

URBAN SUSTAINABILITY AND THE REGIONAL CITY SYSTEM IN THE ASIA PACIFIC

Peter J. Marcotullio

*United Nations University
Institute of Advanced Studies*

Introduction

Urban sustainability can only be achieved through addressing the economic, ecological and social health of the city. Increasingly, scholars have recognized that urban areas are not autonomous units and that are part of a larger development milieu. A growing body of literature has attempted to approach urban sustainability, in terms of the social, economic and environmental development of cities, from international levels (see, for example, Harris, 1992; Burgess, et al, 1997; Low et al, 2000). This paper presents such a perspective. Using the Asia-Pacific region as a case study, a framework is used to relate regional transnational flows to the ambient state of the urban environment and the social conditions within cities. Using the concept of the “functional city system” (Lo and Yeung, 1996), the urban environmental and social issues within types of cities, categorized by their role within the regional production system, are identified. The argument implicates the emergence 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 still play a crucial role in urban development. Globalization driven growth has not translated into a single path of development, rather localities have demonstrated contextually specific paths. That is, addressing urban sustainability will require both local and international policies.

The paper is divided into four sections. The first section of the paper presents an overview of urban sustainability perspectives stressing the importance of placing cities within a broad 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 recent Asian financial crises have provided an opportunity to review the benefits and costs of development aims and as a result a new perspective, based on sustainability, is emerging. The third 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 fourth section the paper addresses how local conditions affected the world city formation process and influenced these circumstances.

Discourse on urban sustainability

Certain discourses concerning urban sustainability posit the city as the unit of analysis. As Graham Haughton (1999a, 1999b) suggests, among the visions of urban sustainability there are at least four competing perspectives including, in his terms: 1) “free market;” 2) “re-

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designed;” 3) “self-reliant;” and, 4) “fair shares” cities models. Of these visions, two (the self-reliant and the re-designed city) base actions upon internal processes and city design as the modes to create more equitable and sustainable urban areas. These models (also known as “dark” and “light” green approaches) focus on improving individual components of the city, preserving natural assets and encouraging small-decentralized communities. While these perspectives of urban sustainable development have provided interesting insights, they are limited in that they suggest that cities are/should be autonomous self-dependent units. The visions of self-sufficient cities within ecologically defined regions or green cities efficiently planned for local transportation, residence, industrial and commercial activities are not aligned to current trends. Increasingly urban growth is 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.).

Two other visions described by Haughton (1999a) attempt to combine global and local factors into a sustainable vision for urban growth. They reject attempts to divorce cities from their broader context within which they develop. One model, the “free-market” city posits that urban centers that undergo economic development defined by the contemporary neo-liberal arguments will inevitably overcome both environmental and social challenges as they gain in wealth. Work on the environmental performance of cities in relations to their income level provides evidence for this argument (McGranahan and Songso, 1994). While some environmental performance relationships, particularly those pollutants related to production, do demonstrate better (cleaner) performance with rising income levels, consumption related production does not. Further, contemporary development does not promise that all cities will undergo development based upon “modernization” stages. Traditional environmental risks and modern environmental risks are being experienced by poor citizens within developing world cities making create unique and sometimes severe problems.

The final vision 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). Yet it also recognizes that global and regional flows are important for development and that cities cannot be analyzed as separate and distinct units and therefore engages the issue of scale. This perspective recognizes the importance of international flows associated with globalization, but also suggests that they should be regulated. In order to perform such a task, an understanding of globalization at different scales is needed.

As Knox (1995) has argued the functional dynamics of cities articulated to the world city system can be best understood in a sequencing of scales from global urban system to metropolitan where the impacts of the world or regional city systems cut across all them. Sassen (1991; 1995) in her work on “global cities” demonstrated that at the metropolitan scale, urban spaces act as sites of production of the producer services necessary for global coordination, the production of the capability of global control. Thus, even at the local level, “labor markets, social networks and the built environment are structured and re-structured in order to accommodate world city functions” (Knox, 1995: 12). The global economy through activities performed in cities not only impacts the urban economy but also has environmental consequences that can be understood at different scales, from the global to the very local.

The framework proposed herein suggests that globalization forces impact the environmental performance at the metropolitan scale of urban regions articulated to the regional city system. In the Asia-Pacific, the regional city system increasingly defines urban economic activities and social trends. This trend can be used to distinguish among types and causes of urban environmental and social conditions. The world city formation process, however, is a local one and can take a variety of paths. Globalization is therefore seen as setting the context for profound change in states and societies as they attempt to adapt to greater interconnectedness in a highly uncertain world (Held, *et al*, 2000).

Urban development in the Asia-Pacific region

A popular conception of development within the Asia-Pacific region has built on the “flying geese” model (see Hatch and Yamamura, 1996; Lo, 1994). 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 have encouraged greater interconnectedness. Japan is the “lead goose” and followed by the Asian NIEs, then the ASEAN, 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 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. Both developed and developing economies in East and Southeast Asia have been active participants in the economic and social integration resulting in growing interdependency and cross-border transactions.

Those cities that have been articulated to the 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 (Friedmann and Wolff, 1982). 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) projects, research and development facilities, industrial estates (particularly export processing zones) and large mixed-use mega-projects developed on reclaimed land.

Asia-Pacific governments have invested in large transportation infrastructure projects over the last few decades. Specific examples include large futuristic airports such as the recently opened Chek Lap Kok in Hong Kong, Kansai airport in Osaka, the Seoul Metropolitan Airport and Nong Ngu Hao in Bangkok. Road and rail transportation access, including major bridge projects, to large cities such as that promoted in Shanghai, Hong Kong and Japan (Wu, 1999; Tatsko, 1997; Thornton, 1995; Lueng, 1998). Other popular transportation related infrastructure projects include large cargo port to accommodate increases in trade volumes. Given the development of an industrial belt in the region, it's no

surprise that 12 of the “top 25” container ports for 1992 are located in its coastal cities and that traffic in these ports is increasing (**Table 1**) (Rimmer, 1996).¹

The high-speed transmission of information, necessary for growth and maintenance of the service sector, has had marked effects on the physical forms in Asian cities. In some information technologies have taken on extra importance. Singapore has attempted to restructure its economy toward the creation of an information city.² The city-state is aiming to make itself a hub of communications, finance and travel and information technology is at the core of plans for the city’s future (Perry, Kong and Yeoh, 1997). The Teleport project in Tokyo, less than 6-km from downtown, was planned as an information and futuristic city. The estimated construction cost of the area’s infrastructure alone is approximately US\$ 20 billion (TMG, 1996a). Malaysia continues to develop a “Multimedia Super Corridor,” Cyberjaya, that would stretch from Kuala Lumpur 50 kilometers to the south ending at a new international airport (Heibert, Jayasankaran, Miller and Tiglao, 1997). This project is envisioned as a setting for multimedia and information-technology companies and is being promoted through government incentives.

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 developments 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 they 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 2**). 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, Jingiao Export Processing Zone, Waigaogiao Free Trade Zone and Zhangjiang High Tech Park (Wu, 1999; Olds, 1997).

Accompanying transportation and telecommunication projects, industrial parks and EPZs are large re-developments projects. Throughout the world large urban mixed-use development projects are on the rise and the Asia-Pacific has its share (Olds, 1995). 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 (Cybriwsky, No date).

