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# PREPARING FOR SUSTAINABLE URBAN GROWTH IN DEVELOPING AREAS

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## A. INTRODUCTION

The social and environmental significance of upcoming urban growth still receives insufficient attention. All urban growth that has occurred since the founding of the first towns in Mesopotamia can be expected to double in the next 40 to 50 years. Practically all of this growth will take place in countries that concentrate most of the world's poverty. These are also countries that are striving to compete in the globalised economy by emulating the economic processes of the industrialized nations, with worrying social and environmental consequences. Africa and Asia alone will experience four-fifths of all urban growth in the world between 2000 and 2030; as a result, their combined population will double from 1.7 to 3.4 billion in the interim.

The social and environmental contours of future urban growth will be critical in humankind's future. The ongoing urban transition provides important opportunities for reducing poverty and enhancing sustainability. Within this framework, one specific issue that will have an important impact on sustainability, and that is very much in need of explicit orientation, is the urban use of territorial space. This paper, after briefly summarizing the historical context within which the second-half urbanization is taking place, will focus on two sets of aspects that affect the sustainable use of urban space: the importance for sustainability of meeting the land and housing needs of the poor; and, the process of converting "rural" land to "urban" uses. A concluding section will discuss some of the policy implications of these different facets of the sustainable use of urban space.

## B. TELESCOPING TIME AND THE CHALLENGES FOR SUSTAINABILITY

Historical time is being compressed in several dimensions, with enormous consequences for development and sustainability in developing countries. Social processes that took centuries in the now industrialized countries are not only being condensed into a few decades in developing countries, but are interacting among themselves in novel ways. Moreover, the gradual socio-economic changes that underlay or trigger those processes in developed countries are being bypassed in developing regions through technological innovations and other factors.

Several contrasting approaches have been developed by economists to describe the environmental transitions undergone by cities. The Environmental Kuznets Curve popularized by the World Bank (1992) and by Lomborg (2001), among others, suggested that environmental problems first got worse, and then improved as incomes rose. Major urban environmental problems, in this framework, would be best resolved by further industrialization and economic growth, according to the win-win argument famously emphasized by the World Bank (1992).

The urban environmental transition theory (McGranahan et al., 2001) questioned this optimistic view and indicated that distinct environmental challenges arise at different stages of development, and that some of these challenges do not follow the Kuznets curve. It suggested that, as cities become wealthier, their environmental impacts shift in nature from localized and immediate health issues to globalized and delayed threats to ecosystems. Marcotullio (2005) built on this model and introduced the notion of "time-space telescoping" in order to help distinguish differences in urban environmental conditions and their transitional phases between now developed and developing cities. Over time, the urban environmental priorities of developed countries have gone from brown issues (waste disposal and water quality) to gray issues (air and chemical pollutants) and on to green issues (sustainability). However, under the influence of globalization, many developing countries are experiencing this whole set of environmental issues simultaneously (McGranahan et al., 2001; Marcotullio, 2005; Solecki, Feng and Yu, 2005:4).

In the population field, the best-known example of a major social transformation being telescoped in time is that of the so-called "demographic transition," whereby people live longer and families become smaller as countries move from high to low fertility and mortality rates. The time that this process took is measured in centuries in developed countries, but in decades in many developing countries. The case of Iran, which recently experienced a decline of 64 per cent in its Total Fertility Rate in little more than a decade (Vahidnia, 2007) is an extreme but meaningful illustration. Yet, while developing countries now worry about decreasing population growth, demographic inertia ensures that Asia and Africa will end up with population dimensions that are unimaginable for developed regions.

Less well known, but perhaps even more significant, is the urban transition, wherein countries move from being primarily rural and agricultural to primarily urban. Again, this transition is being achieved in developing countries over a much shorter period of time, despite involving much greater population volumes than was the case in the industrialized countries. Many Latin American countries accomplished this transition in a few decades, even while experiencing their fastest population growth ever.

It is critical that these three processes – environmental change, population growth and urbanization – are being compressed in developing countries within a historical context that is being simultaneously and differentially molded by the forces of globalization and decentralization. The simultaneity of these historical changes constitutes what could be characterized as the foremost sustainability nexus of the 21st century.

Within the current globalized development scenario, many rapidly growing poor and developing countries are trying desperately to move out of poverty and, ultimately, to imitate the production and consumption patterns of the industrialized world, while also undergoing rapid urbanization. The expansion of private automobile use in some countries, for instance, is also telescoping, into a few years, the absolute rise in car use that took almost a century in developed countries. More generally, given their much larger population sizes, even the modest achievement of developing countries' economic goals, under today's development/environment tensions, could have unforeseen and possibly disastrous consequences.

At the same time, dramatic increases in municipal authority, derived from political and fiscal decentralization, have had two simultaneous effects. First, they have helped to greatly reduce the influence of central governments in deciding where and how economic and demographic growth should occur. Secondly, in combination with globalization, decentralization has provided cities, particularly smaller cities, with exciting new opportunities to manage their own economic destiny. It is not entirely clear how this will affect the trajectory of environmental responsibility, but it is certainly pertinent that smaller cities still constitute more than half of the world's urban population (UNFPA, 2007).

Environmentalists have generally taken a dim view of urbanization and city growth. At its inception, the modern environmental movement focused its attention on the preservation of nature and, consequently, on rural areas. Thus, it was logical that cities be viewed primarily as the locus of the critical environmental problems generated by the production and consumption patterns of modern civilization. Although this link between cities and their ecological footprint has undoubtedly been magnified over time, it is increasingly obvious that this is not because cities concentrate population, but because they are the sites in which "modern civilization" is evolving – for good and for bad – and because they concentrate most affluent consumers.

More importantly, recent years have witnessed a turnaround in environmental thinking, based on the recognition of the potential advantages that cities possess in terms of addressing critical environmental issues, as well as in reducing population growth in developing countries – in addition to their increasingly obvious advantages in promoting economic development. More and more, cities are seen as a potential solution, rather than as a problem, IF a more proactive

stance is taken toward urban growth (UNFPA, 2007). As stated by the World Bank when announcing a new pro-urban strategy: "Urban development can have both positive and negative implications for the environment, just as for social welfare and the economy. The balance depends on how it is managed" (World Bank, 2000:39).

Cities can indeed be considered as the site in which the main economic, demographic, social and environmental issues of the future will play out. The way these different dimensions are interacting in today's cities has, deservedly, been receiving increased attention.[1] However, what has not received nearly enough attention is the magnitude of *future* urban growth and its probable ecological implications. World attention is focused primarily on ongoing processes in existing towns and cities. But these represent only the better known half of the equation in the trajectory of urban sustainability. Indeed, dealing with current issues may be relatively simple, compared to the challenges still to come in the context of globalized development expectations and consumption aspirations, given the dimensions and characteristics of upcoming urban growth.

Current projections would indicate that all the urban growth that occurred in the history of humankind until the beginning of the 21st century will double in some 40 to 50 years. The environmental consequences of this upsurge are critical since most of this expected growth will occur in the world's poorest countries. For instance, 80 per cent of urban growth between 2000 and 2030 is expected to occur in Africa and Asia alone. Current approaches and policies often overlook the innate differences of varying development trajectories for urban environmental management. For instance, discussions of the linkages between urbanization and climate change are wont to lump cities into a single package when discussing mitigation and adaptation challenges, overlooking the enormous implications of massive urban growth in the context of poverty.

This paper focuses on one of the critical environmental problems linked to population growth in urban areas of the developing world – the sustainable use of urban space. The main intention here is to try to get a better handle on the significance of different urban growth patterns for sustainability and, on this basis, to examine policy options for countries undergoing massive urban growth. This leads us to focus on two main questions: the environmental implications of dealing effectively or ineffectively with the land and housing needs of the poor, and the magnitude and significance of "rural" land conversion to urban use. This second issue, in turn, brings several interrelated topics into focus: the size of the urban blot; the location of urban growth by ecosystem; the relative importance of urban sprawl versus other urban forms; and, the relative significance of transportation modes for longer-term sustainability. The concluding section will examine policy options for rapidly urbanizing countries in terms of what can be done to reduce the negative consequences and maximize the potentialities of upcoming urban growth, especially in smaller cities.

