

International Workshop - Session 1

The construction of Eco-city in  
China



## The construction of eco-city in China

\* Fen LI, Linbo ZHANG, Daiqing LI

Institute of Ecological Environment Research, CRAES, China

\*Corresponding author (lifeng@craes.org.cn)

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The ecological civilization is considered a high-level achievement of human civilization. And the ecological city is a new type of city, constructed on the theories of eco-progress and principles of ecology, in which nature, economy, society and human being can develop harmoniously. It will be an inevitable course in Chinese urbanization. The construction of an eco-city will have a strategic significance in the transformation of the city civilization model and in the development of urban life.

We analyzed features and trend of urban development since the founding of the People's Republic of China in 1949 (Fig. 1). China has experienced an intensive and rapid urbanization process since Reform and Opening. With the rapid expansion of city amount and size, China has gradually formed 10 big city groups, they had great denseness in population and highly intensive in economy. At present China's urbanization and industrialization are in the high-speed development stage. The growing problems of resources and energy depletion, environmental pollution and ecological destruction are particularly acute. Therefore the construction of ecological cities is a necessary and urgent choice.

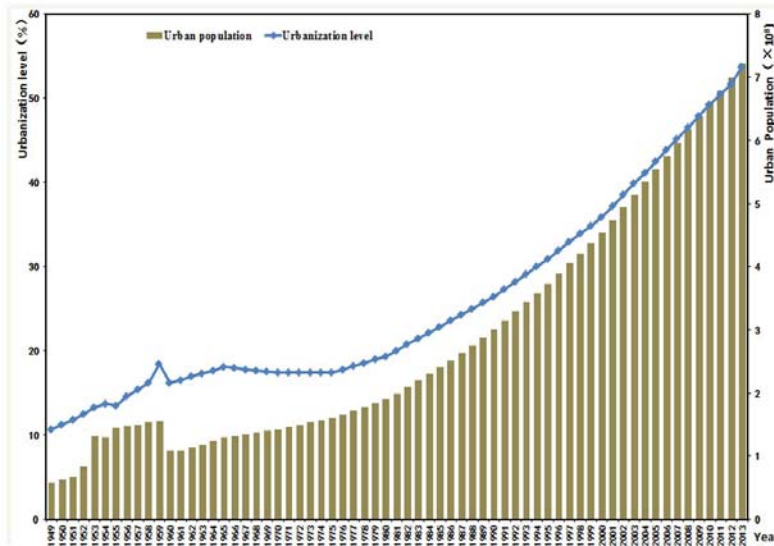


Fig. 1 Urbanization process in China

Based on this background, we reviewed practice and exploration on eco-city construction over the past 30 years in China (Fig. 2), including basic theory, planning guidelines, design method, and management mechanism. The Chinese eco-city development model and policy with a Chinese

characteristic have promoted a sustained economic growth and also effectively improved eco-environmental quality. However, the problems existed in Chinese eco-city construction included think more of economic development, management system to be improved and lack of strong scientific and technological support, etc. In the next study, the theoretical research need to improve, the indicator system of eco-city need to perfect, and the supervision to strengthen in order to make eco-city construction to be more perfect and more vitality.

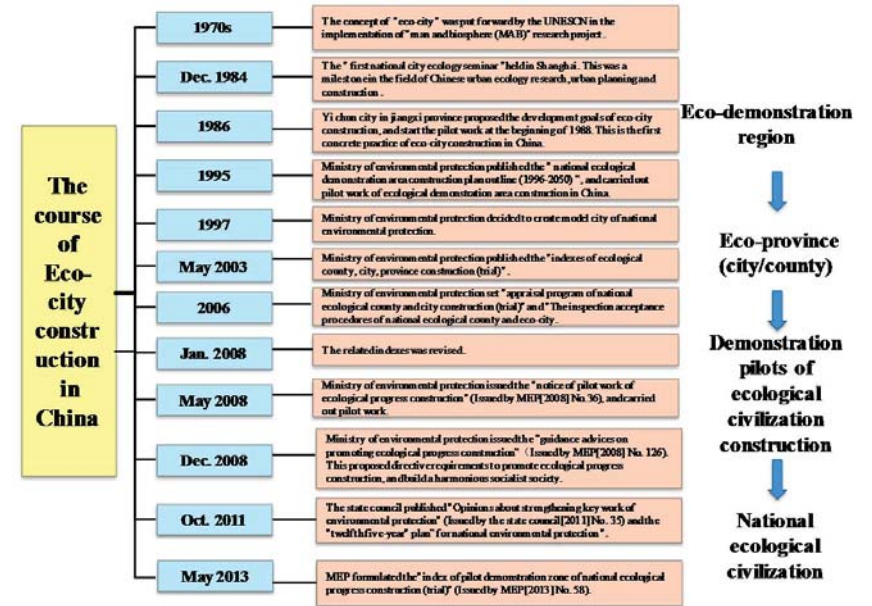


Fig. 2 The course of Eco-city construction in China

The Eighteenth National Congress of the Communist Party of China has put forward to make great efforts to promote ecological civilization, raise our ecological awareness of the need to respect, accommodate to and protect nature, give high priority to making ecological civilization and work hard to build a beautiful country, and achieve lasting and sustainable development of the Chinese nation.

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# The Construction of Eco-City in China

**Li Fen**

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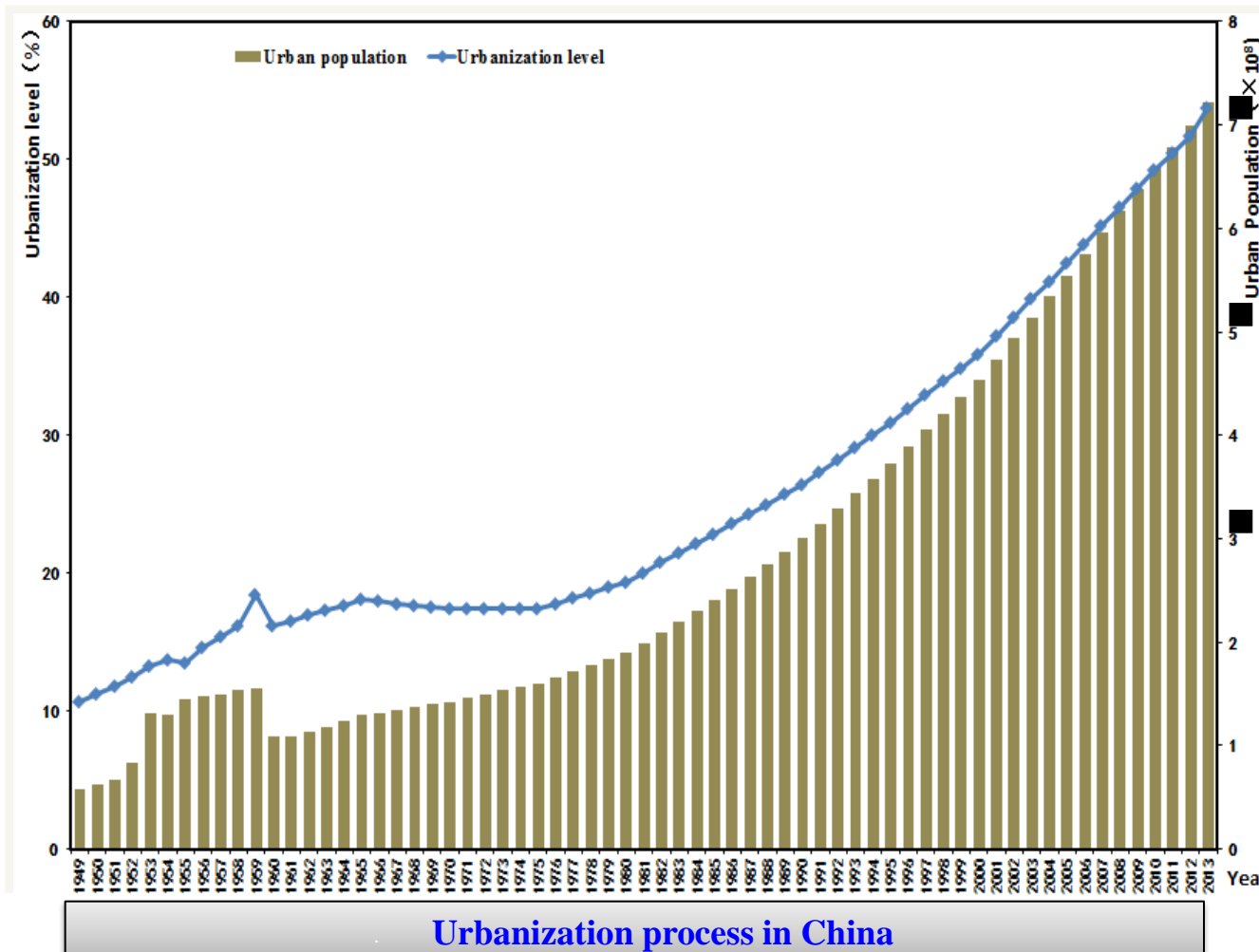


# *Outline*

- 1** **Urbanization in China**
- 2** **Environmental Challenges**
- 3** **Construction of Eco-City**

# Urbanization in China

- China has experienced an intensive and rapid urbanization process. The urbanization rate increased from 10.64% to 53.73% from 1949 to 2013.



