

Smart Growth: An Approach to Historical, Agricultural and Environmental Preservation

Tasnim Feroze

Fariba Siddiq

Tasfia Tasnim

Student, Department of Urban and Regional Planning

Bangladesh University of Engineering and Technology (BUET)

Introduction

Smart growth is a planned approach to urban development that concentrates growth in compact urban centers to avoid urban sprawl and protect environment by promoting relatively high residential density with mixed land use. It is based on an efficient public transport system which encourages walking and cycling, low energy consumption and reduced pollution. Planning process needs coordinated and planned decisions between jurisdictions and stakeholders. Though development on the fringe remains attractive to developers for its ease of access and construction, lower land costs, and potential for developers to assemble larger parcels, smart growth also supports and directs developments towards existing communities. Smart growth approach can preserve historical, agricultural and environmental sites with the help of its policies which encourage more compact, mixed, multi-modal development.

Smart Growth

The U.S. Environmental Protection Agency defines smart growth as “development that serves the economy, the community, and the environment. It changes the terms of the development debate away from the traditional growth/no growth question to how and where should new development be accommodated”. Smart growth is related to particular attributes. They are as follows:

Mixed Land Uses

In contrast to conventional development approaches that isolate residential, commercial, and civic uses from one another, mixing land uses creates vibrant, sustainable communities. Putting homes, stores, offices, schools, and other uses close

to one another makes it easier for residents to walk or bike to their daily destinations instead of driving. Communities can use existing infrastructure more efficiently, with the same sidewalks, streets, and utility systems serving homes, commercial centers, and civic places. Having these diverse uses in the same neighborhood generates vibrancy from active, pedestrian-friendly streets, sidewalks, and public spaces. A walk-able, bike-able neighborhood and people's activity in public spaces provide a strong view of neighborhood character.

Integration of Advantage of Compact Building Design

Well-designed, appropriately scaled compact development which involves vertical development rather than horizontal development accommodates more uses on less land, which preserves natural areas and requires less funding for building and maintaining infrastructure. It is easier to provide various utility facilities in compact neighborhoods. Compact communities can provide a wide range of housing choices, from single-family homes to apartments and townhouses, allowing people of different incomes and at different stages of life to live in the same neighborhood.

Creation of a Range of Housing Opportunities and Choices

Good, affordable housing is the foundation of communities and an essential part of smart growth. A range of housing size, cost, and density should be provided in each community to promote a mixture of income and age groups in each community, and to provide a range of housing choice to meet market needs. Housing structure and location influence access to jobs, schools, and other amenities, along with opportunities for people to interact and the overall feel of a community.

Walk able Neighborhoods

Walk able neighborhoods have a center, whether it is a main street or a public space where enough people for businesses to flourish and for public transit to run frequently. Walk-able communities are designed so that most destinations are within a 15-minute walk of home and work or other services. They contain pedestrian-friendly streets designed for bicyclists, pedestrians, and transit in which buildings are positioned close to street. Walk-ability offers surprising benefits to our health, the environment, our finances, and our communities.

Fostering of Distinctive, Attractive Communities with a Strong Sense of Place

Communities with a strong **sense of place** build on their unique history, identity and assets to foster community pride, increase social interaction and market their community to potential businesses and residents. Vibrant streets and attractive public

spaces are symbols of healthy communities. Distinctive features such as tree-lined boulevards, historic buildings, or rows of shops and cafes make neighborhoods and downtown centers places where people want to be. Smart growth approaches reflect the varied interests of community residents, creating a more cohesive community fabric that helps maintain economic vitality.

Preservation of Open Space, Farmland, Natural Beauty and Critical Environmental Areas

Open spaces play an essential role in the economic, environmental, and social well-being of communities. Natural areas and parks increase neighboring property values, attract businesses and residents, support tourism, offer opportunities for recreation, and provide scenic value. Wetlands, forests, stream buffers, and other critical environmental areas provide many additional benefits, including water and air filtration, recharge of precious groundwater resources, protection of drinking water supplies, and habitat for plants, animals, and beneficial insects. Conserving these resources is important to the environmental health and well-being of any community as it grows or redevelops.

