

## **URBAN SUSTAINABILITY AND THE REGIONAL CITY SYSTEM IN THE ASIA PACIFIC**

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### **Summary**

Urban sustainability can only be achieved through addressing the economic, ecological, and social health of the city and this task can only be accomplished by approaching each of these issues at different scales. Using the Asia Pacific region as a case study, a framework is used to relate regional transnational flows to the state of the environment and the social conditions within cities. The type of city, defined by its international roles, can be used to distinguish among environmental and social conditions. That is, not only is the international “functional city system” within the Asia Pacific increasingly the engine of urban growth, it is also the force behind differentiating urban environmental and social issues among and within cities. This argument implicates managing the impacts of the regional system as a condition for addressing urban environmental and social sustainability. At the same time, while globalization forces have been particularly strong within cities in the Asia Pacific, local factors play a crucial role in the world city formation process. Globalization-driven growth has not translated into a single path of development; rather localities have demonstrated

contextually specific paths. Addressing urban sustainability will require site-specific local as well as more general international policies.

## **1. Introduction**

Urban sustainability can only be achieved through addressing the economic, ecological, and social health of the city. At the same time, cities are not autonomous units, but rather intimately related to their hinterlands and increasingly to ecosystems further away from their cores. Therefore urban sustainable development approaches must include various scales. This chapter attempts to pull together urban sustainability concerns and globalization processes. The Asia Pacific region is used as a case study to associate globalization processes with urban environmental and social challenges. In doing so, the paper will use the concept of the “functional city system,” a network of cities that are linked, often in a hierarchical manner based on a given economic or socio-political function at the regional level. The argument implicates the emergence of an international system of flows in the shifting urban environmental and social conditions of cities and therefore directs attention to the role of international policies in their mediation.

While the emergence of the regional city system links globalization flows to urban environmental and social conditions, the perspective does not imply that external forces are the only important influences on urban development. While transnational flows have been particularly strong within cities in the Asia Pacific, local factors play a crucial role in growth. Globalization-driven progress has, therefore, not translated into a single path of development; rather, localities have demonstrated contextually specific paths. Driving forces of urban conditions also include those associated with localization.

The chapter is divided into six sections. The first section presents an overview of urban sustainability perspectives stressing the importance of placing cities within an international development context. The second section provides a brief review of urban development in the Asia Pacific region demonstrating the relationship of urban growth to globalization forces. The third section argues that the recent Asian financial crises have provided an opportunity to review the costs and benefits of development aims, and as a result a new perspective, based on sustainability, is emerging. The fourth section distinguishes various pressures related to the role of cities within the regional city system and the variety of urban social and physical conditions experienced among types of urban centers. In the fifth section the chapter addresses how local conditions affect the world city formation process. The last section provides some recommendations for policy.

## **2. Connecting the Discourse on Urban Sustainability to Globalization**

There are, at least four competing visions of urban sustainability including those related to “free market” driven, “re-designed” urban forms, creation of “self-reliant” cities, and “fair share” cities models (Table 1). Of these visions, two (the “self-reliant” and the “re-designed” city) either do not explicitly address external pressures or restrict urban resource usage to a bio-region. Their intent is to improve individual components of the city, preserve natural assets, and encourage small, decentralized communities. While

providing insights into aspects of urban development and how to make cities more equitable and environmentally friendly, they are limited in that they suggest that cities are/should be autonomous independent units. Indeed, the idea of self-sufficient cities within ecologically defined regions, or green cities efficiently planned for local transportation, residence, industrial and commercial activities, is not aligned to current global trends and common understandings. Increasingly, urban growth is perceived as dependent upon non-local forces (flows of trade, investment, people, information, etc.) and actors (transnational corporations, multi-national financial institutions, international non-governmental organizations, etc.). Further, the impacts of urban activities are increasingly wider in geographical scale making self-containment impossible.

