THE WORLD BANK'S 2005 INTERNATIONAL URBAN RESEARCH SYMPOSIUM[1]

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As Sir Peter Hall notes in his article in this special issue of *Global Urban Development Magazine*, the "Urban Revolution" now occurring largely in developing countries presents great opportunities and risks. Urbanization can help raise standards of living, provide the infrastructure and services for immense improvement in human welfare, and free people from the total dominance of their daily struggle for food. The attractive neighborhoods and downtowns, efficient transportation, many amenities, impressive social indicators, and high standard of living of Singapore and Curitiba signal this potential.

However, if mismanaged, the urban wave can bring a sharp rise in poverty, result in surrealistically desperate conditions, and foment disease and violence. The pavement dwellers of Mumbai living cheek-by-jowl with the immense wealth of this commercial capital of newly prosperous India, and the seemingly endless slums and hovels that consume many sub-Saharan African cities are emblematic of this other, less desirable, urban reality.

Urban land lies at the center of many of these opportunities and risks. Assembling reasonably priced, well-located land parcels has become the most crucial challenge for affordable housing development. When – as is often the case - such programs are unavailable, large numbers of low- and moderate-income people in many developing country cities cannot afford to purchase the least expensive commercially built homes and, instead, use informal systems to house themselves and their families. Such "progressive housing" also starts with and depends on access to a modest piece of land. Similarly, efficient transportation and the ability of households to connect with jobs and services depend on high densities of urban land use.

Near the start of the great urban wave in developing countries – in the 1950s – poverty households migrating to cities from the countryside could, with some frequency, find centrally located low-cost land on which to settle. The film "Black Orpheus" recreates the myth of Orpheus and Eurydice in the shantytowns on the steep hills with panoramic views above Rio de Janeiro, painting an idyllic picture of *favela* life at that time. It is impossible to imagine that such a lyrical film on *favela* life could be made today. Indeed, Brazilian cinema currently produces many gritty, neo-realistic films featuring the blowback from the spread and worsening conditions in *favelas*, including street orphans, kidnapping, and urban violence.

In this regard, the era of easy access to urban land is long gone in most developing country cities. Continuing urbanization has used up the most developable areas around many cities. Although government agencies frequently own some land in urban and peri-urban areas, large development companies that build mainly for middle- and upper-income households now appear to own most of the remaining developable parcels. The low rates, high technical requirements, and political difficulties of the real property tax in developing countries allow such large landowners to continue to hold their large land parcels at little cost. Without mitigating measures, land titling and other market reforms have resulted in the "commodification" of land and housing (Durand-Lasserve), often raising prices and excluding the poor. For many reasons, urban land has now become the main constraint to adequately housing the low-income families.

This anthology collects and organizes papers presented at the International Urban Research Symposium held on April 4-6, 2005 in Brasilia, Brazil. The World Bank and the Institute for Applied Economic Research (IPEA) jointly sponsored this event.

The papers presented at this Symposium covered six key themes:

- Land Markets, Land Development, and Land Policy
- Secure Tenure, Property Rights, and Informal Land Delivery Systems
- Informal Settlements, Slums, and Upgrading
- Transportation, Density, Urban Planning, and Urban Form
- Housing Markets and Low-Income Housing Programs
- Development on the Urban Fringe and in the City Center, and Improving Urban Environmental Sustainability

The remainder of this general introduction briefly describes these six thematic areas.

Land Markets, Land Development, and Land Policy

Legal land development for low-income households has dried up or is in the process of drying up in many developing country cities. For example, in Buenos Aires, the formal submarket for sales of individual lots in monthly installments to low-income households was important from 1950 to 1970 (World Bank, 2006), but has disappeared since then. During this 20-year period, land developers extended purchase-money loans to buyers (typically 150 monthly installments). This was the most common form of credit finance for selling building plots to low-income households in emerging countries. However, due to price indexing of such contracts mandated by governments, hyper-inflation in many countries during the 1990s essentially eliminated the availability of these types of loans. Partly as a result, numerous subdivisions remain largely unoccupied on the fringes of Buenos Aires, and many legal low-income land markets are now frozen (World Bank, 2006).

Simply adding money – either through subsidies or credit finance – without addressing such land bottlenecks results mainly in raising land prices. Put another way, the inelasticity of supply produces mainly higher prices rather than more housing when market demand increases.

The mounting pressure on urban land has accelerated the rise housing prices, and made housing markets mostly dysfunctional in many major metropolitan areas of developing countries. In Dhaka, for example, the price of the median house is a startling 106 times the median annual household income. In comparison, the highest-priced metropolitan housing markets in the U.S. – New York City and San Francisco – have median price to annual household income ratios of around 6 to 1.

The extreme pressures on and high costs of land have also helped encourage innovative approaches to land development that, in effect, lower the prices and capture a portion of the added value of public investment in urbanization. In particular, Asian countries – Singapore, Hong Kong, and, most recently, China - have taken measures to lower the cost basis of urban land for affordable housing and other types of urban development. Earlier, Japan and South Korea encouraged owners of land on the urban fringe to pool their property as a means of more efficient development – a method called “land readjustment.”

Some governments own considerable amounts of land in both urban and peri-urban areas that is being significantly underutilized. Publicly owned land frequently has fundamental importance for both the public and private sectors. Typically, however, public landownership remains fragmented among many different agencies at various levels of government, each with its own mandate and administrative turf to be guarded. The ownership and legal rights to particular parcels are often in confusion. Hence, the first step usually consists of inventorying publicly owned land along with selected privately owned plots to clarify the legal status of these vacant or underutilized parcels. Such investigations usually show that some parcels can be developed in a straightforward way. Other parcels are likely to have complex ownership problems that are difficult to solve in the short term. Clarifying the legal status of these parcels

represents a prerequisite for action to stimulate their use, such as providing incentive mechanisms to place privately owned property on the market.

