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# Examining the Community Empowerment Process in Public Participation GIS Applications.

**ABSTRACT:** Although currently the subject of disagreement, the extension of Geographic Information System (GIS) applications into local and indigenous communities has become the focal point for claims of empowerment, political access, equity and legitimacy. The community-based GIS applications (termed Public Participation GIS (PPGIS)) have been presented generally as the means for transforming bureaucratic organizations into benevolent institutions that entertain and address the concerns of underprivileged groups. Yet, there has been little discussion of difficulties entailed in the transfer of political power to the communities. We are also not sure of how the filtering of spatial information through foreign GIS experts obscures the real concerns of people in the communities. An investigation into how PPGIS applications empower communities has therefore become imperative. This paper examines how external factors and conditions within local communities impede successful PPGIS applications and thereby prevent full empowerment of the people.

## INTRODUCTION

A few years ago when Geographic Information System's (GIS) applications began to spread among public organizations and private businesses, few people foresaw widespread applications of the technology in marginalized communities. Today, times have changed and the decline in prices of computers, accompanied by remarkable improvements in the quality of computer hardware and accessories, and the shrinking of hardware component sizes, have made GIS adoption very attractive and feasible even in local and indigenous communities. Thus, concerned that mainstream applications of GIS and related computer technologies do not incorporate the interests of less powerful members in society, some GIS practitioners have recently embarked upon less conventional uses of the technology to empower people in local communities. This movement, generally termed as Public Participation GIS (PPGIS), aims to develop a GIS that is adaptable to "inputs from ordinary citizens and other non-official sources" (Obermeyer, 1998:66). The landscapes of

developing countries in Africa, Asia and Latin America, and indigenous communities and enclaves in North American and European cities, have been the grounds for implementing these projects. The PPGIS projects aim at empowering groups whose interests are often ignored in traditional GIS applications (Obermeyer, 1998). Accordingly, GIS and related computer technologies have been adopted to integrate local knowledge of native South Africans into land reforms currently being implemented in the former apartheid state (Harris and Weiner, 1995; 1998; Weiner et. al, 1995). The system has also been adopted to facilitate institution building for collaborative forest management and to foster collaboration between foresters and local community groups in Southern Ghana (Kyem, 1997; 2002). In North America, advocates have used the technology to assist local communities and indigenous groups redefine boundaries and reclaim ancestral lands (Beltgens, 1995; Smith, 1995), empower grassroots social organizations (Sieber 2002, Martin 2000, Meredith et. al 2002) and protect biodiversity (Tulloch 2002). Some of the PPGIS applications focus on social narratives, and the recording of local knowledge to enhance indigenous groups' participation in official decisions that affect them (Arvello-Jimenez and Conn, 1995; Forbes, 1995). The PPGIS applications address inequities in GIS technology transfer among some of the most vulnerable members in society (Metzendorf, 1988). It is therefore possible that aside empowering the communities, PPGIS applications could provide the key to placing the interests and concerns of less privileged groups on the agenda of national and even regional organizations.

Notwithstanding the good intentions of PPGIS experts, the goals of many community-based projects are rarely attained. This is due in part to the ad hoc nature of PPGIS organizations and the poor conditions within the communities. Currently, very little feedback information exists to help us gauge the full impact of PPGIS projects. In particular, we still do not understand how the filtering of spatial information through foreign GIS experts obscures the meaning and understanding of the needs and concerns of the underprivileged groups. Often in PPGIS applications, empowerment is seen as a panacea to problems of official control and the means for transforming bureaucratic organizations into flexible institutions that entertain and address the interests of underprivileged groups. The question is, is that what empowerment is about? Do occasional involvement of communities in PPGIS applications translate readily into their empowerment? Alternatively, can the empowerment of communities be attained through mere participation in PPGIS projects? Answers to these questions have become important today due in part to the widespread adoption of GIS in communities that have until recently, had little experience with applications of such a complex technology.

Questioning the validity of the empowerment claim in PPGIS applications, this paper contends that empowerment of communities is a much more complex construct than a simple search for solutions to non-participation of underprivileged groups in public discourse. The paper explains that community empowerment is a political process that entails redefinition of existing power relations between the haves and have-nots in a community. Empowerment is an investment that involves risk taking, occasional failures and disappointments, constant reviews of strategy and persistence. Considered in the context of PPGIS projects that attempt to empower underprivileged groups in society, empowerment cannot be a simple, straightforward process. It is a task that is entangled

with the intrigues of organizational life, including power sharing and changing alliances that may never happen, or take a very long time to materialize.

