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Cleveland's EcoVillage: green and affordable housing through a network alliance

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This article presents a case study of the inter-organizational network that formed to produce four housing projects in Cleveland's EcoVillage designed to integrate social equity and ecological stewardship as the basis for neighborhood redevelopment. Our paper builds on concepts of community development and housing production through inter-organizational networks spanning nonprofit, public, and private organizations that developed and supported four "green" and affordable housing projects. We are interested in understanding how development of the housing projects changed and connected traditional neighborhood development and ecologically-oriented organizations and how their interaction changed the practice of housing production and environmental and sustainability advocacy locally and regionally. The results of the study reveal that the marriage of green and affordable housing in Cleveland, despite some challenges, was viewed as important and beneficial by the organizations involved, and resulted in a range of demonstration projects that not only changed the EcoVillage, but affected other neighborhood housing projects in Cleveland as well. The projects resulted in enhanced capacity for green housing production through creation of a new network of organizations spanning the housing and environmental sustainability fields of practice that continues to support sustainable housing and neighborhood development in Cleveland.

Keywords: affordability; green housing; inter-organizational networks; neighborhood development

Introduction

This article presents a case study of Cleveland's network of nonprofit, public, and private organizations supporting neighborhood development and how it changed through the development of four "green" and affordable housing projects, to support a new model for redevelopment – sustainable neighborhoods (Barton 2000). Our case confirms previous work that described how the development system (Ferguson and Stoutland 1998; Walker and Weinheimer 1998) is constituted and changes as CDCs expand their work into new aspects of community development (Vidal and Keyes 2005). We have tried to understand and illuminate how development of green and affordable housing projects changed the practice of housing production and environmental advocacy by connecting traditional

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neighborhood development organizations to environmental sustainability organizations locally, regionally, and nationally. These organizations met separately in the region for more than a decade. We also sought to explore this process at the organizational level in terms of how participation in this expanding network changed the organizations in terms of their characteristics. This research is important because increasingly sustainability is being adopted for neighborhood revitalization, and the interdisciplinary and inter-organizational collaborations this requires must be negotiated. Our research provides information about this inter-organizational and inter-sectoral negotiation.

The paper first describes the use of networks to conceptualize neighborhood development, and then outlines the history of the neighborhood development production system in Cleveland. We then describe the neighborhood development of the EcoVillage overall. We present our research design, broad objectives and the methods used for our investigation to understand the organizational network that formed for the housing projects, including how its function changed to incorporate green aspects, and the participating organizations in terms of their relationships across the development system. Finally, we identify the salient system attributes that supported and challenged development of green and affordable housing in this context.

Networks and neighborhood development

The use of a network or system metaphor to describe the interaction of community and social sectors gained popularity during the bio-cybernetic revolution of the 1970s. The earliest work focused on the interaction of individuals inside organizations (Knoke and Yang 2008; Berkowitz 1982; Granovetter 1973). This metaphor was expanded to include inter-organizational networks to describe the development of new policy fields, with organizational alliances and collaboration as the focus of work in public administration to describe development and collaborate management (Agranoff and McGuire 2003). Few better examples of the role of inter-organizational networks than neighborhood revitalization. Agranoff and McGuire (2003) illustrates what Agranoff and McGuire characterize as the “ubiquitous interdependence” among jurisdictions, government agencies, nonprofit associations, and for profit entities at the local level, where entities connect “across organizational and sectoral boundaries” (Agranoff and McGuire 2003) and where inter-organizational development and other nonprofit organizations continue to play an important role in America’s older cities (Keating, Krumholz, and Star 1996; Erickson 1996). An important early work, Ferguson and Stoutland (1998) “reconceptualized community development as a *system*, presenting an integrative schematic of the system (grassroots, frontline, local support, and external organizations) and the actors (profit, nonprofit, and government institutions) in the system and their positions in the system occupied by various organizations. These authors argue that alliances among organizations that spanned both different sectors and disciplines in the system were what made community development efforts effective. The success of these alliances in turn depended on trust, capacity, self-interest, and differences among the organizations.

Walker and Weinheimer (1998) similarly describe the initiative National Community Development Initiative (NCDI), which intended to leverage both the financial assets available for community development and build

among CDCs to provide services. They described one goal of the program as “*systems change*”: assist the development and maturation of local systems that support community development (1998, vii), shifting focus away from projects to support of the funding streams and political environment in which projects were carried out by community development organizations. Under the NCDI, funders for community development formed an alliance with the Enterprise Foundation and the Local Initiatives Support Corporation (LISC) to act as agents through which the goals of NCDI would be achieved (Walker and Weinheimer 1998, xi).

Erickson (2009) characterized trends in community development housing as building the decentralized housing *network*. Beginning with the retreat of the federal government from housing during the Reagan years, Erickson describes how, ironically, the lack of federal activity led to a “sophisticated decentralized network of affordable housing developers” (2009, 37). Erickson characterizes the change in neighborhood housing development as the rise of a new institution, one that is a dense network of many participants with overlapping skills and capabilities, comprised of “multiple constellations” of organizations and alliances. Erickson specifies his use of “institution” in the broad sense as a network that persists over time. The power of this institution is its flexibility: the components of the network come together to address specific problems, disband, and form anew in constantly changing configurations. The institution itself persists by virtue of the long-term relationships that develop among individuals and organizations operating across the housing network.

In a study for the Urban Institute, Vidal and Keyes (2005) described the expansion of community development organizations from a focus on housing to broader community development concerns. The authors studied expansion of the role of CDCs into new activities of commercial real estate, business development, community organizing, and workforce development through the mid 2000s. This expansion is built on the creation of what they call the community development *system*: “the local configuration of neighborhood-based community development corporations (CDCs) supported by a *network* of city-level organizations and national intermediaries that enables the CDCs to effectively produce affordable housing (2005, 6). Vidal and Keyes point to three elements of the community development system: structure (the vertical and horizontal networks of organizations through which these functions are performed); function (the specific things the system provides such as money, technical assistance, and political power); and relationships (ties among the participants, often forming multiple and interconnected networks of relationships through which information, values, mutual obligations, and other contributions to effective action are conveyed). They emphasize the importance of the interaction across the city-, CDC- and the intermediary-networks. The intermediaries serve to link the city-level and CDC-level networked organizations to carry out the functions. Similar to Erickson, the authors point to the importance of ongoing relationships among individuals and organizations forged around common understanding and shared work on projects and programs. Their article focuses on challenges and lessons represented by expansion of programmatic areas.

Cleveland

The neighborhoods of Cleveland suffered substantial population loss over the last eight decades as population in the city fell from more than 800,000 in 1920 to

478,000 in 2000. The effects on the neighborhoods have been well documented (Keating et al. 1996; Krumholz et al. 2006), as the for-profit housing market in the city's neighborhoods collapsed from the effects of redlining and overall disinvestment as residents moved to the suburbs. By 1991, housing vacancies and abandonment numbered 17,500 units, almost 8 percent of the city's housing stock.

