



Environmental Implications of Peri- urban Sprawl and the Urbanization of Secondary Cities in Latin America

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Informal low-income peri-urban settlements can be considered the rule rather than the exception for most Latin American cities.ⁱ “Peri-urban” can be broadly defined as unregulated low-income districts far from a city’s center. Consequently peri-urban irregular sprawl often translates into poor housing conditions, urban violence, lack of infrastructure, and a diversity of environmental hazards, including deforestation, poor sanitation, pollution of rivers and streams, and loss of biodiversity. Handling growth in these areas depends on stimulating compact urban development, regularizing land occupation, and preparing cities for future population growth.

Latin American Urbanization

Between 1950 and 2000, Latin America and the Caribbean experienced a momentous urbanization process. The share of the population living in cities increased from 42 percent to 75 percent. The United Nations projects that the region will be 82 percent urban in 2020, home to 529 million people.ⁱⁱ Since the 1980s, the most dynamic demographic growth has been found in cities between 50,000 and 500,000 inhabitants.ⁱⁱⁱ

This rapid urbanization has translated into stressful urban dynamics. In most Latin American urban areas, poorly regulated land use, inadequate housing, high crime levels, lack of infrastructure, and environmental degradation have been as common as industrialization, skyscrapers and highways. Moreover, the recent increase of food and land prices, as well as the further modernization of agriculture, will probably reinforce the urbanization phenomenon in many countries since its dynamics varies significantly across the region, with different countries at different stages of the demographic and urban transitions.^{iv} (See Figure.)

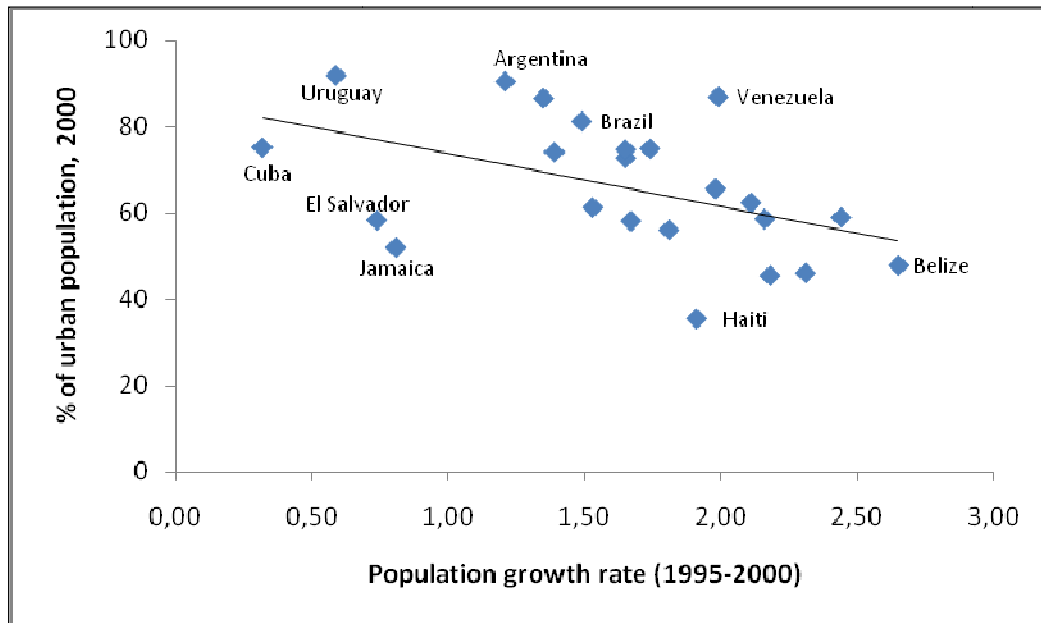
Latin American Suburbanization

Most peri-urban areas in medium and large cities are experiencing three major phenomena: fast growth, informal households, and a concentration of poor families. (Informality refers to a lack of land tenure, when a house is built in an invaded area or in an irregular settlement, and includes different violations of urban codes and building norms.)

First, accelerated peri-urban growth can be seen in an overall decline in the density of built-up areas. A 2005 study that used satellite imagery found an average decline of 0.3 percent per year in the density of built-up areas in Latin American metro areas,^v which means not only that rural areas were being incorporated intensively but also that suburban cities tended to grow faster than capitals. Fast-growing secondary cities within metro areas have also been documented

for the 1990s through census data for the nine largest Brazilian metropolitan areas, Buenos Aires, Mexico City, and Montevideo.^{vi}

Share of Population that is Urban and Population Growth Rates, Selected Countries, 1995-2000



Source: United Nations, *World Population Prospects: The 2005 and 2008 Revisions* (New York: UN Population Division).