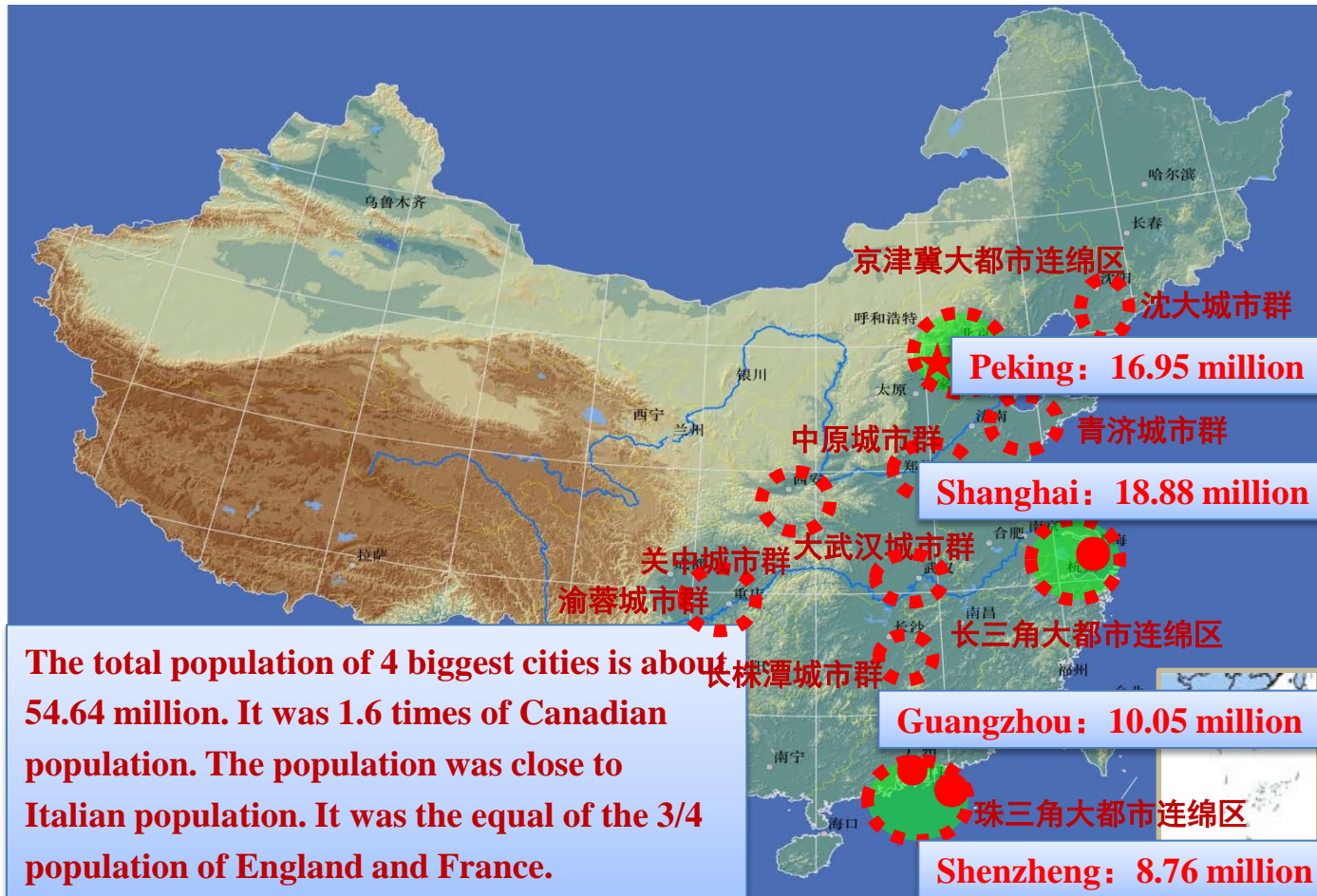
In 1949, Chinese urban population was 58 million. It was 7.2 hundred million in 2013.

For the first time urban population grew more than rural population (51.27%) in 2011.

Since Reform and Opening, China's urbanization speeds up, the urbanization rate of China is 3 times as much as that of the world in the same period.

# Urbanization in China

- With rapid growth of urban population, China's city number and area size also expanded. There gradually formed 10 Metropolitan regions with high population density and intensified economic activity.



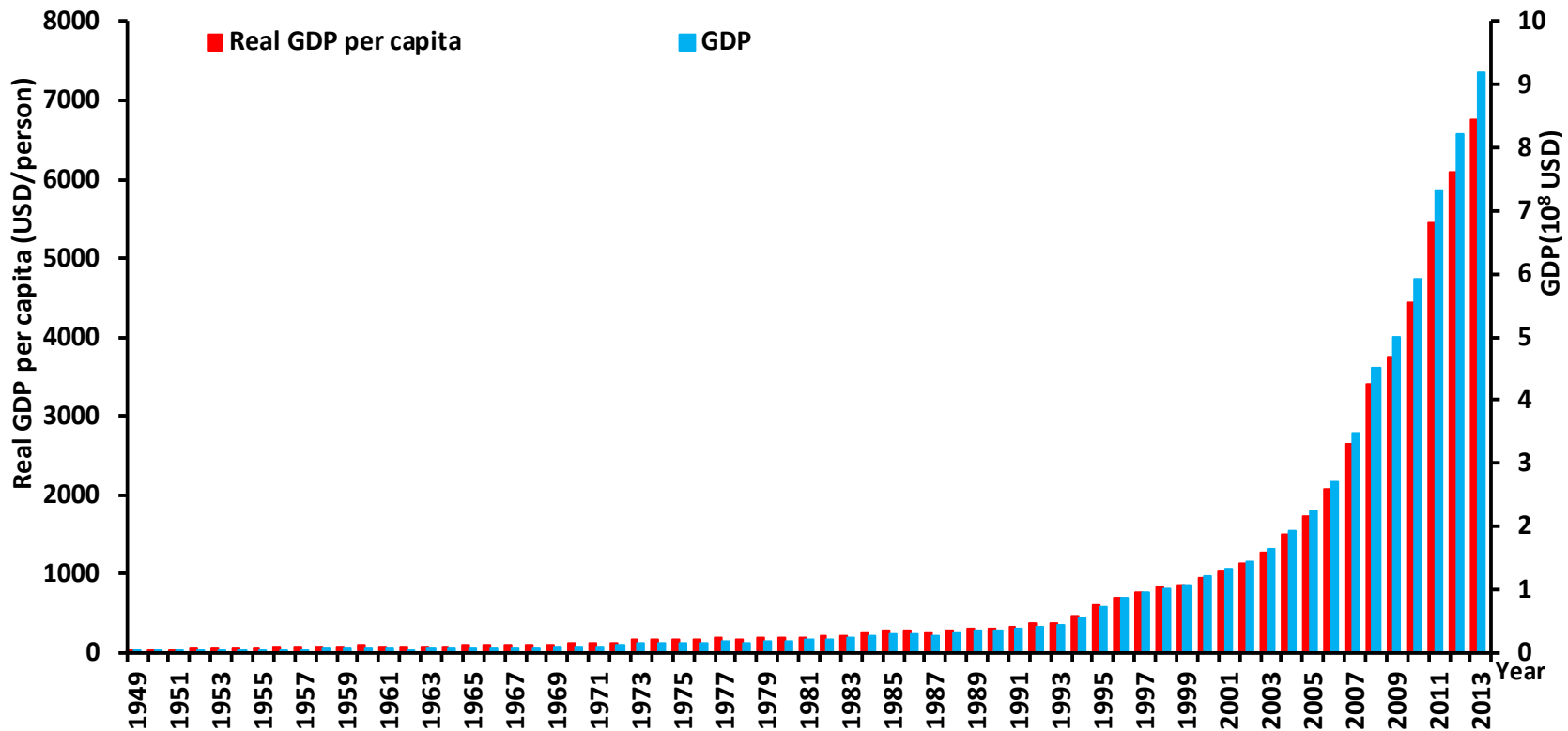
The total population of 4 biggest cities is about 54.64 million. It was 1.6 times of Canadian population. The population was close to Italian population. It was the equal of the 3/4 population of England and France.