The high cost of urban land has become the most important barrier to affordable housing – from Mumbai, where land prices exceed those of Manhattan, to Chile, where the country's successful demand-based housing subsidy program has now lost its effectiveness because of rapidly escalating land prices in most major cities. As real property markets tighten, increases in housing subsidies are simply capitalized into higher land costs, rather than being passed on as cost savings to potential moderate-income homebuyers.

Simply "enabling markets" – the dominant approach to shelter and settlement endorsed by many economists and several international development institutions during the past 15 years – appears essential but insufficient to meet the urban land challenge. New strategies have been designed to lower the costs of urban land in order to make housing and other types of development more affordable. Some jurisdictions with attractive sites for new middle-income housing projects in developed countries either require developers to allocate a portion of each project for low-income households, or require developers to pay impact fees to raise subsidy funds for affordable housing. The costs of these requirements sometimes gets passed on by the developers to the market-rate purchasers who end up paying more to support low-income housing.

Governments also use various means to capture a portion of the value added by their public investment in urbanization such as roads, sanitation, and schools (Smolka, 2002). In high-income countries, the local property tax typically captures 1% to 2.5% of property values each year to fund local public services. The theoretical advantages of the local property tax, in general, and land taxation, in particular, have a long history, dating to back at least to Henry George's classic work, *Progress and Poverty* (George, 1879). However, the high technical demands (accurate and up-to-date cadastral records, periodic reassessment of property values, honest and efficient tax-collecting agencies, etc.) and the political weaknesses of the property tax have resulted in very low revenues in many emerging countries.

Partly as a result of these problems with the property tax, many developing nations have searched for other methods to capture a portion of the property value increase caused by public investment in urban land. These value-capture methods are typically applied at transition points, such as the conversion of rural to urban land, or at the point of sale. Relative to the property tax, value-capture methods substitute large occasional charges for periodic smaller charges (Smolka, 2002). Not surprisingly, they also stimulate political opposition, although more from the owners of large developable land parcels, rather than from the land-owning public in general.

Finally, some countries – particularly Asian ones – either impose restrictions intended to reduce urban land prices, or require property owners to sell their land to governments at discounted prices for affordable housing and other types of urban development. Sometimes, these methods become an accepted part of the social contract, as in Hong Kong and Singapore. An individual landowner may be forced to sell at a price well below the property's highest and best urban use, but in exchange can count on the adequate provision of many essential public services, including affordable housing. Elsewhere, such heavy-handed methods represent a windfall for some and a wipeout for others and can generate heated social conflicts. For example, location permits are used in Indonesia to restrict land sales and therefore reduce the sales price of small properties in favor of particular developers approved by the Government, which unfortunately fuels continual land disputes (Ferguson, 1993). Typically, those families and economic sectors with the least political and economic influence are at the greatest disadvantage. Too often, peasants get their property taken with little compensation. Thus, a shift from the strategy of enabling markets, to one of deliberately and even forcefully controlling them, carries risks as well as potential rewards. However, growing problems with housing affordability and urban development are inducing some public officials to take such risks.

Secure Tenure, Property Rights, and Informal Land Delivery Systems

The drying up of legal low-income land markets leaves illegal development (variously termed "pirate", "informal", and "clandestine") and informal markets as the main sources of land for low-income settlements. The process of self-building ("progressive housing") is now the principal means of construction and occupation of shelter for many low- and moderate-income families in most developing country cities. Typically, households "invade" land or purchase a lot in an informal subdivision and build their own housing over a period of 10 to 15 years. They finance this construction largely through their own savings, but also though numerous other sources including small loans, pension funds (where available), microcredit, and mutual aid arrangements with other families. As the families consolidate their housing, the community bands together to lobby for public infrastructure and services along with security of land tenure. The legal upgrading of community and the extension of services parallels the physical upgrading and building of the individual houses. Thus, progressive housing is partly an individual process – that of the house - but with a strong collective component – upgrading of services and the legal status of the community.

Informal land delivery mechanisms constitute parallel systems for land development and tenure. Although these "para-legal" systems are lower cost, they are often less transparent. Again, Argentina – a middle-income, relatively sophisticated country - provides one example. Households may obtain ownership through peaceful occupation of land for 20 years, in general, and for 10 years in limited cases, and a 1994 law provides for registering the purchase agreements for such lots to increase security of tenure. This informal land system co-exists with the formal registration of property deeds. However, the cost of formal registration typically ranges from US $400 to $700 including title expenses. Most low-income buyers of building lots through installment payments to land developers, even those who made their initial purchases in the 1950s and 1960s, have yet to sign their deeds due to lack of sufficient funds (World Bank, 2006).

These parallel informal systems also often out-compete the formal ones. In effect, the entry costs are much lower (although the total costs over time usually far exceed those of formal sector development), and the characteristics appear better suited to the needs and effective demand of low- and moderate-income households. That is, informal development typically demonstrates some combination of: (a) more central location (closer to jobs and social networks crucial to the poor); (b) larger lot sizes that allow poor households more room to expand and customize their habitat to their needs (larger families, home-based micro-businesses, urban agriculture); and (c) more flexible financing terms (payments can be missed if justified by temporary sickness, job loss, or other compelling causes) that are much better suited to these household's intermittent informal incomes and employment, although interest rates are usually very high. In addition, informal land development also often benefits from the implied promise of subsequent service provision and upgrading by government, largely at public cost. These benefits get capitalized to some extent into higher prices that the households pay to illegal developers for a small piece of raw land.

