Social Science Concepts and Frameworks for Understanding Urban Ecosystems

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Introduction

Cities are a potent demonstration of humanity's domination of nature; they are also the source of a wide range of environmental problems that enmesh city residents in a process of globalisation capable of touching even the most remote and rural of communities. In the context of the agreement reached at the International Summit at Rio in 1992 that all nations should move in the direction of sustainable development, cities also have a critical role to play in determining the rate and nature of that change. For example, were city residents to adopt more pro-environmental lifestyles, then considerable progress would be made towards achieving sustainable development. Against this background, education and communication strategies which seek to promote understanding of the linkages between how people live their lives and the quality of our environment have a potentially important role to play in moving society in the direction of sustainable development.

The purpose of this chapter is to explore some of the concepts and frameworks social scientists use to understand how city residents make sense of their own attitudes, values, and behaviors toward the environment. It does this first by drawing on recent research in the social sciences that support contextualist approaches to society, and second by using the findings of a cross-cultural study undertaken in two European cities: Nottingham in the United Kingdom and Eindhoven in the Netherlands. This study was designed to compare how local residents and decision makers in each city discuss their responsibilities and behaviors toward the environment. By offering a cross-cultural comparison, the study serves to highlight the role that social, political, and cultural factors play in influencing people's willingness or reluctance to adopt more pro-environmental behaviors. It also serves to demonstrate how education strategies designed to promote public understanding of urban ecosystems can be informed by arguments individuals employ to challenge exhortations by governments and other agencies for citizens to "go for green."

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Models of Sustainable Development

Many holistic models of sustainable development seek to emphasize links between society, economy, and environment in the manner of a natural system. Perhaps the most significant contribution these models have made is the extent to which they have encouraged decision makers and planners to identify and take account of the full costs to the environment of unsustainable development. Through the work of environmental economists in particular attempts have been made to assign costs to the losses and benefits of previously taken-for-granted environmental goods and services (see Costanza et al., 1997); however, the social, political, and cultural constraints that prevent environmentally sustainable development from taking place have not been elucidated so clearly (Benton and Redclift 1994). Sustainable development is often framed as an *environmental* problem that can be solved by a scientific approach, thereby excluding (whether deliberately or not) debate about the wider sustainable development issues such as the North–South divide, social inequalities, debt burden, and the endless pursuit of consumption (Wynne 1994).

It is important to understand cities as natural systems and to adopt lifestyles consistent with prudent use of resources, such as decreasing dependency on the car, insulating buildings, and recycling and reclaiming materials. There is no guarantee, however, that individuals or institutions will respond to this logic. Because natural systems have no moral authority and environmental science claims about urban ecosystems are formed and transformed through a range of cultural, social, and political processes, strategies for environmental education and communication need to be informed by a range of intellectual and practical approaches. For example, exhorting the public to adopt more pro-environmental lifestyles involves issues of rights and responsibilities, and raises questions about the role that structures and norms in society play in governing how people engage with these concerns. Recent social models of sustainable development point to a range of approaches that can inform public education strategies about urban ecosystems and promoting pro-environmental lifestyles (Burgess et al., 1999; O'Riordan and Voisey 1997).

Social Models of Sustainable Development

Throughout the last 30 years, new "contextualist" theories of society emerged in social sciences (e.g., psychology, anthropology, sociology, geography, and planning) (Giddens 1991; Giddens and Lash 1994). These contextualist theories have emerged in part to challenge the more traditional reductionist approaches in social science that posit society as an aggregation of individuals who behave rationally (i.e., in their own self-interest). In contrast, contemporary social theory sees individuals as social beings whose actions reflect their socially derived meanings, values, and knowledges. One of the leading theorists is Anthony Giddens, a British sociologist who has done much to explain how individual identity is an integral feature of the social structures that both shape, and are shaped by, individual actions (Giddens 1991). Contextualist theories suggest that how an individual behaves cannot be predicted as a logical outcome of cognitive processes alone. Instead behavior is seen as a more complex, reflexive process of active engagement that is contingent on many factors and circumstances. For example, what we might choose to do is contingent on people's experience with the past and with place, and also on the role structures and norms play in shaping behavior. "Structures" include institutions such as commerce, education, health care, and planning together with their rules and modes of organization, which literally structure social, economic, and political life. Formal and informal rules and regulations ensure that each society has "norms" and functions in a "proper" way. Viewed from a contextualist perspective, actions are interpreted as responses to feelings of emotional attachment and duty, questions of trust and authority, and to a sense of believing (or not) that individual actions can influence change. Given their emphasis on understanding behavior "in context," such approaches favor qualitative research methods where people are

