

### Topic and Research Question

It is expected that by 2050 the number of urban residents will increase sharply and more of the half of the population on the planet will live in cities. Therefore, the national and local governments need to react promptly to various urbanisation challenges. A suggested approach to this matter is the promotion of eco-city initiatives (Tsolakis & Anthopoulos, 2015, p.1).

The topic of this Master Thesis is related to the sustainable urban development in the East Asian region. It is more specifically investigating the model of eco-city development in China and Japan. The research question is:

What are the differences and similarities between the eco-city development in China and Japan?

### State of the Art

Lefebvre emphasized in the 1970s that the sustainable urban development is crucial for the achievement of sustainability and needs to be prioritised by the governments (Brenner & Schmid, 2015, p.155). Richard Register is considered as the creator of the term "eco city". He is also known as the founder of the nonprofit organisation Urban Ecology in Berkeley. This organization was founded in 1975 with the aim to promote the ecological reconstruction of the urban areas (Roseland, 1997, p.197). Register wrote in 1987 the book *Eco-City Berkeley: Building Cities for a Healthy Future*, which has been considered as a pioneering book in the field of sustainable urbanism (Lehmann, 2015, p.14). Roseland identified the eight dimensions of the eco city concept, namely: sustainable development, sustainable urban development, sustainable communities, community economic development, appropriate technology, social ecology, green movement and bioregionalism (Roseland, 1997, p. 201).

David Satterthwaite (1997, pp.1669-1685) outlined the importance of the creation of an institutional framework for the assessment of the sustainability in the cities. He defined the role of the local and national governments and the international agreements in the creation of such framework. Joss, Tomozeiu and Cowley (2012, p.109) investigated various sustainable indicator frameworks. According to Joss (2015b, p.863) the sustainable urban development and the construction of eco cities are greatly influenced by the concept of governance.

Liang Fook and Gang investigated the eco-city development in Asia. They concluded that the eco-city projects hold importance for the realisation of sustainable development in this region (Fook & Gang, 2013, p.7). Hu, Wadin, Lo and Huang (2016, p.86) also investigated the development of eco city projects in Asia and the relationship between the governmental and non-governmental actors, which are involved in this process.

### Methodology and Approach

The case study method and the mixed-research design have been chosen as a methodological approach. The collected data for this research is a secondary one. The case studies, which have been analysed and compared, are: Tianjin Eco City, Suzhou Eco City and Kitakyushu Eco-Town.

The framework, which has been used for comparison, has been developed by the Chinese Ministry of Environmental Protection (MEP). It consists of 19 indicators:

- 1 "Annual net income of farmers"
- 2 "Tertiary industry share in GDP"
- 3 "Energy consumption per unit of GDP"
- 4 "Water consumption per unit of GDP"
- 5 "Compliance rate of enterprises should carry out Cleaner production"
- 6 "Forest coverage"/ "Percentage of the forestry and grass coverage in alpine area and grasslands"
- 7 "Proportion of protected area in total land area"
- 8 "Ambient Air Quality"
- 9 "Water quality" / "Coastal Water Quality"
- 10 "Emissions density and key pollutants"
- 11 "Water quality compliance rate of centralized drinking water source"
- 12 "Centralized municipal waste water treatment" / "Industrial water reuse rate"
- 13 "Environmental quality of noise"
- 14 "Waste"
- 15 "Urban public green area per capita"

- 16 "Environmental protection investment share in GDP"
- 17 "Urbanization rate"
- 18 "Centralized heating supply rate in heating region"
- 19 "Public satisfaction rate on the environment"

### Main Facts

There are numerous reasons behind the need for creation of eco-city development programmes. Examples are the issues caused by climate change, loss of biodiversity, water scarcity, deforestation, desertification, air pollution and water pollution. These environmental issues could also have a negative impact on the economic development in the countries (Hammer et al., 2011). The Paris Agreement, which was initiated in 2016, has the goal to increase the commitment of both developing and developed countries to reducing their carbon emissions (International Emissions Trading Association, 2016). It has been suggested that by 2050 the urban population in the Asia-Pacific region will represent 3.3 out of the 6.2 billion urban residents in the world (Lehmann, 2015)

Japan and China are the two countries with the biggest territory, covered by urban areas in East Asia (World Bank Group, 2015). The issues, which Japan is currently facing, are more specifically the limited quantity of raw materials and the shortage of waste landfill sites (Hashi, 2005). China is experiencing challenges such as: carbon emissions, desertification, deforestation, water scarcity, damaged biodiversity, inefficient waste management, acid rain and soil erosion (Li & Qiao, 2015). The inefficient use of natural resources in China is also an issue of considerable importance (Sun, Liu and Wang, 2016).

Important for the eco-city development in China is the concept of "ecological civilization", which was introduced by the government in 2007 (Liu et al., 2014, p.26). The eco-city projects in China in 2013 amounted to about 100 (Caprotti, Springer & Harmer, 2015). The number of eco-city projects in China is the highest one in the world (Flynn, 2012). The eco-city model in Japan has been influenced by the policies for "Low-carbon Society", "climate change mitigation and adaptation, sound material-cycle society and biological diversity" (Nakamura, 2012, p. 98). The Japanese Eco-Town project was initiated in 1997 and has the aim to establish a circular economy in the country (Li & Qiu, 2015, pp. 58-59).

### Results

After the three case studies were compared according to the MEP framework it became evident that there are more differences than similarities between the eco-city development model in China and Japan. One major difference can be seen in the indicator "annual net income for farmers", which is considerably higher in Japan. The quality of air and water has also better standards in Japan. A similarity between the eco-city projects in China and Japan was found in the creation of green areas. The comparison of the case studies showed that the Japanese eco-city model is more ecological than the Chinese one. The chosen framework for comparison was Chinese and limitations occurred when it was applied in the case of Kitakyushu Eco-Town. Not all 19 indicators could be fully compared due to the differences in the eco-city development method of the two countries. It has been concluded that the Chinese model of eco-city development could benefit from the adaptation of some features of the Japanese eco-model.

### References

All references can be found in the full version of the MA thesis available at <http://others.univie.ac.at>.

### About the Author

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