### *1. The Importance of meeting the land and housing needs of the urban poor*

The largest social category in the towns and cities of developing countries is often overlooked in the planning of urban space. Poor people represent anywhere from one-quarter to three-quarters of the urban population in those locations, depending on the region and on the way poverty levels are calculated. According to UN Habitat's latest exercise, developing world slums contained 933,000 inhabitants (UN Habitat, 2006:16). This is equivalent to 41 per cent of the estimated urban population of less developed countries in 2005 (United Nations, 2006). The proportion of slum dwellers is largest exactly in some of the sub-regions that are expected to experience the most substantial absolute urban growth in coming decades. Thus, 72 per cent of

urban populations in sub-Saharan Africa and 57 per cent of those in Southern Asia are slum dwellers.[2]

Similarly, *urban growth* in developing countries tends to be made up in large part of poor people (UNFPA, 2007). The new urbanites – those who will double the urban population of Asia and Africa in the 2000-2030 period – will be made up, to an even larger extent, of poor people. This is because, on the one hand, rural-urban migrants upon arrival tend to have somewhat lower average socio-economic levels than the native urban population; on the other, since poor people have higher rates of natural increase, their relative contribution to urban growth tends to be higher than their present share of the urban population.

Yet, despite their overrepresentation in existing urban areas and their even greater contribution to future growth, the presence of poor people seems to go largely unacknowledged in the formulation of city plans in developing countries. Seldom are the needs of these people contemplated realistically and explicitly. On the contrary, to the extent that they are planned, cities are largely configured and redefined basically in accordance with the political influences of real estate capital, with large-scale infrastructure designed to fit the needs of economic activity, and in keeping with the demands and preferences of middle and upper-income groups.

Thus, the real and crucial contributions of the poor to the economic life of the city tend to be overlooked, and the poor tend to enter the picture only as a source of problems. In particular, their habitats are seen as eyesores and hindrances that policymakers wish would somehow disappear. Since governments will generally not service areas where land rights are unclear, informal settlements are rarely provided, especially during their formative years, with water, sanitation, transport, electricity or basic social services. Frequently, the pattern of occupation in informal settlements is haphazard and asymmetrical, making it difficult to provide vehicular transportation, or other types of services.

It will be argued here that such difficulties not only exacerbate the miserable conditions of the poor in urban areas, but ultimately have an impact on the quality of life and sustainability of the entire city. Nowhere is the neglect of the poor more blatant, and its broader repercussions more detrimental, than in the area of housing. Disregard for the needs of the poor for land and housing makes them fend for themselves as best they can; this generally means that their quest for housing, infrastructure and services is not only a constant struggle, but one that affects the entire range of urban dwellers in various ways.

As has been pointed out repeatedly by analysts, the problems of most informal settlements are already determined by the way they come to life (Serra, 2003). Lack of access to land, for example, predetermines difficulties of access to shelter. This unnecessarily accentuates human misery and is the starting point for a vicious circle of poverty. The poor live in environments that typically concentrate hazards and lack minimal access to clean water for drinking, cooking, washing and bathing, as well as to serviceable toilets and garbage collection. These conditions increase the spread of disease-causing germs, frequently leading to chronic digestive tract illnesses. Crowded environments help promote such contact-related diseases as measles and tuberculosis, in addition to diarrhoea. Under-nutrition due to high prices of nutritious food leads to severe child malnutrition (Stephens and Stair, 2007: 137). In short, a large segment of the urban population is condemned to a stultifying and unremitting wretchedness that stems, to a great extent, from the lack of minimally decent housing.

Disregard for the land and housing needs of the poor also contributes significantly to environmental degradation because it affects both ecosystem services as well as the city's ability to responsibly and effectively plan for sustainable growth. Having little choice but to invade stigmatised or off-limits terrains, the poor sometimes occupy ecologically-fragile areas

and watersheds, thereby endangering the city's water supply and other ecosystem services. Deforestation to clear spaces for housing also results in flooding. Meanwhile, the occupation of urban floodplains and wetlands not only endangers the lives and possessions of the poor, it also increases the probability of flood damages to other parts of the city. By the same token, the invasion of steep slopes and the removal of tree cover increase the probability of landslides that will not only bury the residents themselves but also spill over into roads, tunnels, streets and houses at lower levels.

The lack of access to water, sewage or solid waste management systems in informal settlements pollutes rivers and ends up affecting the appearance, air quality and health of the entire city. The health costs of dealing with these impacts are very large: "A million or more infants still die each year from diseases related to inadequate provision of water and sanitation, and hundreds of millions are debilitated by illness, pain and discomfort… It is still common for one child in ten to die before their fifth birthday in urban areas in low-income nations, with much higher mortality rates among low-income urban dwellers" (Satterthwaite and McGranahan, 2007:27). In addition to direct impacts on the health of poor people, the number of hours lost due to illness has severe consequences, both for the overall productivity of the labor force and for household income.

The sprawling haphazard settlement patterns that typify the invasion of urban lands by poor people also make it much more difficult to put basic infrastructure into place, including roads and pathways that would facilitate the free movement of residents. The sprinkling of such settlements throughout the city also creates hurdles for the design of effective mass transportation and increases the costs of implementing it. Continually adjusted improvisations that ineffectually attempt to accommodate the increasing flow of people and vehicles (and sometimes animals) through narrow winding streets that bypass these sprawling settlements, not only consume enormous resources, but also contribute to energy waste and pollution.

Perhaps even more telling in today's context of globalised economic competition is the fact that the lack of attention to the land and housing needs of the poor is ultimately bad for business; in a classic vicious circle, it helps to trigger a series of perverse effects that ultimately affect the very ability of a city to be competitive and thus to pursue economic and social development. For instance, it disorganizes the functioning of land markets, pushes up land prices, and increases the difficulties of providing infrastructure and services (Smolka and Larangeira, 2008). In turn, this affects the ability of the city to attract investments, to create jobs and to generate a better financial base for implementing improvements in the city.

In the context of globalization cum decentralization, cities have to generate a favorable business climate that stimulates private and public sector investment in order to generate jobs and improve the tax base. Good governance, level of corruption, quality of infrastructure, good transport and communications, level of access to services and urban amenities, expenditures on health and education, infant mortality rates, an institutional milieu that reflects respect for individual rights, the absence of violence, the effort to meet international standards for waste disposal, air quality and green space per capita are all valuable assets in attracting investments (Campbell 2003; World Bank, 2006). Lack of attention to the housing needs of the poor tends to have negative effects on each of these factors.

In short, attending to the land and housing needs of the urban poor not only has a direct impact on the reduction of poverty but also affects the city's viability and sustainability. Having secure access to a home that can gradually be improved over time is the starting point for poor urban people to gain access to what a city has to offer. Moreover, ensuring that poor people have the possibility of attaining decent living conditions can also be critical in improving the quality of life of the entire city. This affects both the city's environmental conditions and its economic dynamism. Reducing urban poverty and environmental degradation makes the city more habitable for the entire population. In this light, attending to the housing needs of the poor

helps to promote the conditions for urban environmental well-being – an effective win/win situation.

Overall, the prospects for cities and for their inhabitants in developing areas would be greatly improved if national and local governments took proactive steps to deal with the land and housing needs of the growing contingents of the urban poor. Admittedly, adopting such initiatives is never easy: it goes against the grain of both the increasingly prevalent anti-urban policies,[3] as well as the vested interests of strong local power structures that often congregate politicians, administrators, real estate agents and other speculators who benefit from informal urban land markets. Whatever the nature of these difficulties, sustainability will require that, at a minimum, the land and housing needs of the poor be given priority attention in rapidly growing urban areas.

## C. THE EXPANSION OF URBAND SPACE – JUST HOW BIG AND HOW BAD IS IT?

One of the most common environmental criticisms directed at cities is that they occupy and destroy an enormous area of precious land. Such broad condemnations evidently merit qualification. To this end, we will examine here several aspects of the size, location, density, environmental characteristics and social organization of the total land area under urban use, with emphasis on their significance for future urban growth.

### *1. The size of the urban blot*

Recent years have given us much improved estimates on the dimensions of the Earth's land area that is covered by urban localities. These new sets of global databases on urban population and extent combine census data, satellite imagery and different methods of analysis in an integrated geospatial framework. Two of the best known recent studies based on such technologies can, for purposes of this paper, be taken as the upper and lower limits of the current size of the area currently occupied by urban localities.

