

An Eco- economics Analysis on Construction and Development of New Urban Areas

Liang Hongzhi

School of Architecture & Civil Engineering, Wuhan University of Technology, Wuhan, P.R.China,
430070

E-mail

Abstract As the construction and development of new urban areas has been playing an increasingly important role in urban and regional development, the plan and implementation of the construction and development of new urban areas is attracting more and more attention from policy makers. Analyzing from the angle of eco-economics, the construction and development of new urban areas will inevitably be constrained by the ecological environment constantly. Focusing on the eco-environmental constraints occurred during the process of the construction and development of new urban areas, this paper analyzes the eco-economics cost and expounds the enlightenment on the construction and development of new urban areas.

Key words New urban areas; Construction and development; Eco-environment; Eco-economy

1 Introduction

New urban areas are relatively independent urban communities outside the city. With large-scale tract development, unified planning, they are used for the resettlement of population, residential construction, development industry and public service centers. New urban areas are new carriers of urban agglomeration, the new spot of urban economic development and new windows of the city's image. New urban areas have relative independence and integrity on geographical space. They are the subsystems under the city's complex system with the various elements available, and new and old urban areas constitute the organic unity of the city. With constant building and developing, contradictions between urban development and urban environment are more and more complex and acute. Based on this problem, this paper takes full account of the eco-environment of the construction and development of new urban areas and analyzes the eco-economics cost during the process of the construction and development to search for the eco-economic balance of the construction and development of new urban areas and to achieve the sustainable development of new urban areas.

2 Factor Analysis of Construction and Development of New Urban Areas

Since 1990, with the large-scale urban development in Shanghai Pudong New Area, the construction and development of new urban areas have gradually become the main way to expand the urban space. Such as development and construction of the new Suzhou Industrial Park and Suzhou New District, the construction of new administrative, financial, cultural and central business district in Futian, Shenzhen; the construction of New Beach Area in Tianjin, etc. The construction and development of new urban areas contribute greatly to urban development, but also have many negative effects.

As shown in Figure 1, the construction and development of new urban areas caused short-term population centers and industrial aggregation, and a great deal of resource use, material transformation, energy flow, product consumption and other activities happened in the new urban areas, which inject new vitality to urban development and bring more opportunities to economic development. But at the same time, these activities also caused a large consumption of natural resources and a large number of production and living waste water, causing tremendous pressure on the city's eco-environment.

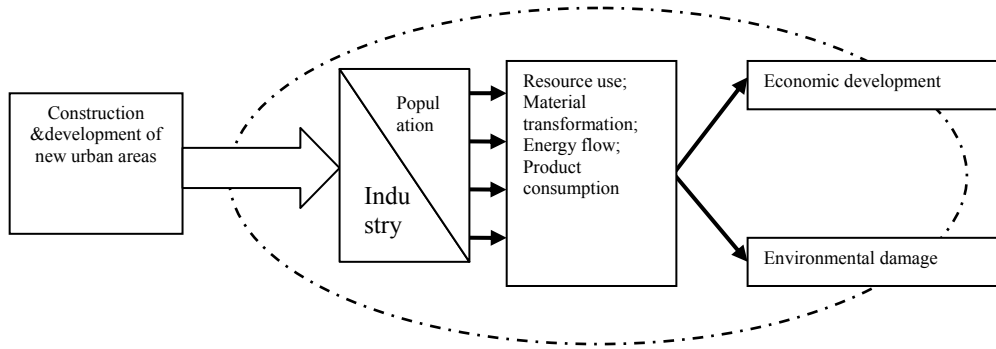


Figure 1 The Factor Analysis of Construction and Development of New Urban Areas

3 Eco-economics Cost on the Construction and Eevelopment of New Urban Aareas

The construction and development of new urban areas will result in different levels of urban ecological environment destruction. As shown in Figure 2, the construction of new urban district may result in eco-economics cost ,for example, shortage in industrial resources and energy, environmental pollution, excessive water consumption and serious water pollution, sharp decline in urban green space and urban rural land, gradual sinking of urban land and so on.

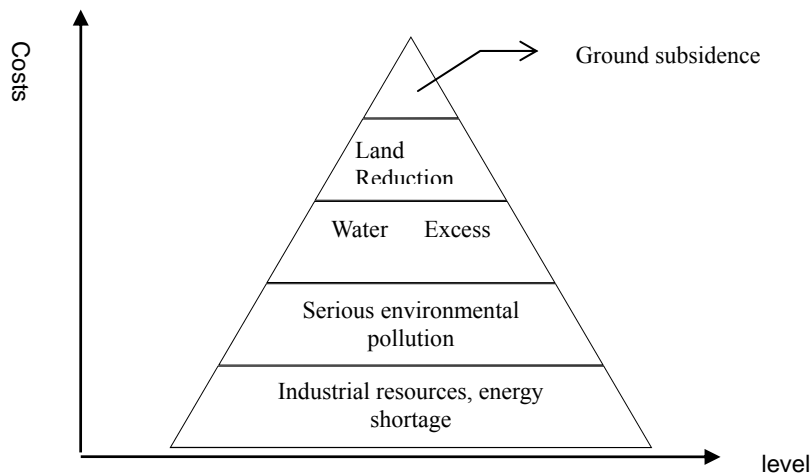


Figure 2 Eco-economics Cost on the Construction and Development of New Urban Areas