Strengthening and Directing Development towards Existing Communities

Sustainable growth directs developments towards communities already served by infrastructure, seeking to utilize the resources that existing neighborhoods offer and to maintain the value of public and private investment. By encouraging development in existing areas, communities benefit from a stronger tax base, closer proximity of jobs and services, increased efficiency of already developed land and space. In addition, the process of increasing development in existing communities can maximize the use of existing impervious surfaces, thereby improving local and regional water quality, and can create opportunities for more transportation options, which lower vehicle miles traveled and ultimately improve regional air quality. Often existing neighborhoods can accommodate much of the growth that communities require through infill development, brown-fields redevelopment and the rehabilitation of existing buildings.

Provision of a Variety of Transportation Choices

Smart growth gives people more options for getting around meets many community goals. When people find it easy and safe to walk, bike, or take transit, they no longer have to rely exclusively on cars to get to shops, work, and school, reducing air pollution and traffic congestion. Walking and biking also help people include physical activity in their daily routines, give more freedom to those unable or unwilling to drive, and can reduce household transportation costs.

Making Development Decisions Predictable, Fair and Cost Effective

For a community to be successful in implementing smart growth, the concept must be incorporated by the private sector. Only private capital markets can supply the large amounts of money needed to meet the growing demand for smart growth developments. For development projects to succeed, they must be buildable within a reasonable timeframe, with a likely profit commensurate with their risk. The public sector can support environmentally responsible development by reducing barriers to smart growth, ensuring that the development process for all projects is efficient, fair, and transparent.

Community and Stakeholder Collaboration in Development Decisions

One of smart growth's signature characteristics is a meaningful public involvement process that ensures that the needs and concerns of all affected stakeholders are identified and addressed. Successful development requires inclusive planning processes that give community members and other stakeholders a clear voice in the development process. Growth can create great places to live, work, and play-if it responds to the community's vision of how and where it wants to grow.

Smart Growth in Historical Preservation

Historical features and buildings are precious asset for communities adding to the dynamism of an urban area. It often becomes difficult to preserve these historical features in case of sprawl due to the expansion in an uncontrolled manner. Uncontrolled growth does not trail any planned approach and more than required space becomes occupied for housing and relevant purposes. On the other hand, smart growth facilitates the preservation of historical features as it emphasizes growth in a concentrated manner leaving sufficient floor to conserve the city's heritages. PDR (Purchase of Development Right) or TDR (Transfer of Development Right) are effective instrument for motivating the owners towards preservation. Different other tax incentives can be helpful also.

Smart Growth in Agricultural Land Protection

Agricultural lands in the suburbs and fringe areas often get invaded by the expansion of nearby cities and for provision of housing. For the last two decades, the encroachment of farmlands, wet lands and water bodies in Dhaka has accelerated at a vulnerable rate. Agricultural land conservation is very important for ensuring food base and for the residents and for strengthening economic progress of a city and its

catchment area. Greenbelts, forest reserves, landscapes, open spaces and water bodies need to be conserved for providing healthy life to inhabitants and attractive appearance to an area. In sprawl growth, often these resources are destroyed. In developing countries, with escalating inflation, the intrusion of such lands is even more severe. Private developers are involved in such activities to a greater extent to serve their own interest. They encroach acres of agricultural and resourceful lands and fill water bodies which rarely fulfills the housing need of the increasing population. Rather a handful of people with accumulation of wealth are privileged by this who invests their wealth in this unproductive sector. Land markets have repeatedly failed to create satisfactory land use patterns, and instead have fostered residential and commercial sprawl that wastes land resources, provides too little public open space, and destroys wildlife habitat (Freilich 1999; Healy and Short 1981). This poses a serious problem to the sustainability of a city's healthy life as the ecology and drainage is badly affected. But in case of smart approach, development is channelized in more suitable location and infill development is given the utmost priority. Less space is required and the greeneries and agricultural lands can be easily preserved.