For the next decade, the City of Cleveland responded aggressively (led by the Mayor, Michael White, and Chris Warren, the Community Development Director), instituting an effort to stimulate new housing in Cleveland's neighborhoods and encourage rehabilitation of housing units as a strong goal (Mayer and Keyes 2005, 3). The city developed a set of policies and mechanisms to restore the housing real estate market, albeit heavily subsidized and led by new public and nonprofit organizations. By 2001 the city had transferred 9,500 parcels from the city's land bank to CDCs and residents (Mayer and Keyes 2005). The city also put pressure on banks to offer better conventional financing and created a trust fund for gap financing, largely by pooling CDBG money (Mayer and Keyes 2005). A program for 10- or 15-year property tax abatements was created for new housing construction. The city also offered a second mortgage program to buyers. Through these efforts, hundreds of housing units were renovated or built by CDCs and sold to owner-occupants, increasing the number of units from a handful to over 200 in a single year. These efforts stimulated significant private investment, so that by 2001 some neighborhood submarkets had experienced quite significant increase in population, particularly in the downtown and its adjacent neighborhoods (Mayer and Keyes 2005).

The capacity of CDCs in the community was bolstered by NCDI programs beginning in 1991 by \$5 million allocated to enhance CDC capacity in Cleveland in the first two rounds of NCDI funding. Capacity building activities included planning, resource development, internal operations and governance, program delivery, and networking with other community development organizations. By 1998, Cleveland's community development system had already achieved status as a mature system, with above average capacity for delivery of community development functions (Walker and Weinheimer 1998). Figure 1 presents the capacity building housing network in Cleveland in 1998 (Walker and Weinheimer 1998), with three levels of structural organization indicated (as per Ferguson and Stoutland 1998).

The maturation of community development housing in Cleveland also occurred in part through efforts of two important intermediaries: the Cleveland Housing Network (CHN) and Neighborhood Progress Incorporated (NPI). These intermediaries provided an effective linking function across the Cleveland housing system. In 1981, with assistance from the Center for Neighborhood Development at Cleveland State University's Levin College of Urban Affairs, six CDCs formed the Cleveland Housing Network (CHN). CHN assists member CDCs to obtain financing for affordable housing, manages many housing units, and has developed four primary housing programs: lease-purchase, for sale, housing conservation through weatherization, and permanent supportive housing. As of 2009, CHN had developed 4,485 affordable housing units representing an investment of \$484 million.

Neighborhood Progress Incorporated was founded in 1988 to raise and channel funding sources to selected CDCs to promote neighborhood redevelopment, providing technical assistance, training, and operating and capital support to Cleveland CDCs (Yin 1998; Lowe 2008). Additionally, LISC and Enterprise Community Partners have for years played important support roles for community development in Cleveland.

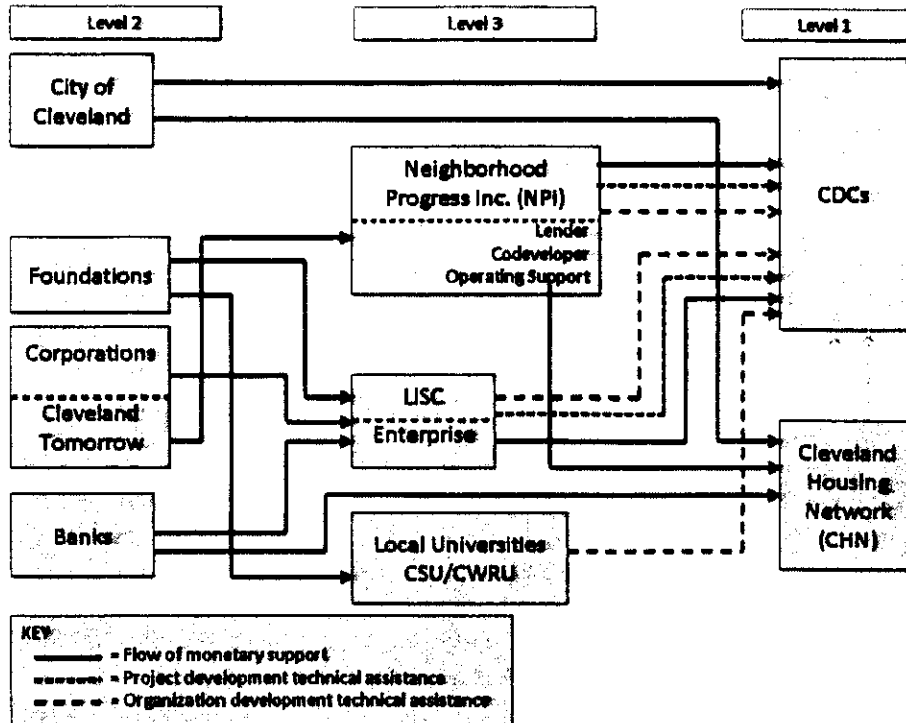


Figure 1. Network for CDC Capacity Building in Cleveland, Ohio. Source: adapted from Walker and Weinheimer (1998), p. 46 and Ferguson and Stoutland, 1998, p. 43.

The Cleveland EcoVillage as neighborhood redevelopment and housing strategy

The four housing projects that stimulated the changes to the housing production system in Cleveland were developed between 1997 and 2009, and each embodied different aspects of affordability and green building. All four projects are located in the city of Cleveland, Ohio in the Cleveland EcoVillage, a place-based redevelopment strategy focused on a half-mile area surrounding a rapid transit station connected to the regional transit system. The overall goal of the EcoVillage has been to develop a model urban village that will realize the potential of urban life in the most ecological way possible.

Beginning in the early twentieth century, the focus of the environmental advocacy community in northeast Ohio had been on land preservation, watershed protection, and pollution. The Cleveland EcoVillage began in 1996 with the vision to address the growing concern with the environmental impacts of urban sprawl, identified by Ohio’s Regional Priorities Project as the most significant threat to environmental quality in the region. With a stagnant regional population level, sprawl, with all its negative environmental impacts, was merely a relocation of people and economic activity out of the core city and older suburbs to the exurban areas. The EcoVillage concept was in part a response to the sprawl designation. David Beach, founder of Eco-City Cleveland,¹ a local environmental advocacy and

¹Beach was a former environmental reporter for *The Cleveland Plain Dealer* and founded EcoCity Cleveland as an advocacy and planning organization in 1992. Now the GreenCityBlueLake Institute (<http://www.gcbl.org>), the entire EcoCity Cleveland web pages, with extensive materials about the EcoVillage, are available through the GCBL website.

planning organization, suggested that the only way people would not move out was if there was an alternative sort of neighborhood to keep them in the city. He believed one of the features that residents were seeking was a greener, more sustainable community and suggested that a neighborhood based on principles of sustainable development might provide a way to attract new residents (and thus improve housing market value in a distressed neighborhood) and improve the quality of life for current neighborhood residents (thereby improving the use value of the neighborhood) (see Stoecker 1997). Consequentially, the purpose of the EcoVillage project was to offer that model of development.