¹ These include (in rank order) Hong Kong (1), Singapore (2), Kaohsiung (4), Pusan (5), Kobe (6), Keelung (10), Yokohama (11), Tokyo (14), Bangkok (19), Manila (21), Nagoya (24) and Tanjung Priok (25).

² Singapore announced in the early 1990s that it intended to turn itself into an 'Intelligent Island' by the year 2000.

Within re-development projects is the high-profile “prestige” building. 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) (Gebhart, 1997). Typically these projects are usually conceived of as landmarks to “symbolize the prosperity of the city...and embody the hopes and lofty ideals of the people.”³ Often these projects are built “reclaimed” land as other areas of the city are unavailable for development.

Physical urban transformations were accompanied by dramatic social changes including increases in per capita incomes (**Table 3**). Rapid and prolonged wealth creation for nations prompted some to call Asian development a “miracle” (World Bank, 1993). Economic indicators alone, however, do not capture the social transformations in the region. It was not only wealth that was increased but also the quality of life in Asia dramatically improved as manifested in reductions in shares of population below basic needs poverty lines, longer life expectancy, reductions in birth mortality, increases in access to basic services and greater literacy (ADB, 1997).

Levels of poverty within the region dropped substantially. From 1987 to 1993, the Asia-Pacific experienced decreases in both numbers of people living absolute poverty (drop from 464 million to 446 million) and percentage of total population living in absolute poverty (28.8 percent to 26.0 percent), while Europe and Central Asia, Latin America, the Middle East and North Africa, South Asian and Sub-Saharan Africa all experienced increases in number of people in poverty (World Bank, 1999). In Hong Kong, Chinese Taipei and Singapore, poverty has disappeared. It has almost been eliminated in Korea and Malaysia. For example, in Malaysia poverty levels dropped from 49 percent in 1970 to 21 percent in 1980 to 9 percent in 1995. In Indonesia, the incidence of poverty was halved from 60 to 29 percent during the 1970s. By 1990 it dropped by half again to 15 percent. The Philippines and Thailand, however, made less progress in this area (ADB, 1997).

Over the last 30 years, Asian nations have experienced increased life expectancy rates (**Table 4**) while birth mortality declined (**Table 5**). No doubt that these trends are related to better nutrition and health care services. As Asian’s chances for their own survival and the survival of their children increased so fertility has dropped. While there is dramatic variation among nations in the region, between 1950 and 1990 the general trend for the number of children per typical Asian woman has fallen from six to three (ADB, 1997). The region has undergone a rapid demographic transition.

The United Nations Development Programme (UNDP) has integrated various development indicators into a “human development index.”⁴ Trends in these indicators for countries in the region confirm that there have been significant social and economic advances over the last three to four decades (**Table 6**).

Up until recently this was the model for urban development within the region. In 1997 and 1998, however, countries in Asia that had enjoyed high growth rates, maintained full employment and where making significant strides in reducing poverty suffered severe

³ Yoshito Kato, managing director of Mori Bini Architects & Engineers in Tokyo as quoted in Fred Gebhart 1997 “View from the Top, Asian Cities Reach for the Sky” *CAAC Inflight Magazine*, pp.46-50,

⁴ The UNDP Human Development Index (HDI) “is based on three indicators: longevity, as measured by life expectancy at birth; education attainment, as measured by a combination adult literacy (two-thirds weight) and combining primary, secondary and tertiary enrolment ratios (one-third weight); and standard of living, as measured by real GDP per capita (PPP\$).” UNDP Human Development Report 1995, New York: Oxford Press, pp. 134.

economic contractions. The speed and intensity within which the crisis mounted within country after country surprised the world. Some have commented that during this period, globalization took a step backwards (ADB, 1999).

The impacts of the Asian financial crisis

The Asian financial crisis began in 1997 and for most developing economies in the region, the next year and a half were difficult. As a whole, developing Asia's growth slowed down from 5.8 percent in 1997 to 1.6 percent and for the first time in the 1990s it was lower than in Latin America or Africa (**Table 7**). Only China and a few countries in South Asia managed to sustain the growth rates of recent years (UNCTAD, 1999a).

Aggregate GDP of the four newly industrializing economies (NIEs) contracted by 1.5 percent in 1998, in contrast to an expansion of 6 percent in the preceding year (**Table 8**). Two of the four economies suffered recessions in that year. Taiwan survived the financial turmoil relatively unscathed (**Table 9**). It is believed Taiwan was able to fight off crisis because of its pre-emptive devaluation and large foreign-exchange reserves built up from current-account surpluses (UNCTAD, 1999a). The decline in growth for the economy was contained at 4.8 percent, against 6.8 percent growth in 1997. Hong Kong on the other hand, experienced its first recession in 13 years. Output declined by 5 percent that year in contrast to a growth rate of over 5 percent in 1997. In Singapore, growth fell to 1.5 percent in 1998, from nearly 8 percent in 1997, but the city-state was able to fight off a contraction. In both Singapore and Hong Kong, wages and employment were allowed to, and in the case of Singapore, forced to fall in order to maintain an external balance of trade and competitiveness (UNCTAD, 1999a). The recession in the Republic of Korea was due to the severe contraction of both domestic and external demand, resulting in output falling by approximately 5.5 percent. Because other countries in Asia were the locations for about half of the Republic's exports prior to the crisis, the fall in external demand was followed the deepening of the financial crisis in the country (UNCTAD, 1999a).

In ASEAN, income for the group as a whole fell by 9.4 percent in 1998, in contrast to an increase of 3.8 percent in 1997. The first to be struck by speculative attack in 1997, Thailand implemented a series of financial and other structural reforms to stem capital outflows. Despite these attempts, the country still suffered an 8 percent contraction. Indonesia's economy bore the brunt of the crisis as exports and investment collapsed resulting in a contraction of nearly 14 percent in output. The country's troubles were exacerbated by the affects of El Niño on agricultural production and continued civil unrest. The economic contraction in the four countries reflected the impact of currency depreciation and generalized debt deflation and produced widespread insolvencies as a massive reversal of private capital flows ensued. In the Philippines, the relatively low level of financial leverage (about 60 percent of GDP) and continued strong export demand helped save it from some of the worst effects of the crisis (ADB, 1999). The decline in the Philippine economy was around 0.5 percent. Malaysia chose a different path, introducing capital controls and expanding the government's economic role in an attempt to shield the domestic economy from the volatility of international capital flows. At first the country appeared to avoid the worst effects of the crisis, but capital outflows brought growth down to -6.2 percent.

The social consequence of the crisis includes increases in unemployment and prices of goods, drops in human development and social capital and increases in poverty (Lee, 1998;

ADB, 1999; Gupta *et al*, 1998). Of course, the consequences vary across countries, but throughout the region, those most often hurt were the poor and vulnerable (women, children and migrant workers). Unemployment rates have risen in Indonesia, Thailand, Korea and the Philippines. In Indonesia, the rate rose to 5.5 percent in 1998, up from 4.7 percent the previous year. In Thailand it reached 5.3 percent, compared with just about 1 percent in 1997. The unemployment rates in Korea more than doubled to 6.8 percent, while in the Philippines it climbed to 9.6 percent. The condition of underemployment also increased markedly. Standards of living have fallen as inflation outstripped any increase in income. The crisis has reduced household expenditures in health and nutrition, education and family planning. It also set back strides made in decreasing poverty. Large numbers of people are falling below poverty levels. The environment has also suffered serious degradation related to the crisis, exacerbated by the needs of poor households. Those families attempting to obtain additional income during this period have resorted to environmental destruction. Further, many countries are experiencing an increase in crime and violence, including domestic violence (ABD, 1999).

