



MEGACITIES AND THEIR CHALLENGES

MEGACITIES

Cities with inhabitants > 10 millions

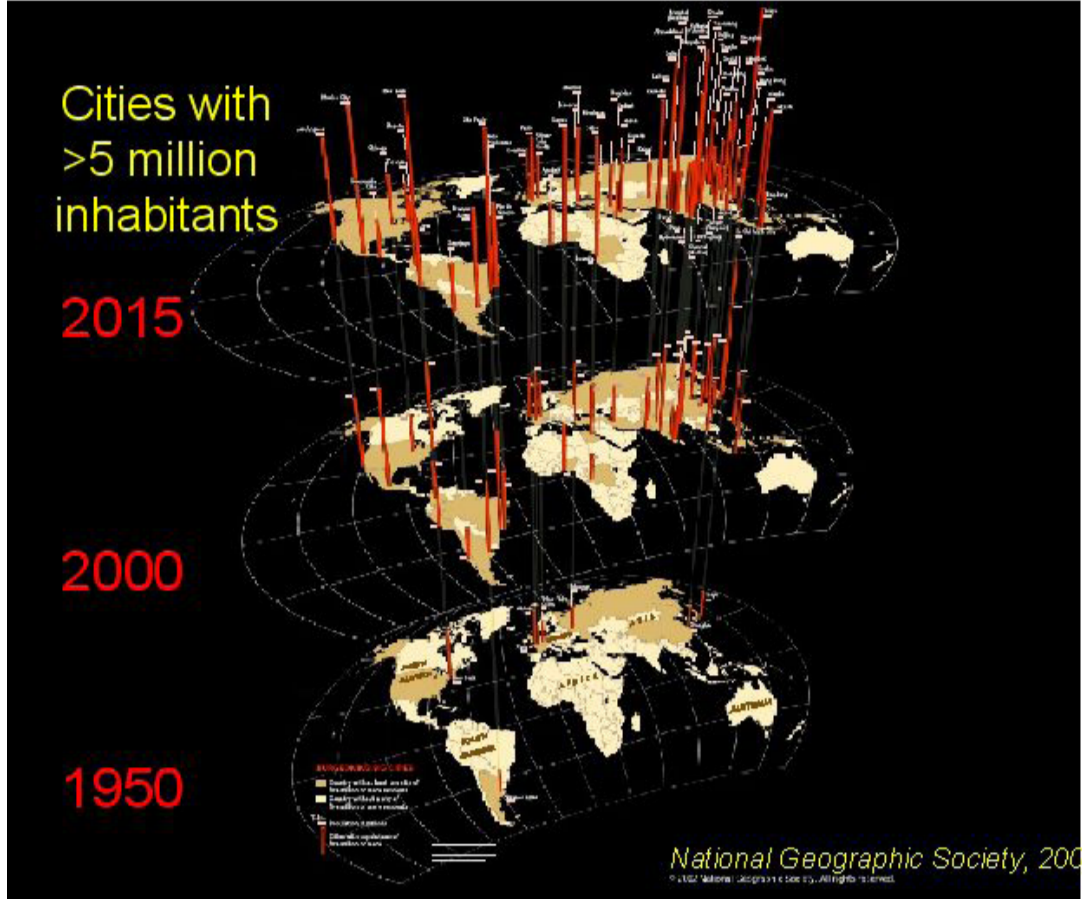


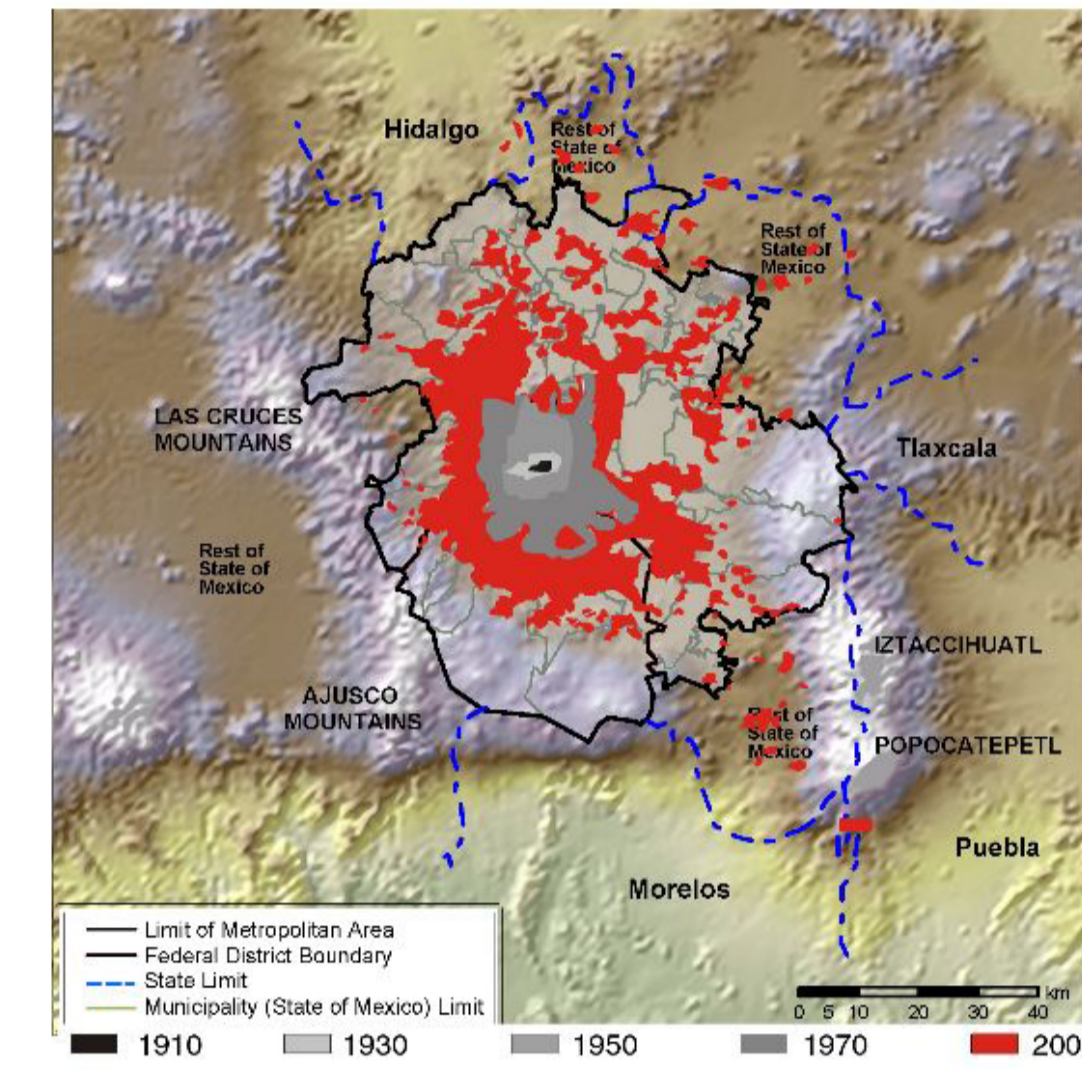
Figure 1

MEGACITIES
>10 Millions
1950 – 1 (NYC)
1995 – 14
2015 – 21

Mini – MEGACITIES
5 to 10 Millions
1995 – 7
2015 – 37

Most of the world's urban population still lives in cities of fewer than 10 million inhabitants; many of these cities are growing faster than the megacities. A metropolitan area - large population center that consists of several town or cities clustered together - usually combines a conurbation proper (the contiguous built-up area) with peripheral zones not themselves necessarily urban in character but closely bound to the conurbation by employment or commerce. For example, the Mexico City Metropolitan Area (MCMA) consists of 16 delegations of the Federal District and 37 contiguous municipalities from the State of Mexico and one municipality from the State of Hidalgo, some with population over 1 million, that make up the total population of about 20 million for this megacity. Figure 2 illustrates urban growth in MCMA.