## THE COMPLEX NATURE OF EMPOWERMENT

Empowerment as a process of both personal and community successes is often misunderstood and frequently misapplied. The popularity of the concept has resulted in the term being applied to a broad spectrum of situations such that its real meaning is at risk of being lost in the process. Empowerment through PPGIS applications is complex and can be elusive due in part to the following reasons. First, the public participation process through which empowerment of communities is realized in a PPGIS application does not lend itself to either easy interpretation or implementation. Participation has been defined in many ways as a strategy for action and research (Fals-Borda 1988; Rahnema 1993). It is also described as a strategy for involving the underprivileged in society in matters that concern them (Chambers, 1994, Korten, 1980; Thomas-Slayter, 1985). The public participation process range from mere tokenism to collaborative partnerships (Arnstein 1969). Arnstein (1969) and Eccles (1993) have observed that organizations usually advance through a hierarchy of empowerment, from manipulation (at the lowest level), through therapy, education (information provision), partnerships, and delegated power, to citizen control. The authors explain that when participation is conducted as a therapy, manipulation, or education, the process creates opportunities for co-opting the less powerful groups. The participatory process in PPGIS applications therefore takes on different forms many of which entail conditions and abuses that can make it difficult for organizations to achieve their goals. Consequently, the methods employed to ensure public participation in PPGIS projects can themselves become obstacles to effective empowerment.

Second, the empowering process is full of twists and turns, for what people in a community may consider as an empowerment might not meet the expectations of PPGIS experts who implement and write about the projects. The definition of empowerment is therefore subject to debate. Within PPGIS projects, empowerment is commonly defined in terms of efforts that PPGIS experts make to increase participation and involvement of less powerful groups in public policy decisions. However, as a process that seeks to empower underprivileged people in a social arena dominated by powerful groups in society, empowerment cannot be a simple undertaking. The term invokes a convoluted power sharing arrangement. It is a political process that entails redefinition of power and the transformation of existing administrative structures and institutions within the community. The demands for successful empowerment may therefore be difficult to attain in many of the communities where PPGIS applications take place.

Third, empowerment in PPGIS projects is commonly conceived in terms of local leaders transferring authority or relegating responsibility to less powerful groups in the community. This conception of the empowering process is usually made with little regard to the difficulties involved in public officials relinquishing power and local organizations and individuals taking on those responsibilities. Nonetheless, failure to appreciate the

difficulties does not make empowerment any easier to accomplish. Finally, empowerment is a dual process comprising the simultaneous fulfillment of personal goals of individuals and that for the community at large. The process is potentially contradictory for the interests of individual citizens do not always coincide with the collective goal set by all members of the community.

## BARRIERS TO COMMUNITY EMPOWERMENT

### *Potential Conflicts in the Community Empowering Process*

That the empowering of communities can be potentially conflicting is illustrated by the fact that PPGIS projects attempt to bestow power on groups who are unequally prepared and trained to take up new responsibilities. The process therefore enhances disparities among individuals in a community and hence increases the chance for conflicts. In the wake of community empowerment, personality conflicts and struggles over influence and opportunities could spring up. Such conflicts could lead to the disintegration of the PPGIS organization and hence the abandonment of the empowering process if the resulting disputes are not handled promptly and effectively. Additionally, empowerment enlarges the power base of communities as opposed to merely redistributing the power. Empowerment is not the outcome of a single action but a process that has its roots in the changing social, economic, and political structures of society. Empowerment can take place only when the power base of people in the community has been expanded. The process therefore thrives on the identification of, and adherence to boundaries (Duvall 1999) but boundaries are often the result of a control effort. Regrettably, this sort of empowerment is often misunderstood, feared and even resisted by those in authority. The simultaneous empowerment of individuals and the community could therefore become a myth that may never be realized.