The crisis has been most deeply felt in Asia's cities (Chatterjee, 1998; Gould and Smith, 1998; Douglass, 1998a; Firman, 1998, 1999). Impacts include economic, political and physical changes to all sizes of urban centers in the region. Most commentators have noted the closed businesses, increases in unemployment and urban poverty, reduced public expenditures on infrastructure and service provision, growing vacant lands and empty high-rise buildings and partially finished construction sites. Among the hardest hit was Jakarta. The related crises, both economic and political (Robison and Rosser, 1998; Haut, 1999) have turned Jabotabek from a "Global City" into a "City of Crisis" (Firman, 1999).

The speed and sustainability of the current recoveries are uncertain, and problems may emerge elsewhere in the region, notably in China with respect to maintenance of the exchange rate (UNCTAD, 1999a). It appears, however, that the worst of the crisis is over. As Palanivel and Lo (1999: 11-12) have noted "The recovery, led by South Korea and hotly followed by Thailand, Malaysia, Singapore and the Philippines, does look genuine and quite vigorous." The IMF predicts that growth will turn positive for the various groups of Asian economies by the year 2000 (IMF, 1999) (**Table 8**). The full affects of the crisis and the sustainability of current conditions can only be measured after the next few years.

The impact of the crisis to regional policy theory has been heightened by the social problems accompanying the crisis and by pollution levels that have increased faster than GDP even during the most rapid growth periods (Brandon, 1994).⁵ A watershed in thinking is emerging significant (McGee, 1998b; Douglass, 1998b). The old model, based on the Japanese experience of "grow now clean later," has been proven faulty and is being replaced by one that includes immediately mitigating environmental and social problems (Webster, 1995; Kato, 1998; Cruz, Takemoto and Warford, 1998). Wealth creation had the upper hand over the last few decades, but heightened by the fallout of the crisis (and increased activism, although at a lower level than seen in the USA and Europe) "sustainability" is increasingly an important component in development strategies.

⁵ The impacts of the crisis has brought environmental (FEER, 1999) and urban issues (Walton, 1997) into focus for policy makers.

Globalization and urban sustainability in the Asia Pacific

When surveying the state of the urban environmental across Asia, damage is often aggregated and compared across different cities to demonstrate difficult conditions. Asia's environmental performance has not matched its economic or human development progress. Indeed, pollution is one of the greatest challenges for the region. In general, Asian environmental quality has deteriorated to the extent that the region is one of the world's most polluted. Environmental conditions in many countries are severe (**Table 10**).

Conditions in urban Pacific Asia have been referred to as an "urban-industrial environmental crisis" (Douglass and Ooi, 1999). Water, air and solid waste conditions in urban areas have reached extreme levels. Asian rivers contain three to four times the level of fecal pollutants than the world average (ADB, 1997). The water supplies within most metropolitan regions in Pacific Asia are at or nearing crisis points (Douglass and Ooi, 1999). Not only are urban population growing rapidly, but also the physical areas covered by cities leading to a loss of ground cover and deforestation of uplands around cities plus contamination of aquifers and seepage of seawater under cities have rapidly diminished supply sources.

The air in Asia's cities is among the dirtiest in the world. The levels of ambient particulate matter – smoke particles and dust, which are a major cause of respiratory diseases – are generally twice the world average and more than five times as high as in industrial countries. Ten of Asia's 11 megacities exceed WHO guidelines for particulate matter by a factor of at least three, four exceed acceptable lead levels, and three exceed acceptable ozone and sulfur dioxide levels (WHO and UNEP, 1992). A World Bank report suggested that annually, in China alone, 178,000 people in major cities die early because of pollution. Lead causes blood poisoning and significantly impairs children's cognitive development. Young populations in the region's urban centers have been affected negatively. Ambient levels of sulfur dioxide – an important cross-border pollutant that contributes to acid rain, which in turn damages crops and eats away at synthetic structures – are 50 percent higher in Asia than in either Africa or Latin America (ADB, 1997). Some Asian cities are so thickly covered with air pollutants that they are not visible on satellite photographs (Elsom, 1996).

Sanitary collection of wastes services within some individual cities remain low, with only 50 to 70 percent of resident receiving any service (Cointeau-Levine, 1994; UNEP, 1993; Dua and Esty, 1997). Some estimates suggest that only 2 percent of waste is treated in cities in some developing countries in the region (FEER, 1997).

Potentially more dangerous than ordinary municipal solid wastes are the growing quantities of hazardous and toxic wastes that hospitals, certain factories and households generate. Surprisingly, the PRC (which generates 50 million tons per year) and India (which generates 40 million tons per year) produces 10 times more hazardous waste per person annually than Korea, Hong Kong or Singapore and 100 times more per person annually than Japan (ESCAP 1995). In Asia, 60 to 65 percent of hazardous waste is put in dumpsites or landfills, 5 to 10 percent is dumped in the ocean and the rest is incinerated or chemically treated (UNEP, 1993). In most cases, proper safeguards are absent or largely ineffective (ADB, 1997).

While urban environmental conditions in the region are severe they have not been experienced in similar ways by all cities. In order to understand the relationships between the forces that have generated these circumstances the current state of the environment, a comparative analysis of changes in environmental conditions associated with current growth

patterns of developing world cities is needed. Within the literature on “sustainable cities” there are limited international comparative studies currently available. Indeed, in a recent compendium of seminal writings on urban sustainability, the editor, David Satterthwaite (1999: 16) noted this lacunae in current research.

Some recent attempts to compare the environmental performance of cities describe conditions and the institutional constraints to solving mediating the problems (Leitmann, 1995). Others provide a cross-sectional analysis of environmental conditions within cities at different development stages or income levels. A comparison of conditions among these sets of cities has provided evidence as to whether cities are undergoing an “environmental transition” and what this transition promises for future generations. The “environmental transition” theory suggests that wealth (in terms of GDP) can be used to distinguish the environmental performance of cities. That is, that as wealth increases, “urban problems become spatially more extensive and priorities shift from environmental health to sustainability” (McGranahan and Songsoe, 1994: 7). One interpretation of this relationship is the environmental “Kuznet’s curve” (see for example, World Bank, 1992). This curve describes a functional relationship between environmental problems and income and is similar to an inverted “U” shape. It predicts that as nations grow, environmental problems increase until a point in development when societal changes in institutions and ideologies force changes in environmental management. The results, some argue, will be decreasing pollution levels with wealth. This theory has been refined to suggest different types of pollution increase and decrease during different stages of development. For example, in low-income communities, poverty related and sanitary issues are of most importance, but quickly decrease with increasing income. At the same time, manufacturing production related pollution increases with industrialization (later to decrease with expanding wealth and increased interest in the environment). Finally in developed countries, despite investment in pollution related infrastructure, consumption related pollution levels increase (see Pugh, 1996).

A study of Japan’s experience with air pollution is instructive (see Sawa, 1997). 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, planning and introduction of heavy oil de-sulfurization facilities. Thereafter, the battle shifted to urban and domestic air pollution caused by nitrogen oxide emissions. 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 of industry from heavy to machine assembly and information, Japan achieved further success. In the transportation sector, however, measures related to manufacturing production distribution and land use did not advance 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).