Topographical map of Mexico City Metropolitan Area showing the urban expansion



Population Growth
>18 million (2000):
>20-fold increase since 1900
Growth projection to >25 million (2010)

Urban Sprawl
>1500 km² (2000):
>10-fold increase since 1960
>Expansion to peripheral areas

Geographic and Topographical Conditions
>High altitude (2240m): less efficient combustion processes
>Mountains are a physical barrier for winds
>2nd largest megacity in the world
>Temperature inversions in the dry season

Increases in Emissions Sources

Figure 2

About half of the world's population now lives in urban areas because of the opportunities for better jobs, access to city services, cultural and educational activities, and a desire for more stimulating human interaction. At the same time, many of these urban centers are expanding rapidly, transforming themselves from villages to towns, towns to cities, and cities to megacities.

Megacity is a general term for cities, together with their suburbs or recognized metropolitan area, with a total population in excess of 10 million people. There is no exact definition of its boundaries, where it starts and where it ends.

During the next three decades, the world population is expected to increase from 6.1 billion in 2000 to 8.1 billion in 2030, with nearly all of this growth concentrated in urban areas (from 2.9 billion to 4.9 billion). Most of the increase will be absorbed by the urban areas of the less developed regions whose population will double, from 1.9 billion to 3.9 billion (see Table 1).

The rapid increase of the world's urban population together with the slowing of rural population growth has led to a major redistribution of the population over the past 30 years. While only 30% of the world population lived in urban area in 1950, this has increased to 47% by 2000 and is expected to reach 60% by 2030, of which 80% will be living in the less developed regions.

The concentrations of people and their activities are exerting increasing pressure on the natural environment with consequences at urban, regional and global levels. However, as the centers of economic growth, technological advances, social dynamics and cultural production, these urban areas also offer opportunities to manage a growing population in a sustainable way. Managing the megacities sustainably will be one of the major challenges in the coming years.

Table 2. Megacities of the World

City	Population (millions)		
	1975	2000	2003
Tokyo, Japan	26.6	34.4	35.0
Mexico City, Mexico	10.7	18.1	18.7
New York, USA	15.9	17.8	18.3
São Paulo, Brazil	9.6	17.1	17.9
Mumbai, India	7.3	16.1	17.4
Delhi, India	4.4	12.4	14.1
Kolkata, India	7.9	13.1	13.8
Buenos Aires, Argentina	9.1	12.6	13.0
Shanghai, China	11.4	12.9	12.8
Jakarta, Indonesia	4.8	11.0	12.3
Los Angeles, USA	8.9	11.8	12.0
Dhaka, Bangladesh	2.2	10.2	11.6
Osaka-Kobe, Japan	9.8	11.2	11.2
Rio de Janeiro, Brazil	7.6	10.8	11.2
Karachi, Pakistan	4.0	10.0	11.1
Beijing, China	8.5	10.8	10.8
Cairo, Egypt	6.4	10.4	10.8
Moscow, Russian Federation	7.6	10.1	10.5
Metro Manila, Philippines	5.0	10.0	10.4
Lagos, Nigeria	1.9	8.7	10.1

Sources: United Nations Population Division, World Urbanization Prospects, 2003 Revision.

Levels of urbanization correlate with national income, and within a country, wealth is concentrated in urban areas. This higher income is a major cause of growth, as people from the countryside move to the city for the jobs, education, and services that an urbanized center provides. Conflict, land degradation, and the depletion of natural resources also motivate migration, especially in Africa, and international migration is another factor. But the largest contributor to growth in urban settings is the increasing number of people in the world, especially in the developing world.

Transportation is a major source of air pollution in many cities, especially in developing countries. The growing problems of congestion, accidents, and lack of security are also worrisome. Yet transportation is also a critical enabler of economic activity and beneficial social interactions. The challenge facing megacities is how to reduce the adverse environmental impacts and other negative effects of transportation without giving up the benefits of mobility. This dilemma becomes most pressing under conditions of rapid urban growth, which is likely to increase travel demand significantly. (see Figure 3 - Vicious circle of growth).

Table 1. Distribution of Global Population by Size of Settlement (1950-2030)

Major area	Population (in billions)				
	1950	1975	2000	2003	2030
Total population					
World	2.52	4.07	6.07	6.30	8.13
More developed regions	0.81	1.05	1.19	1.20	1.24
Less developed regions	1.71	3.02	4.88	5.10	6.89
Urban population					
World	0.73	1.52	2.86	3.04	4.94
More developed regions	0.43	0.70	0.88	0.90	1.01
Less developed regions	0.31	0.81	1.97	2.15	3.93
Rural population					
World	1.79	2.55	3.21	3.26	3.19
More developed regions	0.39	0.34	0.31	0.31	0.23
Less developed regions	1.40	2.21	2.90	2.95	2.96

Source: United Nations Population Division, World Urbanization Prospects, 2003 Revision.

