

# Chapter 3

## Sustainable and Equitable Urbanism: The Role of ICT in Ecological Culture Change and Poverty Alleviation

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### ABSTRACT

*This chapter explores how information and communication technology (ICT) can be used in urban sustainability planning to encourage more ecologically friendly habits and improve social equity. We start by asking why current initiatives to teach ecological urban practices are not more aligned with social equity goals. To understand this misalignment, we review the historical relationship between environmental and social concerns within evolving notions of sustainable development. We then define a framework for urban sustainability that more fully incorporates equity concerns. Unpacking the idea that there are no technical solutions to urban poverty, we argue that intelligent applications of ICT in urban services can significantly improve the reach of public transportation, resource distribution, and civic engagement. We encourage future initiatives to design with social goals in mind, ending with a discussion of current challenges and future opportunities for using ICT in urban sustainability planning.*

### INTRODUCTION

Recently, experiments combining new technologies, incentive structures, and educational activities have shown promising results towards teaching sustainable urban practices. Cities have

successfully used real-time data to educate the public about their choices, as well as harnessed the powers of differential price structures and competitive spirit to encourage people to experiment with their own habits of travel, work, civic participation, and consumption (Spinak, Chiu, and Casalegno, 2008; Mitchell and Casalegno, 2008). Unfortunately, some of the more effective

DOI: 10.4018/978-1-61350-453-6.ch003

solutions in the urban sustainability toolkit have been criticized for disproportionately burdening the poorest urban residents (Albalade and Bel, 2009; Shoup, 2007). Because many of these programs allow people to make tradeoffs between money and convenience or quality, residents on limited budgets are denied the luxury of choice these programs supposedly offer. When the cheaper option – say, using public transportation rather than paying an urban congestion tax to drive downtown – is inaccessible or time-consuming, such “choices” exacerbate pre-existing inequalities. Similarly, information-based initiatives targeting mobile technology users can create problems of unequal access some refer to as a new “mobile digital divide” (ITU, 2007). The danger is that cities may be turning certain public services from rights for all into exclusive privileges for the middle and upper classes in the interests of “sustainability.”

This paper approaches sustainability planning through the lens of social equity, asking: how can initiatives that target individual behavior both improve urban ecological health *and* work to narrow the gap within the dual economy structures that plague many of the world’s largest and most vibrant cities? We argue that cities cannot be ecologically sustainable without social equity, and that poverty alleviation needs to be a central factor in planning “smart cities.” Using case studies from research conducted within the MIT Mobile Experience Lab, we then examine how information and communication technology (ICT) can teach urban residents ecological practices, while also making city services more accessible, more equitably distributed, and more multifunctional. We end with a more theoretical analysis of ICT in sustainability planning.

## **BACKGROUND**

### **Sustainability Includes Social Equity**

The environmental critique has come to be a central part of city planning. Ecological cities are sup-

posed to be compact and efficient, with reduced dependence on personal automobiles, networked and self-powering buildings, and plentiful public green space (Ercoskun, 2010; Kenworthy, 2006; Williams, Burton, and Jenks, 2000). Plans for new-construction eco-cities such as Abu Dhabi’s Masdar and China’s Dongtan promise a near future of closed-loop energy and waste systems and cities that measure their performance in terms of their ecological footprint (Cascio, 2005; Fox, 2008).

According to sustainable development rhetoric, ecological planning should include social equity planning. Conditions leading to environmental degradation are known to also exacerbate public health and resource distribution inequalities as well as stakeholder exclusion within the policy-making process (Agyeman, Bullard, and Evans, 2002; Moore, 2007; Pinderhughes, 2004). Writing about environmental justice in the developing world, David Satterthwaite (2003) cautions:

*It may be misleading to refer to many of the most pressing urban environmental problems as “environmental” because they arise not from some particular shortage of an environmental resource (e.g., land or fresh water) but from economic or political factors that prevent poorer groups from obtaining them or from organizing to demand them. (p. 86)*

Distributional claims such as the one above are acknowledged to be politically difficult to address (Albalade and Bel, 2009; Agyeman, Bullard, and Evans, 2002). However, cities that do not work to alleviate socio-environmental equity imbalances suffer long-term costs – from the lost human productivity due to “diseases of adaptation” in degraded environments (Bullard 1990, p. 7; Camagni, Capello, and Nijkamp 1998) to more general failure to incubate innovations spurred by a “diverse and dynamic” society (McLaren, 2003; Moore, 2007). For these reasons, the intersection of environmental and social equity is a vital area

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