engaged in discussion, rather than experimental and questionnaire-based approaches characteristic of traditional social science.

Against the background of the present topic—understanding urban ecosystems—reductionist and contextualist approaches provide rather different perspectives on how scientific information about city environments is understood and acted on. For example, mass media campaigns designed to promote pro-environmental behavior tend to work with a reductionist cause-and-effect model in which the mind of each individual needs to be filled with new and "correct" information that will engender appropriate behavioral responses. On the other hand, contextualist models challenge this "stimulus-response" model by arguing that individuals engage critically with new information. In particular, information is always understood in the context of the social and cultural relations within which it is embedded. People already have well-developed ideas and opinions which are used reflexively to "interrogate" the authority, credibility, and legitimacy of new information. For example, several studies suggest that the social and cultural status of institutions has an important bearing on the extent to which the public trusts information (Wynne 1994; Irwin 1995). In the same way, questions of trust, authority, and legitimacy all influence public reception of communications seeking to promote an understanding of cities as ecosystems.

In this short chapter the reductionist and contextualist theories can only be treated schematically as "ideal types." This is what Fig. 1 illustrates. Reductionist models anticipate that people will respond "rationally" to choices once successfully communicated; contextualist models suggest that any response is conteigent on whether these choices have authority and credibility in terms of social and cultural identification (or alienation) and not through any "assumed" or natural warrant. Scientific findings may not achieve authority with the public because the reception of information is shaped by a range of social, cultural, and political processes that change over time. Reductionist models construct individuals as "rational consumers" acting on their preferences, responding to market forces, and seeking to maximize their own self-interest; whereas contextualist theories construct them more as "ethical citizens" (see Fig. 1). In the case of the ethical citizen, normative judgments figure prominently in decisions, especially when these decisions impact on communal resources such as the environment and the public domain of streets, parks, and plazas.

These two frameworks can also help illustrate different conceptions of how individuals engage with the political processes that determine the rules and norms of society. Reductionist models favor a dominant role for individual preferences as expressed through the market, for "experts" and "pro-