While studies of environmental transition in cities have been instructive, they have concentrated on the relationship between income levels and the urban environmental rather than the functional role of the urban center with in the regional or global economy and the urban environment. Urban sustainability, however, particularly in the Asia Pacific, cannot be divorced from the wider development context.

The regional city system and urban sustainability in the Asia Pacific

In the Asia-Pacific the functional city system, or “a network of cities that are linked, often in a hierarchical manner based on a given economic or socio-political function at the global or regional level” has developed (Lo and Yeung, 1996: 2). Theoretically, not only does this functional city system impact the economic growth of cities the roles that urban centers play within the larger regional system also significantly relates to the environmental and social conditions within the city. Indeed, it is increasingly difficult to distinguish between industrial and urban impacts on the environment (Douglass and Ooi, 1999). The two processes are linked at the mega-urban region level through a set of activities that are increasingly cross-border in nature (Robinson and McGee, 1995). That is, the growth of these large regions and increasing investment, capital flows and other transnational activities are occurring simultaneously. In part, therefore, understanding the urban macro-development trends helps to explain their costs. The context for understanding “urban sustainability” in this region will vary not only with level of national development, but also with the functional role of the urban center in the regional economy.

Below is a brief description of the topology of urban environmental and social problems found in cities in the region, based upon their functional roles in the international city system (**Table 11**). In general, distinct patterns can be ascertained that are associated with different economic functions and activities. In the case of air pollution indicators, for example, the highest concentrations of particulate matter are in the industrial cities (**Table 12**). Not only are environmentally related conditions categorized by urban type but, there are predictable social distinctions appearing in cities of different functional attributes (**Table 13**). Further speculative evidence is provided for the relationship between the social and environmental conditions in cities and the cities’ regional/global functions.

Capital Exporters (Post-Industrial Cities)

The post-industrial city is dominated by the processing of information and knowledge (Savitch, 1988). Tokyo, Seoul and to a lesser extent Taipei exemplify the Asia-Pacific style of post-industrial development. Sassen (1991) has identified the economic and social order of “global cities,” of which Tokyo is an example. In the Asia Pacific region, the capital exporters are on the top of the hierarchy. These cities are the sites of concentrations of TNC headquarters, multi-national banks, producer and business services. At the same time these cities are expanding outward leaving inner city workers with longer commutes as many of the jobs remain in the inner city area, despite large and efficient mass transit systems. Manufacturing industries have decentralized while advanced services are concentrated in the core regions of the city. The urban population is wealthy and increasingly polarized, in terms of income (see for example Sassen, 1994, chapter 6). Contemporary development pressures have positioned consumption-related pollution, open-space/quality of life issues and those pertaining to sprawl high on the list of policy priorities.

These cities have effectively reduced poverty and industrial pollution and they are now struggling with consumption-related pollution and quality of life issues. As cities such as Tokyo and Seoul have been able to control air pollution from their point sources, they still are attempting to control the increase in air pollution that has accompanied lifestyle changes (i.e., increased automobile usage) (Sawa, 1997; TMG, 1999; Korean Ministry of Environment,

1999) water pollution from household waste effluents and neighborhood noise pollution (TMG, 2000). In Seoul, for example automobile ownership has increased from 60,000 vehicles in 1970 to over 2.2 million in 1999, bringing with it congestion, noise and air pollution (SMG, 2000). Related to high levels of consumption are pollution emissions from waste treatment. For example, dioxin levels and accident fallout from nuclear power plants has been of increasing interest to citizens.

Urban strategies in post-industrial capital exporters that deal with consumption related pollution levels in these cities are mixed. Efforts have increasingly included new environmental strategies, demand management and recycling strategies. In Tokyo, recent attempts to combat pollution from incinerator plants, for example, includes achieving ISO 14,001 certification of for environmental quality performance (Tokyo Metropolitan News, 1999). Seoul has recently set up a pricing system for the *Namsan* Tunnels (that feed into the CBD) in an attempt to reduce traffic (Kwon, 1998). Japan, Korea and Taiwan have adopted strict regulations on separating household waste for municipal pick-up, which has facilitated recycling efforts. Seoul's new waste management plan focuses on reducing the source of waste by approximately 1 percent and increase recycling of waste to 53 percent by the year 2002 (SMG, 2000). Tokyo's Water Plan promotes the use of rainwater and the recycling of wastewater (Tokyo Metropolitan News, 1999)

Also high on the policy agenda of these cities is maintaining a high quality of life for wealthy groups of citizens including increasing open space, waterfront access, urban entertainment and cultural activities (Kato, 1998). Among large cities in the developed world, Tokyo has a very low percentage of land designated as public open space. Further, "green" space has declined causing concern among the city's planners (TMG, 2000). Seoul residents are also increasingly expressing dissatisfaction with the lack of parks and open space (Kwon, 1998). One current and acrimonious debate within the city is how reform the Green Belt Policy that since the early 1970s has attempted to maintain a belt of controlled development and open space around the city (see for example Choe, 1998).

In general, Japan and Korea are responding vigorously through legal actions to their individual environmental problems neglected in the early decades of each of their economic development. Almost the entire body of environmental legislation now in use has been adopted or updated since the early 1990s (OECD, 1997). Korea's Green Vision 21 focuses on creating high quality environments throughout the country by investing about US\$ 66 billion in environmental infrastructure among other actions (Korean Ministry of Environment, 1999). In Tokyo, several new laws including the Tokyo Metropolitan Basic Environment Plan (1997) and the new Environmental Impact Assessment (1998) are attempts to improve the city's environmental quality.

Lastly, capital exporting cities have recently experienced increases in land values within the center cities such that working populations have sought residents further away from the center. Seoul, Korea, in an effort to control housing development has launched a 2 million-unit housing construction program in 1989 and about 80,000 new homes have been built in the city every since 1980. In 1985, the housing supply ratio was down to approximately 58 percent, with government efforts it has increased to over 70 percent (SMG, 2000). Tokyo's land demand pressures have created two problems. Younger residents have moved out to the suburban fringes where as commuters they have notoriously long and congested journeys to work. Despite an excellent and expanding public rail and subway system, passenger boarding rates are around 197 percent of capacity (TMG, 1996b). Some

workers must travel 1.5 to 2 hours each way in these conditions to get to work. An increasing proportion of those remaining in the city area are elderly. Thus, by 2015, Tokyo will face the situation where almost 25 percent of the population will be over 65 years of age (TMG, 1999).

Capital exporting cities are reaching a level of maturity associated with a de-concentration of manufacturing industries and population. In the case of Tokyo, it has already been through an environmental transition, although it is increasingly important to control consumption-related pollution and strike a balance among the many different urban functions and the quality of life issues demanded by the higher income segment of an increasingly polarized society. Seoul is not that far behind. In each city, vast amounts of public infrastructure have been developed in and around these cities, which has helped to make them on top of both their national and regional urban hierarchies.