The project began with a feasibility study for an urban “eco” village² predicated on a decision to locate the EcoVillage in a Cleveland neighborhood, rather than an older suburban community in the Greater Cleveland area or in the rural fringe. If the EcoVillage could be successful there, it could be a demonstration for other neighborhoods in Cleveland, as well as for other rust belt cities. After a review of conceptual underpinnings for the EcoVillage, the study team interviewed Cleveland’s community development organizations, their intermediaries (NPI, CHN, etc.), and local environmental organizations to assess potential support for the EcoVillage. Presentations about sustainability as a neighborhood revitalization framework were given to private and nonprofit sector organizations such as the chamber of commerce, community development intermediaries, city planning and development departments, and for-profit developers. The EcoVillage was explicitly presented as a strategy to leverage new sources of funding for neighborhood redevelopment, improved quality of life, housing, and business and residential attraction (Kellogg 1997; EcoCity Cleveland 2007). After several locations with high potential were identified, a citywide call was made to community development organizations for applications to place the EcoVillage in their service area. While a dozen organizations submitted proposals, the decision was made to locate the EcoVillage project in the Detroit-Shoreway neighborhood (Figure 2), to be led by Detroit Shoreway Community Development Organization (DSCDO). The Detroit-Shoreway neighborhood’s population peaked in 1920 at 41,500. In 2000, the neighborhood’s population was 17,382, and was mixed ethnically, racially, and economically (City of Cleveland 2009). DSCDO was formed in the 1970s in response to bank redlining, substandard housing, and the significant population loss during one of Cleveland’s most turbulent historical eras. DSCDO has since become one of the strongest CDCs in Cleveland. In 1981, DSCDO co-founded The Cleveland Housing Network (CHN). The DSCDO neighborhood is one of the target areas supported by Neighborhood Progress, Inc. (NPI). In 2009, DSCDO had a full-time staff of 31 and an annual budget of \$2.2 million.

For most of the life of the EcoVillage, both EcoCity Cleveland and DCSDO have jointly managed the EcoVillage. The two organizations established a legal partnership and sought grants together for operating and project financial support, with EcoCity acting as a fiscal agent for many of the grants from the environmental policy network that funded housing projects. DSCDO had been providing neighborhood planning and outreach services for over 35 years and successfully competed for the EcoVillage in part due to its history of providing a range of housing types and affordability across the neighborhood. Over the last 13 years, the

²The study was completed by W. Kellogg and the Center for Neighborhood Development at the Levin College of Urban Affairs at Cleveland State University.

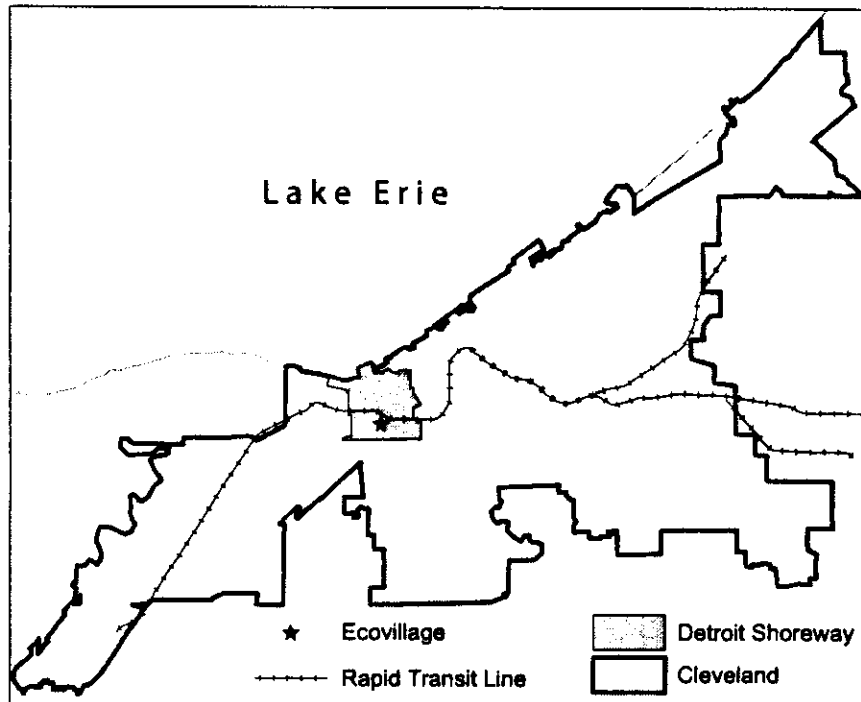


Figure 2. Detroit Shoreway neighborhood, City of Cleveland map.

EcoVillage has included the four housing projects described in this paper and numerous other neighborhood development projects.³ The overall investment into the neighborhood resulting from the area-based planning effort is nearly \$10 million in public and private funding.

Research design

We used the framework of organizational alliances across different practice systems to guide our research, looking to the public administration literature for concepts related to collaborative processes and organizational change that might explain *how* the changes described by Vidal and Keyes (2005) occur. We sought to understand whether and how the EcoVillage housing projects changed the neighborhood housing system (drawing on Vidal and Keyes (2005), Ferguson and Stoutland (1998), Walker and Weinheimer (1998), and Erickson (2009)) in Cleveland in terms of function, structure and relationships. Specifically, we considered the types of organizations (from what sectors and geography) that became affiliated with the EcoVillage project, why they participated, and their functions. We also examined the

³Projects include creation of community and market gardens, creation of neighborhood bike paths and walking trails, two new neighborhood parks, a new “green” Rapid Transit Station that includes community space and a small park, an intensive weatherization program in the neighborhood, solar panels at the neighborhood middle school, work with the city to make two new bridges in the neighborhood more pedestrian-friendly, numerous events to bolster neighborhood cohesion, outreach and programming to neighborhood schools, and redesign of the twenty acres of greenspace surrounding the city’s community recreation center to be sustainable.

types of inter-organizational relationships established among these organizations across different policy systems, and how this network of interactions was supported and nurtured, to support the success of the housing projects. We then sought to identify the outcomes of the interaction in terms of organizational capacity for enhancing neighborhood quality and sustainability and in terms of adoption of green housing in the community housing development policy system overall. As discussed previously, the organizations within the housing development network span the public, private, and nonprofit sectors, and also different physical, jurisdictional geographies (neighborhood, city, region, and beyond). We sought to understand whether and how a similar network of environmental organizations would join with the housing network to generate green housing in Cleveland.

A wealth of research exists on the reasons why organizations form alliances and why these alliances persist over time as networks. These range from internal motivations (similar mission or values, shared management objectives, or the prospect of enhanced service delivery, for example) (Oliver 1990; Michaels et al. 1997; Mandell and Steelman 2003) to externally-driven expectations for increased resources (including funding, filling gaps in expertise, information acquisition, and enhanced legitimacy) (Pfeffer and Salancik 1978; Saidel 1991; Klijn and Koppenjan 2000; Agranoff and McGuire 2003). These alliances may over time form a network, a set of interlocking relationships whereby the interactions implicit in one determine those occurring in others (Nadel 1957, 16; Scott, 2000; Erickson 2009). Although networks are largely nonhierarchical and self-organizing, the process of structuring and operating does not happen automatically. Typically a node of "embedded" organizations forms within the network, providing stability and mechanisms for conveying information throughout the network (Granovetter 1985; Gulati and Gargiulo 1999). This node may have a role that is more directive in order to move the work of the network forward. The network changes over time according to project focus (shifting nodes and links), and the changing relationships among the organizations.

