

Sustainable Development as a Pathway for Building Ecological Cities

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The world is in the midst of a disquieting period of increasing consumption, population growth, and environmental degradation, and the resulting environmental trends such as global warming, urban sprawl, and land consumption are truly terrifying. The major challenge for cities is in their ability to respond to climate change, peak oil, and decline of ecological regions. Cities need to move away from the idea of reducing their impact on their ecological region to actually enhancing it ecologically (Newman & Jennings, 2008).

Some 60% of ecosystem services are in decline, while consumption is increasing at a rate of more than 80% each year. In addition, 70% of mankind's global footprint comes from carbon emissions, with other pressures being linked to commodities such as crops, meat, fish, and wood, and the fresh water we take from rivers and lakes (World Wide Fund for Nature, 2010). Factors that drive risk in cities are unplanned urban development, inappropriate construction, weak urban governance, concentrations of economic assets, a lack of available land for low-income citizens, rising populations, and increased density (United Nations International Strategy for Disaster Reduction, 2010). The big question is how to meet the needs of urban systems and urban life.

Urban life can play an important role in addressing these problems, particularly by minimizing the ecological footprint of the general public, saving energy, providing a car-free environment, recycling water, using sustainable building materials, and incorporating renewable energies

through green technologies. In recent efforts to achieve this, ecological and technological (eco-tech) urban planning and designs have stood out as an invaluable tool for urban sustainability. City planners have discussed urban sprawl, compact cities, and suburbanization under the heading of urban sustainability for many years (Frey, 1999; Gleeson, 2008; Jenks, Burton, & Williams, 2000; Leitmann, 1999; Oktay, 2004; Schmitz-Günther, 1999; Wheeler, 2004); however, these discussions tend to overemphasize the environmental significance of the urban form and fail to address the deeper sociocultural forces that drive the consumption of natural resources. Under the threat of climate change, peak oil, and water and food shortages in cities, a paradigm shift is needed among planners toward the concepts of urban metabolism and ecological regions (Bogunovich, 2002, 2009; Newman & Jennings, 2008). There exists no definite model for urban sustainability. Hope lies not in a final optimal model in the form of a polycentric urban region, an urban village, a compact city or an eco-village, but in an adaptive and resilient urban system for which the goal in planning is to support the development of the socioecological system's ability (Gleeson, 2008). Ecological cities, urban regions, suburbs, and communities will be protected from heat stress, adverse weather, disrupted resource supplies, and so on through the enactment of the right sustainability policies and use of eco-technologies.

The role of the city planner is to consider all scales of planning and design at a regional, city, and neighborhood level. Smart growth zones, improved strategies, and performance standards should be incorporated in comprehensive plans to reduce exposure, the conservation of ecosystems, and greening of the main corridors, with ecological bridges in ecological regions and water basins (Kucukali & Atabay, 2013). The key tools for the planner are control of the urban form, the creation of compact cities and compact centers in metropolitan areas, New Urbanist developments, and the renovation of suburbs using eco-technologies (Stevens, Berke, & Song, 2010). Neighborhoods can be designed with energy efficiency in mind through

distributed power, and can be greened with the creation of edible landscapes and other green infrastructures (Beatley, 2009).

City planners visualize, analyze, and model dynamic urban systems, estimate population and vulnerability, and create linkages through the use of Geographic Information System-based tools for environmental monitoring and modeling (Godschalk, 2003; Ozbakir, 2012); however, technology is only the tool. A planner should be ready to make radical changes in the city. He or she should have green values and a new social sensibility, and should raise societal awareness in nature. He or she should contribute to community building and service to the Earth, and should be fair, aware of the limited resources of the planet, and able to adopt alternative technologies for the symbiotic and harmonious planning/design of a city.