Sites of FDI: Industrial Cities

Industrial manufacturing processes are vitally important to the growth and development of the region and hence these centers play an important role in the functional city system. Industrial centers include urban areas such as Bangkok (Wongsuphasawat, 1997), Jakarta (Soegijoko, 1996) and Shanghai (Cui, 1995). These urban centers have recently experienced a decline in agriculture and an increase in industrial concentration. Global integration has affected the pattern of development by encouraging the concentration of a ring of manufacturing plants in a donut fashion around the city cores. With rapid industrialization and uncontrolled growth, these cities have been characterized by “unsustainable” processes affecting both environmental (Douglass, 1991) and social spheres (Jellinek, 2000).

As manufacturing production has become an increasingly important part of the urban economies of these cities, so too are levels of air and water pollution and concentrations of hazardous wastes rising. Air pollution is a major problem in industrial cities. Vehicles (particularly two-stroke motorcycles and three-wheel taxis and diesel buses and trucks) are the major contributors. Cities such as Jakarta, Bangkok and Shanghai are currently struggling to overcome these types of problems, but increases in vehicle ownership outpace even economic growth, doubling every three years in Thailand and every four years in China (Douglass and Ooi, 1999). Air quality continues to deteriorate in cities such as Bangkok and Jakarta as total suspended particles (TSP) and carbon monoxide increase, primarily from traffic congestion (Webster, 1995). The resultant health and productivity effects of pollution cost billions of dollars a year in these cities. For example, the annual cost of air pollution is estimated at US\$ 1.3 – 3.1 billion in Bangkok, US\$ 1.0 – 1.6 billion in Kuala Lumpur and the Klang Valley and US\$ 400 – 800 million in Jakarta (Brandon, 1994; World Bank, 1992). The human cost is tragic. Bangkok’s children have the highest blood lead levels in the world (Setchell, 1995). In cities in China, coal driven electrical generators, used for about three-quarters of the country’s energy consumption, have had tremendous impacts on the urban air quality. For example, SO₂ concentrations in cities such as Chongqing, Taiyuan, Qingdao and Guiyang (northern cities), substantially exceed the high end of the WHO guidelines for 24-hour exposure scenarios (Lo and Xing, 1999). Shanghai’s level of SO₂ is well over the annual standard WHO minimum exposure levels.

Water pollution is primarily caused by domestic wastewater flowing into open pits and canals without treatment, but industries are increasingly contributing substantially to the

problem. In areas that are served with sewerage, more than 90 percent of the wastewater is discharged without treatment (WHO, 1992). In both Jakarta Bay (Jellinek, 2000) and around Bangkok (Phantumvanit and Liengcharensit, 1989) harmful industrial wastes are being dumped into waterways. The Chao Phraya River, running through Bangkok, no longer supports life (i.e., the dissolved oxygen level in parts of the river are zero at certain times of the year) (Setchell, 1995). The city's *klongs*, storm drainage system, are extremely dirty as much of the city's grey water makes its way directly into these water bodies without treatment of any kind (Daniere, 1996). In the mid-1990s sewers served only 2 percent of the city's population (Webster, 1995), although plans were being made to construct wastewater treatment facilities that would handle up to 30 percent of the population's wastewater (ADB, 1996). In the meantime, however, 6 percent of annual deaths in Bangkok are due to such water-borne plagues as typhus, dysentery and encephalitis (Annez and Friendly, 1996). In Shanghai, river pollution cost the city US\$ 300 million as municipal water intakes were moved 25 miles upstream. In the currently developing Pudong New Area surface water pollution levels are already very serious (Wu, 1999).

To compensate for polluted water, households in these cities have been boiling their water. This practice is widespread in Asian cities and while it is effective it is also costly. In Jakarta, for example, it is estimated that more than US\$ 50 million is spent each year on boiling water for domestic consumption. This sum is equivalent to about 1 percent of the GDP of the city (Briscoe, 1993). Because the fuel used is often biomass, consumption increased deforestation and urban air quality (particularly indoor air quality).

Solid waste is a problem because of high rates of growth in consumerism and inadequate garbage collection. In Jakarta, for example, between 20 and 25 percent of the garbage is collected (Pernia, 1992; Webster, 1995). In the BMR about 20 percent of solid waste goes uncollected (Daniere, 1996).⁶ Hazardous wastes treatment, particularly hospital wastes and toxic substances are generally not adequately handled. Sanitary landfills are rare in Kuala Lumpur, Manila, Jakarta and Bangkok and much of the municipal garbage is eliminated by less sanitary means such as open burning and dumping into rivers and canals or into abandoned mine sites and swamp areas (Lee, 1994).

Many of these major cities are found on the coast where large rivers run into the ocean. Urban and industrial water contamination is seriously impacting the coastal zone ecology. For example, the effluents in Jakarta Bay include mercury such that levels in the bay are second only to the concentration once recorded in Japan's Minamata Bay (Douglass and Ooi, 1999). In Bangkok, approximately 1.5 million cubic meters of untreated domestic and industrial pollutants are discharged directly into the waterways on a regular basis with significant adverse impacts on water quality (Setchell, 1995; Kaothien, 1995).

Further, general environmental degradation in and around these cities has created problems of extreme water shortages in dry seasons and dangerous flooding in wet seasons (Douglass and Ooi, 1999). Recently problems related to slash and burn farming in combination with water shortages during the dry season helped to create the 1997 massive fires in Indonesia which affected an estimated 7 million people (FEER, 1999). Flooding in China claimed over 3,000 lives and about US\$ 24 billion in property damage.

⁶ In the slum settlements, approximately 68 percent of all households benefit from regular solid waste collection (Daniere, 1996).

In terms of transnational flows and environmental conditions there are at least three important considerations that need further examination. The first implicates global flows in altering the environmental transition, in serious ways, creating “environmental risk overlaps.” Kirk Smith (1993) suggests that within an urban setting, when there are significant amounts of both traditional and modern risks occurring at the same time, several classes of problems emerge. For example, Smith (1993) points out that about 40 percent of the people in China still use crop residues for cooking, creating a traditional risk in homes (smoke from burning bio-fuels). Now, however, the pesticide residues left on the crops compound the problems associated with the traditional forms of cooking and heating. These risk overlaps are important for large populations in rapidly growing developing countries. Further, in the past, citizens of developing cities might experience environmental risks mostly associated around the home or within the neighborhood. Currently, however, significant populations are affected by these risks and in addition have to cope with consumption related risks that affect larger areas, such as auto-pollution. These conditions are related to the increasing flows of goods between countries.

The second consideration concerns the role of FDI in environmental pollution. In industrial cities the major environmental pollution sources are manufacturing firms. In industrialized parts of China, for example, 70 percent of environmental pollution is caused by industry (Liu, 2000). Global flows of manufacturing investment contribute to this process. Manufacturing FDI has taken on clear spatial pattern and sector patterns. A large percentage of FDI stock into nations with industrial cities are in the “pollution-intensive industries” (chemicals, pulp and paper, petroleum and coals processing and basic metals industries). For example, in 1996, 68.0, 44.1 and 27.4 percent of all manufacturing inward FDI stock to Indonesia, the Philippines and Thailand, respectively, were in these types of industries (UNCTD, 1999b; see also Brandon, 1994). Further, while commercial FDI is located in the central part of the city, most manufacturing investment is directed to the outer edges of the city. The case of Jabotabek is a good example (**Table 14**). This consequence may be related to lax environmental regulation enforcement in outer areas of the city, among a variety of other location-based decisions. For example, larger firms tend to locate in explicit industrial zones or industrial estates where their activities are easier to notice.

