# Public Participation GIS and Local Political Context: Propositions and Research Directions

*Rina Ghose and Sarah Elwood*

**Abstract:** *Recent discussions in Public Participation Geographic Information Science (PPGIS) research highlight the importance of examining the local contextual factors that shape the PPGIS process. Through ongoing comparative case-study research, we are specifying the local contextual factors that influence PPGIS production and neighborhood planning activities. Using the case of Milwaukee, this article explores the complexity embedded in the local political context that affects the nature of citizen participation and the effectiveness and sustainability of PPGIS initiatives among community-based organizations. Studies on PPGIS initiatives related to community development in cities in the United States have mainly explored the role of the local state in shaping GIS and citizen participation. Our research indicates that the local political context is not a singular/unified factor, but must be assessed as a complicated set of interrelated relationships among multiple government and non-governmental institutions, positioned at different scales, that play an interconnected role in shaping the processes of participation and of PPGIS production.*

## Introduction

Over the past decade, with simultaneous growth in the use of Geographic Information Science (GIS) by community groups and non-governmental organizations and the development of a research agenda exploring the impact of such GIS use, considerable focus has emerged on the issue of access to geographic information and on participatory approaches to using such information, particularly through GIS-based spatial analysis. In urban neighborhoods in the United States, unprecedented numbers of community organizations are adopting and using this technology in their planning and neighborhood revitalization activities (Kellogg 1999, Ghose 2001, Ghose and Huxhold 2001, 2002, Elwood 2002b). Previous research suggested that access to geographic data and participatory approaches to GIS use have an important bearing on the social and political implications of GIS, particularly for marginalized institutions and social groups (c.f. Ghose and Huxhold 2001, Ramasubramanian 2001, Elwood 2002a, Harris and Weiner 2002, Sieber 2002). The articles collected in this issue (and the European Science Foundation/National Science Foundation (ESF/NSF) workshop from which they emerge) represent an important opportunity for GIS scholars to review progress made within this research agenda, identify key issues within the rapidly emerging Public Participation GIS (PPGIS) research agenda, and chart critical research directions for the future. In this short response article, we relate some of our own research findings to the propositions of the research agenda being generated for PPGIS research.

Key issues in critical GIS research span a diverse array of topics – differing national level procedures for spatial data access (Craglia and Masser 2001), effective PPGIS practices from initiatives around the world (Weiner et al. 2001), and the use and impact of digital geographic data in spatial decision making (c.f.,

Laituri 2001, Ramasubramanian 2001, Smith 2001). Although their areas of inquiry are quite diverse, the conference articles develop a common argument that geographic data access and PPGIS projects are highly contingent on and strongly shaped by the local context in which they are situated. Carver (2001) and Elmes (2001), for instance, suggest that space and place (particularly local contexts) play an important role in shaping participatory approaches to spatial decision making. Weiner et al. (2001) further contend that the nature of these participatory processes is crucial to understanding the differential impact of PPGIS initiatives for the individuals and communities affected by them.

An important theme emerging from the discussions at the conference is the notion that local contextual factors are important determinants in shaping access to spatial data as well as the sustainability and effectiveness of participatory GIS endeavors in which it might be employed. The discussions have also suggested to us a useful framework for considering anew the theoretical and empirical contributions of research in PPGIS. While much has been written about the importance of local political context, not a great deal of specific investigation has been carried out as to its particular role in shaping PPGIS production and impact, nor has there been a great deal of elucidation of specific factors that might make up relevant aspects of such local political context that shapes PPGIS. Through our research, we inquire into the complexities of the local political context and explore their influence in shaping the nature of citizen participation as well as the PPGIS process in marginalized and distressed inner-city neighborhoods of the U.S. In this article, we demonstrate that the local political context encompasses a complicated set of factors, involving multiple actors and institutions playing interconnected roles in shaping the processes of participation and of PPGIS production. Thus, in this article, we use evidence from an ongoing

research project to suggest some preliminary ways to specify and detail crucial elements of local political context, and to show how they affect PPGIS and the participatory processes with which it engages. This effort to identify crucial elements of local political context and understand their role in shaping PPGIS production, particularly the effectiveness and sustainability of PPGIS initiatives, contributes to recent efforts within critical GIS studies to more fully theorize PPGIS processes and impact.