Household informality is estimated to account for 74 percent of poor households in Latin American cities areas.^{vii} These houses are generally substandard and often referred to as slums. According to the Economic Commission for Latin America and the Caribbean, the population of slum households accounted for 32 percent of the region’s population in 2001 and increased in absolute terms between 1990 and 2001.^{viii} Peri-urban areas normally house the majority of the slum population; they are the fastest-growing sites and the most precarious ones.^{ix}

High levels of urban segregation by income have also been an important feature in urban Latin America. The region has a historical centralization pattern of high-income groups leaving peri-urban areas to low-income populations.^x Thus contrary to the suburbanization pattern found in the United States, most peri-urban growth in Latin America results from enormous rural land settlements by poor migrants in areas typically poorly regulated and far from key employment centers.

That said, recent trends have called into question this general picture of Latin America's peri-urban growth. Since the 1990s, urbanized and highly urbanized countries—particularly Chile and Mexico^{xi}—have started to offer housing alternatives in the form of significant low-medium income housing projects,^{xii} mostly public or private (subsidized) and located far from the city center due to the availability of large, less expensive land lots. In those countries, peri-urban areas are still growing, but they are becoming less informal. At the same time, a move toward “elite decentralization” can also be observed in more urbanized countries,^{xiii} with the development of high-income gated neighborhoods in particular sections of peri-urban areas, particularly those with significant environmental and aesthetic value. Although indicating important changes in some sectors of Latin American suburbs, and with the exception of Chilean cities, these housing projects and high-income gated communities still represent a small fraction of the overall urban and peri-urban population.

Trends in Peri-urban Sprawl

Peri-urban expansion is influenced by different social forces. National population growth and rural-urban migration patterns are two of the most often discussed aspects, but far from the only ones. Institutional dimensions related to property rights and land tenure legislation also influence the likelihood of peri-urban irregular settlements. Costly judicial processes, red tape, and corruption, for instance, discourage low-income dwellers from obtaining regular land tenure through the justice system, thus reducing the probability of land regularization.

Furthermore, the growing settlements in distant, underserviced peri-urban areas are strongly influenced by land market prices: since central areas tend to be highly expensive, low-income groups and recent migrants are driven to the outskirts of cities.^{xiv} Many urban policies that are supposed to enhance environmental quality within a city—such as the definition of low-density areas and other zoning strategies—end up producing further sprawl by increasing land prices within central urban areas.^{xv}

But housing policies may also play a role in reducing irregular settlements in peri-urban areas. Aside from some large private and public housing projects commonly found in Chile and Mexico, many countries started introducing land regularization programs as a less expensive way of dealing with irregular settlements.^{xvi} Although recently growing in importance, these initiatives have suffered setbacks in the region due to inadequate legislation and slow judicial

processes.^{xvii} In most countries, these programs have yet to reach a critical mass capable of preventing peri-urban population growth.

Finally, economic growth, income distribution, and credit availability also influence irregular peri-urban expansion. The opportunities for poor and low-middle class families to gain access to formal housing markets (even when subsidies are in place) depend on economic stability, the availability of formal jobs, and long-term loans. Chile is the only country in the region to have significantly reduced the share of irregular settlements in its housing stock; it is certainly no coincidence that the country presented the most stable economic growth trend over the last 20 years.^{xviii}

Local governments face important institutional constraints that tend to limit the provision of social services and the solution of the most acute environmental problems.^{xix} Although less expensive than traditional housing projects, implementing urbanization projects may be costly too: for example, the average cost per household in the state of São Paulo, Brazil, varied between US\$3,000 and US\$15,000 in 2010, depending on topography, population density, and previous urban design, and this generally includes only the provision of basic urban infrastructure (water, sewage, electricity, street pavement, and population resettlement out of risk areas).^{xx}

One way to look at future trends in peri-urban sprawl is by distinguishing different levels of urbanization. Urbanized and highly urbanized countries such as Brazil, Chile, Mexico, Peru, and Uruguay will probably experience a decrease in the share of the population living in peri-urban irregular settlements, particularly in large metropolitan areas, albeit with the persistence of urban sprawl. This trend is the result of slower demographic growth, the development of urban improvement projects in these areas, more-stable economic expansion, and the introduction of new institutional mechanisms that favor land regularization.^{xxi}

Average and low urbanized countries such as Bolivia, the Dominican Republic, Ecuador, Guatemala, Honduras, and Paraguay, in contrast, will probably continue to experience increased urbanization and a greater share of their urban population living in peri-urban irregular settlements for the next 15 years. In these countries, the urban population is still growing significantly but the governments often do not have the resources to undertake major urban improvement projects.