	Internally Oriented		Externally Oriented	
	Redesigned	Self Reliant	Free Market	Fair Shares
<b>Orientation</b>	Market-led: Reduce negative external impacts	Bioregion limited: Local capacity driven	Global: Market-driven; unrestricted hinterland	Global-Local: Carrying capacity limits; equity concerns, managed hinterland trading
<b>Regulation</b>	State regulation: Land-use planning and design controls	Self-regulation: Alternative markets; extreme decentralization	Market regulation: Market creation and deregulation; reduce inappropriate subsidies	Major market regulation for trade and investment: Concern for regional carrying capacity
<b>Value System</b>	Anthropocentric: Modify behavior through planning; “Light green”	Ecocentric: Moral sanction; “Deep green”	Market Supremacy: Neoliberalism; “Light Green”	Market Modification: Nature sensitive; “Deep Green”
<b>Technology</b>	Environmentally efficient	Low/appropriate	Smart/high-tech	Mix of Technologies

Table 1. Features of the four models of urban sustainable development

The two remaining visions attempt to combine global and local factors into sustainable urban growth. They reject attempts to divorce cities from their broader development context. One model, the “free-market” vision, posits that urban centers will inevitably overcome both environmental and social challenges as they grow in wealth. Thus, while growth is a transnational issue, a good social and physical urban environment is strictly a local one. Liberalization of trade and investments are the preferred national policies and preparing cities for increased transnational linkages forms the basis of desired local planning strategies. Underpinning this model is the suggestion that wealth will trickle down to lower classes as incomes increase.

One interpretation of the relationship described by advocates of the “free market” sustainable urban vision is the environmental “Kuznets” curve, named after an economist who studied the relationship between economic growth and income inequality. This curve describes a functional relationship between environmental problems and income and is similar to an inverted “U” shape. It predicts that, as nations and cities grow, environmental problems increase until a point in their development

when societal changes in economic structure, institutions, and ideologies force changes in environmental management. The results, some argue, will be a transition from low to high to low environmental pollution levels.

A comparison of conditions among sets of cities has provided evidence as to whether cities do indeed undergo this single transition. Rather than finding a simple relationship, however, researchers have found sets of transitions. In the “urban environmental transition” three important results emerge. First, as wealth increases, urban problems become spatially more extensive. With urban growth, environmental problems spill over to larger and larger geographical areas. Second, increasing affluence accompanies a shift in environmental priorities from human to ecosystem health. Third, the timing of the impact of environmental burdens shifts from immediate to more delayed with increasing wealth. That is, water-related diseases, for example, have immediate impacts on human health, as compared to the ecosystem health-related impacts of global warming.

Historically, the “urban environmental transition” holds for developed cities. The first urban environmental burdens in Europe and the USA, for example, were associated with sanitation and water supply. These problems were overcome, however, with increasing wealth. At the same time, manufacturing production-related pollution increased with industrialization (later to decrease with expanding wealth and increased interest in the environment). Finally in post-industrial countries, despite investment in pollution-related infrastructure, consumption-related pollution levels have increased. The “urban environmental transition”, therefore, consists of shifts in environmental conditions defined by changes in conditions associated first with poverty, then with manufacturing production, and finally with consumption. This perspective highlights that, despite relatively “clean” internal urban environments, highly developed urbanized nations produce global scale environmental challenges.

A study of Japan’s experience with air pollution instructively demonstrates the later half of the stage model. The first stage of air pollution control ended in 1973. By that time the nation’s industrial air pollution was dramatically reduced by governmental regulation, the procurement of low-sulfur crude oil, and the planning and introduction of heavy oil de-sulfurization facilities. Thereafter, the battle shifted to urban and domestic air pollution. Based on the techniques used before 1973, and with some help from the oil shocks that encouraged energy conservation measures and hastened a structural transformation from heavy to machine assembly and information industries, Japan achieved further success. Further policy measures related to manufacturing production distribution and land use, however, were not effective and the pollution situation remains unsatisfactory. The lack of success, despite massive investments (at 1990 dollars, Japan spent US\$ 46.7 billion from 1960 to 1995 on air pollution control technologies), has been attributed to both renewed energy demand increases and lifestyle consumption-related activities (automobile ownership tripled from 21 220 000 in 1971 to 68 100 000 in 1994).

The studies of environmental transition in nations and cities have been instructive in that they have demonstrated that growth does not automatically and naturally produce beneficial environmental conditions and therefore have exposed weaknesses in the “free

market” urban sustainable model.

The last vision of urban sustainability, the “fair shares” model, is the most complex and least developed. It proposes that, while city regions are restricted by carrying capacity, trade and other flows should be encouraged (but only if guided by social and environmental concerns). This model takes features from the redesigned cities and the self-reliant cities models (for example, increased regional autarky, greater urban compaction and improved use of market tools for engaging in more equitable trading relationships with other areas) and it also recognizes that global and regional flows are important for development. It therefore engages issues of scale so important to urban centers in the Asia Pacific region. This perspective recognizes the importance of international flows associated with globalization, but also advocates policies to address imbalances.