The Global Rural Urban Mapping Project (GRUMP) is a widely-acclaimed multi-institutional and multi-year effort to construct an improved population and consistent database of urban areas (CIESIN, 2007). Its best estimate is that urban localities occupied, in the year 2000, a land area of 3,673,155 km². This would correspond to about 2.8 per cent of the Earth's total land area, equivalent to less than half of Australia's total land area. These figures, used as basis for the Millennium Assessment, have been debated at length by specialists, and it is fair to state that they constitute the upper limit of current estimates.

On the other hand, the low estimate can be taken from a recent study commissioned by The World Bank (Angel et al., 2005). This focused only on cities having more than 100,000 persons and, within them, *only on their built-up areas* (excluding green areas and other interstitial spaces). Using a sample of 120 cities worldwide, Angel et al. estimated that cities of 100,000 or more inhabitants contained 2.3 billion of the estimated 2.84 billion urban inhabitants in the year 2000. These urban inhabitants used up a total built-up space of 400,000 km² worldwide, equivalent to 0.3 per cent of the Earth's land area.

Assuming that the total urban population (540 million) living in urban localities having less than 100,000 inhabitants had an average density of 6000 persons per square kilometer,[4] they would occupy another 90,000 km². Under such assumptions, the total land area in urban localities would amount to 490,000 km² (400,000 + 90,000), or an area slightly smaller than Spain and less than half of one per cent of the Earth's total land area.

In short, in 2000, approximately half of the Earth's population occupied an area equivalent to between 0.4 and 2.8 per cent of the Earth's surface, depending on how it is measured. For present purposes, the exact figure is not an issue here since any number within this range does not, in itself, represent a critical threat to the Earth's sustainability. That is, the magnitude of the land area currently occupied for urban purposes, *per se*, does not seem to be a problem at the global level. Moreover, these numbers have to be put into perspective. For instance, the annual acreage given over to urban use is much smaller than the natural lands that are lost every year to agricultural activities, forestry and grazing. It is also much smaller than the amount of prime farmland that is lost annually to erosion or salinization: the issue may thus be more the *type* of land that is being lost than the absolute scale of the loss (World Resources Institute 1997:32).

Although human settlements have so far taken up a relatively small fraction of the Earth's surface area, their specific spatial location can still exert significant environmental and socio-economic consequences. Another source of concern relates to how this occupation of the Earth's land surface by towns and cities will evolve with urban population doubling. Depending on their future spatial growth patterns, urban localities could expand drastically in coming years, both in dimension and in their occupation of inappropriate areas in coming years. Such observations put our spotlight on two related issues: the decreasing density of cities and the significance of urban growth in different types of ecosystems.

### *2. Decreasing densities and expanding perimeters*

The aforementioned World Bank study (Angel et al., 2005) provides concrete evidence that urban land areas are growing faster than ever, not only because of their increase in absolute numbers of people, but also because their average density (that is, the number of inhabitants per square kilometer) is being progressively reduced. This study, based on the actual built-up areas of towns and cities, rather than on administratively-defined areas, observes that urban density has been declining for the past 200 years, but finds that the reduction has been particularly rapid in recent years (Angel, 2006). This tendency towards declining density, combined with unprecedented absolute increases in the urban population, could greatly expand the land area of cities in the future.

As indicated earlier, according to this study, the total built-up area of cities having at least 100,000 people presently occupies a total of about 400,000 km² – half of this in the developing world (Angel et al., 2005:1-2). Cities in developing countries have many more people, but they occupy less space per inhabitant. In both developing and industrialized countries, average densities of cities have been declining quickly: at an annual rate of 1.7 per cent over the last decade in developing countries, and of 2.2 per cent in industrialized countries (Angel et al., 2005:1-2).

Should the recent rate of decreasing density persist, the land occupied by cities having 100,000 people or more will increase by a factor of 2.75 between 2000 and 2030. If current patterns continue, every new resident in developing countries will convert, on average, some 160 square meters of non-urban to urban land. The combination of absolute increases in urban population with this rate of density reduction is expected to *triple* the built-up land area of cities of 100,000 or more inhabitants in developing countries to 600,000 km² during the first three decades of this century (Angel et al., 2005:1-2). It should be noted that these figures reflect overall averages: both decreasing density and size of urban areas will obviously change more rapidly in those countries and cities that are undergoing more intense growth. For instance, the metropolitan area of Shanghai is expected to grow by 150 per cent, from 410km² to 1100km² in less than a decade (Martin, 2005:127).

Cities in developed countries expand at an even faster rate per resident. Thus, despite their smaller population size and lower rates of population growth, cities in the industrialized

world would increase their land area by 2.5 times in the 2000-2030 period, if they followed the recent pace. At that point, they will occupy some 500,000 km² and every new urbanite will convert, on average, some 500 square meters of non-urban to urban land (Angel et al., 2005:1-2).[5]

Overall, should recent trends be perpetuated, the built up land area of cities in the world would grow from 400,000 to 1,100,000 km² in only 30 years' time. But this is likely to be an understatement, for two reasons. First, it can be speculated that recent trends to decreasing density will not only continue but will, in fact, increase with globalization and with its impacts on lifestyles, aspirations and production processes, as well as with the rapid improvement and dissemination of transportation technology, especially automobile transport. Second, all of the above estimates, it will be remembered, relate only to the built-up areas of cities having more than 100,000 inhabitants. These contain, according to Angel et al. (2005) some 80 per cent of the world's urban population. The remaining 20 per cent will be located in smaller urban centers, where rates of growth tend to be higher.

In short, the land areas appropriated by towns and cities can be expected to increase at an ever faster rate. No matter where one stands on the "urban sprawl" versus "compact city" controversy (discussed below), one cannot avoid observing that cities are, in fact, sprawling. However, in developing countries – which again are the main area of interest of this paper – urban sprawl today is much more than just suburban residential development caused by changing values and lifestyles. Peri-urbanization (or the non-contiguous and patchwork form of urban expansion and leapfrog development, related to land speculation, to changing production modalities and to the spread of automobile transportation) may be the dominant form of urban expansion today.

Land speculation raises the price of land to a level that is considered too high for those needing land for actual use. Thus, when many speculators are sitting on land and waiting for higher prices, it obliges those who actually need land for residential or productive activity to skip around them and to obtain land farther and farther away from the city (Tacoli et al., 2008). The prospects of rapid urban growth themselves tend to favor more speculation. This can be adduced as a major cause of urban sprawl and peri-urban growth.

Moreover, the form and site of urban economic activity have been altered by advances in telecommunications, transportation and production technologies. The benefits of agglomeration can be eroded by information technologies and by transportation networks that also foster economies of scale in production and distribution networks and favor large facilities that consume large tracts of land. All of these factors can be expected to help deconcentrate firms away from the central city (Irwin, 2004).

The spread of these advances through globalization have favored de-concentration and decentralization of production at greater distances from the center of cities throughout the world. The end result is that, the world over, the urban blot is growing considerably faster than the number of people. Where and how this new land is incorporated into the urban makeup could have a huge impact on the social and environmental well-being of future populations, as discussed in the next section. Unfortunately, very little attention has been paid to this problem in developing countries where most future growth will occur (Angel et al., 2005).

*3. Location of urban areas by ecosystem*

The basic environmental concern with the conversion of rural land to urban use is that urban growth often involves the appropriation of some of the best agricultural land in the country, and/or that it invades ecologically-fragile areas. This contention would seem validated, at least in preliminary form, by recent research that classifies urban localities according to the ecosystem in which they are situated.[6] As shown below, both ecologically-fragile coastal areas and regions under cultivation are likely to have a higher proportion of urban settlements than other systems.

Throughout history, people have favored city-building in coastal areas to take advantage of a ready food supply, easy access to transportation, and better defense opportunities. Consequently, as shown in Table 1, based on work done for the Millennium Assessment (cf. McGranahan et al., 2005), coastal ecosystems contain a much larger proportion of all urban dwellers (14.4 per cent) and large city population (23.9 per cent) than of the world's total land area (3.2 per cent). In all continents except North America, coastal zones have the highest share of urban population of any system. The proportion of coastal land area that is occupied globally by urban localities (10.2 per cent) is almost four times larger than in the average for all ecosystems. Moreover, the coastal system has a greater proportion of its land area occupied by urban localities, a greater proportion of its inhabitants living in urban areas and a much greater urban population density than any other type of ecosystem.