- Number of city increased from 193 in 1978 to 658 in 2013.

- The 3 biggest city groups had contributed to 14% population and 42% GDP with less than 3% of the land area in China.

# Urbanization in China

- In the past 60 years, China's economy maintained a relatively high-speed growth. China has already reached USD 1000, USD 3000 and USD 6000 of GDP per capita and USD 900 billion of GDP and has now become one of rich developed Countries.

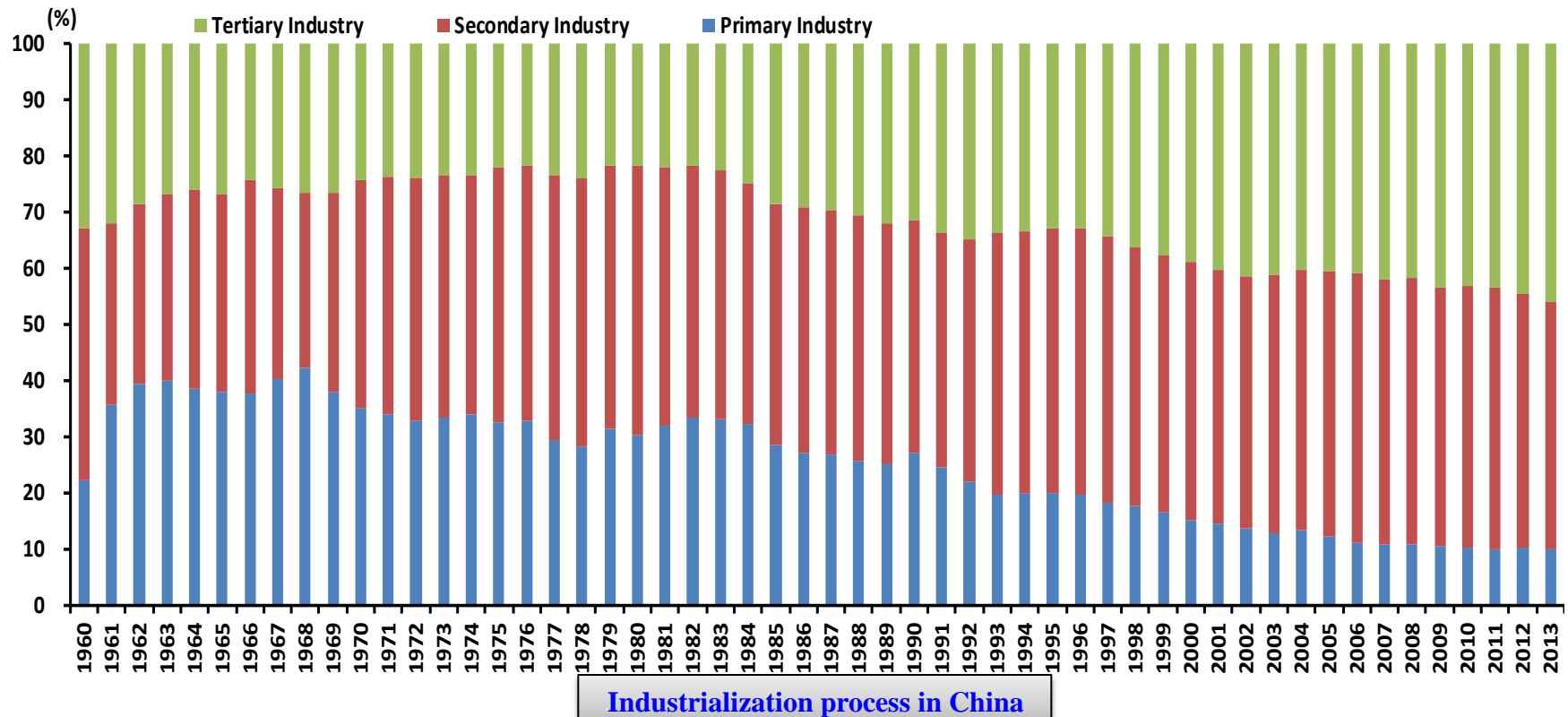


The feature for China's economy

# Urbanization in China

## ■ China's industrialization is still at the mid-stage. Industrialization is still the process that most Chinese cities must go through.

- Proportion of primary industry decreased steadily from 22% to 10%, the tertiary industry increased from 33% to 46% in recent 50 years.
- The gap of industrialization process between developed countries and China remains is huge.





# Urbanization in China

- New government published spatial distribution of new Chinese urbanization plan in 2014.



- Distribution and size of urbanization were determined based on land, water resource, atmospheric circulation characteristics and the ecological environment carrying capacity.

# *Outline*

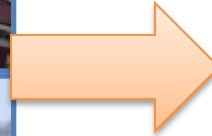
-  **1** Urbanization in China.....●
-  **2** **Environmental Challenges**.....●
-  **3** Construction of Eco-City.....●

# Environmental Challenges

- The global and regional environmental problems mostly come from city. Resource consumption and pollutant emissions account for 70% of that of the whole world.



