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The analysis of comprehensive measurement of the Poyang lake eco-economic zone' urban agglomeration

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ABSTRACT

The Poyang Lake Eco-economic Zone (PLEEZ) is the biggest Eco-economic Zone in China, and the urban agglomeration of it is developing very well. Analysis urban agglomeration compactness of it is very important for implementation the development of the urban agglomeration. In view of the previous scholars mainly using single variable measure to analysis urban agglomeration compactness in China, the aim of the study is to uses comprehensive measurement to analysis it. The study is to analyze its compacted growth within the past few years and offer some constructive suggestions and comments from the perspective of industry, space and transportation. The study concludes that the compactness of PLEEZ' urban agglomeration is increasing gradually in a narrow range, Among this, the compactness of transportation is essentially flat, while the compactness of industry twists and turns up and the compactness of space was improved greatly.

KEYWORDS

The Poyang lake eco-economic zone; Urban agglomeration; The methodology of comprehensive measurement; Compactness.



INTRODUCTION

The Poyang Lake Eco-economic Zone (PLEEZ) includes six districts of Nanchang, Jiujiang, Shangrao, Yingtan, Fuzhou and Jingdezhen and 42 counties (town, region), the land area of which is 5132 square kilometers, account -ing for 31% of the total area of the Jiangxi province. The total population of PLEEZ is 18.8 billion, among which the urban population is 7.9 million, making up 43% and 45.12% of Jiang -xi province's total province. PLEEZ' GDP in 2007 was 300.8 billion Yuan, accounting for the province's 55% of the total^[1]. When it comes to 2011, its GDP reached 5642 billion, increased 18.66% compared with 4589.3 billion in 2010, and it is To 3.58 times in 2004. It is observed that the economic level of the overall urban agglomerations has obtained a big development in the few seven years. In addition, the three industry output value of Poyang Lake Eco-economic Zone has changed in recently years. The range of the output value of the first industry growth is small, while the output value of the second and third industry had a rapid growth. The output value of the first industry increased from the 2004 year's 742.1 billion to the 2011 year's 3154 billion, for the original 3.22 times. At the same time, the ratio of the three industries' output value changed from 15:47:38 in 2004 to 10:56:34 in 2011. The primary industry proportion fell by 5%, the second industry increased by 9%, and the third industry was reduced by four percent. Above all, the economy of the urban agglomeration presents a trend of increasing. From the aspect of population, the urban agglomeration' population is 20.80 billion in 2004. Then it increased to 21.48 billion in 2011, which increased 3.2%, compared to 2004. During 2005 to 2006, the total population of the urban agglomeration turned up a transient gliding. After 2006, the urban agglomeration population continues to increase, and main -tained the stable growth. In 2010, the population stopped growth, and keeping the original value until 2011, maybe the popu -lation of the urban agglomeration has reached the saturation state.

The methodology of comprehensive measurement of compactness was firstly put forward in the 20 century 60's in the foreign. Western scholar Dantzig ect. put forward the concept of urban Compact^[2]. Bertaud and Malpezzi^[3] put forward the compactness used for the measurement of urban compact -ness^[3]. Then, Elizabeth (2002) established the comprehensive measuring index system of urban compactness, categorizing cities, putting different cities into different categories; analyzing and ensuring the different factors of different kinds of cities in accordance with the point that influence the development of urban compactness, and then assign a value to calculate^[4]. Yu-Hsin^[5] put forward defining the compact degree of several indicators and the corresponding quantitative analysis method from the metropolitan area level, and simulating compact degrees by autocorrelation^[5]. The domestic study of the compactness of urban agglomeration rise at the end of last century, which gradually increased in recent years. Fang ect^[4]. established the theoretical model of compre -hensive measurement of compactness to Chinese urban agglomeration from the perspective of industry, space and transporta -tion, and measuring the comprehensive compactness of 23 Chinese urban agglomera -tions^[6]. Tian ect.(2013) using entropy value method to measure comprehensively the urban agglomeration's compactness of Wuhu province in 1996,2005 and 2009, and putting forward some strategies for its urban develop -ment^[7]. Similarly, Mao etc^[8]. used entropy value method to analyses the compact -ness of 13 cities of Jiangsu province, obtain -ing the conclusion that the compactness of Jiangsu province' cities generally weakened gradually from south to north^[8]. Panjinghu and Wen^[9] structured the comprehend -sive measurement model of urban com -pactness from the aspects of economic compactness, land usage degree compactness, population compactness and infrastructure compactness and so on. Using principal component analysis to measure comprehend -sively the urban compactness and Spatial spillover effects of Chinese 287 cities in 2009^[9].