The presence of a catalyst to change network connections is critical. In their study of the open-source movement in the IT industry, O'Mahoney and Bechky (2008) describe the importance of "boundary organizations" that reframe conceptual territory and connect organizations in new patterns or networks to challenge existing structures to generate change. In the housing system, Erickson (2009) and Vidal and Keyes (2005, 9) ascribed this critical function to housing intermediaries, which they suggested bring new ideas into the system and help diffuse innovation across the system as they connect single organizations to each other. If these community development network theorists are correct, intermediary organizations might play this role in the EcoVillage.

As the network forms, continued interaction that is collegial and leads to success tends to build trust among the organizations in the network, trust that the other organizations have ethical motives and are competent and dependable (Ferguson and Stoutland 1998). This quality is critical for continued strengthening of social capital and functionality of the network (Erickson 2009).

Potential outcomes from a collaborative network are many. The most basic outcome of a network is an enhanced and perhaps changed level of interaction, including communication and transfer of resources (Mitchell 1969, 10). A second outcome is creation of public value (Agranoff 2007); in our case, housing that is both green and affordable improves the neighborhood overall and residents' quality of life. One important value created is the knowledge generated for practice throughout

the network. As a network forms across traditional domains of practice to address complex problems, knowledge is a key condition for success as well as an outcome in the form of enhanced organizational capacity. Collaborating organizations share explicit (formal data) and tacit (experientially-based) knowledge through their networked relationships (Hardy et al. 2003; Saint-Onge and Armstrong 2004), which form the basis of enhanced social capital and public value (for example, how to build green and affordable housing). We seek to understand how this process changed the organizations that became involved in the collaborative network. The formation of this *alliance* of networks (housing and environmental in our case) is the process by which the networks build social capital/public value. In the EcoVillage we would expect to see new knowledge and new practices emerge as the traditional neighborhood housing policy system intersects with the environmental (environmental health, energy efficiency, and sustainability) policy system.

Our research methods included review of relevant documents on the housing projects and interviews with key participants. Project-specific files were reviewed to identify the organizations that had participated in the projects and their roles. In addition, one of the authors has participated in the EcoVillage program in an advisory role since its inception. The interviewed participants included twelve who participated in one or more of the housing projects (excluding funders) and several directors or founding members of the collaborative effort from the public, private, and nonprofit sectors. This represents about a third of the organizations that participated in these projects. The interviews were conducted using a pre-sent questionnaire that was administered over the telephone. The questionnaire consisted of both closed and open-ended questions. Respondents were also asked to identify patterns of organizational interaction from a set of diagrams. We sought attribute, relational, and ideational data from participants (Scott 2000). The attribute data related to the attitudes, opinions, and behaviors of the various organizations that participated in the housing projects. Relational data consists of the contacts, ties, and connections among the many organizations that participated in the EcoVillage housing projects. We are able to identify the linkages among organizations using this data source. The ideational data describes the meanings, motives, and typology of relationships.

The housing projects

DSCDO has long oriented its housing program in the neighborhood to achieve a range of affordability and tenure across its service area and the four projects exemplify this overall approach. The projects include 20 new green townhomes for purchase, two new green single family homes for purchase, a renovation of an existing early twentieth century home with green products and design, and four new green cottages available through a long-term lease with a nonprofit land trust organization. Table 1 tabulates the types of organizations contributing through technical assistance and funding and the green and affordable features of the projects.

The 20 townhouses incorporated (Figure 3) the greatest number of green building and site design components. The units first sold for between \$172,000 and \$189,000 in 2004–2005 (middle range for town homes in the city), and were an average of 1,600 square feet in size. Environmental performance included average annual heating/cooling costs of around \$400. The project was used extensively for educating local builders. The two single-family homes were about 1,800 square feet and sold for

Table 1. Summary of types of organizations participating and features of the EcoVillage housing projects.

	Town- houses	Single Family	Ecovation Rehab	Cottages
Types of Organizations				
<i>Building/Technical</i>				
For profit	8	4	4	5
Government	1	1	1	1
Nonprofit (local/regional)	5	0	3	8
Nonprofit (national)	1	1	0	0
Neighborhood-based	3	0	1	1
Total	18	6	9	15
<i>Funding</i>				
For-profit	2	1	0	1
Foundation of for-profit org.	3	0	0	2
Nonprofit (local/regional)	3	0	0	2
Community Dev. Intermediaries	3	0	0	1
Nonprofit (national)	6	0	0	0
Government (local/state)	2	0	0	4
Government (national)	2	1	1	0
Total	21	2	1	10
Green Affordability Features				
<i>Types of Green Features</i>				
Energy generation	1	1	1	0
Insulation/energy conservation	8	7	7	8
Materials waste/recycling	5	1	3	2
Water conservation/stormwater	4	3	1	4
Health/low pollutants	1	2	2	2
Local Business/materials	2	1	1	1
Site location (infill, mass transit)	3	2	2	2
Total	24	17	16	19
<i>Types of Affordability Features</i>				
Price				1
Special financing	2	1		1
Tax abatements	1			
Materials	2	3	2	2
Home operation savings	1	2	1	2
Land Tenure				1
Grants /donated services	2	2	2	2
Total	8	8	5	9

about \$164,000 after owner upgrades. Annual heating and cooling costs have been about \$600. As with the townhouses, green features were augmented through DSCDO's partnership with Building Science Corporation.⁴ Financing for the townhouses and single-family homes included reduced mortgage rates, city-generated forgivable mortgages, grant-subsidy, and property tax abatements.

⁴Participation by Building Science was funded through the Building America Program, which provides research money through the US Department of Energy to teams that assist communities with development of new housing types. The program teams develop prototype green housing, monitor environmental performance, and make design adjustments for model homes. The program's objectives are to build homes that use less energy, are faster to build, are lower cost, and provide a healthy environment for inhabitants (Pettit 2005).



Figure 3. EcoVillage townhouses.

The Ecovation renovation project restored a 1916 home to incorporate green building and site design features and sold for \$135,000 in 2004. Financing was arranged through CHN's Homeward program and included property tax abatement, reduced interest rates, and a forgivable second mortgage. Finally, the four "Green Cottages," the most recent project, are designed for universal access at 1,225 square feet and priced at \$105,000 for the two-bedroom model. Affordability was the primary focus, with green aspects incorporated to the extent possible. The developer was the Cuyahoga Community Land Trust and the Cleveland Green Building Coalition, which is seeking the LEED for homes certification. One cottage has been completed, but due to the real estate financing crash, the others will be built as homeowners are identified and financing can be obtained.

