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Sustainable housing applications and policies for low-income self-build and housing rehab☆

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A B S T R A C T

Recent years have seen an increased focus on the role of house construction and retrofitting within the broader agenda of sustainable development and climate change. To date this focus has largely targeted middle- and upper-income residential neighborhoods in urban areas. However, in the United States, and in middle developing countries such as Brazil and Mexico, there is growing recognition that urban sustainability will only gain traction if widespread applications are also incorporated into self-help and do-it-yourself housing construction and home improvements, especially those that address lower-income housing markets. Here we explore some of the potential ways in which contemporary sustainable housing applications may be integrated into the existing housing stock in low-income and informal settlements in the United States and in Latin America. We document the range of sustainable housing applications that are increasingly available in the U.S. as a baseline for discussion and evaluation of the potential application to lower-income segments of the housing market in both developed and developing countries. A heuristic model is presented to assess the extent to which policy makers, NGOs and low-income owner households may realistically participate in sustainable home building. Beyond physical development applications we close by emphasizing that sustainable housing agendas must adopt a holistic approach: one that embraces community and social organizational development, as well as fiscal and juridical policy dimensions.

Introduction: making sustainability sustainable

In a noteworthy weatherization rollout speech given on December 15th 2009 from a Home Depot store, U.S. President Barack Obama described the notion of retrofitting homes with energy efficient insulation as "sexy".[2] Though the moniker "sexy" may surprise many, improving existing housing stock has been an integral component of sustainability since the very inception of the term, which is most commonly dated to the publication of the UN's Brundtland Report in 1987 and which identified "the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Sustainable Development, 1987). While it remains a contested concept (Connelly, 2007) within urban planning and housing policy, sustainable development is considered to be the product of three fundamental goals: environmental protection, economic development and social equity (Campbell, 1996). In meeting these three goals, especially that of social equity, the role of environmental protections and improvements for the poor is key (Higgins & Lutzenhiser, 1995), and must necessarily include attention to low-income and self-help housing – as the Brundtland Report clearly states in Chapter 2.

In the decades since its publication there has been mounting concern over the need to "green" the new as well as the existing housing stock, and it is increasingly evident that sustainable rehabilitation must also address informal and self-help housing, and not just formal and better off residential development. Yet this remains largely a blind spot in housing policy and research, notwithstanding a resurgence of interest in informality among

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[2] http://firstread.msnbc.msn.com/_news/2009/12/15/4427454-obama-insulation-is-sexy.

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architects, planners and policy makers (Brillembourg, Feireiss, & Klumpner, 2005; Roy, 2005). This includes the call for sustainable housing policy to prioritize the needs of the poor, especially those in informal and self-built settlements (Choguill, 2007), together with a shift in focus that not only includes production of housing but also the rehabilitation of the existing stock (Priemus & ten Heuvelhof, 2005).

The importance of addressing the environmental impact of housing within larger debates about climate change and energy usage is both well established and widely accepted. However, the investment necessary to increase the environmental efficiency of existing homes is often seen as incompatible with affordability goals for low-income residents, so that much of the attention paid to home rehabilitation and sustainable home improvements concentrates on formally produced middle- and upper-class housing. Moreover, the focus is mainly in urban areas and developed countries (Varol, Yalciner Ercoskun, & Gurer, 2011), even though the largest areas of residential development in developing countries are to be found in low-income settlements, much of which is developed informally through self-build at the urban periphery (Balchin & Stewart, 2001; Gilbert & Ward, 1985). Thus if significant and meaningful inroads into achieving more sustainable housing are to be achieved it will necessary to figure out ways of making "green" and other applications more accessible to low- and very low-income communities, including those that are self-help or informal – "the acid test of housing policy for the lower income groups" (Choguill, 2007, p. 147). The aim of this paper is to offer insights about how this might be achieved in self-managed and self-built housing undertaken by low-income households in developed and less developed countries. Research from Texas and from a major multi-city housing project in Latin America provide the context for this analysis, and we provide a series of models that highlight a range of sustainable and often low-cost housing policy applications for energy conservation and weatherization; garden and microclimate design; water and wastewater; and solid waste disposal.