## PPGIS and Local Contingency

Research examining the societal implications of GIS has illustrated the contingent nature of these impact, showing a number of key factors affecting access to and impact of GIS. The work of Harris and Weiner (1998, 2002) has been especially important in illustrating the contingent nature of the social and political impacts of GIS, demonstrating how these impacts are shaped by social, political, and economic power relations structured at multiple scales of interaction. In particular, their research has shown how unequal power relations can differentially affect access to GIS and digital data, as well as control over the representations and analyses created with the technology. Existing studies of GIS use by community-based or non-profit organizations in urban revitalization further identify key stakeholders and relationships affecting this process. Sieber (2000a, 2000b) and Ramasubramanian (1998) have shown how the use and impact of GIS may be shaped by organizational capacities and characteristics, noting that grassroots, non-profit, and community-based organizations have unique needs and resources with respect to GIS and digital data access and application. Other researchers note the importance of locally determined opportunities for digital data access by community-based organizations, as well as the critical role played by other government or non-governmental organizations that may be available locally to support the technology acquisition and application efforts of community groups (Barndt and Craig 1994, Sawicki and Craig 1996, Barndt 1998, 2002, Sawicki and Peterman 2002). Finally, a number of researchers suggest that the use of GIS by community-based organizations active in urban revitalization efforts may be shaped by the openness of local governments to including these organizations as participants and to sharing financial and informational resources necessary for GIS use (Elwood and Leitner 1998, Leitner et al. 2000, Ghose and Huxhold 2002b).

In the context of PPGIS as part of urban planning and revitalization efforts, the ideas developed in existing critical GIS research suggest the necessity of considering how PPGIS production might be shaped by relationships between local government actors and institutions and community-based organizations. In particular, it is important to consider precisely how these relationships shape the local opportunity structures of citizen participation, digital data access, technology access and use, and, ultimately, PPGIS production. Understanding the capacity and effectiveness of public participation GIS efforts in a place requires conceptualization of how the efforts are contingent upon aspects of local political context. Building such a conceptualization of how local political context shaped PPGIS production in urban revitalization efforts is particularly important, given the expanding role of community-based organizations in this process. In the current climate of declining resources for revitalization, service delivery, and problem solving, citizen-based organizations are assuming greater direct responsibilities for these tasks – in effect becoming ever more responsible for meeting the needs of some of the most disadvantaged people and places in American cities. Although debate about the impact of PPGIS in this context continue, there is at least some evidence that organizations and citizens from socially, politically, and economically marginalized places have experienced PPGIS as an effective process informing their revitalization efforts and strengthening their capacity to advocate on behalf of their communities (c.f., Bosworth et al. 2002, Elwood 2002b, Ghose and Huxhold 2002, Parker and Pascual 2002). For these reasons, it is crucial to build a stronger theoretical understanding of PPGIS production – particularly the role of local political context in shaping its effectiveness and sustainability.

In this article, we begin this conceptualization by illustrating several ways in which local political context affects the nature of participatory processes among traditionally marginalized citizens in urban governance, the nature of PPGIS initiatives among community-based organizations, and the effectiveness and sustainability of PPGIS initiatives. With an eye toward recent calls in PPGIS research for case studies investigating the role of space, place and locality in shaping the differential impact of PPGIS, we explore the ways in which such local factors affect the nature of citizen participation and the sustainability of their PPGIS efforts. This article is developed from analysis of data gathered as part of a comparative study of PPGIS initiatives involving grassroots organizations formed by traditionally marginalized citizens in Minneapolis, Chicago, and Milwaukee engaged in PPGIS initiatives in which their GIS use is directed toward facilitating greater citizen participation in urban governance and inner-city revitalization efforts. In our research project, we relied upon ethnographic data collection techniques, including intensive interviewing, archival research, participant observations, and document analysis. In this brief response article engaging the research agenda developed at the Spoleto conference, we present some of our findings from the Milwaukee portion of this project. Much of the data discussed here are derived from interviews with local government officials, local technology and data providers, and community organization staff members. We have also undertaken in-depth analysis of documents and maps produced by actors and institutions as part of their planning, neighborhood revitalization, or PPGIS activities. Comparative analysis of PPGIS efforts by six community organizations in Milwaukee shows that PPGIS production is shaped by the interlocking relationships among local state actors, local technical assistance providers, and community organizations, as these actors are simultaneously involved in PPGIS production, neighborhood planning, and revitalization.