In summary, each project incorporated design features, materials, and construction practices that provided affordability to the greatest extent possible. These features were incorporated through technical assistance from a range of for-profit, nonprofit, and public organizations that operate at the local, state, and national level. The projects were financed through funds from private foundations, banks, public, and nonprofit entities, including organizations that typically operate across the local, regional, state, and national levels. Only the cottages project introduced a different land-tenure structure to enhance the affordability of the homes. While not all the projects were "affordable" in terms of the lowest income segment of potential purchasers, each project examined how the incorporation of green aspects would make the house more affordable in terms of operations.

Results and discussion

This section describes the results of our study, focusing on how the community development "system" was changed as a result of the incorporation of sustainability and green housing techniques in the EcoVillage in terms of structure, function, and relationships among organizations and the qualities of these alliances that supported the successful expansion of DSCDO into green housing. Our results strongly suggest that a network, as one type of system (nonhierarchical with changing nodal centers

that guide activity) is the most appropriate metaphor to describe the structure, function, and organizational relationships that evolved from the four housing projects in Cleveland.

Green housing network: structure

Figure 1 (above) presents a schematic of the structure of affordable housing network and the relevant “levels” or network position of the organizations in that structure. Recall that Ferguson and Stoutland demarcated four levels of structure in terms of the geography of organizational practice (volunteer/resident, neighborhood/CDC, local, and national). Vidal and Keyes (2005) demarcated three levels of networks based on the geography of interaction: CDC networks, city-level networks, and local and national intermediaries.

Figure 4 displays the network that evolved for the four EcoVillage housing projects. The sector of the organization is designated by the shapes (oval, square, trapezoid); the relative “geographic” location of the organization (neighborhood, city, region, and state/national) is designated by its position relative to the concentric arcs orbits around the centerline dividing the housing and environmental sustainability policy systems. The arrows show some of the connections in function in terms of operating support, project finance, and technical assistance.

Figure 4 also show the presence of government, nonprofit, and for profit organizations in both the housing and environmental networks that were joined. The fields of practice represented by the organizations include housing trades, financial, neighborhood development, housing advocacy, environmental protection, environmental health, green building, energy, and philanthropic (regional and national). Several of these organizations worked on three or more of the housing projects.

Our results confirm the existence of the different geographies noted in the community development literature, but we find the structure to be less one of levels than of “fuzzy” orbits populated by organizations and alliances of different characteristics operating across these orbits. It is less hierarchical and even more fluid than a two-dimensional conceptualization can communicate. As Figure 4 indicates, this newly formed system was not homogenously distributed in its geography. Four important clusters of connections are indicated: housing finance (traditional housing); political support (changed by the projects); building design and materials (changed by the projects); and energy (changed by the projects). Each cluster spans several levels of geography and encompasses organizations from different sectors.

Second, we note the strong role that regional intermediary and technical assistance organizations continued to play in the four housing projects; however, in terms of developing this new network, it was more the national nonprofits and federal agencies that played this role, providing conduits for technical assistance and finance through EcoCity to the local level projects. In fact, what is clear through our study is that EcoCity itself is an intermediary organization operating primarily in the environmental sustainability system. It functions in many of the same capacities as NPI or CHN, providing technical assistance, management and fiscal support, and training to a host of environmental organizations in the region. It was the intermediary that spanned the boundaries between housing and sustainability in the region’s policy systems.

At the local level, the Cleveland Green Building Coalition (CGBC) played an important technical assistance and an intermediary role. CGBC worked closely with

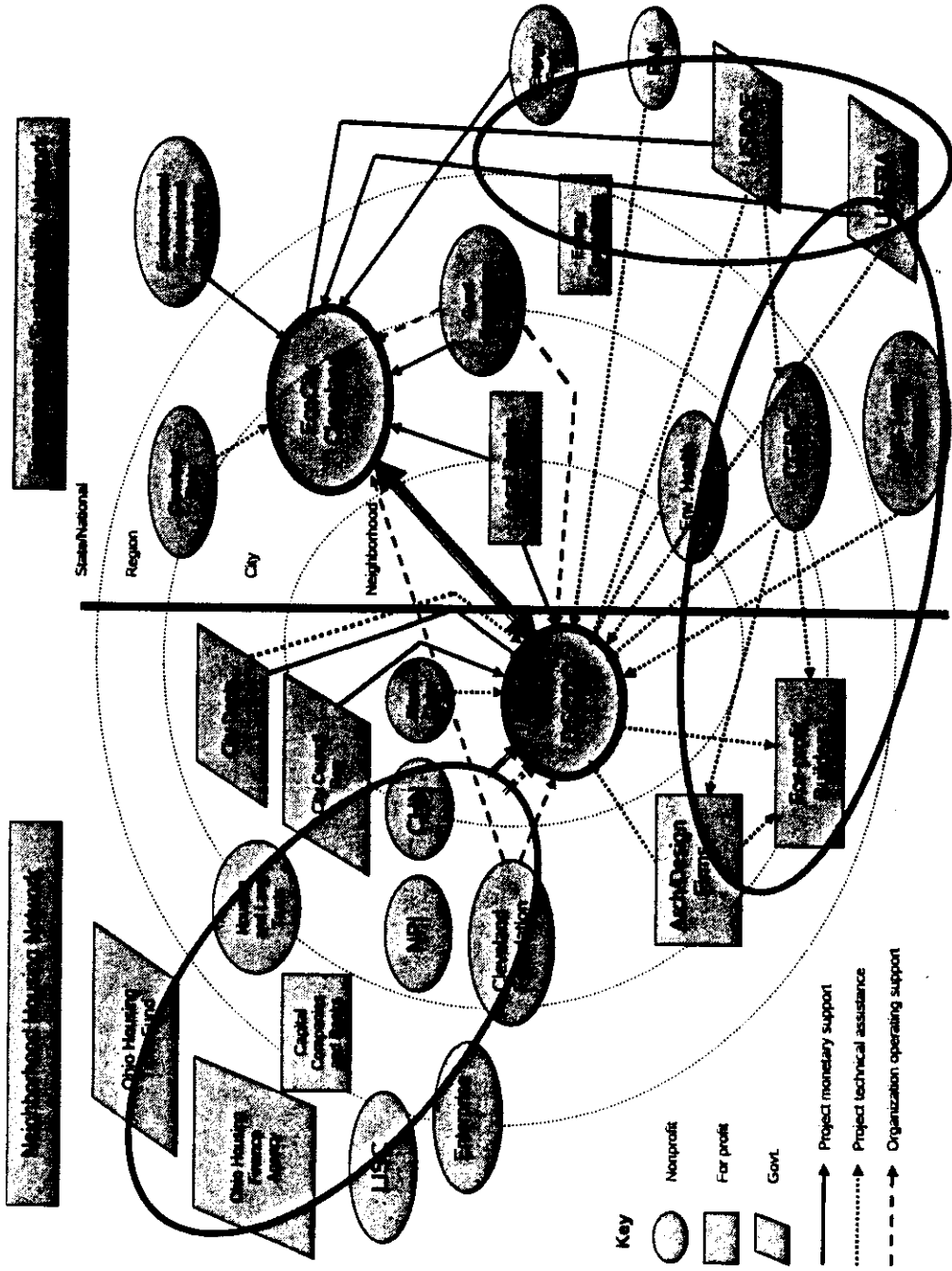


Figure 4. Allied green housing networks.

