years, in order to improve the environmental quality of the port, it has made strenuous efforts.

(1) *Implement "Green Water Project" and protect the harbor waters from pollution.* The past 20 years, in order to implement national environmental laws, regulations, and the International Maritime Organization conventions, implement the guidelines of the Tianjin Municipal Government on the implementation of "green water" project, Tianjin Port has effectively treated domestic sewage, production waste and oil-polluted water from vessels and strengthened the control of port wastewater^[4].

(2) *Implement the "Blue Sky Project" and improve the quality of atmospheric environment of the port.* With the increase in coal throughput of Tianjin Port, it has faced an important environmental issue: relatively high content of TSP, mainly because of coal dust pollution caused by coal transportation, stockpiling, and loading and unloading. In order to control the port air pollution, the following work has been done: canteen stove burning improve; heating boiler dual governance; special renovation of coal dust; perfection of treatment facilities for production and living solid waste; acceleration of the pace of building green port, creation a international port of ecological environment. The above environmentally friendly initiatives, have effectively improved the port's overall environment. Since the second half of 2002, Newport Urban environmental monitoring data show that good days no less than L2 are more than 80% of the whole. It indicates that Port's air quality has been significantly improved; the "Blue Sky Project" initiative taken by Tianjin Port Authority has come to practical results.

(3) *Strengthen environmental management.* After years of accumulated experience, through continuously improvement of the environmental management rules and regulations, Tianjin Port has established a standardization of environmental management model. In recent years, Tianjin Port has continued to strengthen environmental protection, formulated and issued "Tianjin Port air pollution control regulations", and many other environmental protection regulations, related to water pollution prevention, air pollution control, dust control, solid waste pollution prevention and control and many other aspects. It has

achieved remarkable results and laid a solid foundation for achieving standardized management. Meanwhile, in order to further the environmental management standard, the Tianjin Port Group passed the ISO14000 environment management system certification by the end of 2007.

B. Problems of Green Port Construction of Tianjin Port

National macroeconomic policy, external conditions and development of Tianjin Port, created many advantages for Tianjin Port's own green-construction. However, some objective constraints hindered the building of green port.

(1) *Scarcity of water resources.* Most of the construction of Tianjin Port is artificial land reclamation projects and water resources are unavailable in the planning region, as a result of it, it has to rely on the introduction of water from outside the Tianjin Port. According to characteristics of production operations, dust from the production and operations and port forestation needs lots of water resources. Water scarcity has been a constraint to the green port construction of Tianjin Port.

(2) *Harbor waters and the surrounding environmental pollution are serious.* Tianjin coastal waters admit nearly two billion tons of surface runoff and industrial sewage a year, more than 80% of which are from land-based sources. In particular, large-scale sewage rivers on south and north sides of the port lead to poor environmental conditions in the waters of Tianjin, which also bring the difficulty of green port construction.

(3) *The limited availability of coastal resources.* Coastal resources available in Tianjin port for building berths of are limited, and further development of Tianjin Port needs more construction of parking spaces, which can be only rely on land reclamation.

(4) *Port transportation channel within and outside the port.* Tension of coastal resources within the port, low level of road design and slow road construction outside the port have lead to frequent congestion.

(5) *Great difficulty and investment of forestation.* Tianjin Port, a salinization-alkalization area and formation of land reclamation, is not conducive to plant growth, thus creating difficulty in greening and high investment of greening.

V. MEASURES OF GREEN PORT CONSTRUCTION OF TIANJIN PORT

A. Applying the Notion of Green Port Construction in Port Planning

From a development perspective, the environmental resources are scarce, but are the basis of economic development. Green port construction is the adjustment of port activities, which aims to protect the port environmental functions in order to meet the needs of sustainable development in the port. Green port construction should be included into port construction and coastal areas development planning, and taken as part of port planning. It needs co-ordinate distribution in phases, sub-focus within our capabilities, both economic benefit and long-term development taken into account.

Applying the notion of green port construction in port planning, reasonable port development policies can be proposed from the angle of environment and resources, which can facilitate the distribution of productive forces and the rationalization of industrial structure, and starting from the concept of prevention, turn pollution control to the whole process control, combine the pollution control, technological innovation, equipment reform and renewal, technology improvement with production efficiency to achieve the coordination of environment and economic development of the port.

B. *Paying Much Attention to Environmental Impact Assessment*

The law of Environmental Impact Assessment (EIA) was taken effect in 2003 in China. The law established the juristic station of Strategic Environmental Assessment (SEA), and it become more urgent to research Port Planning EIA^[5].

EIA on various planning, can take environmental issues into account in the early stages of the full consideration, so as to eliminate, avoid or mitigate the adverse impact of planning on the environment. Through EIA, environmental protection and ecological construction can be ensured in the process of the overall development planning, construction and implementation of Tianjin Port. Enormous social and economic benefits brought by implementation of Tianjin Port Planning can accelerate sustainable development in Tianjin Port, Tianjin Binhai New Area and Tianjin city.

C. *Establishment of Tianjin Port Environmental Planning*

Establishment of Tianjin Port environmental planning has significance in guiding the direction of the port construction and development, demonstrating the feasibility and rationality of reform of old wharf, building new ones, application of new equipment, conversion of advanced technology, relieving the environment pressure in the process of economic development. Also a systematic, scientific and operational environmental planning can help achieve balance between ecological capacity and economic development.

When we establish environmental planning, we must make an investigation on the resource and environmental status of Tianjin Port, and establish a data-base for it. It's important to establish an index system. The environmental planning can emphasize particularly on pollutant control, ecological construction, environmental risk management, green supply chain and environmental management.

D. *Strengthening Environmental Management*

Port environmental management, particularly during the operational phase, is the key to sustainable development of the port. The management effectiveness is directly related to the future of the implementation of port sustainable development implementation^[6]. Therefore, it is necessary to intensify environmental management, integrate

environmental protection awareness into port management. Taking sustainable development thought as guidance, eliminating and reducing environmental impact of production operations as the premise, from top decision-making to the grass-roots implementation, from the body set to personnel training, from the port construction to the whole process, from policy makers to all staff, environmental protection must be set up. Through various activities, the port seeks coordinated development between economic, social and ecological benefits. Through environmental management, the port eventually maximizes use of material resources, minimizes waste emissions and greens the products adapting to market demand.

E. *Adopting Various Practical Measures*

Green port construction is long, comprehensive, systematic and complex, and is a matter concerning the overall situation and long-term strategic task. Green port construction needs strengthening organization and leadership, improving policies and regulations, innovating management system and other aspects, actively adopting various practical measures adjusting social behavior, coordinating the relationship between environment and human being, full implementing all goals and tasks of the green ports.

VI. CONCLUSION

As is know to all, green port is the trend of international port development, and will accelerate sustainable development and ecological civilization construction in China. However, there is little research about green port planning and development in China. The paper will help to realize economize, clean, safety, and sustainable development of Tianjin Port, and help realization of green port development of other ports in China.

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