**Rapid urbanization  
in China**



**Traffic Pressure**



**Air Pollution**



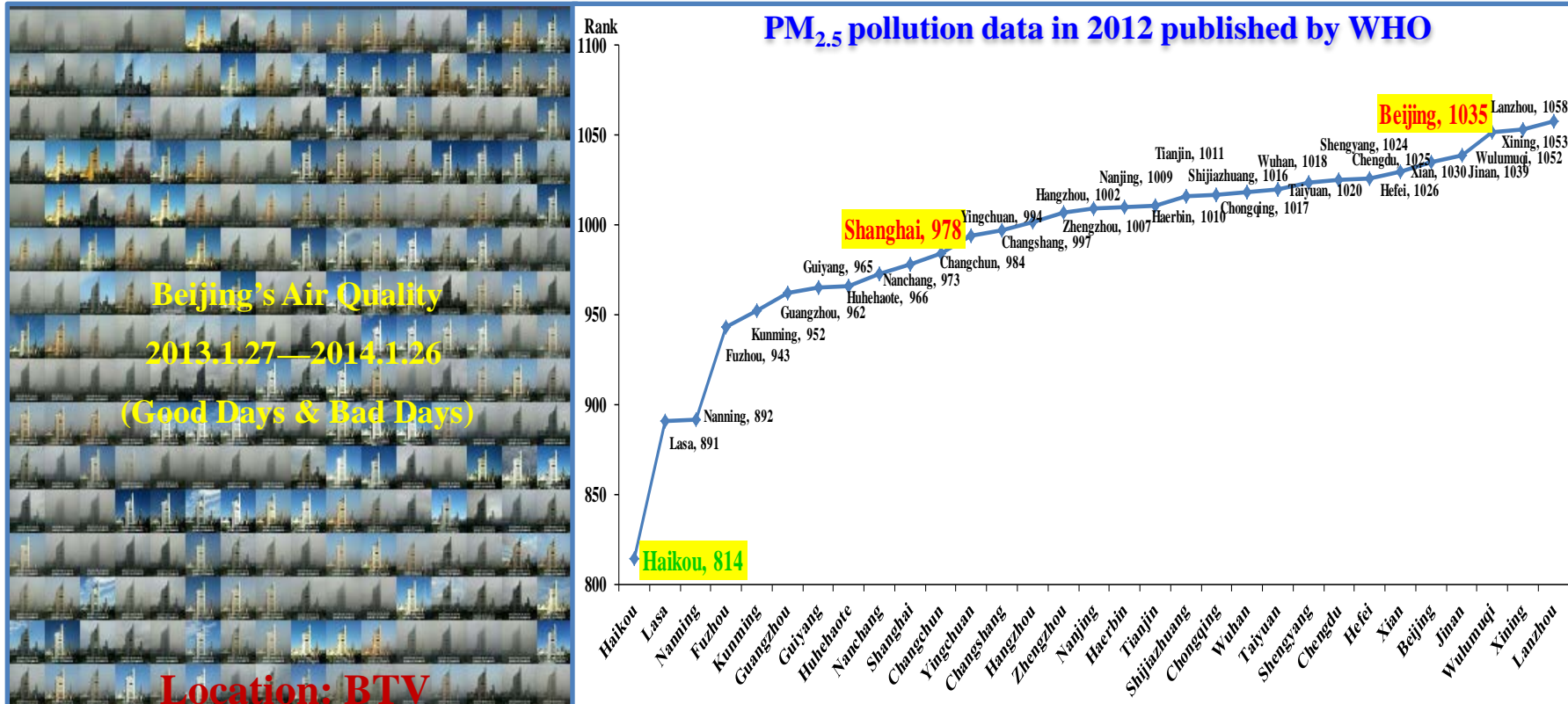
**Water Pollution**



**Ecosystem  
Fragmentation**

# Environmental Challenges

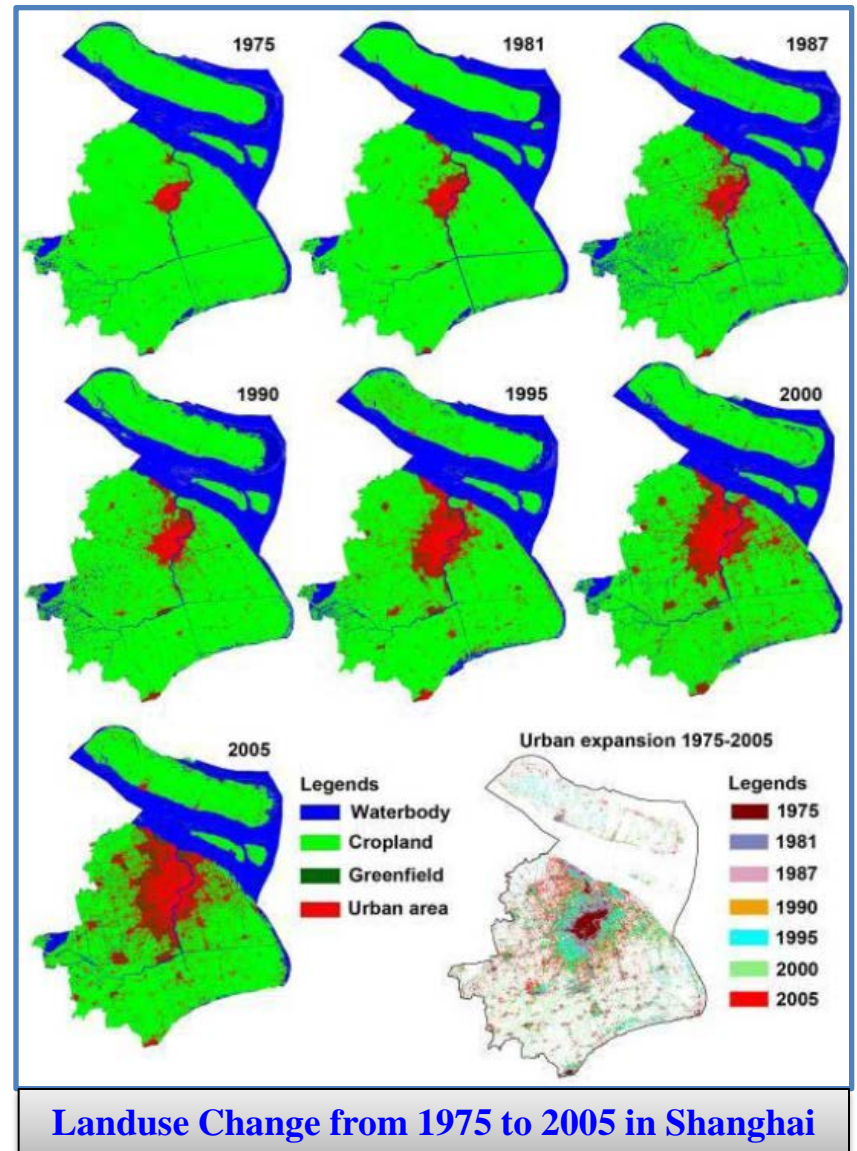
- Large-scale regional atmospheric haze occurs frequently because of interaction of coal-combustion pollution and vehicle exhaust pollution.



- Regional air pollution haze aggravate in the region of Pearl River Delta, Yangtze River Delta and Beijing-Tianjin-Tangshan.
- Air quality report from WHO in 2012 shows that Beijing ranked 1035th among 1082 cities around the world, and Haikou with the best air quality in China ranked after 800th.

# Environmental Challenges

- **Rapid urbanization also transformed massive ecological land into urban area, resulted in habitat fragmentation and loss of biodiversity.**
- Dramatic land transformation does happen, from not only arable land but also forest, grassland, wetland and water surface into urban land.

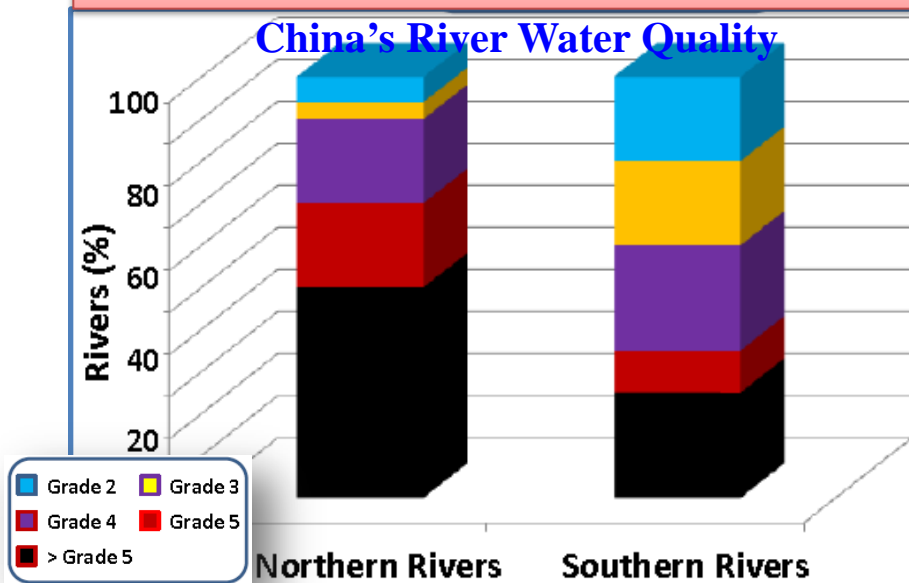


# Environmental Challenges

- Urban river pollution becomes a common phenomenon. More than 400 cities are faced with problems about water shortage and deterioration of water quality. More than 80% of urban rivers are polluted.