EcoCity and the DSCDO coordinator to offer ongoing educational programs to the contractors, builders, and suppliers who were involved in the four housing projects. It also acted as an intermediary to “pull” information from the national level from the US Green Building Council. With EcoCity these organizations provided the “glue” that held this diverse network of organizations together because they had a vision of the “green” housing that was the goal. CGBC and EcoCity acted as the system’s entrepreneurs in expanding supports for new kinds of community improvement activities (see Vidal and Keyes, 2005, 46) and were catalysts for new ideas and best practices (see Erickson 2009, 53).

Third, there is another element in this network that we consider to be structural – the relative formality of the alliance between any given organizations, which extends and perhaps supports Erickson’s notion of neighborhood housing as an institution. The thick line representing the DSCDO/EcoCity connection signifies the alliance between the two networks or systems (neighborhood housing and environmental sustainability). It is important to understand the specific quality of the relationship between DSCDO and EcoCity, as we believe this more formalized relationship was a critical factor supporting the success of the projects (more about this in terms of function below). All alliances are not created equal. In cooperation and coordination, individuals interact across organizational boundaries to share information and provide support, or multiple organizations work together on common tasks toward compatible goals, but remain fundamentally independent (Kagan 1991; Bailey and Koney 2000). This would be the appropriate characterization for many of the relationships in the EcoVillage housing network. Collaboration exists when two or more organizations share resources, staff, and rewards. Full service integration exists when multiple organizations work together to provide a new package of services to their mutual clients. The alliance between DSCDO and EcoCity certainly was a formal, legal collaboration, formed as a result of the early process to identify a location for the EcoVillage itself. The structure of their relationship supported a strong connection between the housing and environmental networks that was necessary over the decade of the housing projects. It was the embedded core (Granovetter 1985) around which the mix of alliances formed that allowed the network to flex to accommodate the varying demands of the four different housing projects.

Green housing network function

Of particular relevance for our project is the work of Vidal and Keyes (2005) for their focus on expansion of the community development system from affordable housing to other activities. Vidal and Keyes discussed CDC expansion into business development, workforce development, real estate development, and community organizing. They described the qualities of the expanded housing policy system in terms of core operating support, project finance, technical assistance, and political support. The four EcoVillage housing projects expanded DSCDO into the role of early adopter and educator for sustainability as a framework for neighborhood development. The green housing aspect was added to the organization’s practice in affordable and market rate housing. Cleveland’s mature housing policy system served to support expansion of DSCDO into green housing because the system had for many years supported development of a strong knowledge base among neighborhood organizations for project management and collaboration. Without

this strong foundation and position in the housing policy system it is doubtful DSCDO would have had the capacity for integration of the new aspects of housing required by adoption of green housing goals. DSCDO was ripe for new approaches, seeking to distinguish itself to more effectively compete for resources with other CDCs. The EcoVillage added a "green" component, and DSCDO found that new sources of finance were tapped once the link to the environmental network (through EcoCity Cleveland) was made.

The relationship between EcoCity Cleveland and the Center for Neighborhood Development at Cleveland State University was a key boundary-spanning function. Not too long before the EcoVillage was started, Phil Star, the director of the center, had become a member of the board of EcoCity Cleveland. He and David Beach had begun, through this relationship, to reach across the boundary between the more typical neighborhood development and environmental organizations.

The formal alliance linking EcoCity Cleveland to neighborhood development resulted in changed functions of the DSCDO, as it became part of a network that now included public, private, and nonprofit organizations that were part of the environmental quality, environmental health, and energy policy systems. In terms of operational support, the strong continued presence of philanthropic foundations, both regional and national, provided operational support for the EcoVillage coordinator position for nearly a decade. In terms of project finance, the diversity of finance sources that supported the housing project is significant, building upon and expanding beyond DSCDO's past experience. City council members representing the neighborhood worked directly with the City of Cleveland Department of Community Development to ensure continued CDBG money for the housing projects while working with the real estate development sector to attract private investment. EcoCity wrote grant proposals to support the coordinator position and technical assistance. DSCDO and EcoCity Cleveland formed the central node that coordinated the design and implementation of the housing projects. The regional foundations that often provide support for innovative housing, and other programs generated through the CDC community, were joined by regional environmental foundations to support the green housing projects. These organizations were joined by the foundations of large corporations, and by federal agencies focused on energy efficiency (USDOE) and environmental quality (USEPA). Thus the marriage of green with housing mobilized a new network of funders who were not typically invested in neighborhood housing development.

The technical assistance needed for the green housing projects came from new collaborators that worked at the national, regional, city, and neighborhood levels. This technical knowledge was for energy efficiency, use of new materials, healthy interior surfaces, and water conservation. Building Science Corporation and the Cleveland Green Building Coalition (CGBC) provided technical assistance in terms of design and materials. The USDOE, Rocky Mountain Institute (RMI), and CGBC provided technical assistance on energy issues directly to DSCDO's housing project coordinator, and through the local energy contractors that worked directly on the projects.

The process to marry green and affordable housing as a neighborhood redevelopment strategy proved challenging in several ways. Perhaps the most significant challenge was on the ground as the housing projects were implemented. The townhouse project, both as the first project and the most complex in terms of green features, illustrates this well. The coordinator at the time did not have

extensive green building experience, but learned quickly as technical assistance from DOE and Building Science was available. He spent time coordinating among the various contractors and designers to ensure that every opportunity for enhanced green building was incorporated into the townhouses. Knowledge transfer was critical in this process. Finally, in terms of political support, each housing project required support across the different structural levels operating in the neighborhood to succeed: the Mayor's community development and planning agencies, the council representative, neighborhood block club's, and the broader community. In Cleveland, development projects occur only with the support of the neighborhood's representative to city council. Both representatives during the housing projects were supportive of the EcoVillage, but the current representative has been extremely proactive. EcoCity Cleveland helped organize educational outreach and promotion of the EcoVillage. Community political support was garnered through charettes, open design sessions, and meetings with block clubs to discuss the goals and obtain feedback on designs for each of the housing projects.