### *Local Impediments to Community Empowerment*

Some barriers to empowerment ensue from conditions within the community itself. Unique customs and rituals, language barriers, lack of infrastructure and skilled local GIS experts are internal factors that could limit the effectiveness of PPGIS applications and hence, the opportunity to empower communities. Also important in community empowerment through PPGIS applications is the definition of some basis of power for local groups to operate without limitations. However, unlike a planning project where public officials may find the need to respond to a community's quest for participation and involvement because community input is critical for defining local issues, community leaders do not have such commitments to the people. Individuals in such poor communities do not usually wield enough political influence (i.e. votes or campaign contributions) to attract the attention of local leaders. It is also possible that some community leaders would resist the empowerment process because it can potentially undermine their power. For example, among groups who have links with federal governments and state authorities, the leaders

may reject PPGIS projects that are designed to empower all members of the community. This is because of the fear that an empowered citizenry would undermine their authority.

Besides, empowerment is not something one can impose on communities. PPGIS experts cannot make people in local and indigenous communities act in an empowered manner. Rather, empowerment is an internal decision by individuals who collectively commit themselves to achieve goals set by the community. In a number of cases, the target communities may not have a desire for the new roles and attention that come with empowerment. The group may lack the ability to use the newly gained power correctly and efficiently. Thus, obstacles to empowerment might not always result from the unwillingness of those in authority to relinquish power. The process of empowering communities entails the adoption of new roles and taking up new responsibilities. There will undoubtedly be difficulties with the transition due either to unwillingness on the part of individuals to accept the changes, or because they lack the appropriate training and experience to take on the new responsibilities. The subsequent rejection of the PPGIS project, and hence the empowerment, is often a decision that communities may reach for the best reasons of their particular situation, but it is a viewpoint that is possibly always ignored by GIS specialists and activists who implement PPGIS projects.

*External Obstacles to Community Empowerment*

A characteristic of PPGIS projects that has the potential to undermine the community empowering process is the movement's almost total dependence on foreign GIS experts and external sources of funding for implementing projects. The dependence on foreign experts means that leaders of PPGIS organizations are not permanent residents of the communities and many of them would be new to traditions, norms and customs practiced by the people. Added to this problem is the fact that the GIS experts routinely contend with modeling traditional beliefs in a technology that draws its strengths from analyses and representation of empirical facts (Taylor, 1991, Lake, 1993). Furthermore, the experts may implement PPGIS projects for reasons other than the empowerment of communities. Some experts undertake PPGIS applications as a means of engaging in research for publications to enhance their promotion and standing among peers. Even the dedicated foreign PPGIS expert would often encounter problems regarding adjustment to conditions within the new organization. The reliance on external sources for implementing PPGIS projects creates conditions that could compel a compromise of the goals of PPGIS organizations (Sieber, 2000) and thereby cause the community empowerment agenda to be sacrificed.

The external problem aside, it is often easy to contemplate the empowerment of marginalized communities without fully considering the effort and length of time involved in the power transfer process. Nonetheless, attaining a lasting empowerment through a PPGIS application would require a long and sustained exposure of the communities to GIS applications. True empowerment can therefore take a long time to materialize even though the urgent need for improvement in underprivileged communities sometimes makes it difficult to contemplate the period it would require to bring about lasting and beneficial changes to the people. Time is therefore critical to the community empowering process but

the temporal nature of many PPGIS organizations does not offer opportunities for sustained GIS adoption and applications in the communities.

## CONCLUSION

It is clear from the foregoing discussion that although community empowerment is a popular and attractive social goal, its attainment through PPGIS applications is contingent upon a complex mix of factors. The factors include the make up of the community in question, endorsement from local leaders, duration of the PPGIS project, and the nature of power relations and administrative structures within the community. Others include the purpose of the PPGIS application, commitment of PPGIS experts to community empowerment, and a stable source of funding for PPGIS organizations. There are some communities and certain local issues where empowerment can be successfully introduced through PPGIS applications. On the other hand, the scope for altering power relations in some communities may be limited. In view of these problems and the fact that empowerment lends itself to many interpretations and also takes on many forms, it would seem efforts to secure empowerment through PPGIS applications would benefit more from a contingency approach rather than a universal strategy for implementing and evaluating the projects.

**References cited:**


Arnstein, Sherry. R., 1969 A Ladder of Citizen Participation, *Journal of the American Institute of Planners* 35, July, pp. 216-224.

Arvello-Jiminez, N., and Keith Conn., 1995. The Yekuana self-demarcation process. *Cultural Survival Quarterly* 18(4) 40-43.

Beltgens, P., 1995. "Resource Information Training Program" in *Cultural Survival Quarterly*, 18 (4): 21-22.