## The Role of Local Political Context in Enhancing and Limiting PPGIS Production

Milwaukee is a particularly appropriate case to examine the process of PPGIS, citizen participation in neighborhood revitalization, and the role of local state actors and policies in shaping both. Over the last decade, PPGIS in Milwaukee has become a central element of multiple collaborative strategies between the local government agencies, community stakeholder institutions, and local citizens in their efforts to battle high rates of poverty, crime, disinvestment, unemployment, and urban blight in inner-city neighborhoods. The citizen-based grassroots community organizations of inner-city Milwaukee are themselves relatively resource poor, suffering from strong financial constraints that seriously limit their abilities to purchase data, software, hardware or to be able to afford/retain staff members well versed in computer technology, GIS, and spatial analysis. Despite these challenges, some of these organizations have successfully employed GIS in their efforts to revitalize their neighborhoods.

Milwaukee is also a useful case study in which to examine PPGIS because of the complex network of governmental and non-governmental institutions that have been engaged in PPGIS production locally. The local government agencies in Milwaukee have a long history of using GIS and spatial information in their urban planning tasks and have also been relatively supportive of efforts to facilitate citizen access to spatial data and GIS (Ghose and Huxhold 2001). The City of Milwaukee has also developed Map Milwaukee, an Internet-based GIS in which citizens can retrieve information through parcel-based queries, choosing from a variety of mapping options. PPGIS and citizen participation initiatives in Milwaukee have been supported by a dense network of institutions that have provided technical and analytical expertise for GIS access and spatial analysis, as well as for neighborhood revitalization planning (Ghose and Huxhold 2001). Supporting institutions include (but are not limited to) the University of Wisconsin-Milwaukee, the Milwaukee Non-Profit Center, the Milwaukee branch of the Local Initiative Support Coalition, and the Wisconsin Housing and Economic Development Association. Data sharing and data development activities between these supporting institutions and the City of Milwaukee have strongly enabled the development of PPGIS initiatives. Citizen participation is further facilitated by a larger number of well-established (albeit resource poor) community organizations that have been actively engaged in their own neighborhood-level improvement efforts and in revitalization planning initiatives of the City of Milwaukee. Among such state-directed revitalization programs, the Neighborhood Strategic Planning (NSP) program has been an important vehicle through which community organizations have been both engaged in revitalization efforts informed and supported by PPGIS applications. This complex set of relationships through which PPGIS and citizen participation are structured in Milwaukee simultaneously restricts and enables PPGIS initiatives of its community development organizations.

With respect to the role of local political context in shaping PPGIS initiatives, our research indicates that this "context" is not a singular unified factor, but must be assessed as a complicated set of interrelated factors. Multiple government and non-governmental institutions, positioned at different scales, play an interconnected role in shaping the processes of participation and of PPGIS production. In Milwaukee, key government agencies engaged in neighborhood revitalization efforts include the Department of City Development and Department of Neighborhood Services within the City of Milwaukee, and the federally funded Community Block Grant Administration (CBGA), whose revitalization initiatives are carried out separately. These institutions share a common goal of improving the quality of life and economic opportunities in the inner-city neighborhoods of Milwaukee, but their vision of and structures for citizen participation differ dramatically.

Inner-city neighborhood revitalization projects undertaken by the Department of City Development and Department of Neighborhood Services are usually pre-determined by the city departments, and citizen participation occurs through public meetings held with neighborhood residents and community organizations in an affected area. In our interviews, community organization staff explained that in such meetings with officials from these two local government offices, their expected role as community representatives is to present the neighborhood's issues and concerns. Several staff members further commented that during these meetings, they are expected to provide formal presentations of their neighborhood's issues and concerns, supported with neighborhood statistics, thematic maps, and, if possible, spatial analysis. They explained that the emphasis placed on such "hard data" by the city departments has motivated their organizations to pursue the collection and analysis of spatial data using GIS.