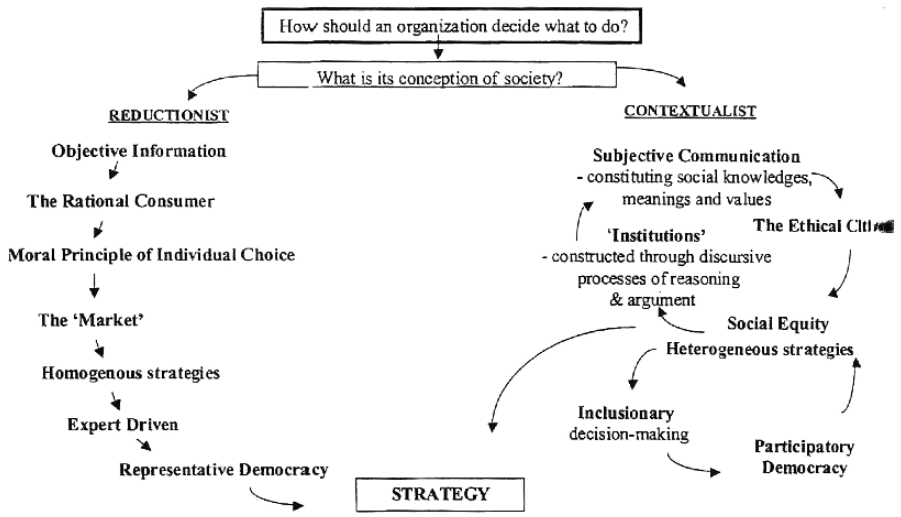

Fig. 1 Approaches to sustainable development

fessionals" in decision making processes and are consistent with forms of "representative" democracy that perpetuate existing rights and power relations (Forester 1993). Contextualist approaches on the other hand favor a stakeholder approach in which anyone who has an interest in the outcome of decisions has a right to be involved. Consistent with a shift toward more equity in the allocation of rights and responsibilities, contextualist perspectives also favor more participative forms of democracy in which a wider range of knowledge is respected and given credence (see Bryant and Callewaert, Chapter 3 in this volume; Forester, 1989; O'Hara 1996; Irwin 1995). Integral to this process of greater participation is the reconstitution of social relations through a process of mutual learning and understanding. In this reflexive process individuals, structures, and norms may be redefined and reconstituted (represented by the feedback loop in Fig. 1). The *transformative potential* of these deliberative and inclusionary processes of decision making contrasts with the reinforcement of existing power relations maintained by conventional, top-down and expert-driven processes of decision making (Fishkin 1991; Innes 1996; Healey 1997). In turn, communication strategies which seek to promote *new* understandings about the environment and society's relationship with it must provide opportunities for open and fair debate that can question existing understandings and social norms.

These ideal type alternatives serve to illustrate how new social concepts provide frameworks for thinking about sustainable development and cities as ecosystems. In what follows, elements of both are used critically to examine how more pro-environmental behavior can be encouraged among city residents.

A Cross-Cultural Study of Urban Residents' Commitments to Pro-Environmental Actions

The two-year study of residents' and decision-makers' attitudes to lifestyle changes required by global environmental change was undertaken in Nottingham (U.K.) and Eindhoven (the Netherlands) between 1993 and 1995. Both are medium-sized cities with a population of 274,000 and 195,000, respectively. Neither city had progressed environmental initiatives very far, although local authorities in both cities were sympathetic to developing integrated transport systems, recycling, and reclamation schemes. Nationally, the central government in the Netherlands had taken a more proactive approach to environmental planning than the U.K. government. Two National Environment Plans published in 1989 and 1993 set targets for all sectors of society to meet, and since 1990 the Dutch government has sponsored a mass media campaign to raise public awareness of how individual behavior could make a difference to global environmental problems. In the United Kingdom there were no such national plans, no sustained media campaign was undertaken, and the dominant approach gave priority to the operation of the market as the primary definer of both what were environmental problems and what their solutions might be. In the light of these national contexts, the overall purpose of the study was to determine whether citizens in Nottingham felt more or less empowered to assume responsibility and undertake pro-environmental behavior than citizens in Eindhoven, and if so to account for these differences.

Phase one of the study involved a questionnaire survey of 250 respondents in each city. The sample was generated randomly and the survey was conducted in comparable, suburban neighborhoods. Phase two involved conducting two in-depth discussion groups in each city—one with men and the other with women. The eight to ten participants in each group were recruited through the household survey and included a cross-section of the community as defined by age, income, and education. The groups met for 1.5 hours on each of five consecutive weeks. The household survey attempted to measure individual responses to questions about environmental awareness, attitudes, and behaviors, whereas the in-depth groups engaged discursively with a small number of people and gave participants time and opportunity to deliberate on the issues raised in the survey. The final stage of the reseach was to conduct a workshop with policy makers in each city to discuss the implications of the

research for their environmental communication strategies (Burgess et al., 1998). The findings of the household questionnaire and the in-depth groups are drawn on here to provide an understanding of how people rationalized their own environmental responsibilities (see Harrison et al., 1996).

Anglo-Dutch Comparisons: Contrasts in Pro-Environmental Practices

First, we will briefly discuss the findings of the household survey as they relate to people's lifestyles and respondents' willingness to adopt more pro-environmental behavior. We will then move on to report on the findings of the in-depth discussion groups and foucs on the reasons participants use to resist calls on them to "go for green."