"Secure tenure" of land protects these poor households against the eviction and destruction of their communities. Hence, it provides the foundation for households to invest progressively in their homes and build their communities. Full legal title backed by modern land systems (property registry, cadastre, effective legal enforcement) gives the greatest security of tenure, but it is much more costly, technically demanding and often pushes the entry price of access to the lot beyond the reach of low- and moderate-income households. In many regions, intermediate and traditional forms of property ownership have provided a sufficiently secure basis for the progressive land and housing process.

Other aspects of property rights systems offer ways to address urban land issues including group rights vs. individual rights, and leasing/rental as opposed to ownership. Individual rights facilitate markets and transparency, but are problematic in reaching low-income households. Experiments with group rights in low-income communities – such as in Recife and Porto Alegre, Brazil, and the Community Land Trusts of Kenya (Payne, 2002) – have proved interesting, but difficult to scale up.

Rental housing and long-term land leases have theoretical virtues. Long-term land leases, in principle, can offer security of tenure sufficient for financing (Deininger, 2003). Informal rental housing in poor neighborhoods already provides the main source of rental accommodation in most developing countries (Gilbert, 2003). Typically, households build an extra room or unit onto their existing home (horizontally or vertically) and rent it out as an extra source of income. Since they do not have to pay for more land, and gain other economic advantages from their adjacent owner-occupied unit (utilizing existing clandestine or illegal service connections), such accessory units are the least expensive method of producing additional low-income housing. By contrast, subsidized formal sector rental dwellings are the main form of affordable housing production in most affluent countries.

Thorny technical and political problems, however, make the expansion of formal low-income rental housing and leasing of land difficult and rare in developing countries. From a technical perspective, noone has solved the problem of who will own, operate, and maintain low-income rental units in a way that ensures satisfactory affordable shelter, and that channels the benefits of any public subsidy or publicly financed improvements largely to the low-income renters rather than mainly to the owners. Western Europe, the U.S., and Canada use networks of sophisticated non-profit developers and/or municipal corporations supported by public subsidy systems backed by a well-functioning legal framework to operate, maintain, and – increasingly – develop affordable rental housing.

However, most low- and middle-income countries still lack such non-profit organizations and the funding and legal/regulatory structures necessary to make this approach work, although a few are beginning to develop affordable rental systems (e.g. Singapore, Hong Kong, China). From a political perspective, most developing country governments find production of owner-occupied housing much more rewarding than subsidizing rental housing. In many regions – particularly in Latin America and South Asia - it could be argued that a strong cultural preference for homeownership eclipses any government effort emphasis on rental housing, except for rent controls, which often disrupts markets and eventually even reduces the available supply of private rental dwellings. In many parts of sub-Saharan Africa, on the other hand, most people in cities view their urban residence as a temporary place for commuting to work in the city before returning to their real homes in their tribal areas, and rental accommodations therefore are much more common.

As the pressures on urban land increase, secure tenure has become the fundamental housing issue for the poor. Urban economic growth brings jobs and rising incomes. However, it also stimulates escalating land prices that make centrally located plots occupied by low-income households highly attractive to other users. Governments often bulldozed informal low-income urban communities during the 1950s and 1960s, when officials typically viewed these settlements as “blighted” areas.

A number of trends have combined to reduce such forced evictions throughout the developing world. Perhaps most fundamental, as elections have replaced overt authoritarian rule in many countries and cities, a significant share of the electorate in these low-income settlements has gained the power necessary to protect and consolidate their community environmentsw. International and local NGOs have led campaigns to focus the attention of the international community on forced evictions generally as well as in particular countries. These actions have resulted in many official declarations like the UN’s Habitat Agenda for housing rights and against forced evictions. Finally, a wave of research beginning in the late 1960s argued that these informal urban settlements are also a solution and not just a problem (Perlman, 1976). Unable to offer alternatives, many local governments and politicians have either bowed to the seemingly inevitable and began protecting informal settlement in return for political support and, sometimes also for cash in their own pockets.

But what kind of “secure tenure”? Hernando De Soto’s book, *The Mystery of Capital* (De Soto, 2000) asserts that individual full legal title can unlock massive amounts of “dead capital” contained in the informally held landed property of low-income households by stimulating both private investment and financial credit, and thus stimulate economic development. From this standpoint, the poor already possess the wherewithal to build wealth and make a better life. In particular, the potential value of this private asset of landownership far outstrips the value of international donor assistance. Government – it

is argued - needs to legalize this asset, and then the other pieces of the puzzle – especially credit – will naturally follow. Establishing widespread individual ownership of private property in land and building improvements is the cornerstone of a process that potentially can replicate the economic success of the developed world in developing countries.

Although appealing and insightful in its analysis of the different modes of informality, this view has proved too simple. Building a working capitalism for the poor, in general, and for low-income settlements, in particular, has turned out to be a much more nuanced process. The experience of De Soto's native Peru with massive land titling programs of low-income communities serves as a case in point (Morris, 2004). Massive titling seems to have had modest economic impacts both on the beneficiary households and on infrastructure investments, and it has led to smaller than expected increases in access to credit (Morris, 2004). Although the Peruvian titling program has greatly reduced the cost of full legal title – from over $2,000 to less than $100 - many fully titled properties lapse back into the informal sector when they are sold to new owners.

Indeed, in the absence of mitigating measures, some authors have argued that full legal tenure can contribute to displacing low-income households rather than building their economic assets (Payne, 2002; Durand-Lasserve, 2002). In this other view, most low-income households neither want nor can afford full legal title. A ladder of property rights and multiple forms of "intermediate title" are much more suitable for these families and communities (Ferguson, 2003b). From this other perspective, policies that accept and formalize traditional land-delivery systems hold much greater importance than titling programs.

