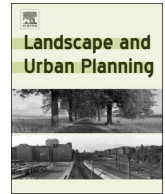




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Research Paper

Ecological urbanism in East Asia: A comparative assessment of two eco-cities in Japan and China

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ABSTRACT

The growth of projects translating the concept of eco-city into practices has accelerated during the last fifteen years, making the eco-city a global phenomenon. Asia in particular has witnessed notable developments, characterized by strong governmental intervention and national initiatives to create model eco-cities. In Japan, the central government launched an “Eco-Model Cities” program in 2008 and has designated twenty-three model cities. In China, hundreds of municipalities have pursued plans to become an eco- or low-carbon city following the government’s demonstration projects. Across East Asia, the eco-city is promoted as an innovative urban policy capable of advancing the agendas of sustainable urbanization and the realignment of the post-industrial urban economy.

This paper compares the policies and strategies of developing eco-cities in Japan and China using Kitakyushu and Tianjin Eco-city as case studies. It examines these cities’ common and contrasting approaches to ecological urbanism, their respective technological and urban design strategies, the relationship between eco-city building and local economic development, and the roles played by different stakeholders in this effort. The research focuses on their Key Performance Indicator systems and the spatial qualities they anticipate, which reflect fundamentally different ideas about what societal role an eco-city should best play. The comparative method sheds light on debates around important aspects of planning and managing an eco-city—namely, between new town and retrofit development, between top-down directive and bottom-up force, and between the eco-city as technology and as culture. This paper thus offers critical insight into the changing notions of urbanity within Asian society.

1. Introduction

Although the “eco-city” has been discussed and promoted for decades, it was only during the last fifteen years that an increasing number of large-scale projects have been undertaken that attempt to translate this concept into practice. The term refers to an ecologically healthy city that enables residents to live a high-quality life with minimal impact on the environment, a goal tied to the notion of sustainability and broadly accepted across cultures. Asian nations are contributing significantly to this global eco-city movement with strong governmental support and direct interventions, and sponsoring ambitious, systematic national initiatives to build model eco-cities. In Japan, the central government launched the “Eco-Town Project” initiative in 1997, then transformed the initiative into the more comprehensive “Eco-Model Cities” program in 2008. To date, twenty-three cities have been designated as Eco-Model Cities, ranging from large municipalities such as

Yokohama to small towns such as Minamata. Financial incentives are provided to support major urban restructuring, low-carbon developments, and sustainable industries. The objective is to create models of ecological urbanism that subsequently will influence the rest of the country and keep Japan at the forefront of sustainable development worldwide.

Arguably the most ambitious eco-city program, however, at least in terms of the number and scale of projects, has been taking place in China for the past decade. There, more than a hundred “new eco-towns” are under development, and more than 250 existing cities have announced their plan to become an “eco-city” or “low-carbon city” (China Urban Sciences Research Council, 2011; Sharifi, 2016). The central government has aspired to lead Chinese cities onto the path of sustainable urbanization by creating a number of high-profile demonstration projects, such as Dongtan Eco-city (with technical support from the United Kingdom) in 2004 and Tianjin Eco-city (a joint venture with

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Singapore) in 2007. Eco-cities are promoted as innovative urban policy and practice under the overarching paradigm of “ecological modernization,” which seeks to de-couple economic growth from environmental degradation by incentivizing low-carbon, low-waste industries and developments utilizing renewable energy and green technologies (Mol, 2006).

This paper studies the model eco-city programs in Japan and China, using a comparative method to examine their policies and initiatives, design and development strategies, and technological specifics. Analysis of the two countries’ eco-city programs focuses on Key Performance Indicators (KPI), an essential tool used widely in both countries to monitor the development of eco-cities (Science for Environment Policy, 2018; Sustainable Cities International, 2012). This paper examines the environmental and social agendas that inform the meticulously formulated KPI systems of Japan and China, as well as the impact of their differing approaches to the KPIs on urban form and urban space. The comparison is based on data of two of the most mature model eco-city projects, Kitakyushu in Japan and Tianjin Eco-city in China, which were thoroughly studied in order to explore their common as well as contrasting strategies for urban sustainability, the relationship between the building of an eco-city and local economic and cultural development, and the different roles played by government and the private sector in this effort. Because both projects are emblematic of the models of eco-city development in their respective countries and widely emulated as the best examples of sustainable urbanization, this comparative case study facilitates a deeper understanding of Japan’s and China’s eco-city policies and practices, as well as the essential characteristics of contemporary Asian urbanism.

The value of the comparative study extends beyond the Asian continent, however, as it also contributes to the general discourse of ecological urbanism currently influencing cities across the world. Despite their regional characteristics, the Asian eco-city models actively engage in the current debates around urban sustainability and livability with contrasting ideas about top-down and bottom-up planning and governance, new town versus retrofit development mechanisms, and balancing technological advances with humanistic dimensions in the sustainable cities. Although not necessarily directly replicable, the solutions offered by Asia’s urban experiments highlight important considerations for scholars in analyzing eco-city practices in other countries, and provide valuable lessons for policy-makers worldwide in crafting guidelines for the sustainable growth of cities.