Private land preservation may involve any of the following techniques: the purchase or donation of land in fee simple, the purchase or donation of conservation easements (also known as development rights), the transfer of development rights, or limited development. The three common features of these land transactions are: 1) they are voluntary on the part of willing sellers or donors; 2) there are negotiations between buyer and seller or donor and donee; and 3) the seller or donor receives compensation in cash and/or through tax benefits (Wright and Czerniak 2000). For governments, this last feature, in particular, is crucial in avoiding a "taking" of private property without just compensation.

Strategies for preserving the agricultural and farmlands might include the PDR and TDR. The conserved lands might be restricted to certain uses (e.g. farming, passive recreation, timber harvesting, and wildlife protection). In some states, the landowner may receive a reduction in the assessed value of the property for property tax purposes. For instance, the Maryland Environmental Trust, as state agency, has the authority to grant a 15-year property tax abatement on any property on which it receives a conservation easement donation (Daniels and Bowers 1997, 214). The Single Tax on land forces landowners to develop open land or build more intensively and thus can help to concentrate development in urban areas; purchasing development rights removes development potential and thus can curb sprawl in the countryside (Daniels and Lapping 2005).

Smart Growth in Environmental Conservation

Development has its adverse effects but if the development is occurred maintaining smart growth techniques which include compact development, reduced impervious surfaces and improved water detention, mixing of land uses, preservation of natural lands, transit accessibility, and better pedestrian and bicycle amenities, environmental impacts can be reduced.

Air and Water Emission Reduction

Smart growth techniques such as better coordinating land use and transportation; increasing the availability of high-quality transit service; creating redundancy, resiliency and connectivity within their road networks; and ensuring connectivity between pedestrian, bike, transit, and road facilities reduce vehicle travels, shorten travel time and thus this approach ensures less air pollution caused by motor vehicles. Siting a new development in an existing neighborhood, instead of on open space at the suburban fringe can reduce miles driven by as much as 58 percent (EPA-1999). A 2005 Seattle study found that residents of neighborhoods where land uses were mixed and streets are better connected, making non-auto travel easier and more convenient, traveled 26 percent fewer vehicle miles than residents of neighborhoods that were more dispersed and less connected (Lawrence Frank and Company, 2005). More than 38 percent of national carbon monoxide emissions and 38 percent of nitrogen oxide emissions come from highway vehicles (EPA-2012). So if communities plan to make it easy for people to choose to walk, bicycle, or take public transit can also reduce air pollution by reducing automobile mileage and smog-forming emissions.

The second most common source of water pollution for estuaries, the third most common for lakes, and the fourth most common for rivers is toxic chemicals such as phosphorus, and nitrogen. Runoff from developed areas often contains these chemicals. Smart growth approach includes compact development and open space preservation that can help protect water quality by reducing the amount of paved surfaces and by allowing natural lands to filter rainwater and runoff before it reaches drinking-water supplies (EPA-2000). Development in watersheds makes water polluted and degraded and thus it becomes unfit for drinking, swimming, fishing, and other uses and the quantity, quality, and diversity of stream habitat for aquatic life are reduced (EPA-2013). Smart growth can protect water quality by concentrating development or with redevelopment. This approach allows building housing near schools, stores and jobs and so less paved roads are required to get between those locations, and fewer pavements means more open space. A study in the Chesapeake

Bay watershed found that concentrated development required about half as much impervious surface as sparsely developed land, and as a result the concentrated development created 43% less polluting runoff. Redevelopment allows new buildings to go up without paving new land and also means no new roads have to be paved out to new development. Mint Plaza, a project in downtown San Francisco that renovated the city's historic U.S. Mint building, won a 2010 Smart Growth Achievement award from the Environmental Protection Agency for its innovative design. The plaza's shifting planes direct rainwater into treatment gardens and an underground infiltration basin, reducing runoff and helping to protect San Francisco Bay (Smart Growth America, 2010).