Informal Settlements, Slums, and Upgrading

Although progressive housing is a crucial solution, it is also an immense problem that exacts enormous public and private costs when unguided. Increasingly, tight land markets force households to settle on precarious locations including ravines, steep hillsides, marshes, river banks, garbage dumps, watersheds, sidewalks, the edges of public facilities and infrastructure lines and associated rights-of-way, and distant sites far from existing infrastructure that are often environmentally fragile or inappropriate. Alternatively, these families crowd into ever denser existing informal settlements: inner-city tenement units divided into many rooms with each one rented to a separate family; and shantytowns on the urban fringe and beyond that expand horizontally into every free space and then vertically by adding stories to existing structures.

Slum upgrading involves retrofitting these areas with infrastructure to create a viable road network underlain by water lines, and accompanied by drainage and sanitation. This process often requires relocating a modest share of a slum's population (around 5%), which is frequently a problematic and costly step. Slum upgrading frequently occurs piecemeal and without an overall plan or layout, mainly close to election time when candidates for political office trade an improvement or commitment for many votes. In contrast, integrated slum upgrading programs provide much needed basic services and – often - join them with organized community participation, key social and economic benefits, and legal tenure. For these reasons, retrofitting such informal settlements through slum upgrading is usually much more expensive than new formal sector development. Governments typically absorb the high capital costs of improving or replacing the infrastructure of these communities, selective resettlement, and regularizing their legal situation.

The relatively high costs of slum upgrading have created problems in terms of financial sustainability and program scale. Particularly when an integrated approach is taken that lifts these areas to standards approaching (but still below) those of the rest of the city, the high cost per household tends to make these programs into boutique, small-scale efforts. The model project looks good, but cannot be expanded to reach a large number of households.

In addition to the public costs of upgrading programs, informal housing development also has high costs for families. The process of home construction is typically long and wasteful. One market study found that building a basic two-bedroom house takes Mexican families an average of 11 years, and costs 30%

more because of the high cost of small purchases of building materials, theft and damage of these materials, and poor planning. Households also end up paying high sums for purchasing a raw lot, for improving security of tenure, for basic services prior to consolidation (e.g. private water supplied by tanker, which is typically 5 to 10 times the cost of publicly-supplied water), and to save and borrow sums of money for the many steps in the progressive housing process. Irregularly-settled neighborhoods also have substantially higher levels of crime and insecurity than other neighborhoods of a similar socio-economic profile. The bad reputation of these neighborhoods can brand their residents, and make them largely unemployable in the formal sector.

The high public and private costs of upgrading existing slums have called attention to the importance of slowing the formation of new slums by getting ahead of demand through expansion of low-income land development. This strategy holds particular importance in South Asia and Africa where urbanization is still rapidly rising. Most medium and large developing country cities are still growing at rates that will double their size in 20 to 25 years. The global population is projected to increase by 1.5 to 2 billion over this period, and the bulk of these people will constitute low-income households living in developing country cities. Where will all these new city residents live? As Geoffrey Payne notes, the international community has come to realize that the "real challenge of slums is two-fold:"

> First, there is a need to improve the living conditions of people living in slums and various types of unauthorized settlements. And second, there is an equally urgent need to create conditions in which all sections of urban society, especially the poorest and most vulnerable, can obtain access to legal, affordable shelter in ways that prevent the need for future slums and unauthorized settlement. (Payne, 2005).

"Slums" display a combination of lack of basic services, substandard or illegal inadequate structures, overcrowding and high density, unhealthy living conditions and hazardous locations, insecure tenure and informal settlement, and poverty and social exclusion. At the turn of the Millennium, 31.6% of the world's population lived in urban slums – approaching one billion people and increasing at a very fast rate. Slums accounted for 43 percent of the urban population in developing nations compared to 6% of those of developed countries. Sub-Saharan Africa had the largest share (71.9%), and Oceania the lowest (24.1%). In between were South-Central Asia (58%), Eastern Asia (36.4%), Western Asia (33.1%), Latin America and the Caribbean (31.9%), North Africa (28.2%), and Southeast Asia (28%). Asia had about 60% of the world's urban slum dwellers. Africa had about 20%, but this percentage is growing quickly. Latin America had 14% (United Nations – Habitat, 2003).

The total number of urban slum dwellers – nearly one billion – is projected to double to two billion by 2025. Thus, the slum challenge presents both a "stock" and a "flow" aspect. Most efforts have focused on the stock by attempting to upgrade existing slums. Decisive action to prevent the formation of new slums is, however, equally important (Payne, 2005).

The high public and private costs of upgrading existing slums presents great strategic dilemmas, and underlies the importance of decisive action to get ahead of the growing demand for low-income land and shelter. Retrofitting existing slums with basic services – the core of slum upgrading – often costs substantially more than providing these services to new formal sector developments (Ferguson, 2003a). While the private sector and, thus, individual households assume the cost of extending basic services to formal development, government ends up paying the great bulk of the capital costs of extending these services to slums.

The capital costs of providing basic infrastructure are only one aspect of the high costs of upgrading existing slums. Slum dwellers also pay very high amounts to obtain land, to regularize tenure and achieve security of occupation, for ongoing basic services (i.e. consumption as opposed to the capital costs) typically through clandestine connections, to construct their homes, and to save and borrow the sums necessary to finance all of these necessary actions.

Transportation, Density, Urban Planning, and Urban Form

The immensity and paradoxes of the urban land challenge suggest that the most effective solutions must join the micro-level of projects with that of the macro-development of the urban region as a whole. Here, innovations in transportation and urban planning, systems of settlements, and the form of large metropolitan areas are crucial.

Urban density studies (such as density-gradient analysis) demonstrate that housing and transport are a binomial equation. Improvement in urban transport opens up much larger land areas for residential development and improves economic productivity. In turn, higher residential densities make public transportation systems economically feasible. The form of metropolitan areas is crucially important to both housing and transportation. This is particularly true for the immense urban agglomerations – or "megapolitan areas" – that contain an increasing share of populations – such as those of Mexico City, Sao Paulo, and Jabotabek (i.e. Jakarta and surrounding areas).

