

The Evaluation Index System of Chang-Zhu-Tan Urban Agglomeration "Two-Oriented Society"

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Abstract: In December 14, 2007, the State Council approved the Chang-Zhu-Tan Urban Agglomeration and the Wuhan city circle to be comprehensive supporting reform tentative areas for the construction of "two-oriented society". How to select evaluation index system is one of the key in the process of constructing "two-oriented society". This paper puts forward the evaluation index system of "two-oriented society" synthetically through understanding the connotation of "two-oriented society" deeply, combining with social subsystem, economic subsystem and resource environment subsystem.

Keywords: Chang-Zhu-Tan Urban Agglomeration, "two-oriented society", evaluation index

I. Introduction

In December 14, 2007, the State Council approved the Chang-Zhu-Tan Urban Agglomeration and the Wuhan city circle to be comprehensive supporting reform tentative areas for the construction of "two-oriented society". This is the important decisions of the country which promotes the rise of the central region, drives harmonious development of east, middle and west districts, accelerate to construct resource-conserving and environment-friendly society.

The "two-oriented society" was proposed in a short time. And the aspect of research is relatively rare at home and abroad. So we don't have a complete theoretical system for support and don't understand each aspect of "two-oriented society" completely, accurately and clearly. How to evaluate the construction situation of "two-oriented society" is difficult to achieve. The evaluation index system and evaluation methods of choose don't have a solid theoretical foundation. This paper aims at lacking evaluation index at present, analyzes influence factors of constructing Chang-Zhu-Tan Urban Agglomeration "two-oriented society", establishes the evaluation index system of Chang-Zhu-Tan Urban Agglomeration "two-oriented society".

II. The connotation of "two-oriented society"

The "two-oriented society" means "resource-saving and environment-friendly society". The essence of resource-saving and environment-friendly is adhering to the modern

development pattern of sustainable development and harmonious development under the guidance of the scientific concept. The resource-saving society and environment-friendly society are complementary each other. Therefore, we will be collectively referred to as a whole, the notion of "two-oriented society". We will refine the connotation of "two-oriented society" further based on the related theory.

A. Theoretical foundation

(1) The sustainable development theory

In 1987, Brundland lady (UN Environment and Development Committee Chairman) was firstly put forward the concept of sustainable development in the 《our common future report》^[1] after long-term studies.^[2] And the basic goal of "two-oriented society" construction is to achieve the comprehensive development of economy, society, resources and environment. Therefore, sustainable development theory is basic guidelines of Chang-Zhu-Tan Urban Agglomeration "two-oriented society" construction. And "two-oriented society" is very good to implement the concept of sustainable development.

(2) The circulation economic theory

Circular economy is essentially an ecological economy. It requires using ecological law rather than closed independent law to guide economic activity of human society. Chang-Zhu-Tan Urban Agglomeration "two-oriented society" construction is under the constraints of resource-saving and environment friendly, consumes the minimal resource and achieves the sustainable development of the economy. This is identical with the goal of circular economy. So we can say that the development of recycling economy is an important way of building the "two-oriented society". The circulation economic theory provides a strong theoretical support for achieving "two-oriented society". The "two-oriented society" is new development model based on sustainable development and circular economy theory.

(3) The new economic growth theory

The new economic growth theory emphasizes that economic growth is the product which does not from external forces (such as exogenous technology changes), but from the internal economic system power (such as endogenous technology changes).^{[3][4]} The new economic growth theory provides basic ideas about input elements for "two-oriented society" construction.^[5] We can improve efficiency of

economic growth through increasing the human capital, research resources and the level of technology.

B. The refining of "two-oriented society" concept

Overall, the "two-oriented society" is not a isolated concept. It realizes the sustainable development of the final is built on the basis of the relevant theories and through hanging the economic growth mode and developing circular economy and ecological economy. From the composition point of view, the "two-oriented society" includes resource-saving society and environment-friendly society. The "Two-oriented society" covers the whole process of metabolism of material flow, energy flow and waste material of the socio-economic system. From the process point of view, the whole society adopts protection, production, living and consumption patterns which are conducive to resource conservation and environmental protection. It can adopt administrative, legal, economic and other measures to improve efficiency of using resources, protecting the environment and the construction of ecological civilization in the production, exchange, consumption, distribution areas. From the results, we can build the social system of the economic, social, ecological and environmental coordinated development and achieve economic and social sustainable development through the comprehensive use of various means.

III. Establishment and evaluation of the evaluation index system of Chang-Zhu-Tan Urban Agglomeration "two-oriented society".