Another important urban issue for all Latin American countries is the increased presence of fast-urbanizing locations near large development projects—as is the case of Macae in Brazil

and Camisea in Peru (gas and oil extraction), Cancun in Mexico (tourism), and Porto Velho in Brazil (hydroelectric power plants). Three other large hydroelectric projects are currently under way in the Amazon basin that will probably produce significant environmental impacts and imbalanced urbanization dynamics. Moreover, the Panama Canal is being enlarged, which will likely induce further urban concentration in Panama City.

Finally, the expansion of the agricultural frontier, notably in the Brazilian savannas and around the Amazon in Bolivia, Brazil, and Peru, is also producing fast and often unstable urbanization dynamics. The fastest-growing cities in Brazil in the last decade are located in the center of the state of Mato Grosso (Brazilian West) around the newly developed soybean-producing areas and in some Amazonian states, particularly Pará.

Many of these locations are not well prepared for the substantial migration movements that should occur within a short timeframe, mostly associated with road works, timber exploration, and initial agricultural development.^{xxii} Land speculation and a rapid surge in the offer of formal or informal jobs attract a significant number of migrants, pressuring local public services and leading to irregular settlement growth in urban areas. This type of land occupation produces a “boom and bust phenomenon” that can be seen in the southern part of the state of Rondônia, Brazil. This area has experienced significant growth in the last decades, but it is now losing population because more stable economic activities have not been established.

The Peri-urban Environment

Urban sprawl worldwide has long been associated with the destruction and fragmentation of natural ecosystems, reduced diversity of species, and an increased risk of flooding due to a more extensive impervious surface. Urban sprawl has also been linked with greater commuting times, air pollution, increases in the number of people who are overweight, higher energy consumption, declining social contacts, decreased aesthetic appeal of landscape, and loss of farmland.^{xxiii} All these are true in Latin America and the Caribbean as well, but in addition the region’s peri-urban sprawl involves limited sanitation, poor housing conditions, increased health risks, invasion of protected areas, deforestation, and pollution of rivers and streams.^{xxiv}

Situations of environmental risk are also quite common. Peri-urban occupation of volcanic areas is noticeable around Mexico City and Quito. And global warming is raising important concerns regarding the increased occurrence of extreme climatic events, destruction of

infrastructure, and greater risks from water- and vector-borne infections, for which peri-urban areas are often ill prepared. In Central America, Hurricane Mitch established new urban devastation records after hitting Tegucigalpa and surrounding areas, destroying 78 percent of the water pipelines, among other impacts.^{xxv}

Coastal cities such as Panama City, Buenos Aires, Santo Domingo, Havana, and Rio de Janeiro are particularly ill prepared for major windstorms. The informal settlements in Rio de Janeiro's coastal mountains are a significant source of concern, as this contributes to severe landslides.^{xxvi} Moreover, rising sea levels are apparently intensifying such risks, particularly in the areas known as low elevation costal zones (those up to 10 meters above sea level). An estimated 23 million people in cities live in this type of area in Latin America and the Caribbean.^{xxvii} Suriname, the Bahamas, and Guyana are listed as the top three countries in the world in terms of urban population living in low-elevation costal zones.

Conclusions and Recommendations

Although peri-urban drama has been a sad reality in Latin America since the 1960s, it has rarely reached the top of the public agenda. Overall economic growth, infrastructure building, and, more recently, poverty alleviation programs have generally occupied the spotlight. Recent decentralization initiatives can be perceived as an opportunity to address such issues.^{xxviii} Organizations of the urban poor may also play a role in pressuring public officers and even providing services.^{xxix} Some important housing policy initiatives are also emerging in different countries, as noted earlier. However, due to the size of the problem and the strength of the urbanization trends, peri-urban sustainability still has a long way to go.

Considering these elements, some key recommendations regarding peri-urban sprawl can be made:

- Cities should stimulate strategies for compact growth to allow for a more intensive use of existing infrastructure instead of having to extend costly roads and sanitation networks to new, more distant peri-urban areas.^{xxx} This would likely require a revision of building codes, new zoning practices, and progressive tax strategies that would help establish lower land prices within city centers.
- Countries should avoid the anti-migration policies followed over the last 50 years in Latin America (which according to most authors are rarely effective)^{xxxi} in view of the

strength of urbanization trends. A more relevant proposal in this field involves policies that try to prepare cities for situations of growth that will inevitably continue to happen in the near future, especially in fast-growing, medium income, less-urbanized countries.^{xxxii}