In-fact smart growth reduces water pollution by reducing air pollution. Reduction in emission of carbon di-oxide and other air pollutants ensures reduction in pollutants that fall on water supply via polluted rainwater.

Green-Space and Wildlife Habitat Preservation

For nearly all plants and animals, species diversity declines with increases in the amount of impervious surface, road density, time since development, human population density, and building density (Pickett et al., 2011). Smart growth involves development in and adjacent to already-developed areas which can help protect natural resources like wetlands, streams, coastlines, and critical habitat. It ensures abundance of open spaces and preservation of wildlife habitat by increasing density and reusing already developed areas. A study of development trends in Orlando, Florida, projected that smart growth principles would reduce wetland and floodplain losses in the area by 20%. Other studies have found that smart growth development helps bird species flourish, with more birds and a greater diversity of species (Smart Growth America, 2010).

Energy Conservation

Smart growth increases density and thus reduces per unit energy consumption and makes it easy to provide electricity, gas, water supply lines to a community. It takes less cost and less labor than in a sprawl area in which a large amount of area has to be covered to provide utilities to all. By providing more transportation choices, which allow for a reduction in vehicle miles traveled and by encouraging walking and bicycling, smart growth ensures conservation of energy. Plants are the best choice to be made when the need is to be energy efficient and smart growth ensures planting by reducing paved areas and providing space for greeneries.

Reduced Heat Island Effects

Urban design plays an important role in formulating heat islands and smart growth can reduce heat island effects through its techniques providing a framework for increasing regional environmental protection, enhancing community character, and strengthening local economies. Following are the four smart growth solutions that can reduce urban heat island effects:

Reducing off-street parking and using porous paving materials:

Smart growth promotes transportation choices through compact and pedestrian oriented development which can minimize the size and number of parking lots and thus reduce heat effects as parking lots transfer heat to the surroundings.

Planting, preserving, and maintaining trees and vegetation:

Trees and plants can incorporate natural environment into built environment by cooling surrounding areas and by increasing evapotranspiration – a natural process that draws heat from the air to convert water in the leaf structure to water vapor. Trees and vegetation can be planted adjacent to homes and buildings which will reduce air conditioning energy demand. They can be planted along medians and sidewalks which will decrease evaporative emissions from cars and filter pollution from the air. Rooftop gardens can mitigate urban heat islands and they also increase the energy efficiency and attractiveness of residential and commercial buildings.

Promoting infill and higher-density development:

Compact development can preserve open space and help offset heat islands and their consequences. A 2001 report found that for every acre of brown-field redevelopment, 4.5 acres of open space is preserved (Stone and et al., 2001).

Increasing public education and outreach:

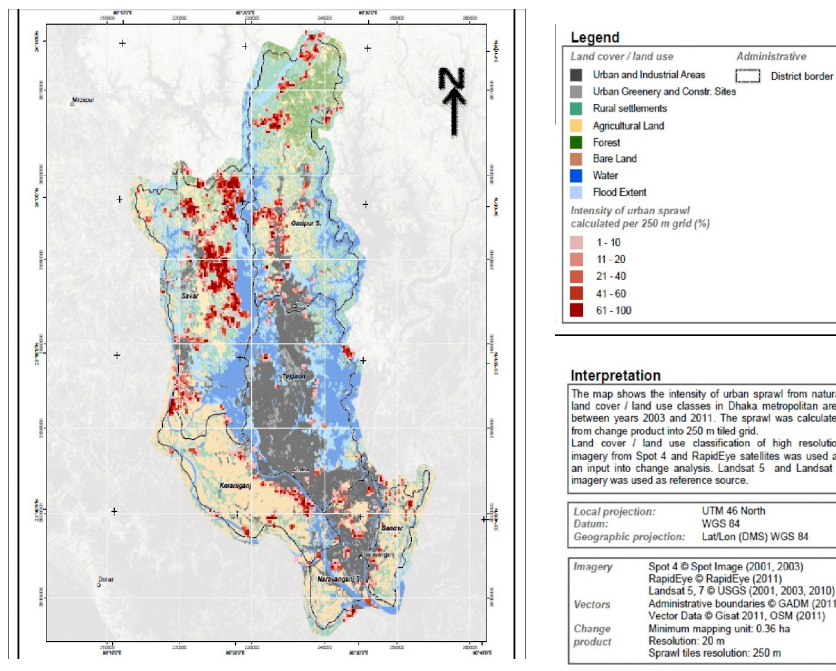
Local variation in the built environment, as well as local preferences and attitudes should be reflected in heat island mitigation strategies. Communities can address urban heat islands and enhance the quality and character of their neighborhoods by working together.