3.1 Shortage in industrial resources and energy

The construction and development of new urban areas has brought great opportunities, such as Shanghai Pudong New District, Tianjin Binhai New Area and the construction and development of new urban areas in other cities have greatly accelerated the city's industrialization, attracting a lot of investment and business opportunities. With the rapid development in industrial economy, the pressure for urban industrial resources also increases. In order to ensure the rapid growth of its industrial economy, the city has to do all it can to provide resources they need, which leads to excessive use of resources and the destruction of the urban industrial resource balance. The contradiction between energy supply and industrial growth in the new urban area is also becoming more evident. The population and industry gathering at the same time in new urban areas, and the required living energy and energy consumption in new industries caused no small trouble to the city's energy supply. During the construction and development of new urban areas, untimely planning for resources and energy use and supply capacity will result in serious consequences to the construction and development of new urban areas, even to the development of the city.

3.2 Serious environmental pollution

The construction and development of new urban areas includes urban infrastructure, real estate development, industrial service development, population aggregation, etc in new urban areas. These

economic activities will inevitably lead to environmental pollution, such as air pollution, water pollution, waste pollution, noise pollution, electromagnetic pollution, urban heat island effect and acid rain. In particular, among the establishment of urban high-tech industrial development zones, economic and technological industrial development zones, a large number of industries cluster, resulting in more severe pollutions. These pollutions will do enormous harm to the ecological environment. It is neither conducive to the health of urban residents and urban environment nor to the long-term sustainable development of cities.

3.3 Excessive water use and the serious water pollution

No matter it is a residential area, or finance and trade zone, or industrial zone, or hi-tech area or tourist resort, a new urban area will consume huge water. Inadequate water supply exists in more than 400 cities among China's over 600 cities. Among them, over 110 have serious water shortage. The construction and development of new urban areas will inevitably face the contradiction between living water demand and water demand in urban industry and the insufficient water resources. Thus, it is of great significance to the sustainable development of new urban areas as to how to resolve this problem. Industrial water in particular may pollute the urban waters, and the problem of industrial waste water discharge will become a focus in the construction and development of new urban areas.

3.4 Sharp reduction of urban green space and suburban land

The selection of the area for development should take the following into consideration: making full use of the various facilities in the old city to accelerate development; relieving the old city's population pressure, and promote the revitalization of new urban areas and the city's rolling development in general. In this case, the new areas' construction and development will inevitably result in occupation of suburban areas and green space.

The constructions in many new urban areas do not integrate their own development needs and the objective conditions, and blindly enclosure without pre-planning. Many cities go all out for all kinds of new development zones, and all those not only result in the reduction of urban green space and suburban land, destroying the environment, but also lead to large tracts of idle land in city, making the rationalization of the follow-up transformation more difficult, thus also affects the timely development of other urban functions, becoming a serious drag of urban development.

3.5 Gradually sinking urban land

The excessive extraction of groundwater and building density in city will result in urban land subsidence, which is bound to be a ecological problem during the process of new areas development. In the process of urban development, land subsidence has a common problem faced by more and more cities. More than 70 cities across the country have suffered land subsidence. After the development of Pudong New Area, ground subsidence in Shanghai increased, with the most serious area up to two meters. How to effectively curb this phenomenon is a very important problem builder and policy-makers should focus on.

4 Ways to Achieve the Coordination between the Construction&Development of New Urban Areas and the Eco-economy

The fundamental way to achieve the coordination between the construction & development of new urban areas and the eco-economy is to achieve the sustainable development of new urban areas. As it is shown in figure 3, the sustainable development of new urban areas mainly consists of the sustainable development of environment, land, transportation and industry. When the city develops into a fixed scale, the planner and decision maker should carry out the coordination from the two aspects of the inherent function and spatial pattern relation and adjust the combination and allocation of the two aspects to promote the healthy and sustainable development of the whole city system. To explore the ways to achieve the coordinate development of the construction and development of new urban areas and the eco-economy, it is necessary to make research into the characteristics of the energy flow, material flow, information flow, human flow, commodity flow and currency flow to make the flow movement process reasonable and efficient to the greatest extent, and thus consummate the ensemble planning and each type of construction of new urban areas.