METHODOLOGY AND MATERIALS

Methodology

Select the space layout, industrial structure, transportation network and other related indicators, which have important influence on the measuring of the compactness of the urban agglomeration, dimension for time series, from the perspective of urban agglomeration compactness, use the model of comprehensive measurement of compactness to measure comprehensively the compactness of PLEEZ' urban agglomeration from 2004 to 2011. Then analysis inductively for the measuring results. Set I_c for

the urban agglomeration' industry compactness index, I_s for the urban agglomeration' space compactness index, I_t for the urban agglomeration' transportation compactness index. And α , β , γ represent respectively the weighted influence coefficient of industry compactness, space compactness and transportation compactness^[6]. Then the comprehensive compactness of the urban agglomeration could be signified as:

$$U = \alpha I_c + \beta I_s + \gamma I_t \quad (1)$$

(1)The measurement model of the urban agglomeration' industry compactness. I_{cc} is Industrial concentration index, which refers to the degree of dominance of a handful of firms' production, sales, and total assets in some industry to the entire industry. It's usually revealed by several companies' certain percentage of the total index of the industry. The size of the market concentration of a company shows its position in the market and its dominant ability of the market. I_{ci} is the concentration index of industrial structure. I_{cs} is the Space efficiency index of the industrial structure. Then the measuring model of the urban agglomeration' industry compactness could be expressed as:

$$I_c = \alpha_c I_{cc} + \beta_c I_{ci} + \gamma_c I_{cs} \quad (2)$$

In this formula: α_c , β_c , γ_c represent respectively the weight of Industrial concentration index (I_{cc}), concentration index of industrial structure (I_{ci}) and space efficiency index of the industrial structure (I_{cs}). The article borrows the outcome that Fang etc^[4]. calculated under the support of the entropy AHP model: ($\alpha_c = 0.30$, $\beta_c = 0.36$, $\gamma_c = 0.34$)^[6]. And I_{cc} , I_{ci} and I_{cs} are calculated by the follow formulas:

Set $x_i = M_i / GDF_i$, and then:

$$I_{cc} = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}} \quad (3)$$

Among this, M_i is the industrial added value of the urban i in this urban agglomeration. GDF_i is the gross domestic product of urban i , \bar{x} is the average value of every index. And n means the number of urban in this urban agglomeration.

Set $x_i = (\delta F_i + \varphi S_i + \omega T_i) / GDF_i$, then

$$I_{ci} = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}} \quad (4)$$

Among this, F_i , S_i and T_i are the three industries' value of the urban in the urban agglomeration. δ , φ and ω are the three industries' weighted value which is calculated by the expert group using the method of democratic decision with the support of entropy technology. ($\delta = 1.50$, $\varphi = 3.87$, $\omega = 4.63$)^[6]

$$I_{cs} = \frac{\sum_{k=1}^2 (\beta_i x_{ik} \gamma_j x_{jk})}{\sqrt{\sum_{k=1}^2 x_{ik}^2 \sum_{k=1}^2 x_{jk}^2}}, i \neq j \quad (5)$$

Among this, x_{ik} is the population of the industry k in city i . x_{jk} is the population of the industry k in city j . β_i , γ_j are the weights of the second and third industry' relative importance.

(2)The measurement of the urban agglomeration' space compactness. Urban agglomeration' space compactness is the compactness degree of elements like population, town and economic relation etc. in space, is the core index of judging intensive land-use and space output benefit. Set I_{si} as Spatial

interaction index, I_{sp} as the population density index, I_{su} as Urban density index. Then the measuring model of the urban agglomeration' space compactness could be showed as:

$$I_s = \alpha_s I_{si} + \beta_s I_{sp} + \gamma_s I_{su} \tag{6}$$

In the formula: $\alpha_s, \beta_s, \gamma_s$ are the weight of Spatial interaction index(I_{si}), population density index(I_{sp}),

Urban density index(I_{su}). The paper borrows the outcome that Fang etc.(2008) calculated Under the support of the entropy AHP model. ($\alpha_s=0.35, \beta_s=0.28, \gamma_s=0.37$) And I_{si}, I_{sp} and I_{su} are calculated by the follow formulas:

$$I_{si} = \frac{\sum_{i,j=1}^n \frac{\sqrt{P_i \cdot GDP_i} \cdot \sqrt{P_j \cdot GDP_j}}{D_{ij}}}{1 + 2 + \dots + (n - 1)} \tag{7}$$

In this formula, P_i, P_j are the total population of the city i and j , GDP_i, GDP_j are respectively the Gross Domestic Product of city i and j . D_{ij} is the distance between city i and j , n is the number of cities in the city agglomeration.