Based on the experience of Asian megapolitan areas, Aprodicio Laquian concludes, "allowing a monocentric settlement to grow in an uncontrollable and haphazard fashion is a recipe for disaster… (These areas are) sprawling, and extremely expensive to provide basic services." (Laquian, 2005) Instead, land use decisions and other planning, investment, and regulatory measures can create poly-nucleated urban regions. Traditional master planning (zoning, subdivision regulations) typically leaves blank spaces for the huge informal settlements within developing country cities, and is of little use. Instead, strategic plans should focus on systems of settlements. Relatively simple actions such as laying out main roads in a rational way in expansion areas can also have an important impact (Angel, 2006).

Improving the governance and management of metropolitan regions is of crucial importance for implementing such large-scale urban planning (Freire, 2001). However, many metropolitan regions in developing countries, as in developed countries, are fragmented into dozens of local jurisdictions and authorities, and the institutions for coordination among them are only gradually emerging.

Informal housing and slums require solutions that go beyond the micro-level of projects to the macro-level of metropolitan development and urban form. In this regard, transportation plays a crucial role.

Transportation and housing are two of the essential lynchpins of urban development. Distant housing (and land) inaccessible to jobs and services has little value. Similarly, density – that is, the concentration of housing and, hence, people – makes investment in transportation (buses, trains, highways) economically viable. "Smart growth" and "new urbanism" both involve increasing density near transport nodes – such as bus lines and subway stations (Katz, 1993). An efficient relationship between housing and transportation makes for a more compact city; many of Western Europe's great cities (e.g. Stockholm, Amsterdam) come to mind.

In comparison, sprawl consumes more land, requires greater investment in infrastructure, lowers social welfare by enforcing longer commutes, and generates more vehicle emissions – in particular, carbon dioxide and other greenhouse gases. Los Angeles and other cities of the U.S. Southwest are emblematic of these problems. Originally designed to transfer manufacturing to the periphery and give working-class families a suburban lifestyle that avoided over-crowding, the sprawl of Los Angeles has become a notorious problem (Kotkin, 2005; Weiss, 1987). Most developing-country cities spread over huge areas like Los Angeles, although a few – e.g. Curitiba and Bogota – have developed more compactly because of efficient transport and/or natural barriers that help contain the area of urban development. Many cities in formerly socialist countries have a distinctly dysfunctional form characterized by relatively low densities in the center (Bertaud, 1997).

The market usually fails to fully price these by-products of sprawl – for example, gasoline prices almost always omit the cost of mitigating the impact of greenhouse gas emissions. However, these "externalities" of sprawl – from greater greenhouse gases to the consumption of more agricultural land by

urban development – contribute importantly to the global environmental decline that threatens civilization as surely as, if more slowly than, international terrorism.

The mega-cities of emerging countries pose special challenges for relating housing and transportation. In 1950, only metropolitan regions, London and New York, had populations greater than 10 million. As of 2000, nineteen urban areas exceeded this threshold, with all but three in the developing world. In this regard, allowing monocentric settlements to grow uncontrollably is a recipe for disaster (Laquian, 2005). Creating multiple compact urban centers with good public transportation connections throughout these megalopolitan areas is becoming increasingly crucial.

Too often, government agencies devoted to either housing or transportation ignore the other function. Housing agencies in emerging countries typically buy distant land parcels because they are "inexpensive" and, thus, fit within the cost and subsidy formulas of their affordable housing programs. Quantitative goals set by the nation's chief executive customarily drive these housing agencies. From this perspective, new housing in a distant periphery or beyond, and better located housing that is much more accessible to jobs and services, have the same economic, political, and social value. However, the distance of these sites matters greatly to their low-income residents who must have good access to jobs to survive and who typically cannot afford private cars and thus depend very heavily on public transportation. Predictably, inaccessibility dooms many affordable housing projects in developing countries to failure. Perversely, housing agencies usually continue to ignore the key importance of transportation and accessibility of jobs and services to the success of their programs and projects. In turn, transport agencies sometimes build roads without relation to where housing is or will be located. In the U.S., for example, the routing of major highways through high-density urban areas destroyed many of these neighborhoods in the 1950s, 60s, and 70s, or ended in half-built freeways when political opposition stopped these projects.

Improving public transportation also increases the productivity of metropolitan areas. It not only lowers the costs of moving people and goods within the existing city, but also helps economically expands the urban region by enhancing the competitive advantages created by the close proximity of firms, services, and skilled labor. Transportation is a vital element of the localized public service system that influences the shape and rate of urban economic growth in the global economy (Freire, 2003).

Housing Markets and Low-Income Housing Programs

Starting in the early 1990s, many governments and donors – influenced by the World Bank – adopted an "enabling markets" approach to housing (World Bank, 1994). The context of the emergence of this approach consisted of the fall of the Soviet Union and entry into the market system of a large share of the world's population (in China, India, and the Newly Independent States), the poor results of highly subsidized housing programs that attempted to replace the market in many countries – particularly in Latin America, and the limited impact of sites and services and slum upgrading projects.

The enabling markets approach has encouraged reform of various aspects (land, property rights, infrastructure, housing finance, housing institutions) of the housing sector, and embraced land issues within a housing framework. This approach caused the World Bank to shift from supporting sites and services and slum upgrading – which were viewed as isolated projects with little systemic impact - to reforming and expanding mortgage credit in the hopes of eventually pushing this and other aspects of formal sector housing systems "downmarket" to reach low- and moderate-income households.