What implications do such findings have for sustainability? In general, the Millennium Assessment declined to explore the differential impacts of cities across the systems they inhabit, arguing that such consequences depend considerably on local conditions (McGranahan et al., 2005:802). Yet, as has been well documented, coastal areas are critical for long-term sustainability. The occupation and development of these areas can cause severe environmental damage, which in turn ends up affecting the quality of life of urban inhabitants. Urban settlements in coastal areas cause the destruction of natural habitats and consequent biodiversity loss, while also altering local and regional hydrology. Invasion of mangroves, coral reefs, seagrass beds and sand dunes destabilizes the coastline, leading to erosion or siltation, damaging infrastructure and increasing the vulnerability of local and regional populations to natural disasters while reducing resiliency to climate change and rising sea levels. Fish stocks can also be lost when important breeding and nursery areas are disturbed.

Cultivated agricultural systems also have higher than average segments of their land areas taken over by urban localities. Since many towns and cities were originally located at the heart of some of the more productive land areas in their respective countries, the outward spread of their urban boundaries inevitably tends to destroy prime farmland. At the global level, ecosystems classified as "cultivated" in the Millennium Assessment also have almost twice the proportion of all urban dwellers as of land area (37.2 per cent and 19.3 per cent, respectively) along with 34.2 per cent of all of the planet's large city population. The proportion of its land area given over to urban sites is 2.4 times that of the average for all ecosystems.

Inland water zones have a somewhat higher proportion of their population in large urban centers while other ecosystems – such as mountain, dryland and forest ecosystems – tend to have a much smaller proportion of their land area in cities and to harbor smaller cities.

Even more pertinent for long-term sustainability is how different types of systems are likely to be affected by *future* urban growth. Since Africa and Asia are expected to account for some 80 per cent of additional growth in the 2000-2030 period, more attention needs to be focused on trends in those regions. As shown in Table 2, these two regions, despite having the lowest proportions of their total populations living in urban areas (38.3 per cent for Africa and

39.8 per cent for Asia, in 2005, according to United Nations, 2006), already have the highest urban density in *all* system types.

Taken by itself, this information on high urban density would bode well for sustainability, since it is an indication that sprawl is much less prevalent in those two regions: in general terms, higher density helps to minimize humankind's invasion of surrounding rural land. On the other hand, it may be of some concern that these two continents have, by far, the highest proportion of their urban populations living in coastal areas: 72 per cent for Africa and 56 per cent for Asia (McGranahan et al., 2005:801). The urban density of Africa and Asia in coastal systems is three to four times higher than in industrialized regions. Inland water systems also have particularly high urban densities in Africa and Asia.

Table 3 provides additional information on the distribution of urban population by ecosystem in Asia and Africa. Essentially, it reiterates the significance of coastal towns and cities in those two regions. Coastal systems in both Africa and Asia have a considerably larger proportion of their total area in urban land, and tend to have larger cities than other systems, in addition to having greater total and urban density. Cultivated and inland water systems are also prominent on these various indicators in both regions. The significance of these findings is less clear since, as pointed out by the Millennium Assessment, urban distribution also reflects a region's basic geography and other characteristics; thus, dryland or cultivated systems only have 20 per cent of their population in urban areas, but contain more than half of Africa's urban population for the simple reason that such systems predominate in the region (McGranahan et al., 2005:802).

Without minimizing the importance of past and current trends, the more important question is – what will happen to the different ecosystems with the rapid doubling of the urban populations in these two regions? What can we predict from past and current patterns for future distribution? This is still a matter for speculation. On the one hand, although past patterns do not necessarily indicate that future growth will be concentrated in the same systems as in the past, historical linkages tend to be significant. Accumulated advantages of cities, ranging from urban amenities to agglomeration economies, are generally appreciated by investors in a market economy. Moreover, the advantages of large urban areas over smaller towns and cities in total factor productivity have been well demonstrated in the literature (World Bank, 2000:37). Potential migrants are also attracted to existing larger centres since these tend to be more dynamic in creating jobs.

Conversely, it can be contended that globalization is already shifting trade and production away from many traditional centres, favoring localities that can demonstrate market advantage. Although decentralisation has advanced at variable speeds in different parts of the world, cities are now linked more directly to international markets. This has reduced the traditional market advantages of some cities and promoted others. Such changes may, in turn, induce large shifts in population distribution, including away from traditional centers (World Bank, 2000:1-2 and 34-35).

In brief, it may be difficult to predict whether inertia, or the new forces of gravitation caused by the combination of decentralisation and globalisation, will have greater influence on the probable evolution of urban growth patterns in those countries that have yet to undergo a significant urban transition. In itself, this apparent ambiguity might seem to allow some leeway for influencing these processes into more sustainable directions.

### *4. The structure and form of urban expansion: will it matter?*[7]

What implications will current trends in the form of urban expansion have for sustainability in developing countries? Given that the world's urban population is expected to double within a relatively short time, and that most of this growth will be concentrated in Africa and Asia, where environmental concerns have generally not taken precedence, it would seem advisable to try to orient this spatial growth in ways that not only avoid the invasion and destruction of prized ecological assets but that also reduce other environmental costs.

How could this be done and in what ways? If one were to suggest models of sustainability to orient the doubling of these regions' urban population, where would one look? To this day, the most voluble discussions concerning patterns and forms of city growth, and their relation to sustainability, undoubtedly come from the debate between critics of urban sprawl and their opponents, the critics of the compact city. This debate is a veritable minefield, booby-trapped with definitional problems, measurement issues, value judgments, ideological perceptions and culture-bound assumptions. Nevertheless, it cannot be ignored simply in any discussion of urban sustainability, particularly when one considers the potential impacts of different patterns of urban expansion in those regions where most urban growth is still to come.

The prototypical urban sprawl that has become the object of many environmentalists' denunciations began with a model of suburban growth spawned in the United States of America in the late 19$^{th}$ and early 20$^{th}$ century. In its initial stages, suburbanization represented a significant improvement for many central city dwellers, who moved from congested, polluted and unhealthy habitats to pleasant, country-style, clean-air environments. This model expanded rapidly and blossomed into a critical part of the ethos associated with "The American Dream" (Hogan and Ojima, 2008). After World War II, several factors helped propel the rapid proliferation of this model across American cities, including: the post-war economic boom; the ease of access to automobile ownership and to inexpensive fuels; the availability of cheap open land on urban peripheries; and, the aesthetic and cultural attraction of single-family dwellings.

Decentralisation, however, was not without its problems: some of these had already been identified in the 1930s. By the 1960s, however, "urban sprawl" became the pejorative term used by many to characterize the negative environmental, social and economic implications of suburbanization. However, by that time, suburban growth had been bolstered both by policies that encouraged urban dispersal and by the expansion of decentralised commercial and service systems catering to suburbanites. Environmental awareness, and the Bruntland Report's emphasis on sustainability, greatly expanded the disparagement of "urban sprawl" in the 1980s, helping give greater credit to the notion that alternative models could be the ideal road to urban sustainability (Arbury, n.d.).

Growing concern with low-density automobile-dependent urban sprawl, and with the environmental problems it generated, thus spawned a renewed interest in the compact city model. This focused basically on intensifying the use of urban space and on increasing the role of public transportation. Compact cities would be more sustainable because they would minimize commuting, reduce energy use, air pollution, water consumption, loss of green space and vegetation, while also avoiding the squandering of biomass on paved streets, driveways and parking lots.

Quality urban design was seen as the key to sustainability. The compact city approach combined environmental objectives with concerns about the future quality of life in urban areas and with equity. In its application, the concept of the compact city borrowed from stylized images of the physical, economic, and social conditions in "traditional" patterns of human settlement prior to the industrial age: the archetype from which they all stem is the ancient

village – physically compact, economically localized, and socially self-contained (Brindley, 2003).