Set $x_i = \eta_i P_i / A_i$, and then

$$I_{sp} = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n - 1}} \frac{\sum x_i}{n} \tag{8}$$

In this formula, x_i respresent the relative index of city i in the city agglomeration. \bar{x} is the average value of every index. n is the number of cities in the city agglomeration. H_j is the weight of different cities' degree. J is 1-5, that is five degree of large cities, especially big cities, large cities, medium cities and small cities. The accordingly weight is 0.36, 0.28, 0.20, 0.12 and 0.04, which is calculated by the expert group using the method of democratic decision with the support of entropy technology.

P_i is the whole population of city i , A_i is the area of city i .

$$I_{su} = \frac{\sum a_j N_j}{\sum A} \tag{9}$$

In the formula, a_j is the weight of different city grade; N_j is the city number of relevant grade. J is 1-5, that is the town system of the five degree, A_i is the area of some city.

(3)The measurement of the urban agglomeration' transportation compactness. The urban agglomeration' transportation compactness is the optimizing degree of all kinds of traffic relation galleries' spatial organization and layout and the height of the clear on the traffic, is the index to measure the traffic relation convenience between the node city from the prospect of the clear on the traffic, reflecting the traffic relation between the node cities from their traffic distance, city quantity and the area size and so on, and then reflect the urban agglomeration' transportation compactness. Set I_{tt} as the weighted insight index, I_{tf} as The not weighted insight index, I_{ts} as space compact index. Then the measuring model of the urban agglomeration' transportation compactness could be expressed as:

$$I_t = \alpha_t I_{tt} + \beta_t I_{tf} + \gamma_t I_{ts} \tag{10}$$

In this formula: $\alpha_t, \beta_t, \gamma_t$ represent respectively the weight of The weighted insight index(I_{tt}), The not weighted insight index(I_{tf}), space compact index(I_{ts}) The article borrows the outcome that Fang etc.(2008) calculated Under the support of the entropy AHP model: $\alpha_t=0.28, \beta_t=0.16, \gamma_t=0.56$ ^[6]. And I_{tt}, I_{tf} and I_{ts} are calculated by the follow formulas:

$$I_{tt} = \sum_{j=1}^n (T_{ij} * \sqrt{GDP_j * P_j}) / \sum_{j=1}^n \sqrt{GDP_j * P_j} \quad (11)$$

In this formulate is the best time that the node takes to the economic center (or the determination). $\sqrt{GDP_j * P_j}$ is some social economic element' flow to evaluate some area center or determination in the area of this system, n is the quantity of the node except this node in the evaluate system.

Set $x_i = (\sum_{j=1}^{n-1} T_{ij}) / (n-1)$. then:

$$I_{tf} = \sqrt{\sum_{i=1}^n (x_i - \bar{x}) / n - 1} \frac{\sum x_i}{n} \quad (12)$$

In the formula, x_i repents the relative index of city i in the urban agglomeration. \bar{x} is the average value of every index. n is the number of cities in the urban agglomeration.

$$I_{ts} = \frac{n \sum_{i=1}^n L_{Ni}}{\sum_{i=1}^n A_i \sqrt{\sum_{i=1}^n (x_i - \bar{x}) / n - 1}} \quad (13)$$

In the formula, L_{Ni} is direction quantity of foreign direct. n is the quantity of nodes in the urban agglomeration. A_i is the area of the city. X_i is the straight distance between the nodes. \bar{x} is the average straight distance between the nodes.

Datas

(1)Data sources: all the data comes from Jiangxi province, statistical yearbook of Jiangxi province, Population and employment statistics yearbook of Jiangxi province, National Statistics Bureau, China's population and employment statistics year -book, bureau of statistics of Jiujiang province, bureau of statistics of Nanchang province, bureau of statistics of Jingdezhen province, bureau of statistics of Yintan province, bureau of statistics of Shangrao province, bureau of statistics of Fuzhou province, bureau of statistics of Yichun province.