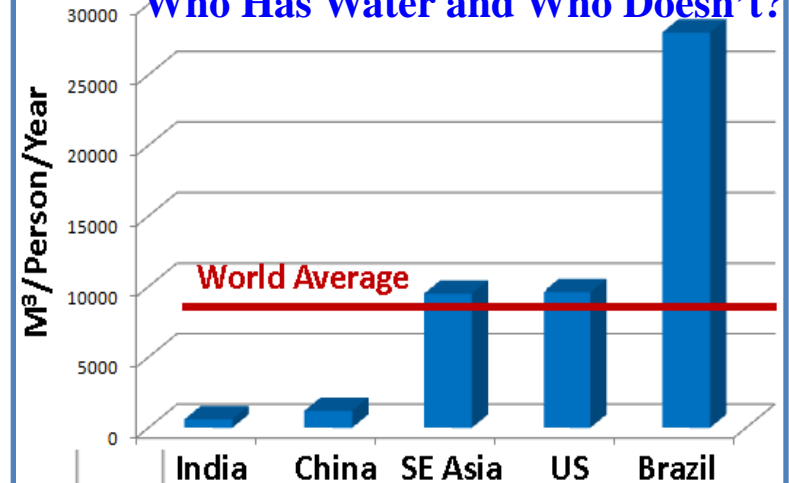
## Deterioration of Water Quality

### China's River Water Quality

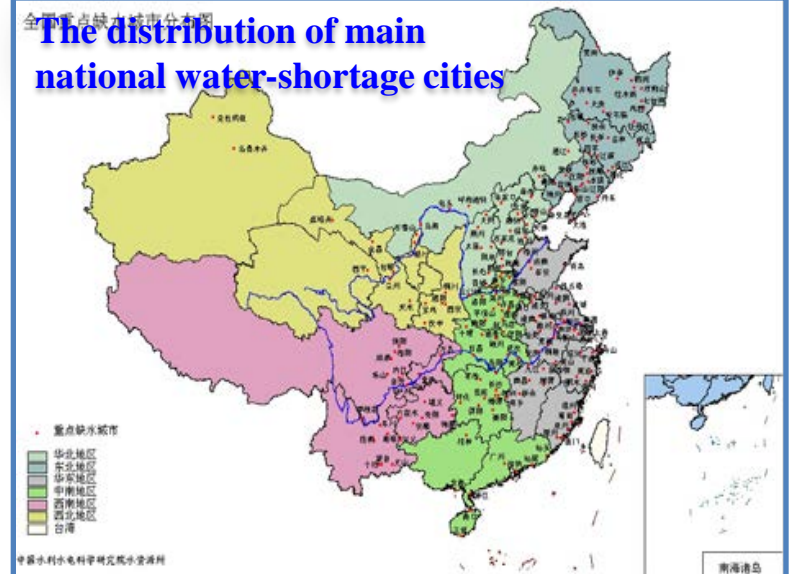


## Water Shortage

### Who Has Water and Who Doesn't?



### The distribution of main national water-shortage cities



# Environmental Challenges

- In the future, rapid urbanization will exert much press on ecological conservation. So many local governments are facing to intractable issue to balance ecological conservation with urban development.



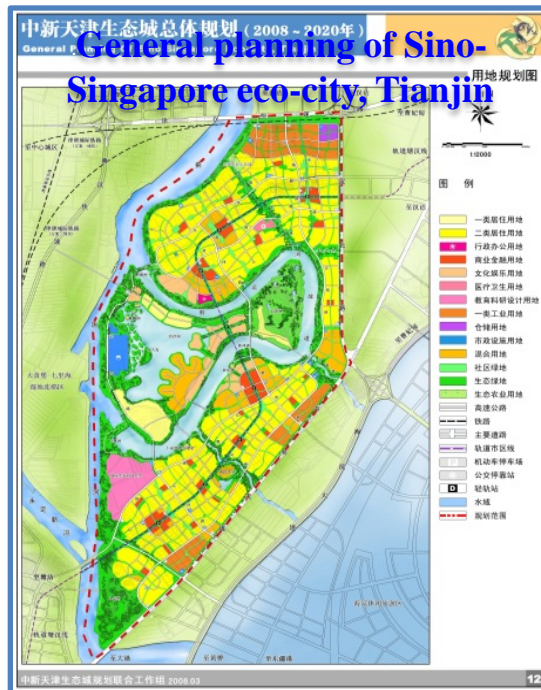
# *Outline*

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-  **2** Environmental Challenges.....
-  **3** **Construction of Eco-City**.....



# Construction of Eco-City

- The concept of Eco-City was put forward by “Man and Biosphere” project of UNESCO in 1971.
- Eco-city is a platform and carrier of the Chinese government to deal with environmental challenges and the practice of the concept of sustainable development.



# Construction of Eco-City

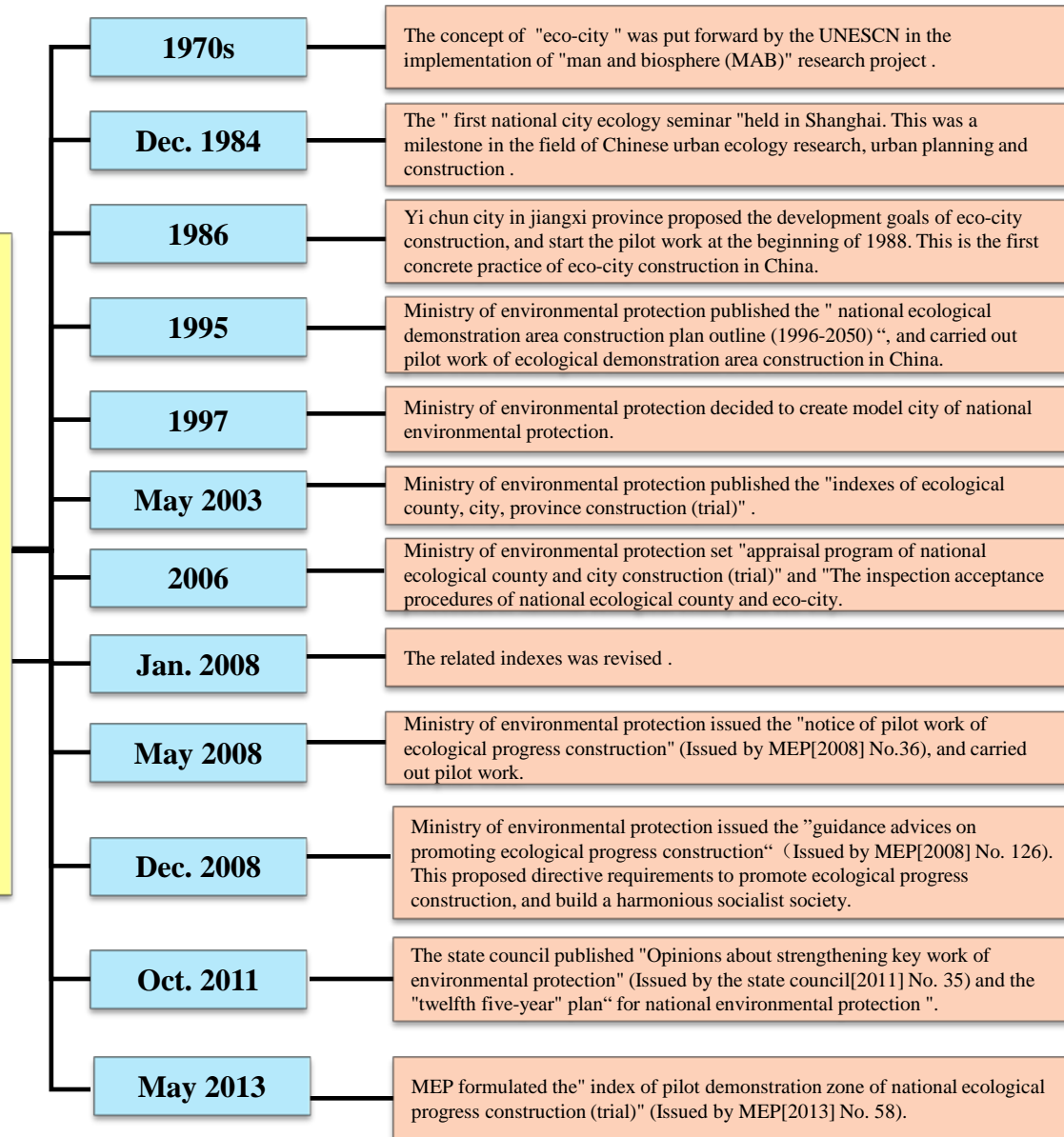
- At the beginning of 1990s, some Chinese cities were beginning to build eco-city. Especially after the policy of ecological civilization construction of new Chinese government, China set off eco-city construction boom in the 21<sup>st</sup> century.



