Population, Urbanization, Environment, and Security: A Summary of the Issues

by Ellen M. Brennan

Abstract: To understand the critical linkages between urbanization, public health and habitat, the environment, population growth, and international security, this article highlights the trends in urban growth, particularly in the developing world, and their potential to affect the international community. Issues addressed include migration to urban centers, the immediate environmental and health impacts of urban pollution on developing country cities, and the link between crime and security.

Introduction

In the latter half of the twentieth century, megacities have been on the rise and future projections for the twenty-first century show an increase in population growth in developing countries' urban centers, with potential catastrophic effects at the international level. To understand the critical linkages between urbanization, public health and habitat, the environment, population growth, and international security, this article highlights the trends in urban growth, particularly in the developing world, and their potential to affect the international community. Issues addressed include migration to the urban centers, the immediate environmental and health impacts of urban pollution on developing country cities, and the link between crime and security.

According to the United Nations Population Division, the world will pass the historical six billion mark in October 1999. Recently, the United Nations issued long-range projections to 2150. According to the medium-fertility ("most likely") scenario, world population will stabilize at slightly under 11 billion persons around 2200.

One of the most striking features of world population growth is the rising predominance of the developing world. Currently, 81 million persons are added annually to the world's population—95 percent of them in developing countries. According to the United Nations' long-range projections, the population of Africa will nearly quadruple—from 700 million persons in 1995 to 2.8 billion in 2150. Significant growth is also projected for Asia. China is projected to grow from 1.2 to 1.6 billion inhabitants. India, increasing from 900 million to 1.7 billion, will surpass China to become the world's largest country. The rest of Asia is projected to grow from 1.3 to 2.8 billion. Latin America is projected to increase from 477 to 916 million, whereas Northern America (Canada and the United States combined) will increase from 297 to 414 million. Europe is the only major geographical area whose population is projected to decline—from 728 million in 1995 to 595 million in 2150 (United Nations, 1998a).

The second striking feature is related to urban growth. Although the growth of world urban population has been slower than projected twenty years ago, it has nevertheless been unprecedented. In 1950, less than 30 percent of the world's population consisted of urban dwellers. In a few years, roughly around 2006, a crossroads will be reached in human history when half of the world's population will be residing in urban areas. Between 1995 and 2030, the world's urban population is projected to double—from 2.6 to 5.1 billion, by which time three-fifths of the world's population will be living in urban areas (United Nations, 1998b).

As in the case of total population, there will be a significant redistribution of world urban population between the developed and the developing regions. Between 1950 and 1975, 32 million new urban dwellers were added annually worldwide—about two-thirds in the developing countries. Currently, 59 million new urban dwellers are added annually—89 percent in developing countries. By 2025-2030, 76 million will be added annually—98 percent in developing countries.

Looking at the regional breakdown, Africa has the lowest level of urbanization and the fastest urban growth. Currently, a

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agglomeration and ry	Population (thousands) 1975	1995	2(
eveloped regions:			
, China	8545	11299	15
y, India	6856	15138	26
s Aires, Argentina	9144	11802	13
Egypt	6079	9690	14
ta, India	7888	11923	17
India	4426	9948	16
, Bangladesh	1925	8545	19
hou, China	1097	4207	11
abad, India	2086	5477	10
ul, Turkey	3601	7911	12
, Indonesia	4814	8621	13
i, Pakistan	3983	9733	19
Nigeria	3300	10287	24
, Pakistan	2399	5012	10
Manila, Philippines	5000	9286	14
o City, Mexico	11236	16562	19
Janeiro, Brazil	7854	10181	11
olo, Brazil	10047	16533	20
Republic of Korea	6808	11609	12
nai, China	11443	13584	17
n, Iran (Islamic Rep. Of)	4274	6836	10
n, China	6160	9415	13
More developed regions:			
Los Angeles, USA	[illegible]	12410	14
New York, USA	[illegible]0	16332	17
Osaka, Japan	[illegible]	10609	10

developing and developed countries. The same is true for cities with fewer than 500,000 inhabitants. Although they have remained relatively stable with regard to population growth, secondary cities are nevertheless critical. Around half of the urban population in both the developing and developed world live in cities of fewer than 500,000 inhabitants (United Nations, 1998b).

The emergence of megacities is a modern phenomenon, occurring over the last half century. In 1950, only New York had a population of ten million or more. In addition to the increase in their number, megacities are becoming considerably larger. The minimum population size for a city to make the list of the world's 15 largest urban agglomerations was 3.3 million in 1950. By 1995, a population of 9.9 million was required as the threshold. Projections for the year 2000 show Dhaka, with 11 million inhabitants, as the fifteenth largest urban agglomeration; by 2015, Los Angeles, with 14.2 million, is expected to be fifteenth on the list (United Nations, 1998b).