While foreign direct investment has been one of the most important drivers in the global economy (Dicken, 1998), systematic “pollution haven” related activities of developed countries, however, have been difficult to establish.⁷ Indeed, some have argued that foreign firms tend to be better environmental citizens than locally owned firms and the challenge for industrial cities is to improve the environmental behavior of small and medium sized enterprises (Webster, 1995). Notwithstanding the debate, the fact is that many Asian governments see industries as the backbone of economic growth in the coming century. Car manufacturers, for example, create skilled jobs and some companies, such as General Motors, Volkswagen and Toyota have invested heavily in countries like Thailand. Other countries, such as Malaysia and Indonesia have developed their own models (the Proton and Timor). Naturally, all manufactures are looking forward to continued growing market for cars. Total

⁷ Anecdotal evidence suggests that it has occurred in selected locations. Douglass and Ooi (1999), for example, discuss how TNC textile companies around Bandung, Indonesia, have not only depleted groundwater but have also fouled it to the point that it causes skin irritations. For reviews of the literature in this area see for example, UNCTD, 1999b, Box X.2 pp. 298 and Esty and Gentry, 1997).

automobile sales in China and Southeast Asia reached 2.5 million in 1996 and are expected to increase by 85 percent by 2000 (**Table 15**) (Doven, et al. 1997). Thus, the globalization of the automobile industry not only impacts the urban environments through production processes, but also impacts urban air quality when the cars hit the streets. Further, given the importance of manufacturing in industrial cities and the growing market for cars the result, it seems, is increased pollution.

Third, an important factor for a developing world city's capacity to deal with environmental problems is the contribution of international donor. Increasingly, however, private investment is growing while official development assistance is not. Between 1985 and 1995, average annual bi-lateral ODA to developing countries has remained between US\$ 50 and US\$ 60 billion (Esty and Gentry, 1997), while during the same period private investment to these economies increased from US\$ 24.7 to US\$ 96.3 (UNCTD, 1997a). Further, donors, such as the World Bank, have not focused project development on urban environmental issues. Although there are recent changes to the trend, over the past 15 years substantially less than one fifth of all spending is for sewerage and sanitation components (Briscoe, 1993; World Bank, 1992). This has made private development increasingly important to creating environmental sustainable third world cities. Unfortunately, privatization in the area of basic infrastructure has been more of a non-event than a panacea (Gilbert, 1992).

In terms of social issues, globalization forces together with pro-growth policies in these cities have created a severe wealth gap that has generated social tensions, which, by and large are only addressed rhetorically by the local and national states (Schmidt, 1999). One basic need that has remained largely unmet in these cities, particularly for low-income families, is housing (Pernia, 1992). This problem is most visible in the continuing presence and proliferation of squatters and slum dwellers. In many of these cities a sizable proportion of the population lives in slum communities. In Bangkok approximately 1.2 million in Manila approximately 30 percent of the population lives in slums. While real per capita income increased in Bangkok by 9 percent a year from 1987 to 1995, for example, Thailand's regional inequality also increased, largely because most of the growth was limited to the city region. Further, despite the impressive gains, poverty also increased in the BMR (Daniere, 1996). Between 1984 and 1994 slum housing within 10 kilometers of the city center declined by 20,376 housing units but at the same time slum housing in the BMR overall increased by 69 percent (Setchell, 1995). This may be due to evictions due to globalization led development pressures (Jellinek, 2000). Certainly, in cases of rapidly urbanizing areas, increases in per capita income are not necessarily associate with increases in well being (Satterthwaite, 1995). In Shanghai, the large migrant population has compounded social problems. Approximately 3.3 million temporary migrants and transients are now working and living in the city and most are not counted as part of the resident population taxing infrastructure and creating significant social pressures (Wu, 1999).

While the traditional center of the city is increasing in population the outer areas are expanding much more rapidly (Clarke, 1996; Douglass, 1991; Seogijoko and Kusbiantoro, 1998). Many of those in the outer rings are the poor, however, the population is not homogenous. The middle classes are also increasingly part of the fringe (Browder, Bohland and Scarpaci, 1995), but in their case often live in protected developments in response to rising social tensions (Leaf, 1994; Firman, 1997; Jellinek, 2000).

Industrial cities may have some of most severe environment and social conditions among those in the regional city system. Air, water and ecosystem damages are widespread

and severe. Globalization flows have fueled the deteriorating state of the environment and has helped to create new sets of risks, by-products associated with both traditional and modern lifestyles. Rising social inequalities have resulted in violent explosions demonstrated in some places during the financial crisis (Haut, 1999). Indeed, Indonesia, the state with possibly the greatest regional imbalances, continues to disintegrate. Government attempts to control development have largely been geared toward promoting growth and not toward protecting the environment, particularly for the poorer classes.

The Entrepots: Borderless Cities

Economic globalization has stimulated sub-regional economic cooperation in several locales while still others are being planned for implementation. Growth triangles, a development pattern that started in the 1980s, are localized economic zones involving several countries and can be viewed as “borderless” economies where the international division of labor has developed to the city’s advantage (Thant, Tang, and Kakazu, 1995). An existing and successful “borderless” economy has grown between Singapore, Malaysia (Johore) and Indonesia (Riau Islands) and is called SIJORI (Macleod and McGee, 1996). It revolves around the City-State of Singapore, which has recently reached out to acquire the benefits that rural industrialization can provide. The growth of the outer reaches of Singapore’s core was directly related to the Singapore’s maturing economy. The flows of people and goods from the city to the outlying areas accompanied an increasing level of cross-border capital flows. Another example of cross-border cooperative development, involving capital, technological and managerial inputs involves the integration of Hong Kong, Taiwan and China’s southern provinces of Guangdong and Fujian. Hong Kong is the center of the Zhujiang Delta and has emerged as a financial and headquarters center. A large proportion of the manufacturing production in Hong Kong relocated to southern Guangdong after China began its policy of economic reform in 1978.

For these cities achieving a high quality of life has become an important concern (see for example, Foo, 2000; ESCAP, 1995). While their economies changed from labor intensive industries in the 1960s and 1970s to high-tech, service and finance industries in the 1980s and 1990s, they have seen the migration of manufacturing and other related activities across their borders.

Indeed, one of the most successful policy areas for Singapore has been environmental management (Ooi, 1995; ESCAP, 1995). They have certainly provided a model for traffic control (Webster, 1995). Because of this emphasis both Hong Kong and Singapore appear on the list of 10 ten most livable cities in the region (Choong, 1999). Singapore has not only overtaken the USA in terms of per capita GDP,⁸ but is Asia’s “cleanest city” (ESCAP, 1995).

In Singapore, the series of public campaigns for a cleaner environment began in 1959. By 1995, 21 different campaigns had been initiated (ESCAP, 1995). At the same time rural-urban migration has been tightly controlled. Together these policies have enabled these cities to increase the quality of their environments. Further, the relationship of the city to its borders, (i.e., the ability to move industrial firms to outside the city boundaries) has played a significant role in keeping the cities clean (see for example Sit, 1998). The command and

⁸ As of 1998, Singapore’s GDP per capita was US\$ 30,060 compared to that of the USA, US\$ 29,340 making it the 9th highest GDP per capita in the world (World Bank, 1999).

control and high-tech functions have remained in the centers while the manufacturing and other pollution related activities have been sent cross-borders.

