

Urbanization & Associated Issues: A Framework for Sustainable Urban Development

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Abstract

In 1800 only about 2 percent of the world's population lived in urban areas, in only 200 years, the world's urban population has grown to nearly 50 percent of all people. Both the increase in and the redistribution of the earth's population are one of the most irreversible human impacts on the global biosphere. It hastens the loss of highly productive farmland, affects energy demand, alters the climate, modifies hydrologic and biogeochemical cycles, fragments habitats, and reduces biodiversity. We see these effects on multiple levels. The environmental impacts of urban expansion reach far beyond urban areas themselves. In rapidly urbanizing areas, agriculture intensifies on remaining undeveloped land and is likely to expand to new areas, putting pressure on land resources. Furthermore, urban areas change precipitation patterns at scales of hundreds of square kilometers. The urban expansion will affect the global climate as well. Direct loss in vegetation biomass from areas with a high probability of urban expansion is predicted to contribute about 5% of total emissions from tropical deforestation and land-use change. Urbanization also affects CO2 emissions and heat budgets and circulation of water.

Many of the effects of urban areas on the environment are not necessarily linear. Bigger urban areas do not always create more environmental problems. And small urban areas can cause large problems. Much of what determines the extent of the environmental impacts is how the urban populations behave — their consumption and living patterns — not just how large they are. This paper outlines that as evidenced by many cities in the developed world and also the rapidly evolving new cities in China, the impact of urbanization on the environment can be managed by a two-pronged approach — improving the finances of the city and efficient governance — the combination creates the required infrastructure and support ecosystem to foster the right kind of behavioral choices by the urban residents to reduce the energy consumption and carbon footprint.

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Introduction

The trend for urbanization is accelerating across the developing economies because cities provide greater opportunities to receive employment, education, health care, and services such as entertainment. The urban poor has less opportunity for education than the urban non poor, but still, they have more chance than rural populations. Urbanization brings higher productivity because of its positive externalities and economies of scale. The same output can be produced using fewer resources with urban agglomeration than without. In this sense, urbanization reduces the ecological footprint. The service sector requires urbanization because it needs a concentration of clients.

The rapid increase in the world's population and urbanization has magnified the effects of our agricultural and economic activities on the environment through their consumption of food, energy, water, and land. People who live in urban areas have very different consumption patterns than residents in rural areas. For example, urban populations consume much more food, energy, and durable goods than rural populations. Energy consumption for electricity, transportation, cooking, and heating is much higher in urban areas than in rural villages. For example, urban populations have many more cars than rural populations per capita. Comparisons of changes in world energy consumption per capita and GNP show that the two are positively correlated but may not change at the same rate. As countries move from using non-commercial forms of energy to commercial forms, the relative price of energy increases. Economies, therefore, often become more efficient as they develop because of advances in technology and changes in consumer behavior. The urbanization of the world's populations, however, will increase aggregate energy use, despite efficiencies and new technologies. And the increased consumption of energy is likely to have deleterious environmental effects, urban sprawl and industrial activities, such as power generation, transportation, construction, garbage and waste disposal, harm the environment.

Urban consumption of energy also creates heat islands that can change local weather patterns and weather downwind from the heat islands. The heat island phenomenon is created because cities radiate heat back into the atmosphere at a rate 15 percent to 30 percent less than rural areas. The combination of the increased energy consumption and difference in radiation means that cities are warmer than rural areas (0.6 to 1.3 C). These heat islands become traps for atmospheric pollutants. Cloudiness and fog occur with greater frequency. Urbanization also affects the broader regional environments. Regions downwind from large industrial complexes also see increases in the amount of precipitation and air pollution.

Urban areas affect not only the weather patterns, but also the runoff patterns for water. Urban areas generally generate more rain, but they reduce the infiltration of water and lower the water tables. This means that runoff occurs more rapidly with greater peak flows. Flood volumes increase, as do floods and water pollution downstream.

Since the 1950s, many cities in developed countries have met urban environmental challenges. Los Angeles has dramatically reduced air pollution. Many towns that grew up near rivers have succeeded in cleaning up the waters they befouled with industrial development. But cities at the beginning of their development generally have less wealth to devote to the mitigation of urban environmental impacts. Capital costs for building improved environmental infrastructure — for example, investments in a cleaner public transportation system such as a subway — and for building more hospitals and clinics are high. And if the lack of resources is accompanied by inefficient government, a growing city may need many years for mitigation.

Governance as a Pre-Requisite to Impact Management

Strong urban governance is critical to making progress. But it is often the resource in the shortest supply. Inadequate governance can be in the form of weak institutional capacity, poor inter-sectoral coordination, Lack of effective public accountability, Inadequate regulatory policies, Unclear property rights, Inefficient economic policies and Insufficient knowledge and information, and plain simple lack of Skills and capabilities - managerial, technical, regulatory and financial. Overlapping jurisdictions for water, air, roads, housing, and industrial development frustrate efficient governance of these vital environmental resources.

When strong urban governance is lacking, public-private partnerships can become more important. These kinds of partnerships can help set priorities that are shared broadly, and therefore, implemented. Public private partnerships are often used to fund infrastructure projects and have been growing in popularity. Public private partnerships can play a leading role in shaping tomorrow's markets, effectively overcoming policy and market weaknesses and failures by catalyzing policies, creating standards, strengthening price signals, mobilizing and directing capital, and supporting technology development.