A. Design ideas of Evaluation index system

According to the connotation and construction target of "two-oriented society", the evaluation index of the "two-oriented society" should cover the stress index which can compare with the international advanced level, the focus of the measure index and the efficiency index which are from various social organizations take action should be on resources, environment, scientific and technological progress, infrastructure, production and other links. This paper is from actual situation of Chang-Zhu-Tan Urban Agglomeration, accords to the principle of establishing of index system, learns the research results of the evaluation index system which are about sustainable development, recycling economy, ecological economy as well as saving society on home and abroad, design the index system which can reflect comprehensively the status and trends of the coordinated development of society, economy, resources and environment of Chang-Zhu-Tan Urban Agglomeration "two-oriented society". It should more focus on the level of resource utilization, environmental protection, scientific and technological progress, industrial structure, etc.

Many scholars only consider the index of resource and environmental in building economical society evaluation index. They think that resources and environment is the key and rarely to evaluate economic and social development. This paper argues that construction of the "two-oriented society"

can not be more than just saving resources, but rather to improve the efficiency of resource use as a starting point. We can improve environmental condition through scientific and technological innovation, then from the overall standard to adjust existing economic structure, and achieve win-win situation of social, economic and resource environment. In addition, the part index of resources and environment are embedded in social index and economic index. Since this paper was to evaluate the construction status of Chang-Zhu-Tan Urban Agglomeration "two-oriented society", thus to highlight the protection situation of resource utilization and environmental. So this paper will list separately the resources and environmental index to highlight the evaluation of resource-saving and environment-friendly situation of Chang-Zhu-Tan Urban Agglomeration when it designs index.

B. The proposal of the evaluation index system

The construction of "two-oriented society" is the environmental carrying capacity as the basis, the laws of nature as the criteria, the sustainable development policy a means of regulation, advocates harmonious coexistence between people and nature and devote to construct a coordinated and sustainable development system. In summary, the establishment of the main function of the evaluation index system of "two-oriented society" has the following four aspects: The first is to describe and reflect all aspects of level and performance of urban agglomeration in any one period of time, thus to realize the overall situation of the area. Second is monitoring and evaluating various aspects of trend and speed of urban agglomeration in the certain period of time. Three is measuring comprehensively the coordination level of various aspects of the whole development. The final function of the index system is established in the above three functions. Decision-makers discover the existence questions and determine the corresponding policy on the basis of information in order to better building "two-oriented society" through understanding the relevant information of the overall regional development and judge whether the development of past achieved anticipated target.

This paper reference the method of range which the foreign cities adopt in designing the evaluation index when we want to establish the evaluation index of Chang-Zhu-Tan Urban Agglomeration "two-oriented society". The entire evaluation index system is divided into three subsystems: the social subsystem, economic subsystem and resources and environment subsystem. So that we can evaluate comprehensively Chang-Zhu-Tan Urban Agglomeration form the whole view.

[1]. Social Subsystem

It embodies the people-oriented ideology, including optimizing structure of the society and improving the city's urbanization level, improving people's standard of living and quality of life, etc. In addition, we classify some indicators which relate to the technology and education for this system, including the basic situation of science and education,

scientific and educational investment, technological transformation level, etc. The scientific and technological level is the most important impetus in the development and construction process of "two-oriented society". Whether developing economic, improving efficiency of resource utilization and protecting the environment, etc, all need science and technology innovation. We can fundamentally achieve resource conservation and environment friendly only by enhancing various aspects of science and technology culture content of the urban agglomeration.

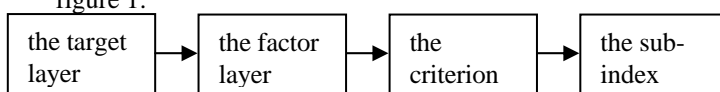
[2]. Economic Subsystem

To achieve economic development is the ultimate goal of constructing "two-oriented society". In this system, setting index should be more consider the sustainability of the economy and strive to fully reflect the results of activities, economic development level and changes throughout the regional economy. In this paper, the designing index take into account index of economies scale, index of economic liberalization and economic structure and efficiency index. We can evaluate comprehensively the development of economic from the economic scale, economic and trade, industrial structure and economic benefits and so on.

[3]. Resources and Environment Subsystem

Resources and environment provide the necessary material foundation and environmental conditions for the future development of the entire region. The purpose of "two-oriented society" is the development of social and economic based on the reasonable utilization of resources and environmental protection. The paper also tries to select index which can reflect the ability of resources and environmental sustainability when it design the index of the system. It considers comprehensively the index of resources and environmental status, index of resource consumption, index of resource utilization and environmental control from the sustainable development, the circular economy and ecological economic perspective.