Whereas the average annual rate of population growth was one percent or less for megacities in the developed world during 1970-1990, megacities in developing countries have exhibited significantly higher rates of population growth, as well as a larger range of rates, than those in developed countries. Some megacities are continuing to grow very rapidly. Dhaka, for example, grew by 7.6 percent per annum between 1970 and 1990, implying a doubling time of only nine years, while Lagos grew by 6.7 percent, implying a doubling time of a little more than ten years (United Nations, 1995a).

Contrary to the alarmist predictions about "exploding cities," the growth of most of the world's megacities has been slowing down, in some instances quite dramatically. Mexico City is a case in point. Whereas projections prepared by the United Nations and the World Bank in the 1970s forecast a population for Mexico City in the range of 27-30 million in the year 2000, Mexico City's population in 1995 was 16.6 million—projected to reach 18.1 million in the year 2000 and 19.2 million in 2015 (United Nations, 1998b). One explanation for the decline in megacity growth rates appears to be a deceleration in rates of national population growth. According to Chen and Heligman (1994), a simple regression indicates that the national population growth rate explains 47 percent of the variation in megacity growth rates in developing countries. Of course, the fact that India's six megacities grew at rates of between two and 4.5 percent per annum during 1970-1990 indicates that other forces must surely be involved. Still, the relationship between megacity and national population growth rates is quite remarkable, given that megacities generally comprise only a very small proportion of their national populations (Chen and Heligman, 1994).

It is difficult to generalize about the factors behind the slowdown in the growth of many of the world's megacities, as numerous complex factors are involved. Again, Mexico City provides an example. In addition to voluntary emigration after the 1985 earthquake, factors making Mexico City less attractive have included rising housing prices, the increasing cost of living, and quality of life considerations (Brambila Paz, 1998). Indeed, one third of a sample of Mexico City residents interviewed in a migration survey conducted in 1987 (CONAPO, Encuesta Nacional de Migración en Areas Urbanas) indicated that they expected to move away from the city in the future; more than 75 percent of the residents sampled referred to problems related to metropolitan life, such as delinquency, stress, and air pollution. Of even greater importance is the fact that more dynamic growth has occurred elsewhere. Indeed, the rapid economic growth of Mexico's border states—which accounted for 62 percent of national job growth from 1985 to 1990 and "without which national economic growth would have been anemic" (Richardson, 1993b) is a major explanation for Mexico City's relative decline.

For purposes of analysis, the remainder of this article will focus on environmental and security issues in the world's megacities. This focus is not to ignore the fact that cities further down the urban hierarchy often have equally or even more severe service deficits and environmental problems with relatively fewer resources available to tackle the problems. Instead it is done to narrow and simplify the analysis

Regional Overview

There is a great diversity of experience among the world's megacities. Broad differences in patterns of megacity growth persist among the major geographical regions. In Latin America, 78 percent of the population lived in urban areas in 1995 (a proportion comparable to that of the developed countries). The rate of population growth of most major cities in the region peaked during the 1960s, when fertility levels were still relatively high and governments in the region were pursuing policies of import-substituting industrialization that drew large numbers of migrants to the cities.

In recent years, a dramatic and unanticipated slowdown in the growth of megacities in the Latin American region surprised even local observers. Whereas a process of intra-metropolitan employment dispersal has been taking place for a number of years in such cities as Buenos Aires, São Paulo, and Mexico City, the scale has increased greatly. Manufacturing plants have been moving much greater distances and often beyond metropolitan boundaries within a 200 km radius from the central core of São Paulo for example (Gilbert 1993). In addition, profound changes have taken place over the past decade in Buenos Aires, Mexico City, Rio de Janeiro, São Paulo, and other large Latin American cities as a result of economic recession and structural adjustment programs.

Despite its relatively low level of urbanization (34.6 percent in 1995), Asia accounts for 46 percent of world urban population. Amounting to 1.2 billion persons, this number is higher than the current urban population of the developed world (Chen, Valente, and Zlotnick, 1998). In the future, a majority of the world's megacities will be located in Asia. Indeed, in 2015 Asia will be home to 18 megacities, increasing its share from 50 percent in 1995 to 69 percent (United Nations, 1998b). Many megacities in Asia have experienced dramatic economic growth in recent years. Seoul, with a gross domestic product (GDP) of US $93 billion in 1990—the twelfth highest in the world (Prud'homme, 1994)—is rapidly moving away

from "developing" country status. Until the Asian economic crisis in 1998, Bangkok and Jakarta had booming economies. In the Southeast Asian countries as a whole, urbanization has been penetrating deep into the countryside, resulting in extended and dispersed mega-urban regions encompassing hinterlands as far as 100 km from the central core (McGee, 1995).