Relationships in the Cleveland green housing network

It was the changing relationships among people and organizations that supported new functions in the system as various types of alliances were created or strengthened through shared vision, trust, and collegial interaction. The core "embedded" organizations (Granovetter 1985), DSCDO and EcoCity, provided continuity as other partners entered and left the housing project network. The reputation of these organizations was very positive in each of their respective systems but not in each other's systems. Organizations implementing the housing projects worked through DSCDO, and these organizations rarely had contact with EcoCity. The infusion of information related to green buildings was from the ties created through the environmental network more broadly, but were facilitated largely through EcoCity. When asked to characterize the kind of relationships among the organizations working on the housing projects from a set of network graphics, every respondent identified a nodal collaborative management pattern, in contrast to other graphics that were completely undifferentiated or hierarchical with one locus of control. Based on the questionnaire, EcoCity and DSCDO were identified as the primary nodes, but respondents also noted how other nodes at times played important roles for specific aspects of the four housing projects. For example, in the Ecovation and "greenbuilt" single-family projects, DSCDO played a secondary role, overseeing the project as the neighborhood development organization, not as the primary builder or developer. In those cases, other organizations took the lead. The broader network arrayed in Figure 4 fluctuated around the core EcoCity/DSCDO node depending upon the design characteristics of the housing project and the financing needs. The core organizations shared values, goals, staff, resources, and the decision making function. The other organizations that participated did so through the coordination of their activities by this embedded core.

If we try to answer why so many organizations joined in this collaborative network, our results indicate that the impetus lies strongly in the importance of the EcoVillage as a concept. Nearly all the respondents said their initial motivation to work on the EcoVillage was that their organization shared the values/ideas embodied in the EcoVillage. The most frequently cited reason for the success of the EcoVillage was the power of the idea of the EcoVillage as sustainable

neighborhood development. As one of the founders of the project suggested during our telephone interview:

This kind of change starts out with an idea, and image in people's minds. Just that fact that there is something called a Cleveland EcoVillage and that the concept is not an oxymoron raises a whole new set of possibilities in people's minds. People are hungry for this kind of community. They need a vision in their heads [in order for change to happen].

Each organization gained critically valued resources from its participation in the housing projects. All but one of our survey responding organizations had been involved in neighborhood housing with affordability aspects but had no prior experience incorporating green features. In responses on our survey, when asked how their organization changed as a result of its participation in the housing projects, respondents' three most frequent answers were "learning more about green aspects of housing/neighborhood development," "obtained new skills or enhanced skills/capacity in terms of project management," and "obtained or enhanced skills/capacity in terms of working relationships with organizations." These responses indicate improvement in both the technical and organizational capacity of these organizations for managing their own work, and for better interaction with organizations across the housing system, green or otherwise.

Slightly less than half the organizations joined in the EcoVillage housing projects because they saw them as an opportunity to enhance their capacity and expertise in building with green features. Despite their willingness to engage in this cross-network interaction, when asked about challenges to working with the other organizations, the most frequently cited challenge was in clarifying or understanding the overall goals of the housing project as it integrated green and affordable features. This challenge was addressed through an enhanced attention to regular meetings, daily reviews and education with individuals, and weekly job meetings where the parties talked through their goals and other suggested solutions. The marriage of green and housing required a heightened level of communication between the "green" design and traditional housing construction organizations, communication that was a critical function of the DSCDO EcoVillage coordinator role. It is important to note that each of these projects was the first of its kind in Cleveland. All were intended as demonstration projects, which means that each project was a new experience. If replicated, it is likely that inter-organizational relationships and the knowledge gained from these demonstrations will decrease the specific attention to knowledge transfer as the learning curve flattened on building that particular product. In addition, the time and attention to good communication across the organizations by the coordinator support the effort. There has not been any major in fighting among the "embedded" organizations working on the EcoVillage over the nearly 15 years of work.

Outcomes

The marriage of green and affordable for neighborhood housing

The four housing projects each tested and led to recognition of the extent to which incorporation of green features both raises and lowers the affordability of the housing. Each project had a different emphasis initially: the townhouses were market rate; the single family "green built" homes were a demonstration of design to reach middle range of costs for Cleveland; the Ecovation house was a demonstration of

green retrofit of a 75 year old house that is typical of Cleveland's neighborhoods; and the green cottages began with an affordability goal and included as many "green" features as possible. Despite these differences, each incorporated features that led to some cost lowering.

Incorporation of green features tended to raise construction costs. Costs were typically higher for adding green aspects in terms of technology and materials. For each project, there were tradeoffs as to how many green aspects could be included within a target end price range, and it is only because of design subsidy and materials donations that some of the features could be included. However, we need to differentiate between construction costs and operation costs for the homeowner. Affordability was dramatically enhanced in terms of the operation of the housing units. This was most evident in terms of enhanced energy efficiency that has dramatically lowered the heating and cooling costs to the owners. A heating bill in winter and a cooling bill in summer of \$100 to \$200 per month in Cleveland are not atypical, and the townhouses, green built single family and cottages are performing lower by a highly significant rate, ranging from \$400 to \$600 *per year*.

Our survey respondents were asked what advantages they saw in the marriage of green and affordable housing projects. The four advantages most often cited were (in order of frequency) better housing design, healthier housing materials, enhanced learning across traditional organizational boundaries, and the opportunity to test new housing technologies or construction methods. As far as the downside of trying this approach, the respondents cited the increased construction costs, but more frequently, cited the increased time and effort to make these more complicated housing projects work.

For DSCDO

The most immediate influence of the housing projects was on DSCDO's own housing practices. After the townhouse project began, DSCDO built dozens of other townhouses in the neighborhood area surrounding the EcoVillage. While none of these projects rose to the green standards used in the EcoVillage, all incorporated more energy efficiency and healthier and more eco-friendly materials than those built prior to the EcoVillage projects. DSCDO changed the way it did business in the housing development system. The projects also enhanced the capacity of DSCDO staff. The knowledge accrued through the EcoVillage housing projects was diffused into DSCDO. By the time of Ecovation project, the organization's regular housing project coordinator ran the project, not the EcoVillage coordinator, who was responsible for many other aspects of the area plan.

The organization's two directors during the life of the EcoVillage housing projects confirmed that as a result of its participation in the projects, it expanded its areas of practice, learned more about green and sustainable neighborhood development, enhanced the organization's skills in terms of working relationships with other organizations, and formed inter-organizational relationships that will help on future projects. They also noted that the EcoVillage housing projects improved the organization's credibility with residents, the city, and the funders. DSCDO was long considered one of the most successful and respected CDCs in the city, and due to its work on the EcoVillage and its housing projects, it is now considered a leader in sustainable neighborhood development. In June 2009, DSCDO received the Innovation Award for "Most Innovative Services" from the

Oberlin College Research Group, in part because of its role in developing the EcoVillage.

