Brief for GSDR 2015:

Reframing Social Housing as an Infrastructure of Production and Consumption

*Steven A. Moore, University of Texas**

Background

In the classical triangular model of sustainability, the 3-Es (Economic development, Environmental protection, and social Equity), are given equal weight (Campbell 1996). However, in climate change research related to the built environment—the sector of the economy that contributes most to GHG emissions—social equity is rarely considered (Oden 2010). In the context of the built environment, equity is typically understood to mean the provision of housing for the poor by government, and is generally perceived as a social issue separate from the more technical problems of designing low-entropy buildings. In technical terms, *equity* is generally placed outside the system boundaries of sustainable building technology (Odum 1994 [1983]), creating a large gap between the science and social policy of climate change in the built environment.

Being thus marginalized by building science, housing the poor is viewed by society as an unfortunate, yet necessary, public entitlement required to keep the poor from becoming further burdens (either through unemployment, ill-health or political unrest) to the more affluent citizens who pay taxes (Mueller 2013). Research demonstrates this to be a short-sighted and ideological way to understand the opportunities inherent in social equity generally, and social housing in particular (Benner et al 2013).

Using the methods of Science and Technology Studies (STS) (Sismondo 2009) it has been demonstrated that the practice of conventional building science leads to *weak* progress against the challenges of climate change (Moe 2014). To accelerate progress, it is hypothesized here, on the basis of empirical research (Moore 2014; Moore and Wilson 2013), that to catalyze *stronger* progress, social equity must be integrated as a system variable considered in climate change research in the built environment.

Frame Transformations

The field of "frame analysis" was initially developed by Erving Goffman (1974). Goffman used the term "frame" to describe the way individuals perceive reality, arguing that frames help us to interpret what is going on around us and direct our actions. Frames inform the development of values by social groups at home, in school, or other institutional contexts. And new frames of interpretation can be consciously adopted by individuals, and groups (like building scientists) when it is demonstrated, usually through collaborative action, that an alternative frame better serves their interests (Snow et al 1986).

It is hypothesized here that by "reframing" three related concepts—(1) system boundaries, (2) infrastructure, and (3) social housing—building science could be transformed to include social equity concerns, and truly sustainable development can be accomplished

1. System Boundaries

STS scholars have documented that all technological systems are also social systems (Winner 1977). By declaring social equity to be *extra-scientific*, or a variable that cannot be

*The views and opinions expressed are the authors' and do not represent those of the Secretariat of the United Nations. Online publication or dissemination does not imply endorsement by the United Nations studied scientifically, conventional building scientists have, studied only part of the system in question. Technological units within a system are designed and tested by building scientists to maximize only efficiency. For example, high-efficiency heaters would be evaluated on the ratio of fuel input to heat output. The problem is that measuring "unit-efficiency" of a heater may have little or no relation to "system-efficacy," or the ability of the whole system to have the effect desired by inhabitants in a particular context (Moe 2014; Odum 1994 [1983]).

The social half of any system is *designed,* whether consciously or unconsciously. And it is the social side of a system that generally produces unwanted consequences precisely because social considerations are ignored by designers (Woodhouse 2004).

Progressive building scientists (Robinson and Cole 2014; Cole 2013; Svec et al 2012) have, however, theorized an innovative inter-disciplinary research and design method that combines traditional building science and constructivist social science. Such hybrid, or "regenerative" research and design methods consciously reframe system boundaries to change how building science looks at all of the built environment in terms of social equity impact.

In the study of social housing, for example, a typical evaluation would measure how many people were housed per dollar per square foot per year in comparison to similar projects. In other words, the "success" of a project would be measured only by the comparative rate of consumption, or efficiency of various ecological and economic "goods."

By contrast, regenerative building scientists study not only *consumption* of building systems, but also their *production*—how much storm-water was sequestered, how much electricity was produced, how many more days did children attend school, what medical and social costs were avoided by vulnerable people living in stable, healthy environments? In other words, what social and environmental "goods" were both consumed *and* produced within the extended system boundary.