More recent offshoots of the compact city approach and its emphasis on urban design as the key to sustainability have materialized through the models of "New Urbanism" (USA), "Smart Growth" (USA), "Urban Renaissance" (UK) and "*Machizukuri* " (Japan), and through various "healthy community" movements. Although each has specific ideas about how cities ought to develop, all these schools have their roots in the same normative ideals that were founded on the notion that urban sprawl damages the environment, sacrifices natural areas and farmland for development, wastes energy and other resources, creates traffic congestion, and in other ways lowers the quality of life (Holcombe, 2004).

The general formula to counteract sprawl in these models includes at least some of the following: compact form, high density, mixed use, intensification of public transportation, greater pedestrian and bicycle transit, utilization of interstitial spaces, protection of natural ecosystems, revitalization of downtown areas, reduction of the amount of land affected by roads and parking lots, increased social and economic interactions and more efficient utility and infrastructure provision. During the early 1990s, various compact city policies were enthusiastically implemented throughout Europe, particularly in the United Kingdom (Arbury, n.d.).

The actual implementation of the compact city approach has been quite heterogeneous and, in the process, the model has acquired operational fuzziness. In retrospect, it has become clearer that the potential of the compact city to meet its objectives is dependent not only on the form it actually takes as a result of drawing-board designing efforts, but also on political structures, societal values, and the general preparedness of the society. There seems to be some consensus that the cities which best support the promotion of equity are those with a large proportion of high-density housing and a large quantity of locally-provided services and facilities. In the end, however, the way compactness benefits individual aspects of social equity varies, depending very much on prevailing societal values (Burton, 2003).

Overall, critics of the compact city model question whether intensification can deliver on its promises of a more sustainable urban future and whether it is acceptable to the general public (Arbury, n.d.). Some of the key points made by critics of the compact city include the following:

- All told, the results of compact city innovations have not lived up to expectations. Their claimed benefits are more ideal than real;

- Neither sustainability nor equity can be achieved through formal designs, especially those coming from the master plans of drawing board planners;

- Compact-city strategies have lost touch with a spatial reality: polycentric urban regions and not compact cities have actually become the dominant form of urbanization in Northwest Europe;

- Compact city policies are anti-democratic, certainly anti-urban, infringe on personal freedom, frustrate consumer choice, and promote homogeneity;

- Compact cities drive up the price of land and housing due to higher design, construction and common-area infrastructure costs;
- The desire to maximize density can lead to layouts that lack privacy and that present an unusual appearance that is disliked by residents;

- The models go against the grain of market forces;
- Compactness has a limited and tenuous relationship with social equity; and
- Compact cities fail to deliver what people really want: a single family dwelling on a large lot, with good automobile access to facilities.

As is evident from the foregoing brief and admittedly selective summary, the sprawl versus compact debate is politically loaded and unlikely to be resolved via academic debate, particularly so since basic methodological problems still haunt the field. What constitutes "urban sprawl" is the object of infinite discussion; not only are ideological issues rampant but the very notion of what constitutes an "urban" area, or how "sprawl" is to be measured, are still being debated. The definition of a "compact city," though somewhat less diversified, is also subject to different interpretations.

Nevertheless, criticism of the compact city approach, though at times culture-bound and variably ideological is, at least in part, based on correct assessments of the assumptions and shortcomings of this model. At the same time, most critics of the compact city models evidently stop short of defending sprawl *per* se. The declining density of cities – associated with sprawl, as well as increased commuting and, thus, greater energy use and air pollution, loss of green space, increased water consumption and squandering of biomass – is markedly difficult to defend.

More importantly, in reviewing this debate, it would seem that the critics of the compact city approach offer little by way of alternatives – particularly not for rapidly urbanizing developing countries. Neuman (2005), one of the most thorough and articulate critics of the various compact city models, supports the proposals made by Leatherbarrow and Durack for "open, indeterminate planning." This supposedly confers four advantages: "First, it supports cultural diversity. Second, it tolerates and values topographic, social, and economic discontinuities. Third, this type of planning invites ongoing citizen participation. Finally, it responds to the state of continuous adaptation, common to all living organisms and systems, including human settlements" (Durack 2001, 67-68, quoted in Neuman, 2005: 14).

The "advantages" cited in this proposal (cultural diversity, valuation of discontinuities, citizen participation and adaptation) are undisputedly desirable components of any urban planning system. The puzzling query, however, is – why would a rather vague "open and indeterminate" planning system be expected to produce such positive results and what environmental criteria and procedures therein will guide city growth?

Overall, the key issue may not be so much the choice between sprawl and compact as the sustainability of a given urban configuration. For instance, Neuman (2005:16) reviews the case for identifying compact cities with sustainability and concludes – correctly it would appear – that "... conceiving the city in terms of form is neither necessary nor sufficient to achieve the goals ascribed to the compact city." Less convincingly, Neuman (following Kostoff), ultimately places all his chips on the primacy of "process" over form. According to this, sustainability is a process of people adapting to and changing a city over time (Neuman, 2005). It is not entirely clear whether process is understood therein as a dialogue among social groups, or as simply letting "market forces" take their course, as recommended by Holcombe (2004).

A longer-term evolutionary (laissez-faire) approach is obviously a perfect foil to the "master designer" conception attributed to compact city developments. Moreover, it may be more justifiable to let natural processes evolve in older and slow-growing cities of the developed world, wherein citizens have a historical sense of the needs, problems and advantages derived from their city's structure, form and operation. Even there, however, if one takes a longer-term evolutionary perspective, the compact city models, despite some undeniable errors

in their assumptions, could conceivably be viewed as part of the process that will eventually help promote sustainability by emphasizing the disadvantages of sprawl!

Be that as it may, the discussion has to take a different turn when discussing upcoming urban growth in developing countries. Despite its domination of the literature, most of the sprawl versus compact city debate is highly ethnocentric in its focus: it centers almost exclusively on the urban issues of industrialized countries. There, lifestyles and consumption patterns are marked by easy access to automobiles and even by subsidized fossil fuel prices. Obviously, this discussion loses a lot of its meaning in contexts where a large part of urban growth is made up of poor people who do not have even the remotest chance of access to automobile transportation.

Yet, even in the framework of developed countries, the outcomes of evolutionary processes are not necessarily "good," or permanently "good." For instance, sprawl itself is evidently the result of process. In turn, this sprawl may eventually be reduced through "natural" processes, such as increased gasoline prices or physical limitations on expansion. For instance, it is highly revealing that even Los Angeles, the acknowledged "mother of all sprawl cities," may soon become notorious as the birthplace of the post-suburban city (Cuff, 2007:86). Faced with prospects of expanding population growth and limitations on land, water and commuting viability, "sprawl has hit the wall" in Los Angeles: outward growth has slowed and interior gaps in the city fabric are being plugged as neighborhoods fill in and grow denser (Cuff, 2007:86-7).

Leaving the destiny of rapidly growing cities of poor countries to evolutionary processes does not appear to be a promising path, especially in view of the fact that the lifestyles and preferences of the ruling elites are likely to follow the consumer patterns of industrialized societies. Rapidly growing and poor developing country cities may not have the luxury of sitting around and waiting for such things as sprawl to sort themselves out and to eventually become sustainable. Too much social and environmental damage is likely to take place before that happens. On the other hand, it is true that few technocratic master plans have had much success in effectively harnessing rapid growth in developing country cities. What is the answer?

The solution would appear to lie on two levels. Firstly, planning is increasingly essential, but a different sort is needed: planning that is non-technocratic and reflects basic values that are consensually defined by all participants and not just the viewpoints of architect-planners and engineers (or other less-influential categories such as demographers). It must be founded on special and genuine efforts to incorporate the perspectives and aspirations of the poor majority. Whatever the results of this participatory approach, it must be more open-ended, continually revised on the basis of consensual values so as to reflect changing realities and the challenges of growth. New approaches to "strategic planning," that incorporate uncertainty and provide for regular and systematic revision, aim to foster a planning process which is participatory, seeks to proceed on the basis of goals and values, but whose concrete interventions are regularly updated.