(2)Study area: the area of PLEEZ' urban agglomeration in the research is the follow 42 counties, which has been divided into Core area, edge area and peripheral area.

The Core area: Nanchang (Nanchang city jurisdiction, Nanchang County, Xinjian County, Jinxian County), Jiujiang (Jiujiang prefecture, Jiujiang County, Hukou County, Duchang county, Xingzi County, Dean County, Yongxiu County), Fuzhou (Dong -xiang County), Shangrao (Poyang County).

Edge area: Nanchang (Anyi County), Jing -dezhen (Jingdezhen city jurisdiction, Leping County, Fuliang County), Jiujiang (Pengze County, Wuning County, Ruichang County), Yingtian (Yingtian city jurisdiction, Guixi County, Yujiang county), Fuzhou (Fuzhou city jurisdiction, Chongren County, Jinxi County), Yichun (Jiangan County, Fengxin County, Fengcheng County, Zhangshu County, Gaoan County), Shangrao (Wannian County, Yiyang County).

Peripheral area: Jian (Xingan County), Fuzhou (Lean County, Yihuang County, Zixi County, Nancheng County), Shangrao (Hengfeng County, Dexin County, Wuyuan County).

(3)Data handling: all the data of industrial added value, gross domestic product, population, production value of the first, second and third industry are down the following data processing:

The data of Jiujiang province = original data of Jiujiang province - data of Xiushui county;

The data of Shangrao province = original data of Shangrao province - data of Guangfeng county - data of Yushan county - data of Shangrao county - data of Qianshan county;

The data of Fuzhou province = original data of Fuzhou province - data of Nanfeng county - data of Lichuan county - data of Guangchang county;

The data of Yichun province = data of Zhangshu county + data of Gaoan county + data of Fengcheng county + data of Jingan county + data of Fengxin county.

EMPIRICAL ANALYSIS

The computing outcome of the compact -ness of PLEEZ' urban agglomeration and its component value from 2004 to 2011 are showed in the following chart:

Analyzing the outcome from the following four aspects

(1)The analysis of the industrial compactness outcome: the urban agglomeration industrial compactness is the degree of industrial clustering which is reflected in the process of the extension of the industry chain and the reasonable industrial division, taking the developed traffic network for contact platform, according to the industry economic and technical contact. It is comprised of Industrial concentration index, concentration index of industrial structure, Space efficiency index of the industrial structure. From chart 1,we can see that industrial concentration index has positive correlation relationship with the city's industrial output. Although the industrial compactness of PLEEZ has a rising trend on the whole, the increases are modest. It seems that the Industrial cluster of PLEEZ has not yet formed a good agglomeration in recent years. Since December 12, 2009, PLEEZ economic planning raised for the national strategy, I_c (the Industrial concentration index) have an obvious improvement, which increased from the 0.00011 in 2004 to the 0.197 in 2011, is 1790 times that of original, which shows the industrial output and the industrialization process in the urban agglomeration improve rapidly. By contrast, we can find that I_{cj} (concentration index of industrial structure) and I_{cs} (Space efficiency index of the industrial structure) not only did not increase but has a downward trend, it says the second and third industry of Poyang Lake Eco-economic Zone hadn't developed to its proper level.

Chart 1: PLEEZ' urban agglomeration and its component value

	2004	2005	2006	2007	2008	2009	2010	2011
I_c	0.4400	0.483	0.4758	0.4570	0.4490	0.4900	0.4760	0.4700
I_{cc}	0.0001	0.006	0.0128	0.0480	0.0755	0.1460	0.1840	0.1970
I_{cj}	0.3360	0.4340	0.398	0.3090	0.2600	0.3200	0.2400	0.2215
I_{cs}	0.9400	0.9570	0.9700	0.9740	0.9770	0.9800	0.9800	0.9900
I_s	0.1470	0.1590	0.1670	0.1770	0.1900	0.2000	0.2120	0.2310
I_{si}	0.0317	0.038	0.0488	0.0570	0.0700	0.0840	0.0960	0.1200
I_{sp}	0.2222	0.225	0.2280	0.2320	0.2350	0.2400	0.2420	0.2400
I_{su}	0.2000	0.224	0.2335	0.2480	0.2710	0.2880	0.3000	0.3309
I_t	0.0547	0.064	0.075	0.0800	0.0860	0.0900	0.0990	0.1000
I_{tt}	0.0170	0.0175	0.0176	0.0177	0.0177	0.0177	0.0178	0.0178
I_{tf}	0.1960	0.2550	0.3110	0.3450	0.3720	0.3980	0.4420	0.4629
I_{ts}	0.0330	0.0330	0.0370	0.0370	0.0390	0.0390	0.0410	0.0420
U	0.2135	0.2345	0.2400	0.2400	0.2420	0.2620	0.2600	0.2700