In contrast, the Community Block Grant Administration has fostered citizen participation through the Neighborhood Strategic Planning program, which enables greater neighborhood involvement in creating revitalization goals and programs. Through the NSP program, each neighborhood organization in the city has carried out a so-called "SWOT" analysis identifying its strengths, weaknesses, opportunities, and threats, and used the results of this analysis to formulate a strategic plan. These plans typically engage a wide array of issues, such as crime mitigation, development of youth programs, employment opportunities, job training, housing rehabilitation, tenant advocacy, health care, and recreational opportunities. The NSP process has been a particularly important motivation for local community organizations to pursue PPGIS initiatives since the CBGA has mandated the use of neighborhood statistics, spatial and thematic maps in the NSP strategic plans. The CBGA has tried to make it possible for community groups to fulfill this requirement by funding the Data Center Program of the Non-Profit Center to provide the organizations with customized data, statistical analysis, and thematic maps for their NSP plans.

It is important to note that the Milwaukee CBGA office is an institution positioned separately from Milwaukee's Depart-

ment of City Development and Department of Neighborhood Services, and it responds to federal-level priorities for urban revitalization. Aside from the opportunity of greater participation, the NSP process is critical for community organizations for its financial aspect because it is directly tied to the distribution of federal funds. The CBGA oversees the distribution of CBGA funds that it has received over a number of years from the federal agency of U.S. Department of Housing and Urban Development (HUD) for the purpose of revitalizing neighborhoods. HUD as a powerful federal agency imposes its own vision of the citizen participation process as a mandate upon the distribution agencies. Consequently, the CBGA "relies on neighborhood strategic planning as the best way to target funds effectively, because it identifies the needs of an entire neighborhood instead of basing decisions on individual agencies' budget demands" (Huxhold and Martin 1996:54). Here we find the process of citizen participation essentially being conceptualized at a national scale and then enacted at a local scale, which further adds to the complexity of the local political context and, as we will show, affects the PPGIS efforts of Milwaukee community organizations.

The role of the local political context as an influential factor in the PPGIS process is further complicated by the differential power positions occupied by the various participants. At the most general level, local government entities hold a more powerful position than the community organizations and have established different modes of participation that the community organizations are compelled to accept if they wish to receive the funding connected to such modes of participation. Moreover, the CBGA and the City Hall departments do not share within themselves the varying inputs, visions, and documents that they have received from the citizens of Milwaukee. Thus, the formal strategic plans received by the CBGA are never viewed by the City of Milwaukee's Department of Neighborhood Services or Department of City Development, both departments that are in fact heavily involved in implementation of neighborhood revitalization programs. Similarly, these departments do not share the information from their meetings with the community organizations with the CBGA. Thus, citizens and community organizations end up either duplicating the input process (which costs them extra time) or having their input received by only one government agency instead of both.

Our interviews with Milwaukee community organizers illustrate a number of ways in which the structures for citizen participation in NSP and the requirements for GIS analysis together limit the utility of the information produced for these organizations (Metcalfe Park Residents Association 2000, Harambee 2001, Lisbon Avenue Neighborhood Development 2001, Sherman Park Community Association 2001). To the organizers, the extent of citizen participation through the NSP process is quite limited because the NSP vision plans of the citizens are ultimately read only by the CBGA and, the organizers contend, are disregarded by other government agencies responsible for neighborhood planning. Related to this problem is the fact that PPGIS initiatives in Milwaukee were designed to help the citizens formulate their NSP vision plans. This disjuncture between the strategic planning initiatives of NSP and the implementation of broad-based revitalization efforts by the City of Milwaukee's Department of City Development and Department of Neighborhood Services has meant that community organization staff and residents invested a great deal of time in undertaking a complex PPGIS effort and producing strategic plans whose elements have largely not been implemented in the actual planning process. As one community organizer commented "The residents worked with the neighborhood strategic planning process [because] they [local government agencies] told people, 'come tell us what your suggestions are, how do we go through this visioning process, what do you want your neighborhoods to look like? Put together these strategies, and suggestion, let us know how you want money coming into your neighborhood.' But as politics goes … you had two different political entities to deal with, [City Hall and CBGA]. The residents felt … that they made suggestions and the answers that they gave weren't really taken in consideration. And they felt burned out by the process. They felt it was ineffective … And so it was [still is] very difficult to reinvigorate people to get once again, involved in the [NSP] process" (Lisbon Area Neighborhood Development 2001).