Other services, such as water supply, delivered at the highest of standards. In Singapore water loss stands at 8 percent (Briscoe, 1993), which is comparable to levels experienced by cities in the developed. All homes receive piped potable water. Wastewater and refuse are collected daily and treated and the air quality is within international standards.

Social sustainability in these cities started with public housing programs. The improvement of low-income communities has taken place through massive provision of housing by government in both Singapore and Hong Kong. In Singapore, 86 percent of the population live in public housing and over three-quarters of the population own the homes they live in. Further, despite its globalized economy Singapore has not experienced solar polarization, rather there is strong evidence of a trend towards a professionalized occupation structure with a growing middle-upper class (Baum, 1999).

This trend, no doubt was enhanced by both Singapore's and Hong Kong's ability to successfully controlled property development during this period (Haili, 1999).

Amenity Cities

According to this perspective globalization pressures can provides the impetus for the development of ecologically "sustainable" policies in some cities. In cities, such as Sydney and Vancouver, government's have been encourage to enhance their environments as part of strengthening their international comparative advantage. Good environmental quality can be an important element in attracting investment and promoting local economic development. These two cities have three important aspects in common: 1) post-industrial economies integrated into the regional economy; 2) 'inviting' natural environments or high concentrations of "amenities"; and 3) economic development accompanied by a sufficiently high level of per capita welfare and political acceptance to maintain and enhance the environment.

Globalization forces impacting Vancouver and Sydney include financial and capital flows consistent with their post-industrial economic structures, trade in goods (for Vancouver), and immigration flows. Sydney is the capital of New South Wales and Australia's most global city. Vancouver, as part of 'cascadia,' has been considered an emerging "sub-global World City" (McGee, 1998a). Each cities' environmental amenities (climate, harbor, beaches, mountains, low levels of pollution), and multi-cultural character are key to each cities' competitive advantage. Vancouver is part of a wide region of "geographical affinity" which stretches from Southern Oregon to the ski resort of Whistler, 120 km north of the city (McGee, 1998a). One problem for Vancouver is managing growth as city expansion is sandwiched between the ocean and the foothills of the Rocky Mountains. In response the Greater Vancouver Regional District, a partnership of 20 municipalities and two electoral areas, has produced a "Livable Region" plan that includes the protection of a green zone encompassing two thirds of the entire area (GRVD, 1996). This green zone is intended to protect the natural assets, including major parks (of which there are more than 22 that comprise 11,400 hectares) (GRVD, 1997), watersheds, ecologically important areas and farmland (GRVD, 1996).

Sydney has many beaches, a beautiful harbor and climate attractions considered an important part of the cities environmental amenities. The state of New South Wales and many

local governments within the area are at pains to protect these amenities. Struggles have been focused on how to keep the beaches clean, for example (Murphy and Wu, 1998). In large part, this is because Sydney is a major tourist stop and the beach area is a important attraction (Murphy and Wu, 1998).

In terms of social issues, both of these cities, however, are facing social tensions due to the large migrant population. Vancouver and Sydney have recently been the sights of Asian immigrants. In 1991, Sydney had 28.5 percent of total persons born overseas within Australia and 42 percent of all immigrants to the country were from Asia. For Sydney the growth of foreign-born residents is twice as fast as the growth of the total population (Murphy and Wu, 1998). Vancouver is one of the most rapidly growing urbanized regions in North America. Between 1981 and 1996 the population of the region increased from 1.2 million to 1.6 million. Of these 600,000 people, almost one third arrived in the years 1991-1994. Most significantly, net international migration increased from 33 percent in 1980s to 59 percent during 1991-1994. Many of these migrants are from Asia (McGee, 1998a). The rapid influx of migrants has not been without problems. Both cities are have faced assimilation and immigrant backlash issues.

World City formation and localization

The conditions described for created by a multi-dimensional and complex set of forces. While, as the paper argues, maintaining growth, striving for equity and sustaining the urban environment will necessarily require a different set of policies based upon the functional role of the city within the global city system, regulating internal dynamics also matter. World city formation infrastructure, in the words of Sassen (1994) “must be produced.” Local government decisions, however, are shaped by a variety of influences including the drive to increase competitiveness and institutional capacity. Both national priorities and institutional limitations have affected the ability for local governments to delivery urban services and regulate private activities.

Decentralisation⁹ of government has not been a strong common political trend in countries of East and Southeast Asia (**Table 16**), although it has been common in other developing countries. According to one study, of 75 countries with developing and transitional economies and population exceeding five million, 63 had transferred additional powers to local government (Dillinger, 1994).

A lack of or delay in decentralization in the post-war period in East Asia resulted in an overwhelming concentration of state power in the hands of central governments, as well as a massive accumulation of rules and regulations and overlapping agency responsibilities (UNDP, 1993). Many Asian countries have attempted to compensate for the lack of decentralization by implementing regulatory liberalization policies. However, an inability to move quickly and efficiently and adjust policies given rapid urbanization has impacted the development of many cities. Often national agencies compete over the development of infrastructure fragmenting the implementation process and metropolitan planning agencies

⁹ Decentralization usually includes the either a horizontal or vertical disbursement of power. The more important circumstance is when lower level bodies acquire responsibilities previously left to higher, centralized government institutions. However, decentralization can also signal a transfer of responsibilities from the public sector into the hands of private actors. Although there were many different forms that this process may take, in general it involves the greater allocation of authority to local governments (UNDP, 1993).

have not been effective in coordinating and enforcing metropolitan development policies (Edralin, 1998).

Notwithstanding some of the variations in the extent that local authorities across countries in the region depend on national government's financial support, the lack of political decentralization often allowed for high Central Government intervention. Even Seoul, for instance, that is largely self-financed, from 1961 to 1991 there was essentially no political decentralization in the Republic of Korea. Hence, the Capital Region Management Law, that provided guidelines for infrastructure provision, was prepared by the National Ministry of Construction and Transportation (Kim, 1998). In Indonesia, the involvement of the Central Government and provincial administrations resulted in relatively weak local authorities. Until recently, Central Government met over 70 percent of costs, and, local taxes typically yielded insignificant levels of revenue. In Thailand, parallel systems of territorial administration and local self-government exist. A department of the Ministry of Interior administers local self-government through provincial, municipal, and district structures. Each is responsible for local government affairs within its area. Central government grants and assigned revenues, however, account for approximately 95 percent of all local government revenues.

Two results of national financing for urban infrastructure are evident. First, infrastructure development has been centered in national capitals to the detriment of other cities. Second, infrastructure projects have been geared toward those large items associated with international linkages as opposed to basic services. Major metropolitan centers in the region have benefited from their national government's largesse. For example of the telephone main lines but in through Indonesia, almost 70 percent were in Java (Bulkin, 1996). Spending on water supply in Bangkok exceeded that of all other urban areas in the country combined (Kaothien, Webster and Vorathanyakit, 1996). In post-war Japan, the national government consistently made massive infrastructure developments in and around Tokyo including the country's first international airport, largest dam, first *Shinkansen* route (from Tokyo to Osaka), and majority of harbor projects (constructed in the coastal strip from Tokyo to Nagoya) (Uzawa, no date).