2. Infrastructure

The second concept to be reframed, *infrastructure*, is a relatively young one that derives from the French term coined about 1875. It originally referred only to the means of getting military materials to the war front, but has gradually expanded to refer, first, to "the roads, bridges, rail lines, and similar public works that are required for an industrial economy, or a portion of it, to function," and more recently to, "basic social services such as schools and hospitals" (AHD 1981).

Although infrastructure generally refers to the technological means that serve a single use (sewers, for example), some infrastructures, like Boston's Fenway Park, designed by Frederick Law Olmstead, fulfill many needs at the same time. Fenway is at once, a constructed wetland that treats storm-water, a carbon sequestration system, habitat for multiple non-human species, a sewer, a streetcar line and a beloved public park. In all, the park manages flows of humans and a variety of nonhuman categories, serving as a complex or multi-purpose infra-structure.

Star (1999) has argued that "Infrastructure is both relational and ecological," it orders the relationships of humans to each other and to the biophysical processes on which humans depend. Infrastructure is about much more than the efficiency of technological units within the system. This observation suggests that we might once again expand, or reframe the meaning of infrastructure to be more than the technological *means* to solve a single problem. Rather, infrastructure, including social housing, might be, like Boston's Fenway, not technological *means*, but also sociological *ends* that consider equity as a design variable.

3. Distributed Housing

The third reframing is of social housing as necessary urban infrastructure that is designed to be, not only units of *consumption* by the poor, but also reciprocal units of *production*.

One early, and incomplete example is the Green Alley Demonstration Project underway in Austin, Texas. This project has emerged over eight-years as a partnership between the University of Texas, the Guadalupe Neighborhood Development Corporation, the Austin Community Design and Development Center, and the City of Austin. Together, the partners are reframing Austin's inner-city network of alleys as regenerative infrastructure.

Austin's alleys were initially designed by engineers to be single-use technological conduits for garbage collection, electrical distribution, and stormwater flows. Maintenance of these alleys was abandoned by the City in the 1990's as a cost-saving measure. As a result, they became environmentally and socially degraded spaces that fostered erosion and crime. To make matters even more inequitable, the rapidly increasing population of the city dramatically increased real estate taxes and threatened neighborhood residents with economic dislocation (Austin 2001).

The east-side of the city, where persons of color were obliged to live by the socially inequitable City Plan of 1928 (Koch & Fowler 1928), provided the best opportunity to integrate sustainable technology and social-equity. Beginning in 2006, the partners worked with the community to construct small back-yard houses, or "alley-flats," and redevelop a selected alley to demonstrate how these once purely technological spaces might become socially equitable and richly inhabited places that integrate:

- **Affordable houses** that match the scale and texture of the neighborhood. Alley-flats resist gentrification, increase urban density, reduce vehicle miles traveled, improve urban air quality, and support urban transit.
- **Solar arrays** that distribute municipal energy production, making it more resilient to severe weather events and reduce utility costs for neighborhood residents.
- **Water cisterns** that sequester storm-water, reduce soil erosion and water consumption, and improve municipal drinking-water quality.
- **Low-impact stormwater bio-swales** that return and filter degraded stormwater to the aquifer, rather than to the city water supply. Native plant materials selected also produce human food and attract insect pollinators that support the local ecosystem.
- **Public art** contributed by neighborhood residents that contributes to local identity and to the social quality of the space.

In sum, this on-going project demonstrates through participatory action research (Kemmis 2005), how social housing might be seen as complex infrastructure that can produce eco-socio-technical benefits required to sustain cities. The consequences for sustainable development are significant, because such a reframing would allow designers, policy-makers, and scientists to close the gap between science and social policy and thus accelerate progress against the challenges of climate change in the built environment.

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