For the environmental community

The timing of the EcoVillage, starting in the late 1990s, is indicative of a shift in the work of the environmental community in northeast Ohio as well. One of the founders noted how the environmental community was transitioning during this time, from a focus on stopping pollution or the nuclear energy industry, and relying on volunteers, to staffed organizations promoting good development patterns, with the EcoVillage as a good example. The experience with the EcoVillage helped shift the participation of the environmental community more broadly to issues related to good development patterns, housing and the transportation system, beyond traditional open space conservation and pollution. One respondent noted that by stressing a positive agenda of what an environmentally-friendly neighborhood would be like, "the EcoVillage helped give environmentalism a root in Cleveland [proper, rather than in exurban areas]" and provided an opportunity for the environmental community to "shape the long-term thinking about green and affordable housing" in the city. All the organizations responding to our survey noted the higher up front costs of many of the "green" components, primarily to increase the energy efficiency of the house itself and the mechanical systems. In all four projects, however, the housing built had dramatically lower energy costs and were close to a transit station (meaning in theory lower transportation costs to work and shopping). Together, these three major expenses embody the true cost of housing as comprising not just the construction costs, but also the related energy and transportation costs. One respondent noted that EcoCity has helped "expand the message to the CDCs about this," and felt the other Cleveland CDCs had learned this as well based on their interaction with EcoCity through the years. In addition, as a result of its participation on the Green Cottages project, Environmental Health Watch (EHW), a local nonprofit organization that had consulted on the environmental health aspects of the project, established an Affordable Green Housing Center.

In the neighborhood housing network

The survey asked respondents how they thought the EcoVillage housing projects had changed neighborhood development practices in Cleveland. The overwhelming response was that these projects have changed neighborhood development in a transformative way:

[The change] is significant. The first EcoVillage housing project showed that green and neighborhood development projects are compatible; the success of that project inspired a lot of CDCs to start thinking green.

And:

The interest level and inclusion of green has increased. Groups that would not normally have worked together had. We really learned a whole lot from this project. Green building will persist.

This change in practice quickly spread to other neighborhoods and other housing organizations supported by the strong collaborative organizational networks that

already existed within the housing and sustainability networks. The boundary-spanning conceptual nature of the marriage of green and affordable housing challenged the knowledge capacity of these organizations, allowing them to learn new methods of practice, and to become familiar with organizational culture in a different domain of practice. They collaboratively generated knowledge for an alternative model of neighborhood housing. This emergent capacity was due to the mix of organizations over time and the flexible network that developed around the four housing projects into which organizations came and left, created ties to other networks, and shared tacit and technical knowledge across the networks. In our case, this system, formed from two pre-existing ones, operates in a place-based context. The place-based nature of both neighborhood development and preservation of the biophysical world that is the focus of environmental organizations anchors both networks, but requires expansion of the network outside the neighborhood geography to encompass sufficient resources to achieve program objectives.

The pre-existing networks and the strong embedded relationship in the housing development system facilitated diffusion of the experiences of the EcoVillage housing projects into the intermediary organizations that work with Cleveland's CDCs. For example, in 2006, the Cleveland Housing Network shifted its housing projects toward green, energy efficient affordable homes and by 2008, CHN received the state's first Green Communities designation for a single-family affordable housing rehabilitation project. In rebuilding neighborhoods, CHN is committed to green housing:

A pillar of CHN's new strategy is our strengthened commitment to green, sustainable practices. Green, energy efficient affordable homes for low-income families are not only possible, but essential. Our living environments have profound physical and mental health outcomes, especially for minority families and low-income communities. So with a commitment to green, sustainable practices, CHN has adapted and leveraged its talents and resources to better address Cleveland's new urban environment. (CHN 2009)⁵

Because CHN will be a key driver in the rebuilding of Cleveland neighborhoods in the wake of the foreclosure crisis, CHN's commitment to a green building approach is significant, reflecting the influence of the collaborative impact of the EcoVillage project.

Another critical local community development intermediary whose work has expanded into support of "green" housing is Neighborhood Progress, Inc. (NPI). The Detroit Shoreway neighborhood is one of NPI's target investment areas and several staff members who have participated in the EcoVillage housing projects have held positions at NPI, Enterprise, and with the City of Cleveland during the life of the EcoVillage. These personal ties and the capacity taken from one organization to another, illustrate one of the mechanisms through which knowledge and support has spread. In the last two years, NPI has sponsored the "Re-Imagining a More Sustainable Cleveland" initiative, which works with local universities and

⁵Ohio Green Communities is a program of Enterprise Community Partners, Ohio Capital Corporation for Housing, and the Ohio Housing Finance Agency. The program's purpose is to "make environmentally sustainable development the mainstream in the affordable housing industry" (CHN 2009). To date three projects have been designated, representing 257 green dwelling units and reached a milestone of 100,000 households that have received energy conservation and utility assistance.

neighborhood organizations to explore the reuse of the increasing amount of vacant land in the city for ecological restoration purposes.

Finally, the supportive role of the city council representatives has spread green building into the formal structure of city government. In 2007, Mayor Frank Jackson announced creation of a green building standard for the city based on the Enterprise Green Communities Initiative standard. Beginning in 2008, developers could qualify for additional resources for residential projects meeting the standard; in 2009, all residential projects receiving direct assistance from the City of Cleveland were required to meet the Cleveland Green Standard; and in 2010 all residential projects seeking Cleveland's CRA tax abatement are required to meet the standard (City of Cleveland 2010a). The area's city council representative suggests that the EcoVillage and the housing projects have served as a model for the city's current expanded programs for urban revitalization within a sustainability framework (City of Cleveland 2010b). These policies will support development of greener housing in Cleveland, and can be leveraged by CDCs to promote green and affordable housing as well.

Conclusion and remaining challenges

The convergence of the innovative ideas of EcoCity Cleveland, the support of the foundations, and the city council representatives (and with sustained commitment of faculty and staff at Cleveland State University) allowed the green neighborhood housing projects to succeed to the degree in which they did. However, despite the enhanced network connections, the EcoVillage has not reached the scale that was originally envisioned. One significant and continuous challenge has been the overall housing market in the city of Cleveland. While many parts of the country experienced a dramatic rise in housing value and production during the early 2000s, the residential housing markets in Cleveland, for the most part, remained weak. At the core of the development for the EcoVillage is a TOD around the rapid transit station, envisioned as a mixed-use development. While the housing projects described in this paper are all a short walk away, the center development piece of several hundred housing units with a day care center and grocery store has not been possible. Over the last ten years DSCDO and EcoCity Cleveland have promoted the site several times to developers, but the Cleveland market has not been vigorous enough to support such development, despite a range of subsidies. The project was envisioned to be the signature big development that would put the EcoVillage on the map. Instead, the smaller housing projects and other community development programs that have come about have garnered international and national attention.

Housing and other development in Cleveland's neighborhoods will likely continue to require incentives for years to come, but much progress was made in revitalizing Cleveland's neighborhoods over the 15 years prior to the current foreclosure crisis. Dozens of CDCs and their supporting organizations built and rehabilitated hundreds of houses for Cleveland residents and attracted new residents to the city. Our research confirms the need for continued innovative collaboration and strong leadership among the city's intermediary organizations and regional foundations. Together they can nurture the network evolving from the union of "green" and neighborhood housing, with an expanded set of functions and types of relationships in the EcoVillage housing projects. We conclude that if green and

affordable housing can be built and sold in Cleveland, one of the weakest housing markets in the country, housing and green building advocates should be encouraged that similar projects are possible by promoting collaboration among existing networks when designed and financed in stronger markets.

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