Secondly, such plans must reflect an environmental, rather than a formal approach to city growth. The outlines of this orientation are suggested by McGranahan – "… Sprawl is almost always a symptom of environmentally negligent development, but the solution is not necessarily to strive for compact settlement. Rather, the response should be to take environmental concerns seriously in planning, taxing, etc. This may well yield more compact settlement, but might also yield other more environmentally sustainable forms. For example, higher gasoline taxes, more investment in public transportation and road pricing could be justified not as a means of achieving compact settlement, but as a way of limiting environmentally damaging transportation. The effects may be compact settlement, but if the result is some multi-nucleated low-transport settlement that doesn't fit the definition of compact, is that necessarily a problem? Similarly, is it not possible that ecologically-informed

development restrictions can create more green spaces and more ecological service production within urban settlements, and contribute to sustainability, but also make the settlement less compact?"[8]

So far, the noise level of the debate between sprawl and compact has mostly precluded the type of discussion suggested by McGranahan. Moreover, it has largely drowned out some really basic issues that do urgently need to be taken into consideration when the prospect of urban doubling in Africa and Asia is under the microscope.

Although it is generally recognized that the American form of suburban development is spreading to many cities throughout the world (Hogan and Ojima, 2008), it is only part of a much larger set of problems plaguing the growing cities of the developing world. Decreasing urban densities today are not primarily the product of residential preferences but, especially in developing countries, they are increasingly linked to a combination of factors that include the mobility of globalized economic activity, heightened speculation in land, lack of administrative controls and an overriding under-valuation of environmental assets.

Suburbanization in the classical North American mode affects only a small segment of the developing world's population. Developing country cities are constituted, by and large, of poor people whose primary aspirations revolve around minimal housing and access to jobs and incomes that will permit them to survive and slowly improve their housing and living standards. The house and car on a big lot that constitute "what people really want," according to some critics of the compact city, can only be attained by a small minority and represents a mere fantasy for the great majority of the urban population in developing countries. Yet, the tragedy is that the aspirations of the minority tend to dominate city planning and the allocation of resources within the burgeoning cities of developing countries.

The escalating prevalence of automobile use is one clear instance of the inappropriate, inequitable and unsustainable patterns that are dominating urban growth. It is an issue that has already received considerable interest in the literature, but it still deserves greater attention in the context of urban doubling in Asia and Africa. Most of the sprawl versus compact city debate ultimately appears to have limited relevance to these two regions. The possibility that densely populated countries will find room and resources to build freeways *a la* Los Angeles seems remote. Nevertheless, the issue of transportation and the use of the automobile are critical in developing countries, as discussed in the next section.

### *5. Car transportation, sprawl and equity*

From a reading of the above sections, it would seem fairly evident that issues of transportation are at the root of many discussions of urban sprawl and urban density. Automobile use is both a cause and a consequence of sprawl in many countries and innate values pertaining to the realm of "the right to an individual car" seem to be at the core of many anti-compact arguments. Perhaps less evident, but even more important, is the role of transportation in equity, particularly in developing countries.

The role of automobile transportation in urban sprawl has been well documented in the case of North American, Australian and New Zealand cities (Arbury, n.d.). But there is considerable diversity in its impact elsewhere. For instance, in Western Europe and Japan, where urban growth is minimal, suburbanization and auto-centered transport systems have been associated with higher population densities and multi-modal transportation systems (Martin, 2005: 125). However, the role of the automobile in developing countries tends to be much more damaging, both because of its social impacts and because of its detrimental effects on the development of public transport systems.

For developing countries faced with rapid expansion of their urban population, it would seem that the pattern of automobile-based dispersion is extremely inefficient. Yet, though automobile transportation is accessible to only a small portion of the population, it appears to be prioritized in the transportation plans, processes and road-building activities of a wide variety of places, such as Bangkok, Shanghai, Panama City and Santiago.

Cars are among the most desirable objects of consumption available on the global market and a symbol of success for the upwardly mobile. Their number has increased from 200 million worldwide in 1970 to 850 million in 2006 (Newman and Kenworthy, 2007:67). Meanwhile, car production and consumption has spread quickly throughout the world, with China showing the fastest increases. The automobile industry is heavily marketed and lobbied and has enormous clout everywhere, due to its widespread forward and backward linkages on economic activity and employment.

The power elites and the better-off categories of consumers in all developing countries tend to prefer and demand access to automobile transport, leading to a prioritisation of private automobile feasibility in government policies. Such priorities generally lead to car-centered transport systems, to the detriment of other forms of transit and public transportation systems.

The multiplication of private car use leads to congestion and reduced efficacy. The usual response to traffic congestion, road accidents, pollution and energy costs is to build more road capacity for automobiles, at enormous cost and with further perverse effects on public transportation and other forms of transit. Such approaches, borrowed from the lexicon of urban planning in developed countries and from the priorities of transportation engineers, are doomed to exacerbate environmental degradation and social inequity, while also impairing economic growth in poorer countries.

From an economic standpoint, since the priority accorded to car transportation directly affects the efficacy of public transport systems, it increases the number of hours spent by workers in their journey to work, thus affecting their quality of life and their productivity. The sheer cost of building roads and highways, as well as of providing the physical space that automobiles require for roads and parking, is considered to be its biggest economic impact (Newman and Kenworthy, 2007: 83).

The majority of the population in developing countries evidently does not have the economic resources to access this form of transportation, leading to social fragmentation and increased inequity. The environmental impacts of increased car use and motorized urban sprawl are also significant, ranging from bad air quality, energy costs, extravagant land use and invasion of farmlands and ecological reserves (Martin, 2005:122; Newman and Kenworthy, 2007:67). “The car is a greedy user of land because its use tends to be individualized and privatized, and because its operation requires multiple, dedicated sites… Cars demand more land area than other transport modes by large multiples” (Martin, 2005:124).

In order to give sustainability a chance in the upcoming doubling of the urban population in Africa and Asia, priorities in the structure of urban transportation will obviously have to be redefined within a more organic vision that incorporates social, spatial, environmental and economic issues. Greening and democratizing transportation in rapidly growing cities is not just political correctness, it is at the core of societal subsistence. Both local and regional governments need to come up with visionary plans based on ample consultations and solid information. Political leaders need the foresight and charisma to overcome eventual obstacles and to sell greener and more equitable approaches to different audiences.

In this light, the recent experience of Bogota is enlightening. Facing gigantic traffic problems, as well as increasing social disturbances, two successive mayors undertook unconventional approaches that not only greatly improved the traffic problem but also uplifted the face of the city. The technical solution initially proposed to fix Bogota's monumental traffic woes were the usual: build billions of dollars' worth of freeways and overpasses. Instead, Bogota's mayors chose to focus on rapid bus transport (following the Curitiba model) and to free up many of the streets and sidewalks (routinely used as parking spots) for bicycle traffic and pedestrians. Meanwhile, investments in parks and other public places, coupled with better and cheaper transport, also gave the majority of the city's population access to a much improved range of leisure activities. Evidently, this inversion of social and transport priorities initially met with considerable opposition, but the end result was a notable improvement in the quality of life for all (UNFPA, 2007:75).

## D. POLICY IMPLICATIONS: "PROCESS" OR INTERVENTION? THE NEED TO PLAN AHEAD

There is little indication that ongoing urban growth in developing countries is fulfilling its social and environmental potential. Given the upcoming doubling of urban population in Africa and Asia, such failures represent a major opportunity lost. In principle, there is no question but that urbanization is critical for overall poverty alleviation (UNFPA, 2007, chapter 3). Urban proximity and concentration not only favor economic dynamism but also the provision of infrastructure and services at a much lower per capita cost to urban inhabitants. Nevertheless, urban poverty is growing faster than rural poverty; a significant part of that poverty would be preventable if proactive and effective policies were adopted in attending to the land and housing needs of the poor.

Similarly, urban concentration can constitute an important ally for sustainability. With a world population of 6.7 billion, growing at close to 80 million a year, demographic concentration in densely-populated urban areas actually favors the protection of rural ecosystems. Moreover, cities are the major source of critical technological innovations that can benefit the environment. Nevertheless, present patterns marked by the disordered spatial expansion of cities – an expansion that uses up more land than necessary, that encroaches upon valuable agricultural or ecological riches, that generates biologically sterile expanses of built-up land and that squanders biomass – also fail to maximize the potential benefits of concentration. The amount of land area that is increasingly being appropriated for urban land use is not negligible, nor is the environmental loss it causes (UNFPA, 2007, chapter 4).