Some developed countries in Scandinavia, other European countries, Australia, or Canada have adopted international policies, programs, and practices in urban planning such as selecting European Green Capitals, creating ecological neighborhoods, and adopting green certification systems such as LEED, BREEAM, DGNB, and so on at a neighborhood level. Although some developing countries such as China, India, Turkey, or Brazil have made considerable progress in relation to achieving the economic dimension of sustainable development through improving quality of life, the ideals of sustainable development largely remain a distant reality in developing countries, due to factors such as rapid urbanization and increased poverty and unemployment. A practical understanding of sustainable development is especially necessary and urgent in developing countries. So, what are the barriers to ecological city planning and implementation of eco-technologies? These can be listed as follows:

1. Limited knowledge of ecological planning and existing eco-technologies,
2. Lack of appropriate knowledge-sharing systems (best practices are not completely shared; workshops and other activities are still very few),
3. Unsupportive policies,

4. Time and funding limitations,
5. Skill barriers (insufficient education among urban planners, architects, designers, and operators),
6. Challenges that may affect community buy-in,
7. Perception that implementation is difficult,
8. Limited scope of implementation.

Current problems within the planning and administrative system and the lack of key urban legislation are other hurdles that need to be overcome for the implementation of better practices; however, the main barriers seem to be economic. Consequently, developing countries need to provide more resources to expand the green sector and to bring more environmental research to the market. Education and awareness-raising among urban residents who are consumers remain important in this very complex area. Finally, local governments need to set out a clear and predictable regulatory framework.

Turkey is an interesting case among developing countries in the area of ecological city planning. Rapid urban transformation in Turkish cities in recent years has neglected and devastated local values. Traditional cities and urban environments can be evaluated using sustainability principles, and positive qualities can be improved by providing some clues for contemporary planning and design. Traditional Turkish cities in different ecological regions, using sustainable planning and design principles, can be analyzed in this framework.

Sustainable urban planning and design principles can be listed as (Wheeler, 2004):

1. Compact and efficient land use,
2. Less automobile use, more accessibility,
3. Efficient resource use, less pollution and waste by water and storm water management,
4. Natural system restoration, self-sufficiency in food and production by urban agriculture,
5. Better living environments by climate-friendly design,

6. Healthy social ecology, protection of local culture,

7. Sustainable economy, and

8. Public participation.

An organic layout in respect to topography and climate could be found in traditional Turkish settlements. The continuity of local architectural style, different stone construction traditions, and different climatic conditions created various townscapes. Small housing units with small vegetable plots identified neighborhoods with vineyards and gardens in these settlements. A green belt was woven between neighborhoods with vegetable gardens, creeks and orchards, providing solutions of self-sufficiency in food and production. A mixed-use layout existed in traditional Turkish settlements. The home–office relationship was very close. Wider streets led to narrower ones and to cul-de-sacs in a hierarchy where pedestrian flow was prioritized. The cul-de-sacs between houses were semi-public spaces and places of sociality between residents. The solidarity in the community, commercial relationships, common rural history, ethnic or religious identity, mixed income, and common occupations played important roles in a healthy social ecology. Traditional crafts, language, rituals, cultural practices, and construction techniques, use of local food and other items played an important role in the protection of local culture.

Traditional settlements well adapted to nature were examples in the urban environment where better use of local resources, improved local skills and fulfilled needs could be defined on the human scale. Traditional settlements and neighborhoods in ecological regions were closely knitted communities. These settlements should guide new developments harnessing new eco-technologies today.

Eco-cities are also on the agenda of Turkish municipalities. Gaziantep Metropolitan Municipality has an eco-city project in a development area of Gaziantep supported by Agence Française & Development (AFD; 2012) Gaziantep Metropolitan Municipality prepared a

territorial climate/energy plan, which defines the strategy and implements the city's priorities for climate change adaptation. Nilufer Municipality Eco-City in Bursa and Eskisehir Metropolitan Municipality Super-City are other eco-city projects which have not yet been completed. The application of Cittaslow (14 Cittaslow settlements in Turkey) and healthy city models by Turkish municipalities is considered to have a big potential for sustainable development.