Many community organizers in Milwaukee are also unfamiliar with the concepts and strengths of statistics or spatial analysis and the techniques of GIS, and had to develop a level of understanding of these in order to use them in their NSP plans. During the 1999 phase of the NSP process, the CBGA mandated the use of Data Center-generated tables, statistics, and thematic maps in their strategic plans. While some community organizations viewed these instructions as well-intentioned advice that actually aided in their planning process, other organizations were resentful of such mandates and barely analyzed the data and maps in their plans. As one community organizer noted, "[Data and GIS generated maps were] definitely in it [NSP plans] because it was required, no question. I wouldn't have put too many of those in there myself. In fact, I didn't put all of them in" (Sherman Park Community Residents Association 2001). This sentiment is echoed by a former CBGA staff member who administered NSP plans, "In many ways what they [community organizations] simply did was to put the tabular runs that the Non-Profit Center had done, just put it right there [in their NSP document]. In some cases, it was my feeling they didn't even analyze the data, they just included it" (Martin 2000).

In keeping with the participatory intent of the NSP program, community organizations were expected to involve a large number of their citizens in the planning process. Program guidelines mandated a minimum of 300 interviews with residents in the planning process – an extremely important community participation activity, but a frustrating endeavor if the resulting priorities are not acted upon. Many community organizers, while not underestimating the importance of citizen participation, questioned the effectiveness of such numerical quotas for involvement. One organizer said, "It's nice to have some sort of quotas or objectives in the sense of can we strive to have a certain percentage, or number

of people really becomes involved. But, it became a mandate – you must go out and get so many people to answer this, and that is a silly mandate" (Sherman Park Community Residents Association 2001). Commenting upon the politics of citizen participation, another community organizer mentioned "In terms of rhetoric, it's a wonderful idea … [but then] you get politics, you get who has the upper hand in a situation … I think that neighborhood planning and citizen participation in a process of neighborhood improvement can work … [but] I think it cannot be dictated or commissioned by the city" (Lisbon Area Neighborhood Development 2001). Reflecting on the difficulties of fulfilling these mandates, one University of Wisconsin-Milwaukee faculty member who has frequently collaborated with community organizations suggested that perhaps the community organizations had not been given adequate resources to support the strategic planning and PPGIS efforts, saying, "… that's what a lot of the [community organizations] complained about, that it's a big job, we don't have the resources to really get at it" (Sanders 2001). Moreover, some organizers we interviewed felt that limited resources, high expectations, and perceptions of limited impact of the NSP diminished community support for GIS-based spatial analysis within their revitalization efforts. Residents were disinclined to invest extensive time and resources in PPGIS, because they saw it as linked to the NSP process, which, in their opinion "… was not taken very seriously" and consequently "are burned out on neighborhood strategic planning" (Lisbon Area Neighborhood Development 2001).

On the other hand, certain community organizations in Milwaukee have taken strong advantage of the NSP participatory process and PPGIS initiatives and have been able to make their voices heard at the key departments within the City Hall. Such organizations have commented that the NSP process has made them better organized and better able to articulate their concerns and configure their strategies (Harambee 2001, Lisbon Avenue Neighborhood Development 2001, NorthWest Side CDC 2001, WAICO-YMCA 2001). These organizations have discovered that the data analysis and strategic plans created to meet NSP requirements are equally useful in demonstrating to other federal, state, or local agencies, and to private foundations and entrepreneurs that the community has clearly articulated revitalization goals and strategies. However, not all organizations in the city have experienced similar benefits from their involvement in the NSP program. According to a University faculty member who worked as a consultant for several organizations creating NSP plans, "… the NSP process … has worked as well as the agencies responsible cooperating. It's based on their competency, [and] their capacities" (Sanders 2001). Our further investigation of the differential impact of NSP suggests that key organizational factors (such as knowledge, stability, capacity, and leadership) are indeed differentially affecting the ways in which community organizations in Milwaukee are engaging with local political structures and GIS opportunities in their PPGIS activities (Elwood and Ghose 2002). Thus, while some of the political structures of planning and PPGIS production in Milwaukee

have limited the utility of spatial analysis created by community organizations, certain organizations have been able to use their PPGIS products in leveraging funding and other opportunities from alternative sources.