2. The rise of eco-city movements in Japan and China

The initial discussions of ecological urbanism emerged out of the countercultural movements in the 1960s and 1970s, representing a new approach to urban development that emphasized respecting environmental limits instead of working against them (McHarg, 1969; Soleri, 1969). A series of scholarly explorations and institutional frameworks continued to define the scope of this emerging theory and its application since then (Rapoport, 2014). Richard Register coined the term “eco-city” in his 1987 book *Ecocity Berkeley: Building Cities for a Healthy Future*, based on studies he conducted with the group of Urban Ecology (Register, 1987). His concept of the eco-city supported the fundamental objectives of sustainability that were gaining currency following the publication of the Brundtland Report, yet focused on the application of ecological principles on urban planning, design, and management (Register, 2002; The World Commission on Environment & Development, 1987). The 1992 United Nations Earth Summit in Rio de Janeiro and the resulting action plan, *Agenda 21*, further articulated the principles of sustainable development and formed the policy guidelines for theoretical explorations of the eco-city and its planning. Few built examples of eco-city emerged, however, before the end of the twentieth century; most of them that did were located in Europe. First generation eco-cities such as Schwabach, a small historic town in Germany, BedZED, a carbon-neutral community in England, and Bo01 Harbor

District in Malmö, Sweden, were created at the modest scale of the neighborhood or district (Joss, Tomozeiu, & Cowley, 2011; Rapoport, 2014).

At the beginning of the 21st century, urban populations surpassed rural populations for the first time in human history. The issue of climate change gained credibility in light of a growing body of research, inspiring activists like Al Gore and inter-governmental coalitions, leading to action plans like the Kyoto Protocol (entered into force in 2005) that called for concrete measures to combat greenhouse gas emissions (Joss, Cowley, & Tomozeiu, 2013). As a response from the field of urban planning and development, the eco-city movement gained momentum. Asia, which was then caught in the throes of a significant transformation, moved to the forefront of the eco-city movement. Countries like China and India were rapidly urbanizing, while others like Japan and the Middle East were searching for new ways to stimulate the urban economy while also tackling energy and environmental challenges. The result was the emergence of a number of ambitious projects—or example, Masdar in the United Arab Emirates, Dongtan Eco-city in China, Songdao in Korea, and the Delhi-Mumbai Industrial Corridor in India—that would exert influence worldwide (Cugurullo, 2013; Joss et al., 2011).

Japan and China in particular stand out among other Asian countries in eco-city development, thanks to their enormous governmental commitment to urban sustainability. This commitment has generated ambitious, systematic programs for eco-city building. In Japan, the national and local governments have taken the lead, bringing industry clusters together with local communities to pursue comprehensive goals of sustainable development focused on energy conservation, resource recycling, and integrated waste management (Low, 2013). The eco-city concept materialized in Japan in 1997 through the legislation initiating a national program for “Eco-Towns.” The Ministry of Economy, Transportation and Infrastructure (METI) and the Ministry of the Environment (MoE) were responsible for framing and implementing this program. The Eco-Town initiative focused on citizen and company decision-making at the local level. It aimed to assist those in declining industrial sectors (such as steel and cement) embrace the technological and management enhancements inherent in the Zero-Emission concept (Global Environment Centre Foundation, 2005; Van Berkel, Fujita, Hashimoto, & Geng, 2009). Kitakyushu was among the first cities recognized as Eco-Towns in 1997; since then twenty-six cities have joined the program.

In February 2008, the Japanese government established the cabinet-level Commission on Low-Carbon Society to study solutions to global warming and a wide range of related issues, and to lead the country toward a higher level of sustainability. The commission initiated the “Eco-Model Cities” program, which aims to involve local governments and communities in collaborations designed to incorporate current technologies into social and economic systems and to more radically reduce greenhouse gas emissions. Six cities, selected from an applicant pool of eighty-two, were identified at the G8 Summit in Hokkaido the same year as Japan’s first Eco-Model Cities: Kitakyushu, Yokohama, Toyoma, Obihiro, Shimokawa, and Minamata. The number of Eco-model cities increased to twenty-three by 2013. In 2010, a sister program called the “FutureCity” Initiative was inaugurated to help cities “create new value by tackling environmental issues and aging.” Eleven projects, including several existing Eco-model cities, were identified for additional support (Promotion Council for the “FutureCity” Initiative, 2016) (Fig. 1).

Both the earlier Eco-Town program and the current Eco-Model City and FutureCity initiatives underscore and address prominent issues plaguing Japanese society such as a shortage of natural resources and a shifting population demographic. The eco-city concept also forms part of a holistic program to revitalize environmentally degraded cities, to direct national government funding in a more effective way to areas in need, and to deal with climate change in the context of the nation’s reduced reliance on nuclear power as a result of the Fukushima

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