Post-carbon, climate responsive, city planning will require a shift in our current way of thinking, as many practices of car-oriented, single-zoned planning will no longer be viable. That is to say, for the ideals of sustainable development to be achieved in developing countries, the various manifestations of poverty, urbanization, and urban transformation need to be carefully considered, analyzed, and incorporated into strategic and local policies geared toward sustainable development. Globally, sustainable development is recognized as a potential pathway for building ecological cities, reducing poverty and unemployment, and safeguarding the natural environment. With the aim of achieving a symbiotic relationship between the economy, society, and ecology, the concept of sustainable development should be increasingly focused on fostering adaptive capabilities and creating opportunities to maintain or achieve desirable social, economic, and ecological systems for both present and future generations.

REFERENCES

- Agence Française & Development. (2012). *4th focus area: Supporting municipalities in their sustainable development*. Retrieved March 24, 2014 from <http://www.afd.fr/lang/en/home/pays/mediterranee-et-moyen-orient/geo/turquie/tr-axes-strategiques-strategie-Turquiestrategie-turkiye/axe-4-accompagner-les-municipalites-dans-leur-developpement-urbain-durable>
- Beatley, T. (2009). *Planning for coastal resilience*. Washington, DC: Island Press.

Bogunovich, D. (2002). Eco-tech cities: Smart metabolism for a green urbanism. In C. A. Brebbia, C. Martin-Duque, & L. C. Wasdhwa (Eds.), *The sustainable city II* (pp. 75–84). London, UK: Witpress.

Bogunovich, D. (2009). From planning sustainable cities to designing resilient urban regions. In C. A. Brebbia, M. Neophytou, E. Barlatos, I. Ioannou, & A. G. Kungalos (Eds.), *Sustainable development and planning IV* (pp. 87–96). London, UK: Witpress. doi: 10.2495/SDP090091

Frey, H. (1999). *Designing the city: Towards a more sustainable urban form*. London, UK: E & FN Spon.

Gleeson, B. (2008). Critical commentary. Waking from the dream: An Australian perspective on urban resilience. *Urban Studies (Edinburgh, Scotland)*, 45, 2653–2668. doi: 10.1177/0042098008098198

Godschalk, D. R. (2003). Urban hazard mitigation: Creating resilient cities. *Natural Hazards Review*, 4(3), 136–143. doi: 10.1061/(ASCE)1527-6988(2003)4:3(136)

Jenks, M., Burton, E., & Williams, K. (2000). *The compact city: A sustainable urban form?* London, UK: E & FN Spon.

Kucukali, U., & Atabay, S. (2013). Havzaların Fiziki Planlamasına Ekolojik Yaklaşım. *Türk Bilimsel Derlemeler Dergisi*, 6(1), 180–183.

Leitmann, J. (1999). *Sustaining cities: Environmental planning and management in urban design*. New York, NY: McGraw-Hill Professional Architecture.

Newman, P., & Jennings, I. (2008). *Cities as sustainable ecosystems principles and practices*. Washington, DC: Island Press.

Oktaç, D. (2004). Urban design for sustainability: A study on the Turkish city. *International Journal of Sustainable Development & World Ecology*, 11, 24–35. doi:

10.1080/13504500409469808

Ozbakir, A. B. (2012). Urban environmental applications of GIScience: Challenges and new trends. In O. Y. Ercoskun (Ed.), *Green and ecological technologies for urban planning: Creating smart cities* (pp. 192–211). Hershey, PA: Information Science Publishing.

Schmitz-Günther, T. (1999). *Living spaces: Sustainable building and design*. Ljubljana: Könnemann.

Stevens, M. R., Berke, P. R., & Song, Y. (2010). Creating disaster-resilient communities: Evaluating the promise and performance of new urbanism. *Landscape and Urban Planning*, 94, 105–115. doi: 10.1016/j.landurbplan.2009.08.004

United Nations International Strategy for Disaster Reduction. (2010). *Making cities resilient: My city is getting ready. 2010-2011 world disaster reduction campaign report*. Geneva, Switzerland: United Nations.

Wheeler, S. M. (2004). *Planning for sustainability: Creating livable, equitable, and ecological communities*. Oxon, UK: Routledge. doi: 10.4324/9780203300565

World Wide Fund for Nature. (2010). *Living planet report*. Gland, Switzerland: World Wide Fund for Nature International.