I_c is industry compactness, I_{cc} is Industrial concentration index, I_{cj} is concentration index of industrial structure, I_{cs} is Space efficiency index of the industrial structure; I_s is space compactness, I_{si} is Spatial interaction index, I_{sp} is population density index, I_{su} is Urban density index. I_t is transportation compactness, I_{tt} is The weighted insight index, I_{tf} is The not weighted insight index, I_{ts} is space compact index, U is urban agglomeration compactness.

(2)The analysis of the space compactness outcome: the urban agglomeration space compactness refers to the degree of concentration of every cities spatial size on the regional spatial in the urban agglomeration, which could be used to judge intensive land-use and space output benefit and embody the basic index like city node allocation, density of population, per capita area, which is also the index to measure the degree of concentration of city and population from the perspective of area. Space interaction index is a index to measure the interaction intensity between cities in urban agglomeration. The most important index of spatial interaction index is the population and gross regional production. From chart 1,we can see a marked trend upward on space compactness and its component, and it would continue to go up. The space compactness increased from 0.147 in 2004 to 0.231 in 2011, which raised 57.14%. It says the population and gross regional production in the urban agglomeration had a jump rise in the recent years. In addition, compared to I_{sp} (population density index) and I_{su} (Urban density index), I_{si} (Spatial interaction index) had a more obvious rising. It says for space compactness, the contribution of spatial interaction is larger than others. However, under the influence of family planning, the increase of population density index and urban density index are suppressed in some extent, especially for I_{sp} (population density index).

(3)The analysis of the transportation compactness outcome: Traffic network construction and optimization is of great significance for the development of urban agglomeration. But in consideration of that the larger the area of urban agglomeration, the larger of the transportation distance, then the transportation compactness may decline. So, the area of the urban agglomeration has a large influence on the measurement of the transportation compactness. Since the area of PLEEZ were designated, it range was barely changed. From chart one, we can see that the final transportation compactness were relatively stable, having no fluctuation basically. I_{tt} (The weighted insight index), I_{tf} (The not weighted insight index) are composed of the shortest time taking from city nodes to economic center and so on, so its downward trend year by year reversely reflect the rising of the transportation compactness, It also conforms to the basic common sense and logic. In addition, I_{ts} (space compact index) increased slightly, which explains that the transportation condition in the urban agglomeration were increasing slowly and the contact between cities in the urban agglomeration are more and more convenient.

Chart 2: The grade for PLEEZ' urban agglomeration

year	2004	2005	2006	2007	2008	2009	2010	2011
U	0.2135	0.2345	0.24	0.24	0.242	0.262	0.26	0.27
Grade	Low	Low	Low	Low	Low	Low	Low	Low

U is urban agglomeration compactness, and Grade is the level of it.

(4)The analysis of the urban agglomeration compactness outcome. From chart 2 we can see that the compactness of PLEEZ increased from 0.2135 in 2004 to 0.27 in 2011, the increasing rate reached 26.5%. It says the he Poyang Lake Eco-economic Zone has a good development in recent years, and then promotes the rising of the urban agglomeration compactness. the outside resources and material gathered into the urban agglomeration acting as economic growth pole for surrounding areas with its economic development. At the same time, we can see that the increasing extent of I_s (space compactness) is the largest. That is to say the spatial exchange of the urban agglomeration are getting larger, the urban agglomeration are related together gradually. It also reflected the spatial structure superiority of the 42 counties.

Referring the way that Fang etc.(2008)^[6] divided the grade of Chinese urban agglomeration: $0.00 < U < 0.15$ is no compact ; $0.15 < U < 0.35$ is Low compact ; $0.35 < U < 0.50$ is Medium compact; $0.50 < U < 1.00$ is compact; $U > 1.00$ is high compact. The text makes the grade separation for PLEEZ' urban agglomeration.