Growth in Context of Dhaka

Though the development in the core of the city has occurred as consolidation, development in the fringe areas has mainly occurred in the form of sprawl. In case of

the inner part of the city, very few approaches go after the characteristics of smart growth and most features trail to unplanned growth. The number of automobiles has been increasing in Dhaka city at the rate of at least 10 percent annually, which has been contributing to air pollution on the one hand and traffic congestion on the other (Mahadi, 2013). According to the Air Quality Management Project (AQMP), funded by the government and the World Bank, an estimated 15,000 premature deaths, as well as several million cases of pulmonary, respiratory and neurological illness are attributed to poor air quality in Dhaka. The World Health Organization (WHO) says vehicular air pollution is a major cause of respiratory distress in urban Bangladesh. Though Dhaka city has a high density, it does not actually fulfill the requirements of smart growth approach. People of Dhaka are highly dependent on private cars as there is lack of various transportation choices. Walking and bicycling amenities are absent in the built environment. Smart growth approach creates open space by increasing density in the developed areas but here in Dhaka, people have occupied almost all spaces with high density. Thus the benefit that smart growth offers by creating high density is almost lost. As a result air and water emission reduction, wildlife habitat preservation, energy conservation and reduction in heat island effects has not been effective here in Dhaka though it has already ensured having a very high density. The problem lies mainly in the transportation choices.

Map of Urban Sprawl Intensity of Dhaka within 2003-2011



Source: Earth Observation for Development (eoworld)

In consideration of the city's outward expansion, it has expanded in an unplanned manner resulting in haphazard development. The intensity of sprawl is mostly observed in Savar, Gazipur and Keranigonj. This mainly occurs as the land grabbers encroach potential agricultural lands, wet lands, forests, farmlands and open spaces to develop as housing projects. The annual loss of agricultural land in Dhaka Division during 2000-2010 was 0.65 percent while forest land decreased to 3.17% during the same period. The rural settlements, urban and industrial area, and charland increased by 4.78%, 8.75% and 9.81 % respectively during 2000-2010. The horizontal expansion results in an inefficient use of space where space is a scarce resource in this developing country in comparison with the ever increasing population.

The area of the city is expanding horizontally because a lot of informal settlements are developing in the inner part or periphery of the city. The development of such informal settlements is causing inefficient use of space; hence the city is expanding horizontally.

According to the DAE, four upazilas and three metro areas of the district have lost 7,982 hectares of agricultural land from 2002 to 2011. Agricultural land in Dhamrai upazila came down to 23,518 hectares in 2011 from 25,581 hectares in 2002. In Savar, the agricultural land shrunk from 18,634 hectares to 17,580 hectares and in Keranigonj the decrease was 9,688 hectares from 11,380 hectares. Nawabganj encompasses 24,481 hectares in total and it has also lost about 1,000 hectares of agricultural land during the period.

In case of wetlands, the scenario is identically worst. Due to illegal earth filling, More than 10,000 acres of wetland have been disappearing each year since 1999. About 77 percent of wetland on the city's eastern fringe had already been filled up. Flood flow zones, retention ponds are being filled at random by land grabbers, even sometimes by the planning authorities themselves violating their own law.