Enabling housing markets has had a number of successes. In particular, mortgage finance – which was formerly available mainly in OECD countries – has now spread throughout the world (Buckley, 2005). However, formal systems – including mortgage credit – have largely failed to reach many low-income households. In most countries, even moderate-income families remain left out of formal sector housing and land markets. Meanwhile, slums and informal settlements – which were still viewed as a limited "market failure" in the early 1990s – have continued to grow in many regions. In sub-Saharan Africa,

where many countries have urbanized rapidly without economic growth, these irregular settlements consume the great bulk of many cities. It is now clear that these impoverished, poorly housed, and poorly serviced areas are at least semi-permanent features of the urban landscape in many regions (Fay, 2000).

In retrospect, the initial enabling markets approach was far too sanguine about the difficulties of creating "well-functioning" housing markets – where "everyone is housed adequately…..at a reasonable share of income" and "residential land is available at a reasonable price" (World Bank, 1994). The urban process is also much more complex and diverse now than when the World Bank first started its work (Buckley, 2005). Well-functioning housing and land markets are powerful but difficult to create and maintain, and must frequently be supplemented with interventions to overcome large-scale market failures. This is true not only in developing countries but also in developed countries. Housing affordability has declined both in Western Europe and in the U.S. and Canada in recent years.

Some have speculated that the enabling housing markets approach appears to be a "transition to a moment when much greater and more systematic attention needs to be paid to housing, land, and urban development." (Laquian, 2005) This is not just the job of the public sector. Gross Domestic Product (GDP) in developing countries overall is growing by an average of over 6% per annum, compared to rates of around 2% for the developed world. Housing is the largest single investment of the majority low- and moderate-income population.

Surely, if markets are to play a substantial role in development, then the private sector could have a substantial role in low-income housing and land. However, the private sector organizations that employ the most effective management methods and that have the greatest capacity to help low-income households – multi-national corporations and large local companies – generally do not understand low-income markets, and – with some notable exceptions – have kept out of them (Prahalad, 2005). Instead, marginal producers and suppliers of land, building materials, finance, and other inputs to the land development and housing construction process still predominate. The result is, too often, very high-cost, "savage" low-income housing and land markets in which local warlords and public and private crime syndicates greatly increase costs at many key transition points (Buckley, 2005).

Thus, the methods and models for involving the private sector constructively in solving low-income housing problems are yet to be discovered and implemented on a large scale. An encouraging exception is that of CEMEX, the third largest cement maker in the world, in satisfying markets for progressive housing in Mexico. The CEMEX "Patrimonio Hoy" program organizes small groups of families who commit to a 70-week structured savings program, arranges with local building materials suppliers to deliver high-quality products to these families at competitive prices, and advances microcredit to these families in the form of delivering building materials well prior to the required loan repayment by the households. CEMEX operates this program by establishing offices located in low-income communities, and through utilizing local "promoters" – 98 percent of whom are women – to inform local households about the program. Patrimonio Hoy has proved to be astonishingly successful, reaching 100,000 people in its first two years of operation, with plans to expand this number to one million people over the next five years. The program operates without any public subsidies, and the other two of the top three cement manufacturers of the world – Folcin and Lafarge - have recently launched initiatives to reach the progressive housing market in numerous developing countries. Hence, the involvement of large corporations and application of modern management methods to low-incoming housing still has potential, despite the uneven results of a decade and a half of enabling housing markets.

Due to the crucial importance of urban land for the poor and the failure of the enabling markets approach to address this problem, a land-centered approach appears to be replacing a housing-centered approach to low-income shelter and settlement. Nevertheless, the traditional challenges of housing finance – including how to effectively combine housing credit, housing savings systems, and housing subsidies to make shelter more affordable – remain largely unsolved.

An important area for innovation and program design is the various forms of "low-cost housing solutions." "Low-cost land and housing solutions" consist of a wide range of options that compose the steps of the

progressive housing process. These include serviced and unserviced lots, rehabilitation and improvement, expansion, construction of a core housing unit on a lot already owned by the family (for replacement, to add a unit, for rental), tenure regularization, infrastructure and service upgrading, etc.). These incremental housing solutions cost a small fraction of purchasing of a new commercially built unit. Thus, they represent a fundamental key to large-scale provision of affordable shelter and housing policy in many countries

Joining such project approaches with new technologies including housing microfinance (Ferguson, 2004), organized community participation (Ruster and Imparato, 2003), and selective involvement of the private sector – such as the *Patrimonio Hoy* program of CEMEX – may hold the key to creating a new generation of more effective, more sustainable, and more massive low-income housing projects that really do reach the poor at sufficient scale. In this context, it may be time to re-evaluate the earlier experience of the World Bank and county governments with sites and services, and slum upgrading programs (Buckley, 2005).

In contrast, many government housing programs still often focus on making moderate and middle-income families bankable in order to move formal sector credit and other systems "downmarket" to these groups and to spur economic growth. Physically, the prototype moderate-income housing solution in Latin America consists of a core expandable unit of 25 to 45 square meters that families upgrade and expand in programmed steps, as need and available resources dictate; and, in East Asia, a 40 to 80 square meter housing unit in a multi-story building. The vested interests of the construction and development industry often play a large role in promoting this policy approach. However, most developing countries usually have a very small housing credit system and a potentially more important instrument is providing financial subsidies (Buckley, 2005).

The art of low-income housing program design consists mainly of joining financial resources (subsidies, credit, and household savings) with different types of low-income housing solutions to suit local housing conditions, together with strengthening the financial capacity of government to fund these efforts, and the institutional capacity of other key actors (housing NGOs, local governments, lenders) to perform their roles more effectively in these efforts.