We know that some index of itself does not have the testability when designing the index system. However, these indexes can be broken down into several sub-indexes, then forming a hierarchical structure of rational. The evaluation index system of Chang-Zhu-Tan Urban Agglomeration "two-oriented society" can be divided into four layers: The first layer that is the target layer, the comprehensive evaluation index; the second layer that is the factor layer, the structure evaluation index; the third layer that is the criterion layer, the classification evaluation index; the fourth layer that is the sub-index layer, the single evaluation index. Generally speaking, the single evaluation index has characteristics of single structure, concise and distinguishable and easily measured. To sum up, the overall framework of the evaluation system of Chang-Zhu-Tan Urban Agglomeration "two-oriented society" is shown in figure 1.



From the above consideration of several aspects as start, reference the literature of the sustainable development, circular economy and conservation-oriented society, combine with the overall framework of the evaluation system of Chang-Zhu-Tan Urban Agglomeration "two-oriented society", select the evaluation index of "two-oriented society". Such as shown in Table 1:

Grade I indicators	Grade II indicators	Single evaluation indicators
Social subsystem	Basic social indicators	Urban residents per capita disposable income
		Level of urbanization
		Engel Coefficient
		Registered urban unemployment rate
		Education funding accounts for the proportion of regional GDP
		Government research into the proportion of total regional GDP
		Scientific and technological activities funding of large and medium-sized enterprises
		The number of applying patents
		Technical contract transaction
		Conversion rate of scientific and technological achievements
Economic subsystem	Technology transformation indicators	Per capita regional GDP
		Regional GDP
		The growth rate of regional GDP
		Total industrial output value
		Industrial growth rate of large-scale enterprises
		Amount of investment in fixed assets
		Total retail volume of social consumer goods
		Total imports and exports volume
		FDI projects
		The secondary industry accounted for the proportion of regional GDP
	Economic and trade indicators	The tertiary industry accounted for the proportion of regional GDP
		High-tech output value accounted for the proportion
	economic structure and efficiency indicators	

Resources and environment subsystem	Resources and environmental status indicators	of regional GDP
		Composite index of industrial economic efficiency
		Excellent rate of air environmental quality
		The attainment rate of drinking water resources
		The attainment rate of industrial wastewater discharge
		Built-up area green coverage rate
		Per capita green area
		Per capita arable land area
		The energy consumption of unit regional GDP
	Resource consumption indicators	The energy consumption of the unit scale industrial added value
		Unit regional GDP power consumption
		The value of comprehensive utilization of waste products
		The comprehensive utilization rate of industrial solid waste
		The governing pollution sources accounted for the proportion of regional GDP
		Urban environmental infrastructure investment accounted for the proportion of regional GDP
		Urban sewage disposal rate
		The harmless disposal rate of domestic garbage
	Resource Utilization and Environmental Governance Indicators	

The index system is based on three major subsystems, and sketches out the nine major dimensions of 38 indicators. The index system is mainly consisted of quantitative index. The qualitative index finds a balance with quantitative indexes. Quantitative index and qualitative index should make the appropriate treatment in the actual evaluation process, then can input to a specific evaluation model. For the quantitative index, we can obtain through consulting the relevant literature. Or we can get through the special research way. The level of quantitative and qualitative index can be determined the scope through benchmarking method in the actual evaluation process.

In practice, the above index can be extended according to the actual situation of Chang-Zhu-Tan in order to make the evaluation results become more authenticity, reasonable. In addition, selecting the evaluation model of "two-oriented society" and calculating the value of the index are the key link of Chang-Zhu-Tan Urban Agglomeration "two-oriented

society" evaluation. It is an important way which can ensure the evaluation process to obtain more depth and get accurate conclusion. This paper argues that we can distribute the weight through analytic hierarchy process, and conduct the comprehensive evaluation of the actual situation through matter-element analysis methods or set pair analysis theory, and analyze the construction status, finding problem and solving problem in the practical application of Chang-Zhu-Tan Urban Agglomeration "two-oriented society" construction.

IV. Conclusions

The proposal of Chang-Zhu-Tan Urban Agglomeration "two-oriented society" only lasted for 2 years from putting forward. Due to lose experience for reference of the "two-oriented society" construction, this requires that the evaluation index system, evaluation methods and evaluation region belong to which stage of "two-oriented society" construction. This paper divides the index system into three modules: the social subsystem, economic subsystem and resources and environment subsystem on the basis of the relevant theories of "two-oriented society" and the actual situation of Chang-Zhu-Tan Urban Agglomeration. We design 9 Secondary indexes which include scientific and technological input, resources and environment and contain 38 single indexes based on three modules. In addition, it also can reduce and complement based on the specific situation in practice and forms a complete evaluation index system. We you can understand the economical use of resources in a given area and put forward specific policies and measures. Finally, the whole society highly uses resources and truly builds the "two-oriented society".

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