There has been a dramatic increase in the number and size of large urban centers during the second half of the 20th century, as well as a change in the geographical distribution of these cities. In 1800, London was the only major city in the world, with a population of 1 million. Cities with a population of at least 1 million increased to three by the beginning of the 20th century; today, there are almost 300. The average population of the 100 largest cities was 200,000 in 1800; this increased to 2.1 million by 1950, 5 million by 1990, and 7.7 million by 2002. In 1900, 9 of the 10 largest cities were in North America and Europe, whereas today only 2 are in the developed world. In 1950, New York and Tokyo were the only megacities. That number grew to 4 (Tokyo, New York, Shanghai, and Mexico City) by 1975 and to 20 by 2000 (see Table 2 and Figure 1).

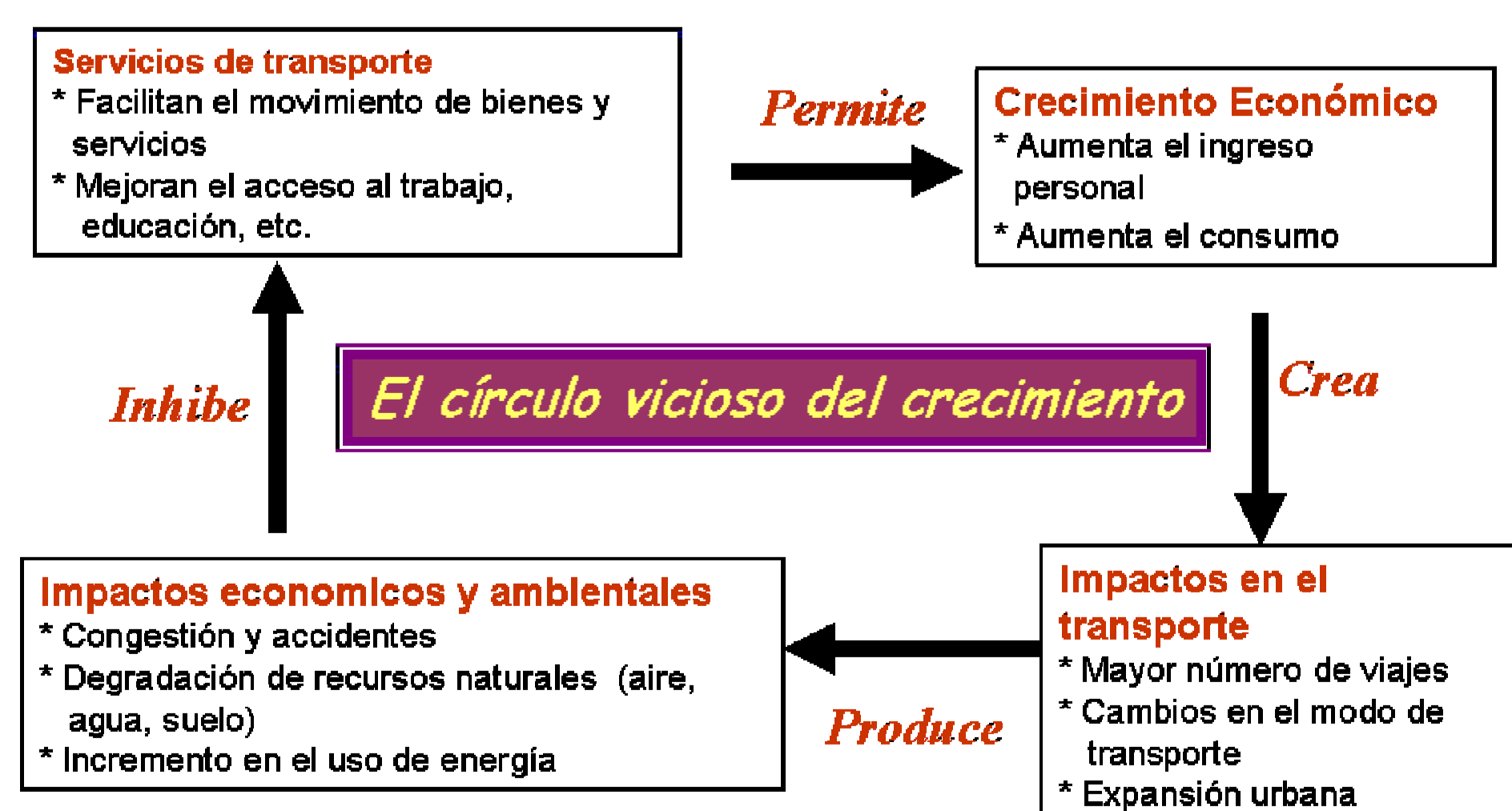
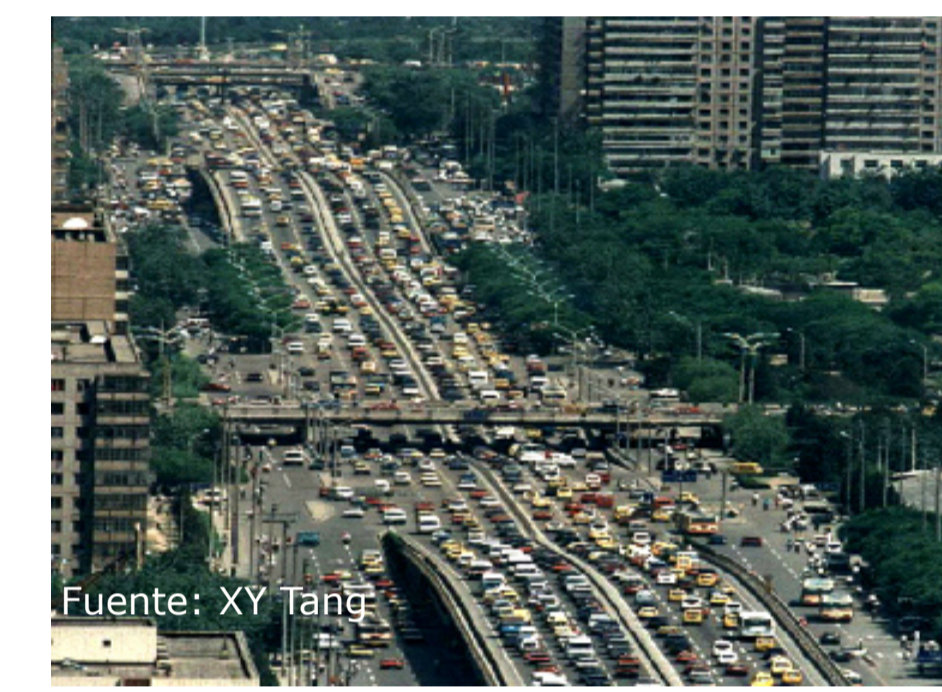


Figure 3

Challenges of Megacities



Traffic in Beijing, China



Coke plant in Cairo, Egypt



Diesel buses in Mexico City



Motor-taxis in Bangkok, Thailand



Ground-level view of burning savanna grasslands in South Africa. (Fuente: http://eobglossary.gsfc.nasa.gov/Library/BiomassBurning/biomass_burning.html)

Biomass Burning is the burning of living and dead vegetation. It includes the human-initiated burning of vegetation for land clearing and land-use change as well as natural, lightning-induced fires. Scientists estimate that humans are responsible for about 90% of biomass burning with only a small percentage of natural fires contributing to the total amount of vegetation burned.

Burning vegetation releases large amounts of particulates (solid carbon combustion particles) and gases, including greenhouse gases that help warm the Earth. Greenhouse gases may lead to an increased warming of the Earth or human-initiated global climate change. Studies suggest that biomass burning has increased on a global scale over the last 100 years, and computer calculations indicate that a hotter Earth resulting from global warming will lead to more frequent and larger fires.

Biomass burning particulates impact climate and can also affect human health when they are inhaled, causing respiratory problems.