All these irresponsible stances pose a great threat to the city's sustainability as well as destroy the city's healthy and beautiful appeal. If the planning scheme for Dhaka and its suburbs was smart growth incorporating all the developers', inhabitants', planning authorities' and government's good will and concern, the city could easily meet the housing problem of its inhabitants and the potential farmlands, wetlands, agricultural lands, forests and potential environmental areas could be easily preserved. Less space would be required for providing housing and other needs for the city residents. Public transportation needs to be highly encouraged and some restrictions should be made through policies to discourage private cars. The land which is still vacant must be left for greeneries and no more paved areas should be

built to ensure sustainable future. This would give the city healthy life, liveliness and attractive appearance. The historical features can also be conserved which represents the city's heritage and past increasing tourist appeal.

Conclusion

Haphazard and poor development of an area draws out the economic and social vitality out of cities and older Suburbs causing premature and excessive conversion of farmland, open space and natural areas, automobile dependence, consumption of imported oil, air pollution from vehicle-miles traveled, increased public service costs, and water pollution from on-site septic systems and increased storm water runoff from the paving of open space with roads and parking lots. Smart growth emerges to combat the shortcomings of sprawl and creates the prospect for rehabilitation and Use of Historic Buildings, conservation of critical environmental areas upholding a city's exquisiteness and sustainability.

References

- Bangladesh-Dhaka-Urban-Sprawl Intensity 2003-2011, Available at http://siteresources.worldbank.org/INTEOFD/Resources/EOW_GISAT_Dhaka_Sprawl_2003_2011.pdf accessed on 20 October 2013.
- Dhaka Tribune (2013) *Urban Sprawl Eats Up Dhaka's Farmland* Available at <http://www.dhakatribune.com/environment/2013/sep/21/urban-sprawl-eats-dhaka%E2%80%99s-farmland>
- EPA. (2000) *The National Water Quality Inventory: 2000 Report to Congress*. Available at <http://water.epa.gov/lawsregs/guidance/cwa/305b/index.cfm>
- EPA. (2001) *Smart Growth and Urban Heat Islands*. Available at <http://www.epa.gov/heatisland/resources/pdf/smartgrowthheatislands.pdf>
- EPA. (2013) *Our Built and Natural Environments: A Technical Review of the Interactions Between Land Use, Transportation, and Environmental Quality (2nd Edition)*. Available at <http://www.epa.gov/smartgrowth/pdf/b-and-n/b-and-n-EPA-231K13001.pdf>
- IRIN. (2013) *BANGLADESH: Air pollution choking Dhaka*. Available at <http://www.irinnews.org/report/83772/bangladesh-air-pollution-choking-dhaka>
- Islam, M. S., (2007) *Physical Density and Urban Sprawl* Available at <http://www.infra.kth.se/bba/MASTER%20THESISSES/SyfulFinal.pdf>

Lawrence Frank and Company, Inc. (2005) *A Study of Land Use, Transportation, Air Quality, and Health (LUTAQH) in King County, WA*. Available at http://your.kingcounty.gov/healthscape/publications/LUTAQH_final_report.pdf

Mahadi, M. (2013) *Air Pollution in Dhaka City*, Available at

<http://www.scribd.com/doc/10304145/-Air-Pollution-in-Dhaka-City> accessed on 20 October 2013.

Pickett, S.T.A., Cadenasso, M.L., Grove J.M., Boone, C.G., Groffman, P.M., Irwin, E., Kaushal S. S., Marshall V, McGrath B.P., Nilon C.H., Pouyat R.V., Szlavecz K., Troy A., Warren P. (2011) “Urban Ecological Systems: Scientific Foundations and A Decade of Progress” *Journal of Environmental Management* 92 331-362.

Smart Growth America. (2010) *Smart growth protects water quality* Available at <http://www.smartgrowthamerica.org/issues/environment/smart-growth-protects-water-quality/> accessed on 17 October 2013.

Stone, B., and Rodgers, M. O. (2001) “Urban Form and Thermal Efficiency: How the Design of Cities Influences the Urban Heat Island Effect” *Journal of the American Planning Association* 67 (2) 186-198.