Taking full advantage of the potential benefits of urbanization would require a range of initiatives from the political, social and economic domain that far surpass the scope of this paper. The point being made here is simply that the social and sustainable use of urban space would, in and of itself, make a significant difference in the welfare of people and in environmental outcomes. Moving in that direction will require foresight to orient the use of urban land within an explicit concern for both social and environmental values. This would seem applicable to both the intra-urban use of land as well as to the broader expansion of urban land uses across different ecosystems.

In this connection, it is undoubtedly interesting to observe that the World Bank – one of the key institutions in the propagation of the current liberal ethos and its tenet of non-interventionism – has undertaken a broad-based approach to improving urban management with such initiatives as the "Cities in Transition" and the "Cities Alliance" programs. In this sense, it is noteworthy that a key element of the Cities Alliance strategy is that "cities need to plan ahead in order to make more informed choices about the future and they need to act now" (Cities Alliance, 2007). Similarly, the Cities in Transition strategy paper notes that - "Urbanization, when well-managed, facilitates sustained economic growth and thereby promotes social welfare gains… But policy weaknesses can disrupt the benefits from urbanization. Policies affecting

urban land use and housing investment have major ramifications for households, businesses and the nation…" (World Bank, 2000:2).

More recently, the Bank also sponsored an influential study that made a stalwart case for planning ahead in the area of urban growth. Therein, it is asserted that: "the key issue facing public sector decision-makers – at the local, national and international levels – is not whether or not urban expansion will take place, but rather what is likely to be the scale of urban expansion and what needs to be done now to adequately prepare for it…the message is quite clear – developing country cities should be making serious plans for urban expansion, including planning for where this expansion would be most easily accommodated, how infrastructure to accommodate and serve the projected expansion is to be provided and paid for, and how this can be done with minimum environmental impact" (Angel et al., 2005:91 and 95). The lead author of that study has subsequently gone on to provide detailed suggestions on how city administrations could plan ahead effectively for the land needs of the poor (Angel, 2008).

Until the present, planning ahead for rapid urban growth has clearly not been the norm. On the contrary, as noted earlier, policymakers in developing countries seem to be increasingly determined not to let the inevitable process of urbanization run its course. Given the enormity of the expected expansion in their urban population, as well as the potential economic, social and environmental implications of this growth, such negativism and the consequent absence of a coordinated proactive approach towards future growth is rather astounding. Angel et al. (2005:101) cite a number of cogent reasons why this is occurring: the short planning horizons of politicians; the unwillingness of most national and local governments to accept urbanization as a positive trend and, thus, to prepare for orderly urban expansion; the preference for ambitious and utopian master-plans that have little prospect for being enacted or enforced; and the fact that international organisations have refrained from engaging in policy dialogue aimed at the design and implementation of effective investment programs.

Beyond these several valid explanations, there is also an ethos defined by the present development context, wherein governments are enjoined to let the markets proceed, and to stay out of the way of economic forces as much as possible. In developing country cities, which have often witnessed several layers of "Master Plans" that became outdated before they were ever implemented, the idea that evolutionary processes (i.e., laissez-faire), rather than drawing-board plans, should orient the organisation of urban space may seem even more attractive.

In such a context, technical people have, in recent times, been admittedly hesitant about proposing long-term orientations for the sustainable use of space. It is pertinent, for instance, that the Millennium Assessment shied away from advocating any particular direction for future urban growth on the grounds that, in a liberal market economy, investors rather than planners make the decisions as to where growth will occur (McGranahan et al., 2005: 802).[9]

The extent to which the location and form of urban expansion are amenable to public sector intervention is an issue that would merit considerably more discussion, especially in the context of Africa and Asia. There is a real question as to what margin of maneuver national and local policymakers there will have with respect to the sustainable use of space in future urban growth. This margin is established in large part by the nature of political processes, by the relative significance of different political issues in country contexts, and by the extent to which where social advances, rather than personal gain, are a pre-eminent objective of politicians and administrators.

There is also a real question as to the capacity of local governments to diagnose the nature of the problems associated with rapid urban growth and, more importantly, with the nature of the solutions that must be adopted. With few exceptions, local governments are the most unprepared level of decision; they often have a poor understanding of the challenges and a mediocre capacity to propose and implement effective solutions. Moreover, intentions of personal gain often predominate over public goals, especially in the area of land use where corruption seems particularly enticing and resilient to accountability efforts.

This situation is made more complex by overall development goals. Currently, there is little doubt that the effort to reach and maintain high rates of economic growth holds priority on the agenda of most developing countries, with social and environmental issues being relegated to a vague set of postponed desiderata. This seems to give investors, public or private, a bigger voice in decisions as to where and how production will expand, thus essentially determining future patterns of population distribution. Since, in a globalised market, economic opportunities can often be volatile, the possibilities for impressing specific spatial orientations on population distribution appear tenuous.

Nevertheless, environmental awareness and reactions to unsustainable or polluting kinds of growth are having an influence on the location and characteristics of economic activity, even in the context of traditional centrally-planned economies such as China (Bai, 2008). To the extent that environmental awareness is allied to good governance (which includes not only representation of all relevant groups but also good information and analyses as to what can effectively be done), it would still seem possible to influence the direction and the form of urban growth in positive ways. Thus, advocacy for the effective consideration of social and environmental concerns in urban planning appear to be a valid starting point for action.

Such intervention, however, requires clear ideas on what is desirable with respect to the social and sustainable use of space. Ultimately, letting "process" and "indeterminate planning" resolve the future destiny of cities sounds disturbingly like putting our faith in market forces and their ultimate capacity to somehow make everything right in the end. Surely there have to be some overarching concerns, standards, criteria or desiderata on which people already agree and these should be able to help shape urban growth policies in more sustainable ways.

Despite the current standoff on the sprawl versus compact city debate in developed countries, some alternatives for the use of urban space are more sustainable than others and could be recommended in the orientation of future urban growth in Asia and Africa. Thus, most people would agree that urban sprawl (decreasing density) is *per se*, less sustainable, at least in those regions. At a minimum, there would appear to be agreement that the prototypical American suburb should not be reproduced throughout the world. Applying this model, based on individual housing and automobile transport, to rapidly-expanding cities of developing countries does not seem feasible, practical or desirable, especially when viewed in environmental terms.

On the other hand, most of the desiderata cited earlier as part of the formula of compact cities all seem quite valid for the orientation of upcoming growth within a systematic concern with environmental issues: high density, mixed use, intensification of public transportation, greater pedestrian and bicycle transit, utilisation of interstitial spaces, protection of natural ecosystems, revitalization of downtown areas, reduction of the amount of land affected by roads and parking lots, increased social and economic interactions and more efficient utility and infrastructure provision.

Perhaps the biggest problem with the compact city approach was less its environmental desiderata than its faith that drawing board designs could concentrate all these advantages in "compact cities" rather than in the urban forms that would result from negotiations among different environmentally-conscious sectors of society.

Within the framework of the broader and non-formal environmental approach suggested above by McGranahan, it would seem appropriate to promote the sustainable use of urban space through environmentally-inspired approaches to a variety of interrelated issues. A very partial list, for purposes of illustration might include, *inter alia*:

- ensuring that new developments are properly sited with respect to the conservation of biodiversity, wetlands, watersheds and other resources, as well as other sensitive or valuable lands;

- taking a proactive and effective stance to attend the land and housing needs of the poor, thereby relieving human poverty and misery while also contributing to the sustainability, quality of life and economic attractiveness of the city;

- emphasizing public transport over private automobile use. Changing the transportation paradigm by financing public transportation projects, and eliminating subsidies to automobile traffic would seem to be absolutely essential in practically all urban contexts of developing countries;

- ensuring the existence and effective management of facilities for waste collection treatment and disposal;

- promoting recycling, restriction of carbon emissions and energy use;

- ensuring provision of clean water and sanitation and other key environmental services;

- maximizing access by all to wide urban swaths of public space, and guaranteeing the preservation of diverse and diversified green spaces; and

- allowing natural processes to generate diversity, beauty and health, laying to rest the conception of cities as biologically sterile environments and learning to use the enormous water, energy and nutrient resources that are the by-products of urban drainage, sewage disposal and other functions of city processes.