**Making great efforts to promote ecological civilization of the 18th CPC National Congress in 2012 and the Third Plenary Session of the 18th CPC Central Committee in 2013.**

# Construction of Eco-City

## The course of Eco-city construction in China



Eco-demonstration region



Eco-province (city/county)



Demonstration pilots of ecological civilization construction



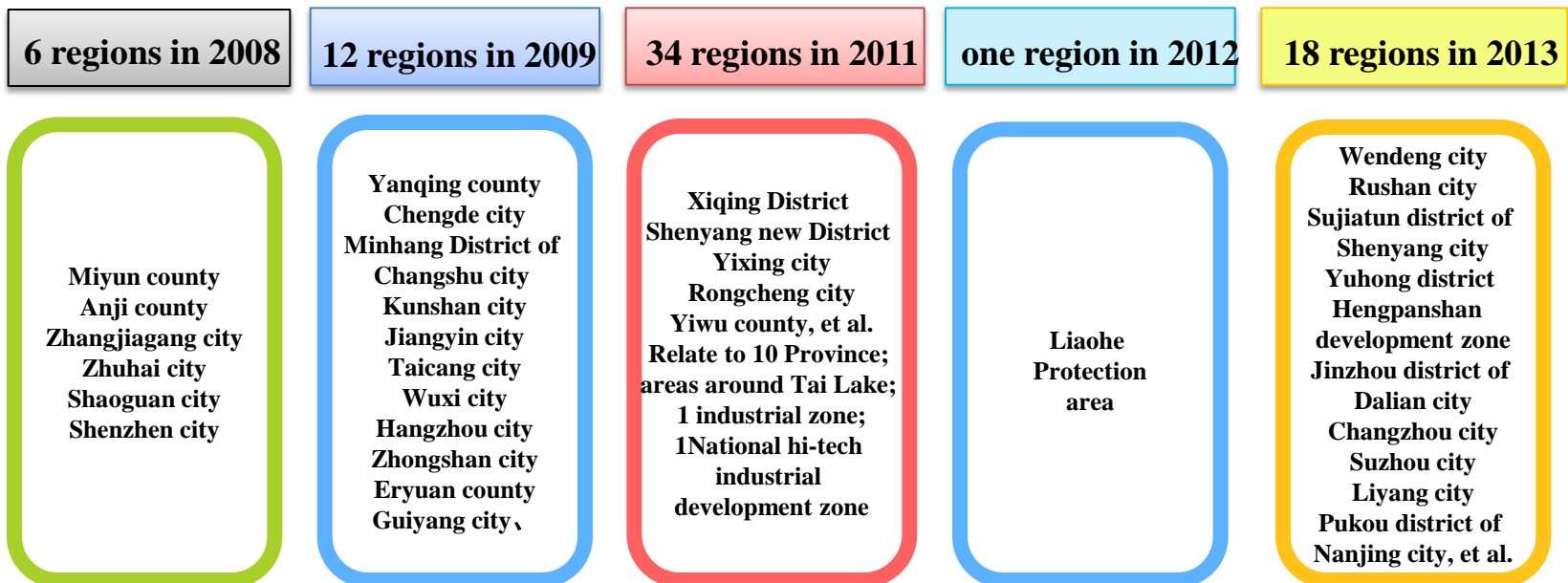
National ecological civilization

The process of heritage, climax, and deepening.

# Construction of Eco-City

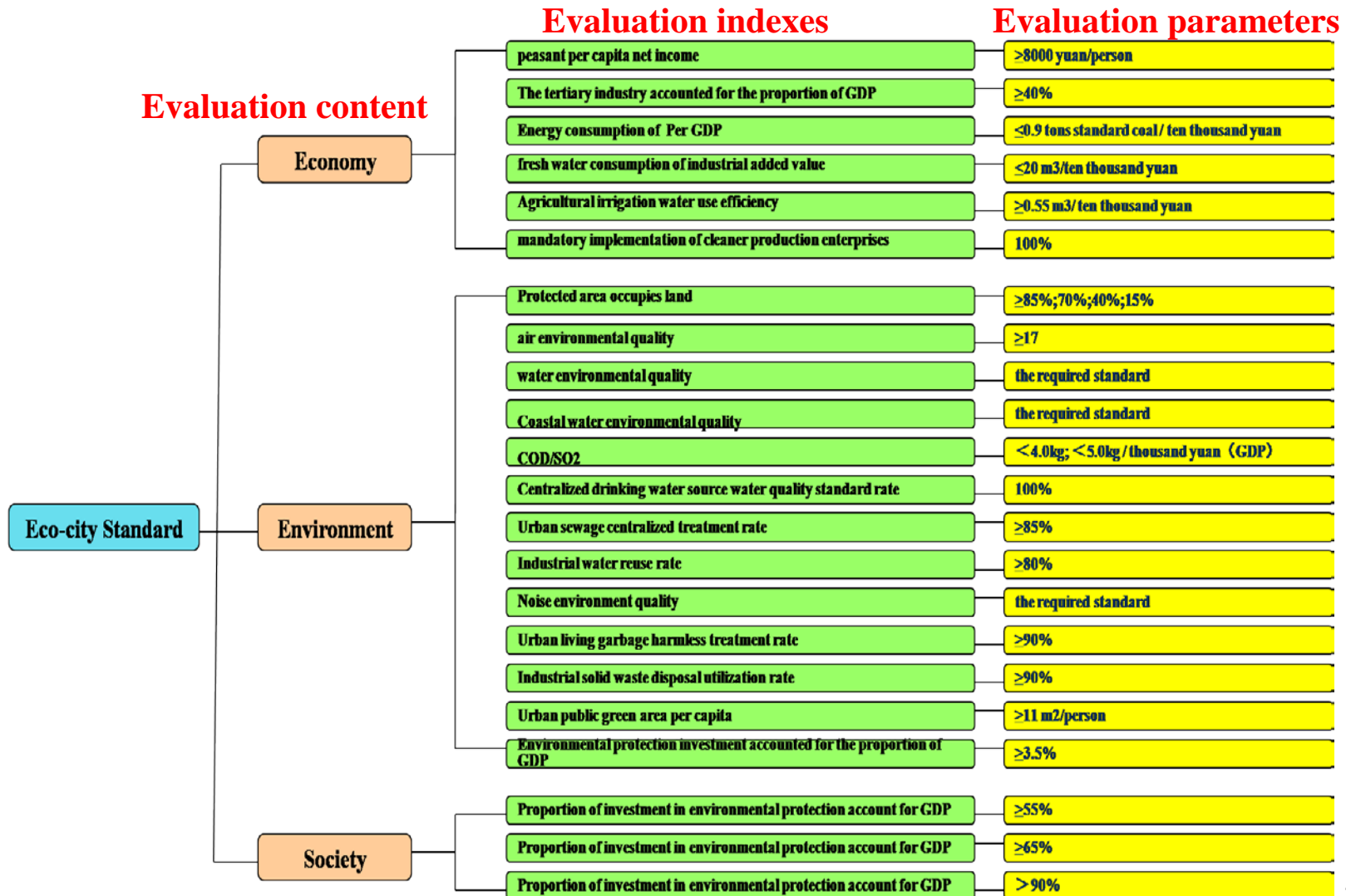
- China has begun to make great efforts to promote the overall ecological civilization demonstrate-building activities.
  - A total of 71 pilot areas of ecological civilization construction has been set up 5 groups.
  - At present, there are more than 20 cities (districts or counties) compiled the ecological civilization construction planning.