The presence of alternative avenues for community organizations to access PPGIS and use their spatial analysis to leverage new opportunities has been enabled through the dense network of actors providing alternative GIS support in Milwaukee. For instance, University of Wisconsin Milwaukee partners assisted the WAICO-YMCA community organization in carrying out a complex GIS-based study assessing quality-of-life indicators in their neighborhood compared to those of other inner-city neighborhoods and the city as a whole (Ghose and Huxhold 2002). WAICO then took the results of this complex, multi-scalar study to the City Hall and was able to convince them to formulate a Tax Increment Financing District in their neighborhood. Other Milwaukee organizations have created different strategies for accessing technological assistance and generating spatial data and analysis. The NorthWest Side Community Development Corporation (CDC) has engaged in partnerships with the University over a number of years to formulate their strategies and have used geographic information from their neighborhood to launch an Internet-based cyber-organizing program called Neighborhood Net, through which they have very successfully made their voices heard in the City Hall (NorthWest Side CDC 2001). Another community organization, Lisbon Avenue Neighborhood Development, has drawn on their partnership with University graduate and undergraduate interns for such assistance, receiving a feasibility study and needs assessment for GIS implementation and, later, assistance in beginning to use their GIS. Of course, the capacity of a community organization to access spatial analysis assistance from supporting institutions varies. In Milwaukee, the organizations with greatest success in such partnerships tended to be those with pre-existing technology and spatial analysis experiences, a stable resource base, histories of collaborative partnerships, and strong internal support for such collaborations.

Our research then indicated that while the complicated contextual factors in which PPGIS is produced and implemented can constrain community organizations' PPGIS activities and limit the impact of their spatial analysis in decision-making processes that affect them, this complexity can create opportunities as well. If some actors and institutions limit PPGIS efforts and citizen participation, community groups can and do form collaborations with other actors and institutions that can assist their PPGIS development and their efforts to insert their spatial analysis into the local planning arena. As Sieber (1997) argued of environmental non-governmental organizations, some urban community organizations develop effective ways of circumventing limitations on their GIS use. Our research suggests that this is made possible through multi-layered collaborations – cooperating with multiple institutions involved in PPGIS production and neighborhood revitalization planning.

## Future Directions

Past research has called for investigating the ways in which local political context shapes GIS use, information access, and participation in these endeavors, calling for evaluation of such factors as the openness of local government to sharing necessary resources for urban GIS analysis (such as government-collected data on housing conditions or tax valuations), openness to including community groups as authoritative participants in planning, and local government agencies' own experience and expertise with using GIS for urban applications (Sieber 1997, Elwood and Leitner 1998, Ramasubramanian 1998, Elwood 2000, Leitner et al. 2000). It is also critical to understand how the actions and involvements of other institutions intersect with local state initiatives in PPGIS production and citizen participation. It is clear here that local political context shaping PPGIS is composed of multi-layered entities and also includes the role of non-governmental actors engaged in urban planning, neighborhood revitalization, and PPGIS production. As well, this case underscores the necessity of examining ties between different actors shaping the politics of PPGIS production and citizen involvement in local planning and revitalization. In Milwaukee, for instance, the Non-Profit Center and its Data Center program are involved in multiple aspects of both PPGIS production and community development. We would propose that continued study of these overlapping relationships and involvements in PPGIS and citizen participation is essential to understanding the differential impact of PPGIS, as well as clarifying links between information access and public participation – two key elements emerging in current discussions of a PPGIS research agenda.

## About the Authors

**Rina Ghose** s Assistant Professor of Geography at the University of Wisconsin-Milwaukee. Her research interests are in Public Participation GIS, Critical GIS, and Urban Geography.

Corresponding Address:
Rina Ghose
Assistant Professor
University of Wisconsin-Milwaukee
Bolton Hall Room 462
PO Box 413
Milwaukee, WI 53201
Phone: (414) 229-3981
Fax: (414) 229-3981
rghose@uwn.edu

**Sarah Elwood** is Assistant Professor of Geography at DePaul University. Her research interests include urban geography, neighborhood planning and development, Public Participation GIS, and Urban Geography.

Corresponding Address:
Sarah Elwood
Assistant Professor
Department of Geography
DePaul University
990 W. Fullerton, Suite 4400
Chicago, IL 60614
Phone: 773-325-4782
selwood@depaul.edu

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