

There is considerable debate regarding the contribution to be made by higher education institutions and the researchers they employ in realising environmentally sustainable urban spaces, and the relationship between academic research and lay knowledge. The framing of the university researchers' engagement with citizens may be cast in terms of how researchers can help to assist residents in defined neighbourhoods or localised communities of interest to take individual and collective actions to reduce carbon emissions (whether this be in the name of 'doing something about climate change' or saving money on energy bills).

The writing of the paper was inspired partly by concerns expressed about conventional 'scientifically oriented' approaches to research in which data is collected from participants, and knowledge is 'produced for disciplines' – mode 1 science (Gibbons et al, 1994), and about the limited role accorded to citizens in the science, technology and environmental matters which concern them. These tendencies are implicated with crises of legitimacy and credibility that have beset and undermined scientific expertise (and experts) and for which greater and genuine collaboration among professionals and non-specialists has been advocated. With this in mind the paper sought to build on previous insights regarding the question of what factors enhance or detract from effective collaboration as well as the roles played by academic researchers therein. Prior research has shown that researchers may play a range of roles in collaborating with various actors to work towards the realisation of environmentally sustainable urban locations. Specifically, the paper builds on the work of Cada and Ptackova (2013) in identifying factors connected with the institutional environment, project structure and non-structural factors affecting collaboration between university researchers and others, and that of contributors such Devine-Wright et al (2001), Healy (2008), Zilahy and Huisingh (2009) and Lehmann et al (2009) on the roles of academic researchers in urban or regional sustainability initiatives.

Drawing on previous work, the paper identifies roles that may be played by academic researchers in building sustainable urban locations. Extending the focus to sub-city scale the paper illustrates how the roles played are affected by structural and non-structural factors which also shape the nature of collaboration among university researchers and other participants in urban sustainability projects. The paper does this on the basis of analysis and reflection upon research, networking and related activities taking place over the period 2007-2011 in Newcastle upon Tyne in the North East of England, focusing on a project called Newcastle Low Carbon Neighbourhoods. In the NLCN case wider institutional factors at play include changes in the requirements for securing national research funding for individual projects or centres, and for assessing the quality of research undertaken in higher education institutions, on which national funding for research in universities depends. The prevailing values of autonomous science have been challenged though arguably have yet to be supplanted by the encroachment of societal 'impact' into the allocation of research funding. However, this and certain other developments have had a catalytic but also disruptive effect on the substance and conduct of the NLCN research and the roles of the researchers. In terms of substantive achievements, it is clear that only minor significant collective action has occurred (the thermal imaging heat loss surveys of cooperatively-owned properties) which is directly attributable to the intervention of the researchers but that individual residents (particularly tenants) have been involved a process of knowledge sharing enabling them to use central heating more efficiently and understand energy bills better. In relation to process issues the receipt of funding from New Deal for Communities for a feasibility study into the creation of an 'eco-neighbourhood' put the researchers into a client-consultant relationship with the funder; this suddenly ended when NDC folded. The

conduct of the feasibility project for New Deal for Communities required the team to play the role of intellectual authorities and also of action researchers and consultants. However, the parallel receipt of funding from Beacon North East contributed to certain members of the research team assuming the role of facilitator of an interactive research project, influenced by ideas about co-inquiry and mutual collaboration between researchers and the researched and aided by related training on the concept of community-based research and the facilitation of public engagement projects and events.

Project specific structural factors influencing the roles of the researchers and their relationships with collaborators and participants have been identified in the paper. Of particular note are the density of the project network, the reciprocity of ties among the participants and the confluence of interests among some contacts and members of the research team. In order to operationalize the project, the research team played a number of distinct roles in parallel rather than perform any one overarching role (c.f. Healy, 2008), a phenomenon which may be understood when one reconsiders the institutional and social contexts of the activities discussed above. In addition to the above, the personal, pre-existing involvement of one of the research team in local 'green' groups, in which his role has been that of an activist to some extent spilled over into his work and networking on the NLCN (arguably helping to build credibility with participants). More cohesive relations were maintained with those who were similar in interest and working practice to the researchers than with those who weren't (tenants). This suggests a possible avenue for building effective collaboration and growing projects (with contacts having similar characteristics). It also indicates that such efforts may be constrained by what network theorists call 'redundancy' (Burt, 1992), drawing attention to the idea that strong 'bridging' work would be better achieved by growing 'weak ties' with actors who are quite different from researchers (Granovetter, 1973), and who could be brought into the 'magic ring' of expertise. Overall, the paper's findings support the argument that academic researchers play multiple roles in such initiatives, and that national structural and locally contingent factors affect the manner of collaboration with non-specialists and the durability of urban sustainability projects.