## The first group   The second group   The third group   The fourth group   The fifth group



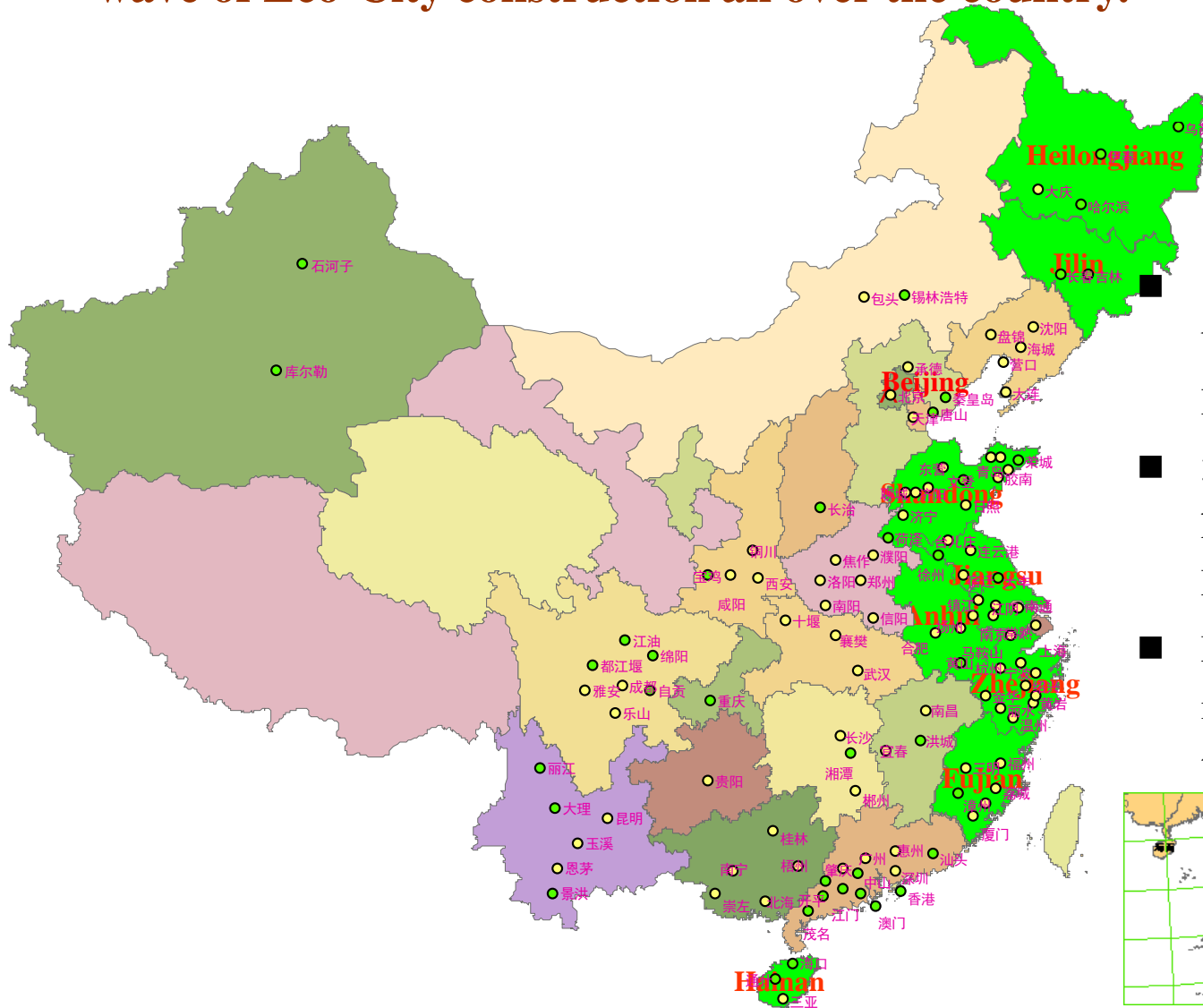
# Construction of Eco-City

- China's MEP issued "Ecological County, Ecological City, Ecological Province construction index" in 2008.



# Construction of Eco-City

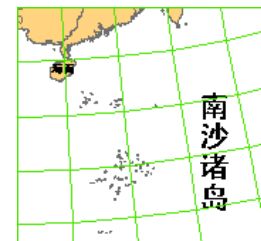
- MEP published eco-city indicators and standard which encouraged a wave of Eco-City construction all over the country.



- 14 provinces were approved by MEP as National Eco-Province Construction Pilot.

- 38 Cities (district and county) have been awarded the title of National Eco-City.

- More than 600 cities are making their efforts to get the title of National eco-city.



# Construction of Eco-City

- Different types and modes of eco-city construction were kept together all over the country.

## Different builders

## Scope

- **International cooperation**
  - ❑ Sino-Singapore Tianjin Eco-City (Singapore-China cooperation)
  - ❑ Caofeidian International Eco-City (Sweden-China cooperation)
  - ❑ Chongqing Yue Lai Eco-city (U.S.-China cooperation)
  - ❑ And so on...
- **Ministry, province and city cooperation**
  - ❑ Wuxi city
  - ❑ Guangming new district of Shenzhen city
  - ❑ And so on...
- **Local city**
  - ❑ Anji county of Zhejiang province
  - ❑ Huainan city of Anhui province
  - ❑ Yanqing county of Beijing city
  - ❑ Miyun county of Beijing city
  - ❑ And so on...

- **A single project**
  - ❑ Huainan city of Anhui province: its focus is the use of high concentrations of methane gas and ecological restoration of the coal mining subsidence area
  - ❑ And so on...
- **Full-scale operation**
  - ❑ Anji county of Zhejiang province
  - ❑ And so on...

## Eco-city in China

- Sino-Singapore Tianjin Eco-City is the first eco-city in China, it being jointly by China and Singapore.