Housing program and policies have reflected the division in the underlying market between formal and informal development. In most emerging countries, only the top 10% to 30% of households can afford to purchase commercially built housing at market prices. This fundamental limitation derives largely from intractable socio-economic realities that define "underdevelopment." Fundamentally, the bulk of households have very low incomes. Even in Mexico, a dynamic middle-income country, for example, half of the households earn less than US $450 per month. Real interest rates – including mortgage rates – are often extraordinarily high – from 7% to 20% above inflation (compared to those in most affluent countries today of 1% to 4% above inflation) – reflecting macroeconomic imbalances (fiscal and trade deficits) and high risks (e.g. rapid devaluation, political instability).

In this context, most financial institutions are either unwilling to lend at the long maturities associated with mortgage finance in developed countries, or ration such lending to their best customers (the upper and middle classes) in order to avoid interest-rate risk and other financial problems. . The fixed costs (including loan processing and underwriting, and titling) of mortgage lending also make up a larger share of the smaller loans required by lower income households, contributing to raising the effective interest rate for less prosperous families. Even when they can get mortgage credit, most low-income households are highly reluctant to take on the long-term risks of such large loans because their incomes and employment fluctuate greatly. Thus, the market for the supply of and demand for mortgage loans for low-income households tends to be relatively non-existent. Titling problems and infrastructure extension substantially limit the amount of available urban land on which formal sector development can occur. In turn, developers build their businesses around serving a relatively small number of middle- and upper-income households, rather than the low- and moderate-income majority.

Historically the production of affordable or "social" housing has served as a way to push formal market mechanisms – starting with mortgage finance – down to reach a greater share of the population and to reduce informal development. Many countries have also attempted to use government-assisted housing production as a means of generating economic growth and employment. This strategy has a long tradition, dating at least to the housing programs and institutions that the U.S. government instituted (e.g. the Federal Housing Administration's home mortgage insurance program, secondary mortgage market institutions including Fannie Mae to purchase and securitize these loans, and a housing finance liquidity facility like the Federal Housing Loan Bank System) to stimulate economic growth in the face of mass unemployment and mortgage foreclosures during the Great Depression of the 1930s. Indeed, housing expenditures typically have a large impact on the economy (through their high economic multiplier effect) and in generating unskilled and semi-skilled employment.

The experience of Latin America and of East Asia stands out. The archetypal Latin-American case is that of Chile. Starting in the mid-1970s, Chile replaced a confusing variety of supply-side subsidies (including discounted land costs and below-market rate mortgage loans channeled through developers and financial institutions) with a "direct demand" housing subsidy. In effect, the direct-demand subsidy gives a grant to eligible families, thus enabling these households to combine the subsidy with a market-rate mortgage loan and their own savings for the downpayment in order to purchase a new developer-built home.

A central purpose of Chile's direct-demand subsidy has been to stimulate home mortgage credit and household savings. Chilean households have used these portable vouchers to shop for new housing by choosing among developers and projects, and to access mortgage financing by choosing among financial institutions, which compete for their business. The Chilean direct-demand subsidy has used a sophisticated beneficiary selection point system in which households qualify for these direct-demand subsidies based on their "effort" (determined by the size and length of their household savings) as well as their "need" (measuring income levels, number of family members, condition of existing habitation, etc.). The Chilean national government had used similar subsidies and point systems on other social programs, and was experienced in managing the considerable administrative complexities involved. The Chilean financial system was also capable of providing the complementary mortgage credit. Finally, the adoption of Chile's direct-demand subsidy system coincided with the start of a long period of relatively high national economic growth. Over the next 25 years, Chilean GDP increased at rates averaging 7% per annum, which has helped to expand government budgets and, therefore, funding for the housing subsidies, reinforced by a strong political commitment to the highly popular direct-demand program.

Under these circumstances, Chile's direct-demand housing subsidy program has performed very well. Formal housing production has exceeded new household formation for much of the last three decades. This success has virtually halted new informal development. Slum upgrading programs have largely addressed the remaining slums left over from prior eras. Even in Chile, however, the mechanism of a direct-demand subsidy has failed to stimulate formal-sector financial institutions and developers to serve low-income households, and national government continued to build for and finance directly this group (a process called "turnkey development"). Thus, the direct-demand housing subsidy program has worked well to incorporate moderate and middle-income households into formal systems, but not the poor.

Chile's impressive success with housing has reverberated throughout Latin America. Most other Latin American countries have adopted parts of the direct-demand subsidy Chilean model (Ferguson, 1996). Of these, Costa Rica, which adopted a direct-demand subsidy approach in the late 1980s, has had the greatest success. Similar to Chile, Costa Rica has built formal sector units at rates above new household formation and greatly reduced informal settlement. Costa Rica's greatest success has involved the emergence of a network of strong and sophisticated housing cooperatives and NGO developers that have used the direct-demand subsidy to reach low-income households.

Most other Latin-American countries, however, have adopted only parts of the Chilean model and lacked many of the favorable conditions prevalent in Chile at the time. The most common problems have included uneven funding of the subsidy system and – as a result – disruptive lapses in the program that have cost economic actors (developers and financial institutions) great sums of money and damaged

program credibility, lack of complementary credit for low-income households who are thus unable to complete the subsidy with a mortgage and unable to use the subsidy, lack of a supply of appropriate units due to a combination of uninterested developers and high land prices and insufficient land availability, and fraud and/or politicization in the use or targeting of the subsidy rooted partly in administrative shortcomings.

In contrast with Chile, housing subsidies in much of Latin America have largely replaced housing credit and household savings rather than stimulated these more sustainable forms of home finance. Housing subsidies (direct-demand subsidies as well as other modes of subvention) have also widely served political ends – to gain votes of household beneficiaries and to channel housing development and finance business to firms that are allies or friends. Housing subsidy systems also often develop incrementally without following basic principles (transparency, targeting, efficiency, administrative simplicity, sustainability) and join many components (land discounts, below-market interest rate loans, prompt-payment discounts, direct-demand subsidies, and others) into a convoluted whole (Hoek-Smit, 2005).