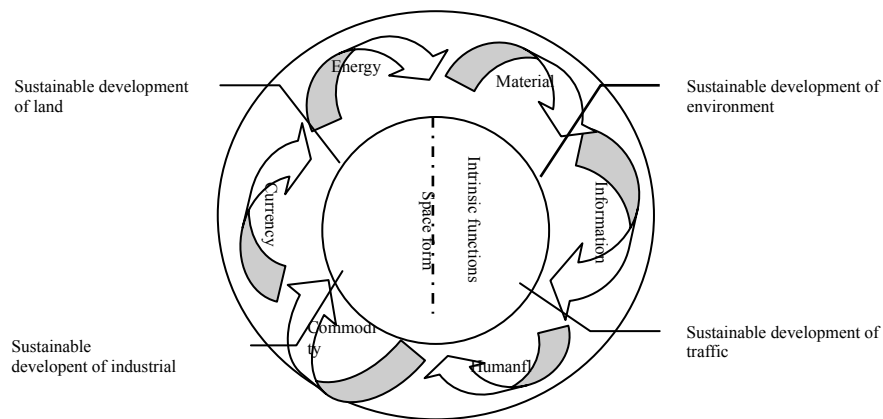


Figure 3 Circulant Graphs of the Coordination between the Construction & Development of New urban areas and the Eco-economy

Specific ways to achieve the coordination between the construction and development of new urban areas and the eco-economy are as follows:

Make the constituent parts of new urban areas form into interconnected green ecology network to adjust the urban ecological environment jointly. The new urban areas planning aims at drawing up the economy and society development goal of new urban areas, confirming the properties, scale and develop direction of new urban areas, planning and arranging the various land and space resources of new urban areas as a whole and realizing the sustainable development of economy and society of the entire city. When establishing the construction and development scheme of new urban areas, the planner and decision maker should assume the living quarters, industrial districts and infrastructures as an organic whole part and make up a interconnected green ecology network, which can lead to the reasonable distribution and use of resources and energy and consequently bring about a benign new urban area environment.

Pay attention to the ecological elements in the construction and development of new urban areas, achieve energy conservation and water conservation with high-tech methods and make use of land resource economically by planning reasonably to realize the mutualistic symbiosis of construction and nature. One of the key problems to achieve the coordinate development of the construction and development of new urban areas and the eco-economy is to make use of resources and energy economically. The principal way to solve the resources and energy problem is to make use of resources and energy economically and to develop and seek renewable succedaneum. In this procedure, the application of high-tech products and approaches is definitely the uppermost way. In the planning and construction process of new urban areas, more clean energy, renewable energy and products with the characteristic of energy conservation and water conservation should be used and each kind of finite resources should be used economically. With artificial planning, land resources should be used economically and ecological elements should be transfused into every single link of the construction and development of new urban areas to achieve the mutualistic symbiosis of construction and nature, city and nature.

Advocate green construction. Popularize green construction materials, strive to develop low-carbon economy and penetrate the energy saving and emission reduction concepts into the public. In the process of the construction and development of new urban areas, environmental protection concept can be realized by popularizing green construction materials massively. Low-carbon economy has become prevalent in China since the Climate Summit in Copenhagen. The idea of low-carbon economy can be used for reference in the construction of new urban areas, which means blending in numerous low elements in the pre-planning, and construction and building energy conservation and environmental protection concepts in city. To achieve energy conservation and environment protection primarily, in addition to improving the available resource and energy application conditions, it is also significant to transform residents' perception, lead the ordinary people to join the energy conservation and environmental protection team, build the energy conservation and environment protection consciousness, and save the resources little by little to achieve the harmonious development of human, city and nature.

5 Conclusions

From the analysis above, we can get that the ways to achieve the coordination between the construction&development of new urban areas and the eco-economy include making the constituent parts of new urban areas form into interconnected green ecology network to adjust the urban ecological environment jointly, paying attention to the ecological elements in the construction and development of new urban areas, advocating green construction.

References

- [1] Wang Rusong. Systems Ecology[M]. Beijing: Science Press, 1990 (In Chinese)
- [2] Tang Jianrong. Ecological Economics[M]. Beijing: Chemical Industry Press, 2005 (In Chinese)
- [3] Aim for Resource Allocation. Urban Ecological Economics[M]. Beijing: Economic Daily Press, 1989 (In Chinese)
- [4] Tongji University Editor of Urban Planning Principle[M]. Beijing: China Building Industry Press, 1991 (In Chinese)
- [5] Shen Please Base. Urban Ecology and Urban Environment[M]. Shanghai: Tongji University Press, 1998 (In Chinese)
- [6] Yang Zhifeng, Xu Linyu. Urban Ecological Planning Study[M]. Beijing: Beijing Normal University Press, 2008 (In Chinese)
- [7] Zhao Xiaoming. Theory and Practice of City Management[M]. Beijing: China Renmin University Press, 2006 (In Chinese)