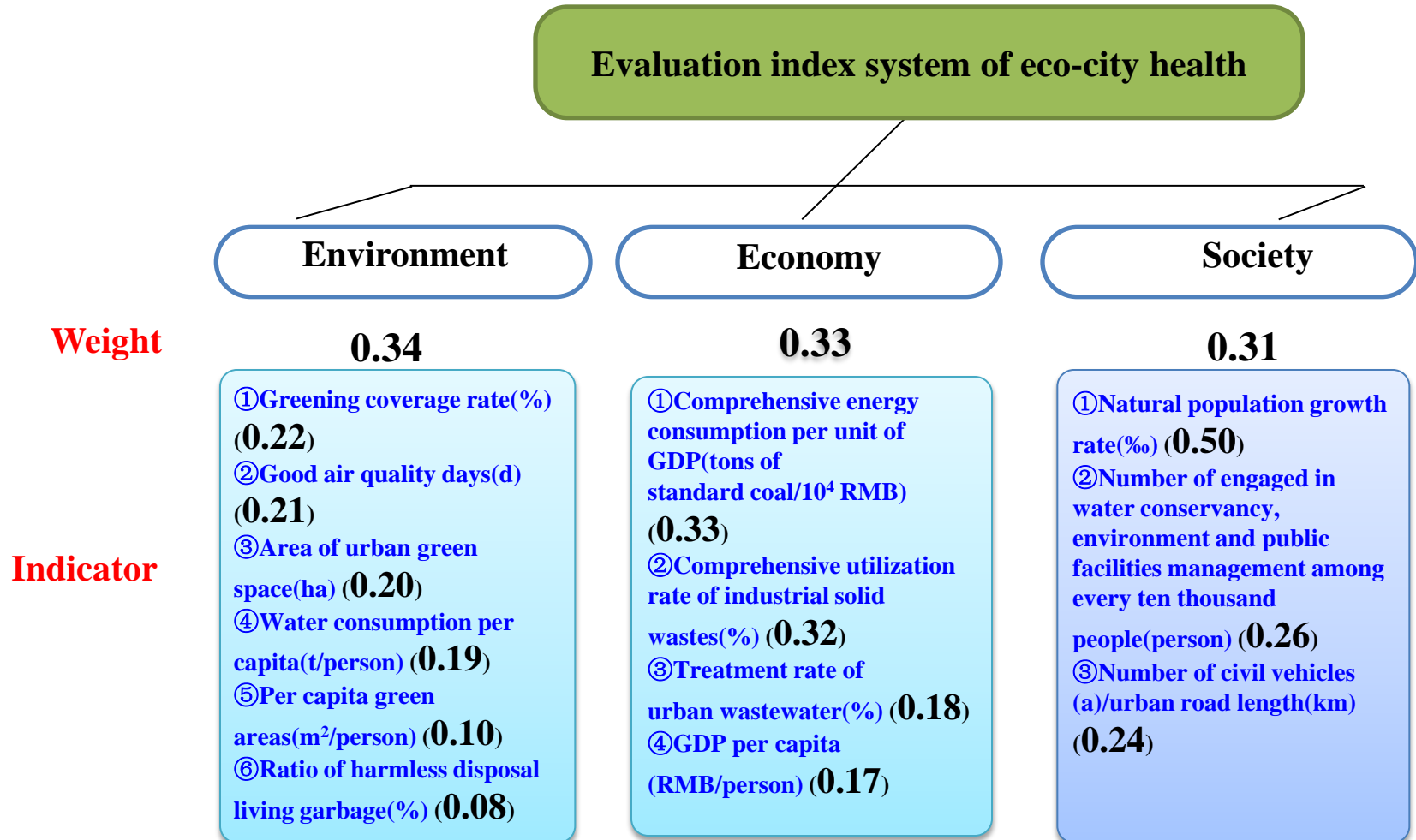


中新天津生态城

SINO-SINGAPORE TIANJIN ECO-CITY

# Construction of Eco-City

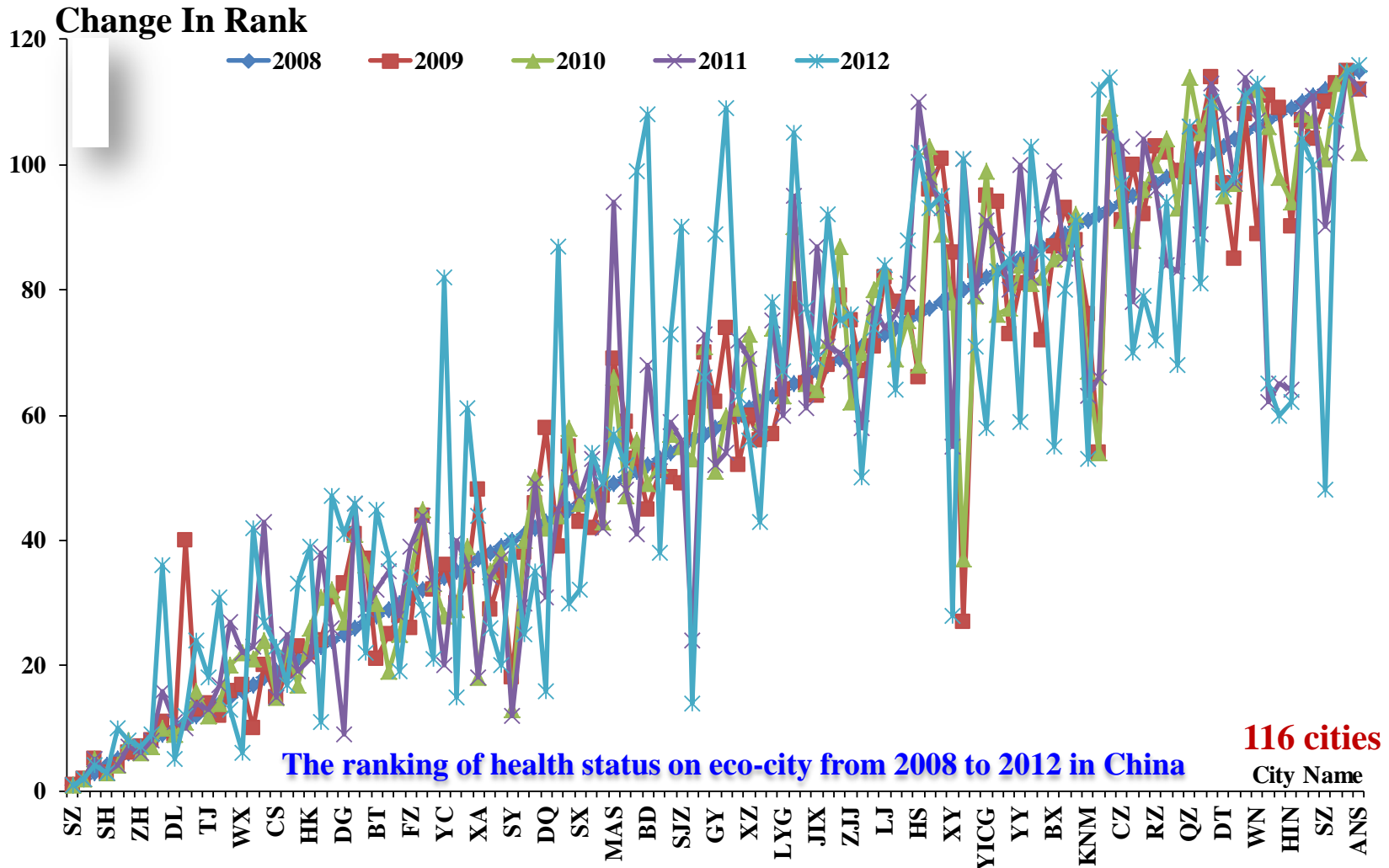
- Using analytic hierarchy process (AHP) and an integrating index evaluation method, eco-city health in China was quantitatively assessed.





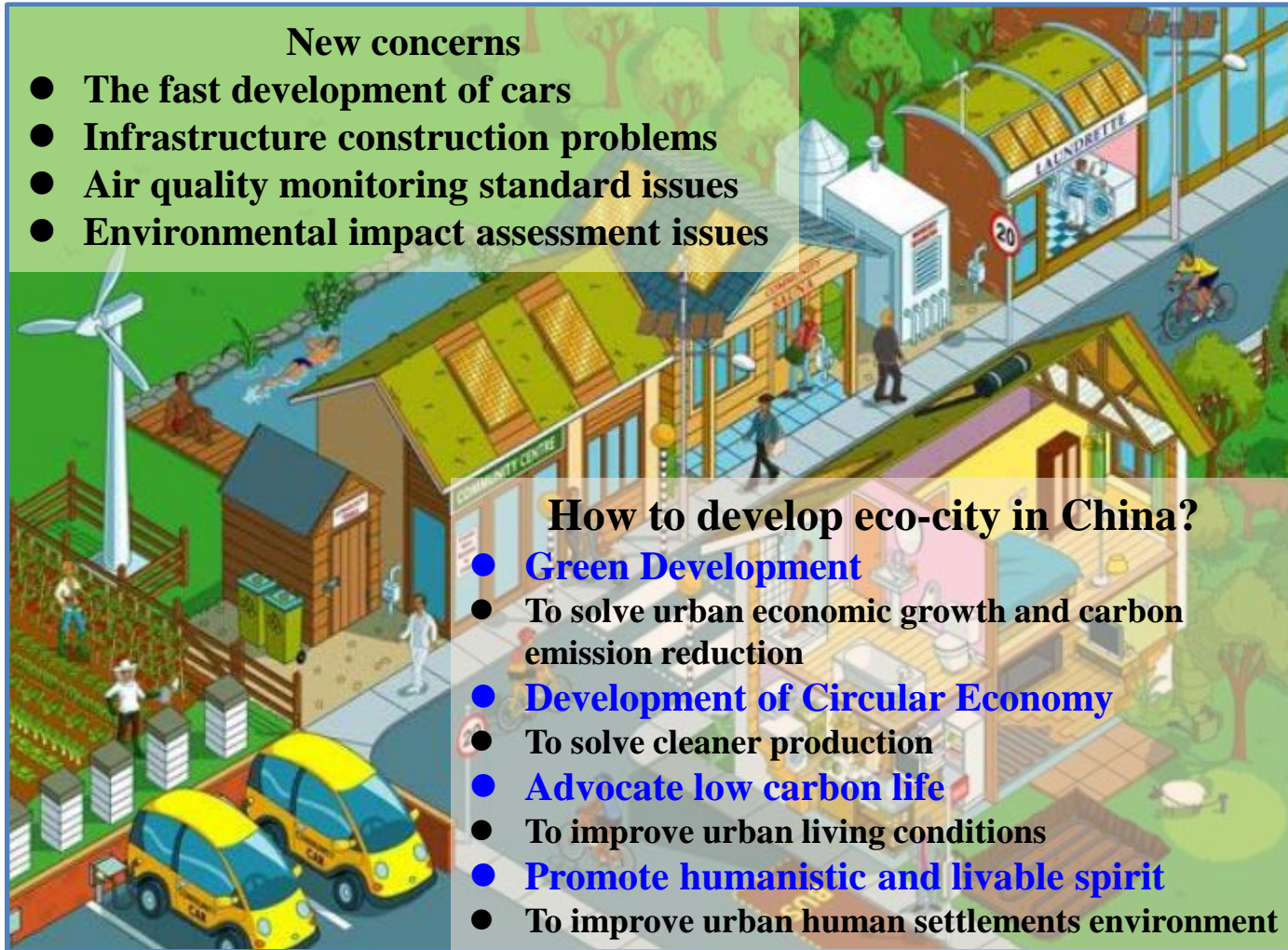
# Construction of Eco-City

- The overall rank list of health status on eco-city shows a obvious fluctuation during 5 years from 2008 to 2012. Some cities have a great change in rank in different years. CEC is still at an early stage in China.



# Construction of Eco-City

- Some new problems should be concerned in the construction of eco-city in China.



**New concerns**

- The fast development of cars
- Infrastructure construction problems
- Air quality monitoring standard issues
- Environmental impact assessment issues

**How to develop eco-city in China?**

- **Green Development**
- To solve urban economic growth and carbon emission reduction
- **Development of Circular Economy**
- To solve cleaner production
- **Advocate low carbon life**
- To improve urban living conditions
- **Promote humanistic and livable spirit**
- To improve urban human settlements environment

# Conclusion

- **There is no any other country like China, which has so many cities are making their efforts to construct Eco-City. They are mainly concentrated in the eastern and central parts of China. They all proposed to build eco-city in 3-10 years.**
- **China has formed an integrated eco-city development model, which could provide useful experiences to other country.**
- **Eco-City construction will greatly contribute to China environment improvement in future.**

Caofeidian International Eco-City



Sino-Singapore Tianjin Eco-City





**Thanks for your attention!**