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## NOTES

[1] For instance, Latin America accomplished an urban epidemiological transition over a much shorter period of time through a combination of macroeconomic improvements and preventive health measures. “The more urbanized the country, the faster mortality rates fell” (Stephens and Stair, 2007:141)

[2] Admittedly, not all slum dwellers are “poor” and not all poor urban residents live in “slums.” Nevertheless, the orders of both categories’ is magnitude is sufficiently compatible for present purposes.

[3] The number of countries reporting that they had policies to curb migration towards urban areas rose steeply from 51 per cent in 1996 to 73 per cent in 2005 (United Nations, 2006b).

[4] The Angel et al. study assumed an average density of 8,000 per km2 in developing countries and 3000 per km2 in industrialized countries.

[5] This may actually be a low estimate of declining densities. In the United States, at least, a study of 282 metropolitan areas found that the growth of land area outpaced population growth two to one (Reported in Hogan and Ojima, 2008).

[6] Since these ecosystem data do not consider lifestyles, consumption patterns or ecological footprints, they evidently provide only broad indications of the nature and extent of “damage” that can be caused by urban expansion. Nevertheless, they provide useful indications as to what types of ecosystems are most affected by urban growth in different regions.

[7] This section is largely based on a literature review prepared by Martine and Odelius in preparation for UNFPA (2007).

[8] Gordon McGranahan, IIED (International Institute for Environment and Development), London. Personal communication, May 12, 2007.

[9] It should be noted that, despite its reticence to interfere with market forces, the Millenium Assessment did recommend that urban growth should be restricted where it threatens ecosystem services such as watersheds or ecologically fragile areas (McGranahan et al., 2005:802).

[10] The data base does not discriminate between urban and rural areas of municipalities. However, since Brazil is now 83% urban, according to official data, the size categories of municipalities are a fairly good proxy of urban size categories.

*Table 1 – Distribution of Urban Population in Selected Ecosystems*

| (1) Type of Ecosystem | (2) % of Urban Dwellers in Ecosystem | (3) % of Total Land Area in Ecosystem | (4) % of Large City Population (Cities of 5+ million people) | (5) Urban land as % of ecosystem's land area | (6) % of ecosystem's population in urban areas | (7)Urban Population Density in Ecosystem |
|---|---|---|---|---|---|---|
| Coastal | 14.4 | 3.2 | 23.9 | 10.2 | 64.9 | 1119 |
| Cultivated | 37.2 | 19.3 | 34.2 | 6.8 | 45.3 | 793 |
| Dryland | 18.7 | 29.2 | 12.7 | 2.1 | 44.9 | 749 |
| Forest | 7.8 | 20.5 | 6.3 | 2.0 | 35.6 | 478 |
| Inland Water | 15.1 | 14.3 | 18.9 | 3.2 | 51.8 | 826 |
| Mountain | 6.8 | 15.6 | 4.0 | 1.7 | 30.3 | 636 |
| Overall | 100% | 100% | 100% | 2.8 | 46.7 | 770 |

Source: Based on McGranahan et al., 2005, Tables 27.4, 27.5 and 27.6.
NB. – The ecosystems are not mutually exclusive. Figures in columns 2, 3 and 4 thus contain duplications of population and land area. Island systems are excluded.

*Table 2 – Urban Population Density in Selected Ecosystems, By Continent*

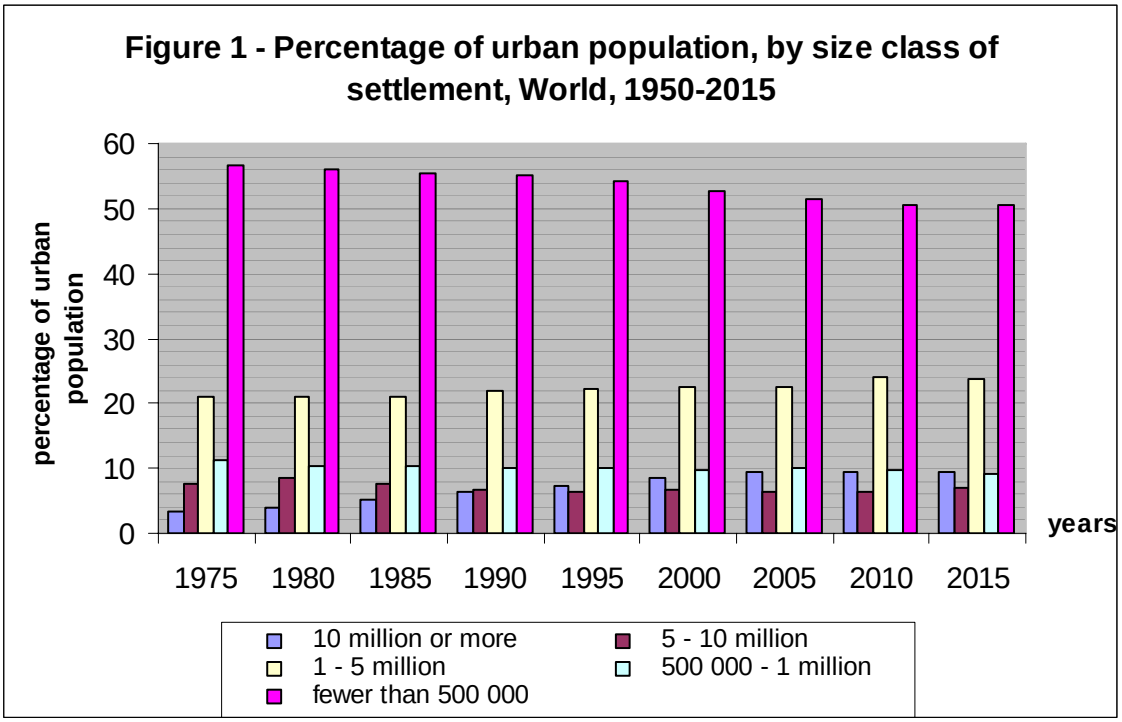
| **Ecosystem** | **Africa** | **Asia** | **Latin America** | **Oceania** | **Europe** | **North America** | **World** |
|---|---|---|---|---|---|---|---|
| Coastal | 2123 | 1934 | 789 | 610 | 640 | 497 | 1119 |
| Cultivated | 1279 | 1352 | 548 | 300 | 630 | 258 | 793 |
| Dryland | 1200 | 1034 | 541 | 159 | 522 | 265 | 749 |
| Forest | 997 | 956 | 685 | 300 | 387 | 206 | 478 |
| Inland Water | 1647 | 1536 | 655 | 451 | 604 | 302 | 826 |
| Mountain | 810 | 879 | 746 | 191 | 387 | 154 | 636 |
| Overall | 1278 | 1272 | 656 | 427 | 588 | 289 | 770 |

Source: Based on McGranahan et al., 2005, Table 27.6.
NB. – The ecosystems are not mutually exclusive. Island systems are excluded

*Table 3 – Distribution of Urban Population in Selected Ecosystems, Africa and Asia, 2000*

| Ecosystem | Urban land as % of ecosystem's land area | | % of ecosystem's population in large urban areas* | | Urban Population Density in Ecosystem | | Average Population Density in Ecosystem | |
|---|---|---|---|---|---|---|---|---|
| | Africa | Asia | Africa | Asia | Africa | Asia | Africa | Asia |
| Coastal | 5.4 | 13.0 | 56.1 | 69.6 | 2123 | 1934 | 160 | 451 |
| Cultivated | 1.8 | 6.9 | 49.8 | 47.5 | 1279 | 1352 | 56 | 255 |
| Dryland | 0.6 | 3.0 | 50.3 | 41.6 | 1200 | 1034 | 18 | 82 |
| Forest | 0.5 | 2.6 | 25.9 | 39.9 | 997 | 956 | 23 | 105 |
| Inland Water | 1.2 | 5.0 | 54.6 | 56.7 | 1647 | 1536 | 37 | 185 |
| Mountain | 1.1 | 1.6 | 19.8 | 34.1 | 810 | 879 | 42 | 60 |
| Overall | 0.8 | 3.5 | 45.9 | 50.6 | 1278 | 1272 | 27 | 120 |

Source: Based on McGranahan et al., 2005, Table 27.6.
NB. – The ecosystems are not mutually exclusive. Island systems are excluded.
* Cities of 1 million or more




Source: United Nations, 2006