At the metropolitan level many Pacific Asian cities have privileged large regionally and globally linkage infrastructure without appropriate attention to basic infrastructure needs. Infrastructure was often geared toward large projects dedicated to increasing capital accumulation processes rather than providing basic services to the expanding population. For example, during the 1980s and early 1990s, while telecommunications and transportation projects received 30 percent of Indonesia's infrastructure development expenditures, housing and water supply received only 6 percent (Bulkin, 1996). In Thailand transportation and telecommunications infrastructure spending increased from 43.5 percent during the 1982-86 period to 57.8 percent during the 1992-96 period, while expenditures on utilities (water supply, wastewater and solid waste) fell from 9.6 percent to 7.7 percent during the same times (Kaothien, Webster and Vorathanyakit, 1996). Royston Brockman suggests that "Asia failed to anticipate and plan for the massive urbanization of the last decade. Urbanization has brought prosperity for many millions but still more live in conditions that are similar to those of the Middle Ages instead of the close of the millennium" (FEER, 1997: 69). To overcome some of the problems mentioned above, in the future developing Asian cities will need to invest US\$ 2.5 to 3 billion a year on sanitation, waste and wastewater infrastructure alone (Ghooprasert, 1996).

Typically, cities at different development levels experience different levels of expenditures on basic services (**Table 17**). It isn't surprising therefore, that an international comparison demonstrates different levels of provision and maintenance. In terms of water supply system maintenance an important management issue is leakage (**Table 18**). Some of the industrial cities have poor records in this regard, while other cities in the hierarchy perform better. For example, in terms of water supply one third of Bangkok's population has no access to public water (Lee, 1994) and in Jakarta, less than one half of the population has direct connections to the municipal water supply system (ADB, 1996) while in Shanghai only 7 percent of the population are not connected to faucets (Wu, 1999). Further, poor maintenance of systems has led to high water leakage rates. In many systems leakage is over 45 percent. A reduction to 30 percent would, in Jakarta alone, retrieve 45 million cubic meters of water, enough to provide for 800 000 people a year (Serageldin, 1999). In Manila leakage accounts for over 55 percent of withdrawals while around 1.5 million people in the metro area are not served by public water supply (ADB, 1996).

In Pacific Asian cities, the recent financial crisis has compounded these impacts, as less funds for local projects. Before the financial crisis, Brockman (1996) estimated that Asia would need US\$ 6.9 trillion in infrastructure investment (US\$ 280 billion annually) to meet its needs. Compare this with annual investment of US\$ 250 million in all developing countries throughout the world (Briscoe, 1999). In the 1980s about 10 percent of total public investment in developing countries or about 0.5 percent of GDP was for water supply and sanitation (Briscoe, 1993). During the financial crisis national governments cut funds for many infrastructure projects around the region and the economic situation have made extracting revenues from local populations difficult. The questions remain if, how and when these cities will be able to provide money for environmental clean up. When Japan began to clean up the environment in the early 1970s, pollution abatement investment surged to up to approximately 11.4 percent of total private capital investment (Kato, 1998).

Despite the high cost these systems must be financed. Those hurt most by the lack of infrastructure are the poor and just as urban centers cannot afford to isolate themselves from the global economy, so they cannot afford to isolate their poorest neighborhoods from wider urban societies and economies. The handicap imposed on the poor by the lack of clean water, effective sanitation, sufficient drainage and decent roads impedes the growth of entire cities (Annez and Friendly, 1996).

Addressing the issues within cities across the region requires appropriate coordinated integrated responses among a variety of agencies and institutions that work at different levels. Successful cities, such as Singapore and Hong Kong, have planned at the mega-urban region level.¹⁰ They were helped, no doubt, by wise leadership, their size, the city-state political system, which made the cities priorities national priorities and the ability to reach across borders when expanding their economies. Given the specific context of their success, not all aspects of the Singapore environmental model may be transferable to developing world cities.

If neither the Japanese nor the Singapore models are available to most developing world cities, what are the alternatives? One argument is for a complement of policies based upon the "fair shares" city model articulated by Haughtan (1999a). This includes both policies

¹⁰ Examples of strategic environmental plans for entire urban regions have been developed by the Hong Kong's Environmental Protection Department and by Singapore's Ministry of Environment.

at the local level and those that deal with international flows. This would require new forms of governance. That is a sub-national, regional arrangements with institutional capacities and the authority over the large urban regions. This may take the form of more collaborative styles of governing, both between the public, private and NGO sectors and between different public administrative regions. This type of governance pattern is emerging in some urban areas in the region (McGee, 1998a). Regional development strategies, that accompany adequate private property laws, appropriate tax regimes and shared infrastructure development will prevent a “race to the bottom” or “bidding down” syndrome, where localities will lower environmental standards or enforcement as a means to attract domestic and foreign investments (Douglass and Ooi, 1999).

At the international scale there is also a need for new arrangements. Despite the growing number of actors (governments, NGOs, private sector groups, etc) that have responded at the international level, the environmental has continued to degrade and the gap of what has been done and what is needed is widening (UNEP, 1997). Currently, the most appropriate international actors are multi-lateral financial institutions, regional trade and investment institutions and developed nations that provide overseas development funding. Dua and Esty (1997) have argued that to cure the Asia-Pacific region’s environmental problems, the Asia Pacific Economic Cooperation forum (APEC) is the optimal institutional response since no other forum covers all the relevant actors and attempts by other actors have fallen short. Specifically, they argue that APEC’s role must go beyond the push for liberalization and that the environmental agenda for the region must include different and often conflicting priorities. To this I would add only an emphasis on differing urban environmental and social priorities.

Conclusions

As Graham Haughton (1999b: 234) has noted “it is futile and indeed meaningless to attempt to create a sustainable city in isolation from its broader hinterland area.” David Satterthwaite (1999: 6) has highlighted this point noted that “the key issue is not ‘sustainable cities’ but cities whose built form, government structure, production systems, consumption pattern and waste generation and management systems are compatible with sustainable development goals for the city, its wider region and the whole biosphere.” The increasing scale of development influences, demands for more studies on the relationship between the regional and global economy and the urban social and physical environment. The Asia Pacific region provides a good case study with which to sketch out some speculations.

The concept of the functional city system, which defines urban development patterns by the particular roles that cities play within the increasingly interdependent regional economy, also provides for a differentiation of environmental and social conditions. Not only is the functional city system defining economic activity but is also penetrating physical and social realms. While this framework, is helpful in understanding the current development of cities and the challenges they face in terms of environmental and social issues, it does not imply a single model for development. Certainly, globalization processes that are historically unprecedented driving forces to contemporary development. But, globalization is a contingent process; it is not only dynamic but also open-ended. There is no future trajectory of globalization. It is a long-term process that can be shaped by its own internal contradictions along with a host of other factors (Held, *et al*, 2000). The impacts to urban communities can

be shaped to a large extent by the political will of the community. In terms of environmental performance and development, Singapore stands out as an excellent example of overcoming many of the problems associated with rapid development. The city-state has overcome negative environmental trends that have accompanied development in other urban centers in Asia. It is a clean and efficiently run city, demonstrating that politics and political culture can make a difference. This is not to underplay the role of the small size of the city (approximately 3 million) and the ability for it to control cross-border migration of people and economic activities, however. Rather it points out that different trajectories are possible.

Lastly, this perspective is highly speculative and in need of further systematic data gathering for the confirmation of the linkages between transnational flows and impacts to urban conditions. Notwithstanding the tentative nature of the results, the implications are consistent with current policy studies that suggest effective “sustainable” policies for urban environmental and social development must be constructed at all scales of governance.

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