In recent years, China's megacities have been growing at very rapid rates, although this growth is partly due to reclassification. Goldstein (1993) cautions that the meaning of "urban" in China is now far different from the generally accepted meaning of that term. The use of official urban and migration statistics to measure levels of and changes in urbanization can be seriously misleading. Moreover, the experience of China's megacities has been fairly unique. Urban migration over the past several decades has been closely related to political swings, economic changes, and related policy shifts.

The megacities of the Indian subcontinent (e.g. Bangalore, Bombay, Calcutta, Delhi, Hyderabad, and Madras in India; Karachi and Lahore in Pakistan; and Dhaka in Bangladesh) have followed a different pattern. More similar to the African experience, urban growth is fueled less by economic dynamism than by rural poverty and continuing high fertility. Many

the excess of urban fertility over urban mortality.

A study of the components of urban growth prepared by the United Nations Population Division found that whereas internal migration and reclassification was the source of 64 percent of urban growth in developing Asia during the 1980s (around 50 percent if China is excluded), it accounted for only 25 percent of urban growth in Africa and 34 percent in Latin America (Chen, Valente, and Zlotnick, 1998). These findings have important implications for policymakers and planners. In regions characterized by economic stagnation, where rates of rural out-migration have declined over the past decade, such as Africa and Latin America, the contribution of natural increase has been strengthened. Consequently, if the growth of urban areas is to be significantly reduced, more emphasis needs to be given to the reduction of fertility.

Interestingly, for all of the theorizing about the linkages between urbanization and fertility decline over the past several decades, detailed work in this area has been quite sketchy. Using Demographic and Health Survey (DHS) data collected between 1987 and 1993 in 14 African countries, recent research on fertility behavior in African cities has found that high levels of female in-migration have reduced total fertility rates in African cities by about one birth per woman (Brockerhoff, 1996). This influence of migration on fertility appears consistent throughout sub-Saharan Africa, suggesting that migration to cities may be promoting national fertility transitions in Africa. This situation is all the more ironic since most African governments currently are quite serious about reducing aggregate rates of population growth. Yet they are quite insistent on curbing the growth of metropolitan areas, mainly by retaining population in the countryside.

In a sense, the richness of this research highlights how little has been known up to now about the complex factors involved in recent urban fertility behavior in developing countries. Factors such as the volume and permanence of migration, the effects of age structure, spousal separation, exposure to modern ideas, and the changing opportunity costs of childbearing remain understudied. Despite the widespread acknowledgment 20 years ago that family planning was one of the most cost effective means of reducing urban growth, virtually no work has been done on family planning use and needs among the urban poor. Indeed, from a policy perspective, the limited knowledge of the linkages between rural-urban migration and, in particular, contraceptive behavior has hampered the efforts of policymakers and program workers to design and implement effective family planning programs which might have a significant impact on reducing urban growth (Brockerhoff, 1996).

Attempts to Control Megacity Growth

While a considerable knowledge gap remains regarding the complexity and future implications of demographic change in the world's megacities, there is a generally accepted body of ideas in the policy arena for controlling megacity growth. For example, the anti-urban bias finally appears to have dissipated. It is now widely acknowledged that cities are, in general, productive places that make more than a proportionate contribution to economic growth. In retrospect, it is perhaps astonishing that the antiurban bias of planners, some scholars, and government officials has continued for so long despite apparent grounds for discrediting it. For years, planners made futile attempts to "contain" urban growth on the assumption that rural to urban migration could be stopped or slowed down and that people could be relocated from the existing urban areas. These views no longer are accepted widely, except perhaps in Africa.

Early attempts to "contain" megacity growth ranged from the "closed city" policies of Jakarta (1970) and Manila (1960s), which were notorious failures, to China's household registration system. It was long assumed that direct controls on residential mobility had little chance of success, except perhaps in a collectivist society such as China; even this turned out not to be the case. Despite decades of restrictions, China's "floating population" in its largest cities now numbers in the millions.

A number of developing countries have devoted considerable efforts to devising strategies to reduce metropolitan growth, primarily by fostering the growth of secondary cities and promoting regional development. Mexico is a prime example. Since the early 1970s, Mexico has had one elaborate plan after another—typically a new one in each six-year presidential term of office. It is generally acknowledged, however, that these plans have had minimal impact on influencing Mexico's patterns of spatial distribution (Brambila Paz, 1998).

The great paradox is that profound changes have occurred in patterns of spatial distribution in Mexico and in other developing countries. Yet regional policy is considered to have contributed very little to it. Indeed, as Gilbert (1993) notes, deconcentration has occurred in practice when regional planning has been at its weakest, with few governments in heavily indebted developing countries having any funds to invest in infrastructure in the poorer regions, or to offer incentives to industrialists to locate to the periphery.