- Efforts to regularize existing irregular settlements should be strongly supported as a means to both stabilize urban occupation and allow for the adoption of minimum urban and environmental standards.
- Support to new housing projects should avoid fostering new peri-urban occupations as well as increasing levels of urban segregation. Whenever possible, local housing policies should rely on retrofit as well as on the production of smaller-scale projects within more-adequate and central urban locations.
- Large project developers should be held accountable for the urban impact of their activities in a more comprehensive way, particularly in less-urbanized frontiers. They should be involved in infrastructure development of urban sites that expand significantly as a result of their operation and also get more involved in income generation and other social development programs, particularly those that will ensure the city's economic, social, and environmental sustainability in the long run.
- Cities should be encouraged to develop adaptation strategies for climate change, following some of the initiatives that are happening along the Caribbean. The first step would be to have detailed studies on the local impact of climate change to identify the most affected intra-urban areas and local services. Next, a local adaptation investment plan should be put in place to improve the infrastructure most likely to be affected, with the establishment of prevention measures. It is also important to mention that those plans should consider the particular conditions of peri-urban occupations. This kind of initiative is particularly relevant in disaster-prone cities and coastal areas subject to significant sea level increase.
- The invisibility of the peri-urban poor is a key issue: peri-urban dwellers are not only less able to make their voices heard, they are also inaccurately described or registered in the public information systems available.^{xxxiii} Efforts should be made to improve the registration of peri-urban sprawl, building adequate geographic information systems that could anticipate rapid population growth as much as possible.

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- ⁱ Smolka and Laranjeira 2008, p. 100.
- ⁱⁱ United Nations 2006, 2009; Rodriguez and Martine 2008. U.N. estimates and projections consider the official definition of urban population provided by each country, which may vary significantly. A more strict definition is “the population living in cities with more than 20 thousand inhabitants,” which reached 63 percent of the region’s total in 2000.
- ⁱⁱⁱ Rodriguez and Martine 2008; Portes and Roberts 2005.
- ^{iv} Demographic and urban transitions are understood here as interlocked processes, the former referring to the transition from high to low rates of population growth and the latter to low to high rates of urbanization; Skeldon 2008.
- ^v Angel et al. 2005; Angel 2008.
- ^{vi} Torres 2002; Groisman and Suárez 2009; Villareal and Hamilton 2009; Kztzman and Retamoso 2009.
- ^{vii} Mac Donald 2004, p. 70. Her estimates of informal households are based on regional household surveys. They refer to the proportion of households lacking at least one of the following elements: piped water, sewage, adequate walls, and household self-declared ownership. However, since interviewees tend to declare themselves owners of their households even when they live in an invaded land, surveys are a rather inaccurate way of capturing the real dimensions of informality.
- ^{viii} “The percentage of slum dwellers out of the total urban population declined from 35.4% to 31.9% between 1990 and 2001. Over the same period, the urban population increased by about 79 million. This reveals that the number of slum-dwellers rose from about 111 million to about 127 million.” ECLAC 2004, p. 194.
- ^{ix} Torres et al. 2007.
- ^x Roberts and Wilson 2009; Schnore 1965.
- ^{xi} Jones 2005; Sabatini et al. 2009.
- ^{xii} This has also been recently happening in Brazil due to the Federal program Minha Casa, Minha Vida, which subsidizes housing for low-income families.
- ^{xiii} Sabatini et al. 2009; Caldeira 1996, 2000.
- ^{xiv} Torres and Goncalves 2007.
- ^{xv} “Urban zoning and building norms tend to artificially influence land availability and price. Zoning restrictions that forbid vertical building, for instance, render important central areas with often low population density and ample infrastructure a very expensive housing option. This kind of building norm, albeit producing highly desirable neighborhoods, such as Vitacura in Santiago, Polanco in Mexico City and Jardins in São Paulo, also induces the horizontal spread of the rest of the city, leading to inevitable peri-urban settlements” (Torres 2008).
- ^{xvi} Ward 2006.
- ^{xvii} Fernandes 2007.
- ^{xviii} Although reducing irregular settlements, housing policies in Chile have been criticized on the grounds of generating increased segregation; Sabatini et al. 2009.
- ^{xix} Smolka and Laranjeira 2008; Torres et al. 2007.
- ^{xx} Information privately obtained in an interview with a professional of the housing agency of the State of São Paulo in 2010.
- ^{xxi} Venezuela and Argentina are possible exceptions due to a less stable institutional environment.
- ^{xxii} Browder and Godfrey 1997.
- ^{xxiii} Soule 2006; Redman and Jones 2005; Hasse and Lathrop 2003; Frumkin 2002; Jargowsky 2002; Johnson 2001; Duany et al. 2000; Benfield et al. 1999.
- ^{xxiv} Torres et al. 2007; Torres 2008; Satterthwaite 2003; Pick and Butler 1997; Roberts 1994.
- ^{xxv} Hardoy and Panella 2009.
- ^{xxvi} Sherbinin et al. 2009.
- ^{xxvii} McGranahan et al. 2008.
- ^{xxviii} Finot 2002.
- ^{xxix} D’Cruz and Satterthwaite 2005.
- ^{xxx} IDB 2010.

^{xxx} Martine et al. 2008.

^{xxx}ii Angel 2008.

^{xxx}iii Torres 2006.