Finally, urban land prices tend to rise to consume ever-greater portions of the subsidy, even in Chile. Pumping more money – whether subsidies or credit – into a housing and land system suffering from important bottlenecks tends to raise land prices rather than reach targeted households.

These problems have resulted in uneven experiences with direct-demand housing subsidies and in poor performance in enabling formal sector systems to reach low-income families in most Latin American countries, although they are often an improvement on the supply-side subsidies that they have replaced. Here, as in most of the developing world (Africa, South Asia), informal development continues to have a predominant role in low-income shelter and settlement, and formalizing informal development remains the most viable overall approach to affordable housing (Soliman, 2004). New technologies and approaches to financing such as housing microfinance (Ferguson, 2004; UN-Habitat, 2005) and providing land for progressive development of many different types of low-cost housing solutions (Ferguson, 2003b) that reproduce but reduce the costs and increase the benefits of progressive housing represent the way forward in these areas.

The East Asian approach (e.g. Singapore, Hong Kong, China) to stimulating formal sector housing development contrasts with, as well as has some similarities to, that of Latin America. The East Asian housing strategy has accompanied rapid GDP growth and has occurred in the context of the region's overall approach to economic development, often called the "developmental state." In addition, governments have either owned or managed a great deal of urban land. The interventionist public role in land development and the extremely high densities of East Asian cities have resulted primarily in high-rise apartment building. Finally, as Chile and Costa Rica, governments of East Asian countries have invested large sums over long periods in affordable housing, funded the production of large numbers of units relative to new household formation, and thus have substantially reduced the number and size of urban informal settlements.

Development on the Urban Fringe and in the City Center, and Improving Urban Environmental Sustainability

Development on the urban fringe increasingly takes polarized forms in developing countries. Low-income households – although not the poorest, whose main priority is to live as close as possible to jobs in the city center – tend to occupy sprawling informal subdivisions on the periphery. Subsidized government housing development for low- and moderate-income families depends on the availability of low-cost land, also located on or beyond the urban fringe. At the other end of the income spectrum, the elite follow manufacturing subsidiaries of international companies, universities, local high-tech manufacturers, and international service-providers, and commercial establishments to the suburbs, and increasingly live in gated suburban communities.

The resulting sprawl has strong negative environmental impacts. It consumes agricultural and environmentally sensitive land. Metropolitan growth also contributes to threatening an absolute global shortage of fresh water. Utility companies must go farther afield to obtain new sources of water, and spend skyrocketing sums on processing, pumping, and transporting it to increasingly extensive service areas. Desalinization technologies may have a role to play here in coastal cities. Most troubling of all, sprawl joined with the export of old, highly-polluting manufacturing, power generation, and automotive technologies has substantially increased the emissions of carbon dioxide and other greenhouse gases throughout the world, greatly contributing to the rapidly growing global crisis of climate change.

The alternative to sprawl involves greater densification of existing urban areas, particularly around transport nodes. In this regard, many larger and older developing country metropolitan areas have come to assume the spatial form of U.S. cities. Congestion, crime, and the flight of middle-class households to the suburbs has left behind central cities confronted with declining population and employment.

Redevelopment of central cities appears to make sense. After all, these areas already have developed infrastructure systems and widely available services, and they are located much closer to most jobs than the peripheral urban communities. On closer inspection, however, the costs of purchasing, cleaning (necessary for "brownfields" sites formerly used for polluting industries), and developing centrally located sites are usually higher than development costs on the fringe. Strong public-private partnerships are essential to assemble sufficiently large parcels of centrally located land to make such redevelopment projects economically viable. While redevelopment of central cities has a long history in the U.S. and Western Europe, most developing countries are only now beginning to build the institutions and legal frameworks for such public-private partnerships.

Virtually all net growth of the world's population until 2050 is projected to occur in urban areas of emerging countries (except for the U.S., which is the one developed country where population and urban growth continues at moderate rates, mainly because of large-scale immigration to that country from the developing world). In effect, relatively poor countries will have to build the equivalent of a city of more than one million people each week for the next 45 years (Cohen, 2006). This challenge involves doubling the amount of urban infrastructure investment on the planet in the next half century. After that, if population growth rates continue to decline as they have since 1970 (from 2.1% per annum to 1.2% today), world population will stabilize.

The ecological impact of this expansion of cities over the next half century forms part of a global environmental crisis that biologist E.O. Wilson of Harvard University has called "the bottleneck" – a period of maximum stress on natural resources and human ingenuity: "Depending on how we manage the next few decades, we could usher in environmental sustainability – or collapse." (Musser, 2005)

The ecological impact of cities begins with their location. Many major cities were established in regions of exceptional agricultural productivity – such as the flood plains of rivers – or in coastal zones and islands with favorable access to marine food resources and maritime commerce. These sites now greatly magnify the environmental consequences of growing urban populations. Many cities – especially in developing countries – have expanded in area rather increased their density, using the fertile agricultural land around them. If cities double in area by 2050, urban areas will go from occupying 2% to 3% of ice-free land to 6%, thus consuming a considerable part of the 10% to 15% of the land considered arable (Musser, 2005). The rivers, seas, and – even – oceans - on which these cities sit face a growing challenge from urban waste. These sites also increase the vulnerability of large urban populations to natural disasters, which environmental problems, especially global warming, are making increasingly frequent.

The tendency of most cities to expand on the urban and even peri-urban fringe rather than densify at the center, increases travel times and congestion, and has disastrous implications in terms of accelerating climate change. Greenhouse gas emissions – particularly carbon dioxide – from internal combustion engines have contributed to an increase in the excessive burning of fossil fuels from under 1 gigaton of carbon at the start of the Industrial Revolution in the early 1800s to over 7 gigatons today (Musser, 2005).

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