The challenge of fleshing out the relationships between globalization and changing conditions within urban settings calls for an analysis of international interactions among cities. With globalization as the backdrop to development, the context for the growth of nations and their cities is changing. For example, rather than finding that growth brings prosperity for all, incomes in nations that are globalized are polarizing. Further, social, criminal, and spiritual influences are also moving across borders affecting developing countries. Given the enormous task of uncovering the variety of ways in which globalization is impacting urban development, it is no surprise that research has only begun to address globalization and urban sustainability at this scale. Within the literature on “sustainable cities” there are limited international comparative studies currently available and even less on the impact of globalization on urban environmental conditions.

This chapter attempts such an analysis, but only partially. The proposed framework suggests that within the Asia Pacific region, globalization influences the environmental and social performance of metropolitan urban regions articulated to the regional city system. It argues that the regional city system increasingly defines urban economic activities, social trends, and urban environmental conditions. At the same time, the world city formation process, a local one, allows for a variety of developmental paths. Indeed, globalization forces only set the general context for transformations in states and societies as they adapt to greater international interconnectedness.

### **3. Urban Development in the Asia Pacific Region**

A popular conception of development within the Asia Pacific region has built on the “wild flying geese” model. This model spells out a protracted process, driven by the gradual and international diffusion of technology, in which a developing country upgrades its export and industrial structures and suggests that an international division of labor among countries at different levels of industrialization has encouraged greater interconnectedness. In this model, Japan is the “lead goose” and is followed by the Asian newly industrializing economies (NIEs), then countries in Southeast Asia (including Indonesia, the Philippines, Malaysia and Thailand), then China, and so on. As Japan becomes more technologically advanced, it pulls the entire V-formation along by successively shedding industries in which it no longer holds a comparative

advantage. Through foreign direct investment (FDI), these industries ultimately find a new home among the less developed countries (“follower geese”) of Asia. Over time, these developing countries master the new technology, upgrade their own industrial structures, and begin shedding outdated industries. Therefore, growth within the region has accompanied continual structural changes within national and urban economies as they moved up the comparative advantage ladder.

### 3.1. World City Formation in the Asia Pacific

At the heart of the connections between nations are cities. Those cities that have been articulated to the international regional economy have been undergoing dramatic transformations since they are increasingly dependent upon global flows of goods and services, investments, people and information. The process of economic, physical, and social restructuring has been called “world city formation.” In the Asia Pacific, the “world city formation” process has taken on obvious physical characteristics. Some important projects that are increasingly part of the urban landscape include large transportation (including rail, sea, and airport hubs) and communication infrastructure (including teleports), research and development facilities, industrial estates (particularly export processing zones) and large mixed-use mega-developments, often placed on reclaimed land.

Specific examples of Asia Pacific investments in large transportation infrastructure projects include futuristic international airports such as the recently opened Chek Lap Kok in Hong Kong, Kansai airport in Osaka, the new Incheon Airport in Korea, and the planned airport Nong Ngu Hao in Bangkok. Road and rail transportation access includes major bridge projects to large cities such as those promoted in Shanghai, Hong Kong, and Japan. Large cargo ports to accommodate increases in trade volumes have been built throughout the region. Indeed, 12 of the “top 25” container ports are located in the region’s coastal cities and the traffic in these ports is increasing (Table 2).

Region	1984		1992	
	Number	Share (%)	Number	Share (%)
Europe	6	25.3	5	18.9
North America	6	23.4	6	16.6
Africa and Middle East	1	3.2	1	2.7
Center and South America	1	2.8	1	2.5
Asia	10	43.4	12	59.3
Oceania	1	1.9	0	0.0

Table 2. Change in the world’s “top 25” container traffic league ports, 1984 and 1992

The high-speed transmission of information, necessary for growth and maintenance of the service sector, has had marked effects on the physical forms in Asia Pacific cities. Singapore has attempted to restructure its economy toward the creation of an information city. The city-state’s plan to make itself a hub of communications, finance, travel, and information technology is at the core of plans for the city’s future. The Teleport project in Tokyo, less than 6 km from downtown, was planned as an

information and futuristic city. Malaysia continues aggressively to develop a “Multimedia Super Corridor,” Cyberjaya, which will stretch from Kuala Lumpur 50 kilometers to the south ending at a new international airport. Often telecommunication projects are incorporated in large R&D facilities. This includes entire technologically advanced cities or “technopolises” such as Tsukuba Science City located 60 km northeast of Tokyo, Japan, or Science Park, a new R&D and high-technology manufacturing center located in Hsinchu outside of Taipei, Taiwan.