CONCLUSIONS

Data of the above results can be seen that the Poyang lake ecological economic zone has a certain increase of urban compactness degree generally; this growth is mainly manifested in the space compactness growth. It proved that the population and GDP of the Poyang lake ecological economic zone have obvious increase in recent years. For the growth of the industry compactness is mainly reflected in the growth of industrial concentration index, the other two component concentration of industrial structure and industrial structure space efficiency index, have no obvious improvement. It indicated that the development of Poyang lake ecological economic zone urban agglomeration of the third industry has not yet reached certain level. In addition, the Poyang lake ecological economic zone of urban agglomeration transportation compactness and its components had no obvious change in recent years, which says urban agglomeration transportation development is not been improved to a certain extent. It also needs to improve and increase its compactness. I will put forward several policy suggestions aim at the phenomenon.

(1) Adjust the industrial structure, increase the contact between industries gradually, and strengthen the output of the third industry. Poyang lake ecological economic zone as commodity grain production base, agriculture as the leading enterprise is indisputable, but at the same time we must strengthen the production of the third industry. The third industry mainly strengthens the tourism and the development of high-tech industries. Poyang Lake is the largest famous freshwater lake in China with a series of natural scenery, historical landscape and revolutionary tradition education. These suggested that the Poyang lake ecological economic zone in the travel service industry development is of great potential. As for the new and high technology industries, there are Jiujiang, Nanchang along the lake. Jiujiang to Nanchang has formed the "south nine industrial corridor" now. We can take advantage of this ecological economic zone to strengthen the development of aircraft manufacturing, automotive and electronics industries.

(2) Strengthen the transport links within the urban agglomeration. In order to strengthen the Poyang Lake ecological economic zone city group regional integration development goals and objectives, relieve the tense situation of regional transportation, improve the structure of integrated transport and promote the urbanization process, we should strengthen the internal transport links, urban agglomerations so that we can strengthen the industry, such as economic and trade links. We should increase the central city transport links particularly, including input and output bidirectional links. From the survey we can see that urban agglomeration in the Beijing-Tianjin channel's traffic growth rate has reached 7% to 10% in nearly a decade. The Hunting channel Yangtze river delta urban agglomeration, interrupt growth rate has reached 10% to 19%, and the pearl river delta urban agglomeration in Dongguan, Shenzhen connect channel part has reached 11% to 16% in recent 5 years. Thus, in order to speed up the urban agglomerations of the development of the Poyang lake ecological economic zone, we should strengthen its traffic links with the outside world.

(3) Make full use of the Poyang lake ecological economic zone of the natural environment advantages, and try our best to protect the environment in order to make its advantages exist for a long time. As China's largest freshwater lake, Poyang lake has a broad wetland area, rich biological species (including wild birds such as owl, geese, swans, moment, gulls, heron, etc, and the dearest first-grade state protect animal red-crowned crane), which is one of the top ten ecological function protected areas in China. It is also one of the WWF global important ecological zones with low terrain, fertile soil, and abundant water resources. Its natural resources and environment is very important for the economic development. The production of photoelectric, new energy, biological, pharmaceutical, steel, copper smelting processing, such as pillar industry development in Poyang Lake ecological economic region need many kinds of production material and energy coming from the natural environment. But at the same time, we should save for rainy days. Don't forget to strengthen its environment protection while developing economy, Such as the implementation of returning farmland to forest project, the improvement of the construction of environmental monitoring system, the application of ecology principle to create the ecological technology, and so on. This requires government to take it seriously,

and people's consciousness. We should work together to achieve the purpose of protecting the environment.

(4) Like other urban agglomerations, we should increase the construction of urban agglomeration center city and improve the economic center of radiation effects. The cultivation, development and expansion of the Poyang Lake ecological economic zone urban agglomeration is the inevitable trend of its long-term development. We must strengthen the central city of all aspects of development to improve its economic center of radiation effect for a better urban agglomerations construction. Nanchang, the provincial capital of Jiangxi, its economy, transportation, industry have a good development, and has the strongest economic ties with other cities, so we should increase its economic development. In addition, Jiujiang which has formed the dual-core with Nanchang has the core city quality. In 2011, Jiujiang GDP reached 103.2 billion Yuan, much higher than the other cities of urban agglomeration. In order to play a leading role to the development of the whole urban agglomeration, the construction of Poyang lake ecological economic zone city group should strengthen the dual core city development of "Nanchang-Jiujiang".

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