It is now widely acknowledged that it is counterproductive to talk about how to "control" the growth of megacities, whether through coercive measures or channeling growth to secondary cities. Moreover, despite the rhetoric which still abounds, megacity size per se is not a critical policy variable. Since the 1980s, there has been a remarkable shift of research attention from the demography of cities to the polity of cities, with particular focus on issues of urban management and, in the 1990s, urban governance (Stren, 1995). With respect to management, a virtual consensus has emerged among urban

megacities—Tokyo is cited most often—are seemingly well managed and, therefore, not too large.

Environmental Issues

Megacities throughout the developing world are experiencing tremendous environmental stress. Quantification of the extent of pollution in specific megacities is difficult, because monitoring stations are rare or non-existent. Nevertheless, it is widely recognized that environmental degradation in many of the world's megacities is becoming worse. Given this fact, it is ironic that the greatest attention—even at international fora such as UNCED (the United Nations Conference on Environment and Development, Rio de Janeiro, 1992)—has been paid to issues of managing the "global commons" rather than to the critical "brown issues," such as polluted air, filthy water, and inadequate sanitation that affect hundreds of millions of the world's urban inhabitants. It is even more ironic that this distortion is sometimes reproduced within developing countries. Some national environmental groups become active in saving endangered species, but give little attention to the acute public health hazards and problems of environmental pollution facing their own citizens (Hardoy and Satterthwaite, 1989).

The sheer magnitude of population growth is an important variable affecting urban environmental problems because it directly affects the spatial concentration of people, industry, commerce, vehicles, energy consumption, water use, waste generation, and other environmental stresses (Bartone, Bernstein, and Leitmann, 1992). The environmental impact of city size is generally considered negative. The larger the city, it is assumed, the greater the per capita environmental costs or damages. However, as Prud'homme (1994) cautions, a number of caveats are in order. Since what ultimately counts is not so much pollution discharged, but rather pollution discharged minus pollution eliminated, it is important to note that for a number of pollutants (e.g. solid waste, water pollution), there are economies of scale in pollution abatement. Also, large cities are generally resource-saving relative to smaller cities; they are usually denser; they lend themselves better to public transportation usage and include a larger share of apartment buildings, hence they consume less land and less energy per capita. Finally, because transportation flows increase with population dispersion, environmental damages associated with transportation pllutisumedR Twı[,Fd ab raeuced

that are little better than raw sewage. Because sanitation is a service that depends for its effectiveness on a high level of consistent and reliable coverage, providing service only to a select minority, or service that is intermittent, does not produce the anticipated public health and environmental benefits (Kalbermatten and Middleton, 1991).

Megacities are being inundated in their own wastes as a result of inadequate waste management policies and practices. Uncontrolled, unsegregated dumping of municipal solid waste, hazardous/industrial wastes, and clinical/medical wastes at the same sites in periurban areas and near squatter settlements increases the risk of injury and exposure to other health hazards. In most megacities in developing countries, solid waste management costs consume from 20 to 50 percent of local government expenditures (Cointreau-Levine, 1994). Only 50 to 70 percent of urban residents receive services, however, and most disposal is by unsafe open dumping.

Throughout the developing world, the problem of air pollution arises from the fact that emissions from vehicles, industrial boilers, and domestic heating sources exceed the capacity of cities' natural ventilation systems to disperse and dilute these emissions to nonharmful exposure levels (Bartone, 1989). Of the major sources of air pollution in the world's megacities, sulfur dioxide comes chiefly from emissions from oil burned in power generation and industrial plants; suspended

and poverty partly explain the scale and extent of urban violence and crime, other factors such as the political and economic climate, local traditions and values, and the degree of social cohesion and solidarity among urban communities also play a role. Erosion of moral values and the collapse of social structure and institutions, such as the family or the neighborhood, put communities more at risk of urban violence and crime (Habitat Debate, 1998).

Urban violence is also deeply embedded in the specific local context. Among the world's large cities, there are sharply different degrees of social welfare development and income distribution patterns, contrasting demographic patterns (e.g. in terms of population growth, internal and international migration flows, age structure), varying cultural factors (e.g. religion, ethnicity), and differing paces of cultural change.

There is considerable debate about the relative importance of different factors. Many specialists stress the significance of inadequate incomes. These disparities are usually combined with very poor and overcrowded housing and living conditions, and often insecure tenure. Together the situation presents fertile ground for the development of violence (United Nations Centre for Human Settlements, 1996). Other explanations focus on the contemporary urban environment, particularly the ostentatious display of wealth and luxury goods in certain areas. These displays engender an attitude that legitimizes the "distribution of wealth" through criminal activity (United Nations Centre for Human Settlements, 1996). Indeed, in a simple "Robin Hood" model of income redistribution developed by a World Bank economist, inequality variables seem to play a significant role, particularly in the case of property crimes (Bourguignon 1998). Little is known about how crime varies with business cycles; a study of Lagos in the early 1980s found that fraudulent offenses appeared to occur only in times of

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