Sustainable applications for self-help and housing rehab in comparative perspective

Thus our paper responds to the desire for creative thinking about how sustainable technologies might be applied both to low-income (self-help) settlements in less developed countries, as well as poorer neighborhoods in the USA in order to make them more resource efficient and more sustainable, both to improve the quality of life of the residents as well as to benefit the environment (Winkler, Spalding-Fecher, Tyani, & Matibe, 2002). We will outline new approaches of sustainable housing applications in two contexts: first, that of informal self-help and self-managed low-income housing environments in Latin America and in the southern USA; and second, in the context of lower and middle income do-it-yourself home improvements associated with housing rehab in the older and often deteriorated "first suburbs" housing belts in Latin America and U.S. metropolitan areas. In focusing upon sustainable technologies in the developed countries, we wish to explore the relevance that our findings in the U.S. can have for the self-built housing stock of Latin America. We are interested in exploring how such a "baseline" of possible housing applications might be applied more widely in housing practices and policies, especially in Latin America where poverty levels are more acute, and where self-build is widespread.

Self-help and informal settlements

In Latin America and in less developed countries the majority of the urban population lives in informal settlements in which self-build is the norm (Gilbert & Ward, 1985; Ward, 2012). New settlements continue to be created informally at the urban periphery, albeit at pace that appears to have slowed in the past decade or two, and government policies, quite reasonably, continue to prioritize the provision of basic infrastructure and title regularization However, apart from some "low tech" policy solutions and approaches to sustainability, interest and commitment to urban and housing sustainability in Latin America have not been as well developed as in the U.S.

Less widely known, and with evident differences that cannot be overlooked, low-income and self-help communities in the U.S. share some important characteristics with their Latin American counterparts. One area in which these commonalities are most clearly observed are the peri-urban and *colonia*-type settlements that house some of the nation's lowest income residents. *Colonias* are widespread especially in the southern states bordering Mexico (Mukhija & Monkonnen, 2006; Ward, 1999) and comprise low- and very low-income populations with households earning on average $15,000 or less per year. Informal homestead subdivisions (IFHSs) are similar except that they are to be found beyond the border region in the interior of the Southern states, located 10-20 miles outside of metropolitan areas (Ward & Peters, 2007), and are not quite so poor (average household incomes are likely to be around $25,000), and affordability is achieved through informal or self-financing, as well as through self-help building and management. Different types of self-managed housing exist: self-built homes and extensions; manufactured homes (single or doublewide trailers) that vary greatly in age; and modular housing structures that are erected on site (Ward, 2003). But here, too, the policy agenda has largely eschewed housing sustainability options for self-help and improvement, although the production of new manufactured homes increasingly makes use of more sustainable and energy efficient housing elements (Krigger, 2006). However, for *colonia*-type environments the major constraint when thinking about housing sustainability tends to be that of affordability, and – at least in the past – the lack of low-cost sustainable housing applications provided through the larger do-it-yourself stores such as Home Depot, Lowes, etc. That is rapidly changing as technologies become available at much lower cost, as public awareness and commitment to green practices expands, and as government incentives such as the U.S. Department of Energy Weatherization Assistance Program (McCold, Goeltz, Ternes, & Berry, 2008) and the American Recovery and Reinvestment Act of 2009 come on line to support weatherization and energy efficient home improvements and upgrades.

Rehab of lower-income "first suburbs" and "innerburbs"

Increasingly, too, throughout Latin America older (now) consolidated informal settlements that were created thirty years ago today form part of the intermediate urban area, usually forming rings around the older urban core (see www.lahn.utexas.org). These older settlements developed in the 1970s and 1980s are now fully integrated into cities such that most observers would not imagine that they had begun as shacks and squatter settlements. Families have often subdivided their lots and housing units among (now) grown children and grandchildren. While these settlements are usually fully serviced there are urgent needs for the rehabilitation of the residential environment in order to retrofit and recast the neighborhood and dwelling space to meet contemporary community and household needs (Ward, Jimenez, Grajeda, & Velázquez, 2011).

Similarly in the U.S. the older "first suburbs" of working and middle class neighborhoods that formed from the late 1940s through the 1970s today comprise an inner ring of suburbs that