Other visible urban developments associated with world city formation are industrial parks and export processing zones (EPZ). An EPZ is a relatively small, separated area that is designated as a zone for favorable investment and trade conditions (compared with the host country). In effect these areas are export enclaves within which special concessions apply including extensive incentives and often exemption from certain kinds of limiting legislation. While some EPZs have been incorporated into airports, seaports, or commercial free zones located next to large cities, others have been set up in relatively undeveloped areas as part of a regional development strategy. Asia contains the lion’s share of EPZs in the world, with the majority of these sites located in China (Table 3). In Shanghai alone there are three economic and technical development zones (Minhang, Gachjajing, and Hongqiao) and the Pudong New Area (which has Special Economic Zone status). Further, within Pudong there are four sub-area key development zones (Lujiazui Finance and Trade Zone, Jingjiao Export Processing Zone, Waigaogiao Free Trade Zone and Zhangjiang High Tech Park).

<b>Region</b>	<b>Number of Zones</b>	<b>Percent of Total</b>	<b>Selected Countries (a)</b>
North America	320	38.1	USA 213 (b), Mexico 107
Asia	225	26.8	China 124, Indonesia 26
Europe	81	9.7	Former Yugoslavia 9, Bulgaria 8, Slovenia 8
Africa	47	5.6	Kenya 14, Egypt 6, Sudan 4
Caribbean	43	5.1	Dominican Republic 27
Central America	41	4.9	Honduras 15, Costa Rica 9
Latin America	41	4.9	Brazil 8, Colombia 11
Middle East	39	4.6	Turkey 11, Jordan 7
Pacific	2	0.2	Australia 1
<b>Total</b>	<b>839</b>	<b>100.0</b>	<b>608</b>

Table 3. Distribution of export processing zones and free zones by region, 1996

Accompanying transportation and telecommunication projects, industrial parks and EPZs are mega-developments projects. Throughout the world large urban mixed-use development projects are on the rise and the Asia Pacific has its share. In Tokyo, for example, the four largest redevelopment projects are the Tokyo Metropolitan government, Ebisu Garden Plaza, the Tokyo International Forum, and the Tokyo Teleport. These re-developments efforts are similar to those of the post-Great Kanto Earthquake in 1923 and the reconstruction after the 1945 bombings as they spread the

city in all directions possible: up to new heights, out to edges of the Kanto Plan; off into Tokyo Bay and down below the ground. Often, within the mega-development projects are the high-profile “prestige” buildings. According to the Tall Building Council, in 1986, the ten tallest buildings were all in the United States. In 1996, four of the top ten were in Asia (Petronas Towers, Malaysia; Central Plaza, Hong Kong; Bank of China Tower, Hong Kong; Shun Hing Square; Shenzhen). Often these projects are built on areas “reclaimed” from sea or swamps, as other areas of the city are unavailable for development. For example, the large development projects called “Rainbow Town” in Tokyo and *Minato Mirai 21* (MM21) in Yokohama are on re-claimed land.

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### **Biographical Sketch**

**Peter J. Marcotullio** is a Professor of Urban Engineering, Research Center for Advanced Science and Technology, University of Tokyo, and a Visiting Research Fellow at the United Nations University, Institute of Advanced Studies, Japan. He is a native of New York City, where he received his Ph.D. from Columbia University in Urban Planning.

Dr. Marcotullio has published articles on aspects of globalization and urban development in the Asia Pacific and he is the co-editor (with Fu-chen Lo) of *Globalization and the Sustainability of Cities in the Asia Pacific Region*, UNU Press (2001) and (with Andre Sorenson and Jill Grant) of *Towards Sustainable Cities: East Asian, North American, and European Perspectives on Managing Urban Regions*, Ashgate (2003 Forthcoming). His research interests include globalization and urban development, regional planning, urban infrastructure history and urban environmental management.