Chambers R., 1994. The origins and Practice of Participatory Rural Appraisal. *World Development* 22 (7): 953-969.

Duvall, C. King 1999. Developing individual freedom to act Empowerment in the knowledge organization. In *Participation & Empowerment: An International Journal*, Vol 7 Issue 8. p 1-12

Eccles, A. 1993. The deceptive allure of Empowerment *Long Range Planning*, Vol. 26 (6) p. 13-21.

Fals-Borda, O. 1988 *Knowledge and People's Power*, New Delhi, Indian Social Institute

Forbes, A. A. 1995. Heirs to the Land: Mapping the future of the Makura-Barun. In *Cultural Survival Quaterly* 18(4) 69-71.

Harris, T.M. D. Weiner, and R. Levin, 1995. Pursuing social goals through participatory GIS: redressing South Africa's historical Political Ecology. In J. Pickles (ed). *Ground Truth*: the social implications of geographic information systems. New York, Guilford,196-222.

Harris, T. and D. Weiner 1998. "Empowerment, Marginalization, and Community-integrated" GIS. In *Cartography and Geographic Information Systems*, 25(2) 67-76.

Korten, David C., 1980 Community Organization and Rural Development; A Learning Process Approach, in *Public Administration Review* September-October; 40 (5) pp. 493-503.

Kyem, P.A.K., 1997. *A GIS-based strategy for Improving Local Community Participation In Resource Management, Allocation and Planning: The case of Institution building For Collaborative Forest Management in Southern Ghana*. Ph.D. Thesis, Graduate School of Geography, Clark University, Worcester, Massachusetts.

_____ 2002. Promoting local community participation in forest management through a PPGIS application in Southern Ghana. In *Community Participation and Geographic Information Systems* Will Craig, Trevor Harris and Dan Weiner (eds.) Taylor and Francis. London & New York. p.218-231.

Lake, R W 1993 Planning and applied geography; Positivism, ethics and geographic information systems. *Progress in Human Geography* 17 p. 404-413.

Martin E.W., 2000 Actor-networks and implementation: examples from conservation GIS in Ecuador. In International Journal of Geographic Information Science 14 (8) 715-738.

Metzendorf. D., 1988. An urgent need: Equal access of computers among the poor. In B. Glastonburry, W. Lamendola and S. Toole (eds.) *Information Technology and Human Services*, New York, Wiley. 347-349.

Meredith, Thomas, Gregory Yetmen and Gisela Frias., 2002 Mexican and Canadian Case Studies of Community-based Spatial Information Management for Biodiversity. In *Community Participation and Geographic Information Systems* Will Craig, Trevor Harris and Dan Weiner (eds.) Taylor and Francis. London & New York. p.205-217.

Obermeyer, N., 1998. The evolution of Public Participation GIS. In *Cartography and Geographic Information Systems*. 25 (2) 65-66

Rahnema, M. 1993 "Participation" in *The Development Dictionary:* A guide to Knowledge as Power, Wolfgang Saachs (ed.) Johannesburg, Witwatersrand University Press.

Sieber R. E. 2000. Conforming (to) the opposition: the social construction of geographical information systems in social movements. In *International Journal of Geographic Information Science* 14 (8) 775-793.

_____.2002 Geographic Information Systems in the Environmental Movement. In *Community Participation and Geographic Information Systems* Will Craig, Trevor Harris and Dan Weiner (eds.) Taylor and Francis, London & New York. p.153-172.

Smith, R.C. 1995. GIS and long range planning for indigenous territories. *Cultural Survival Quarterly* 18 (4): 43-48.

Taylor, P. J., 1991. A distorted World of Knowledge, in *Journal of Geography in Higher Education*, 15: 85-90.

Thomas-Slayter, B., 1985 *Politics, Participation and Poverty: Development through Self-Help in Kenya*, Boulder, West view Press.

Tulloch D., 2002 Environmental NGO's: Community access to technology as a force for change. In *Community Participation and Geographic Information Systems* Will Craig, Trevor Harris and Dan Weiner (eds.) Taylor and Francis, London and New York. p. 192-204.

Weiner D., T. M. Harris, and R.M., Levin 1995. Apartheid representation in a digital landscape: GIS, Remote Sensing, and Local Knowledge in Kiepersol, South Africa. *Cartography and Geographic Information Systems* 22(1): 33-44.