It is important to develop a strong methodological approach to assess the potential of public private partnerships (PPPs) – to analyze whether the PPP there is alignment of interests across the value chain and whether the partnership can scale appropriately and rapidly and whether the partnership allows the partners to overcome barriers that they would have been unable to conquer alone. It is important

to create the right legal framework for the PPP, prioritize political smart projects based on quantifiable public goals and create a clear and transparent process with active engagement of stakeholders.

PPPs often tend to be most suitable in pre competitive industry situations or when the price is not the only barrier to implementation. For example, there may be additional barriers beyond “getting prices right” that need to be overcome to accelerate change, including awareness and behavioral failures, policy failures, capital failures, technology failures, and coordination failures. In other cases, there may be a first-mover disadvantage such that competitors are not incentivized to take action in the current rules of the market.

By and large five core archetypes of PPPs are advocated,

1. Awareness raising and behavioral shift;
2. Policy and regulation;
3. Capital mobilization;
4. Product development;
5. Coordination and Delivery.

It is imperative to strengthen public finance, transparency, and accountability. Public finance can be improved by broadening the tax and revenue base and by increasing the access of urban governments to broader and deeper capital markets in order to lower infrastructure and public service costs. The public sector can play a role in helping mitigate the risk of potential investments to create an environment where private investment in these resource productivity opportunities is more viable. The public sector can help mitigate the risks to capital, such as policy risk, and for foreign investors, foreign exchange risk. There is often a high cost of debt linked to the local financial sector being relatively unfamiliar with the risks and opportunities and therefore being unable to appropriately ‘cost’ debt financing). There is also a role for encouraging local financial institutions to see this area as a commercial opportunity, by incentivizing local financial institutions through (credit analysis, support with financial product development, sector studies and offering loan guarantees and other co financing instruments. Public procurement can play a role in providing reliable demand for new products as well as helping drive scale.

Another top priority is to improve energy efficiency and conservation through appropriate pricing, regulations, and public sector support. It is vital to get prices right so that they incorporate the full social costs and benefits, and ensure the efficient allocation of resources. This can be done by imposing congestion and emission charges,

as in Singapore, and by removing inefficient subsidies, as in Indonesia. Other examples are the introduction of carbon taxes, as in the Republic of Korea, and increasing block pricing for water, electricity, and other public utilities, as in the Philippines.

Town Planning

Because land-use decisions are critical determinants of environmental quality it is imperative that land use controls be effectively practiced to combat such problems as pollution, the occupation of hazard-prone areas, the degradation of wetlands and other coastal resources, and the loss of open space and other cultural resources. The ways to accomplish these are:

1. Land Use and Maintenance: Ecological land-use planning, building/area restoration, open space preservation, tree planting, community gardens, etc. Essentially, strategies and techniques that protect and restore ecology within urban communities.
2. Energy Efficiency: Energy-efficient buildings and energy conservation in general. Examples include urban design enabling individual buildings to maximize solar access, and the design and construction of dwellings that are designed with passive solar design principles to utilize available solar access.
3. Water: Water conservation, rainwater harvesting, greywater harvesting, water treatment and wastewater reuse.
4. Pollution Control: Recycling of food and other solid wastes, reduction of industrial wastes, enforcing air/noise pollution control.
5. Density planning: Effective town planning to manage energy spent in daily commutes, reviving city centers and developing compact, walkable satellite cities centered on efficient train, light rail, or subway systems, and speedy connections to and from satellite cities.

Urban ecology strives to create, preserve and restore green and open spaces sustainably. It provides many environmental benefits: it reduces the urban heat island effect, minimizes our use of pesticides, conserves energy, cleans urban air, and absorbs carbon dioxide from the atmosphere. But urban ecology also offers a practical day-to-day understanding and linkage between urbanites and nature.

Governments' existing decision-making processes for land-use, planning and approvals are too fragmented, expensive, and time-consuming; insufficiently sensitive to environmental and social factors; excessively rigid and rule-bound; too slow, reactive, and arbitrary; and unable to ensure, even to promise, attractive, vibrant, and sustainable settlements. The best practices of successful sustainable neighborhoods are too little known and are not taken into account in urban design tools, besides there is no existing

comparative analysis of best practices that would provide common guidelines for the implementation of new autonomous sustainable neighborhoods.

The best use of urban space must be proactively planned and controlled, rather than result from an adhoc response of the land use/management authority to the development proposals that emanate from corporate citizens and groups from time to time. Certainly, most urban areas have fairly well-established patterns of growth -residential and commercial. And such development understandably links residential areas to schools and workplaces by day, as well as nightly entertainment and weekend sports and recreation. It is also clear that the physical and social environments and their evolution can play a major role in how urban space is utilized in a priority and cost-beneficial way.

Finally, the higher standard of living associated with urbanization generates revenues that fund infrastructure projects, reducing congestion and improving public health. Urbanization fosters a pro-environment stance among property owners and the middle class, which is crucial for the introduction and enforcement of environmental laws and regulations.

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