One of the most intractable environmental issues facing cities is the demonstrable need to reduce traffic and to increase independent mobility without relying on the motorcar. In both cities local authorites had attempted to promote a number of measures designed to reduce car dependency, including car-sharing, promoting public transport, designating high-occupancy vehicle lanes on commuter routes and providing cycle routes. Overall, people in Nottingham exhibited a much higher dependency on the car than in Eindhoven. Car ownership was slightly higher in Nottingham (77 percent) than in Eindhoven (74 percent) but 69 percent of car owners in Nottingham reported using their cars 5 days a week or more compared with 41 percent of car owners in Eindhoven. In addition, there was a greater reluctance to change transport behavior in Nottingham. When asked if they had changed their transport behaviour in the last 5 years, only 37 percent of Nottingham respondents said that they had, compared with 60 percent in Eindhoven. Of this latter group, 35 percent said they now used their car less often compared with only 17 percent of the former. Alternative transport modes used most frequently involved walking and cycling in Eindhoven and using public transport in Nottingham. Only in Eindhoven did people mention that they had changed their behavior "for the sake of the environment" (13 percent). On this evidence, although the majority of people in both cities depended on the car, more people in Eindhoven reported that they had changed their behavior in favour of less-polluting transport modes, and for some people these changes had been made for "environmental" reasons.

When it came to addressing the wider issues raised by sustainable development, such as the need to reduce consumption and use natural resources in more prudent ways, a similar picture emerges. The level of pro-environmental behavior was much higher in Eindhoven than in Nottingham. For example, people purchased more green products, recycled more materials and shared these tasks among members of the household. In this sense the overall commitment to recycling in Eindhoven was much higher than in Nottingham, but it was not clear whether this pro-environmental behavior had become a matter of routine, signifying a change in lifestyle, or whether commitment was more pragmatic and ephemeral.

Analysis showed that respondents who were most "environmentally active" (excluding car use) lived in households that are better educated than average, had higher incomes, and held managerial and professional jobs, although members of all social classes participated in pro-environmental behavior. This is consistent with the findings of other surveys that suggest a marked shift in environmental behavior since the early 1980s (Witherspoon 1994). Certainly residents of Eindhoven seemed more environmentally committed than residents of Nottingham. Whether this was the result of access to more information associated with the mass media campaign, access to more recycling facilities, or a greater predisposition to a "collective" approach to solving problems could not be determined from the household survey. Detailed statistical analysis revealed very little consistency between pro-environmental behavior and gender, education, class, voting intention, or how active in the local community people report themselves to be. In other words no simple and coherent "green" view about how to address environmental problems existed among these city residents, and pro-environmental behavior could not be predicted with any confidence from recorded variables.

One of the main purposes of the in-depth discussion groups was to explore the apparent ambiguities raised by the analysis of the questionnaires and to allow us to work with qualitative methods of inquiry that are more sensitive to contextualist accounts of society.

Resisting Calls to "Go for Green": Findings of the In-Depth Groups

The four groups (nine men and nine women in Nottingham and 10 men and 10 women in Eindhoven) met for 1.5 hours each week over 5 weeks. The groups followed a similar agenda. Topics included green consumerism, the impacts of technological and social changes on people's daily lives, their experiences of environmental changes, and ideas about sustainability. Through the discussions it became clear that assuming responsibility for addressing problems associated with global environmental change was a complex concept that involved a number of real and sometimes intangible constraints and benefits. Running through all the discussions was a powerful moral or normative dimension about what people *ought* to be doing, not only for the sake of the environment but also for the sake of society. For some people this sense of commitment came from deep personal conviction and was expressed with emotional force. Other people had a much weaker emotional commitment but wanted to engage altruistically in contributing to the collective good. Being able to exercise choice in what to buy and having the time to recycle was also important; however, people were concerned, too, about whether or not their actions were effective in achieving the goals they espoused and whether or not they could believe all the information they received about environmental problems and solutions.

The Role of Information

In both cities, the media played a particularly prominent role in discussions about these wider political and social concerns, in particular through their reporting of environmental issues, which severed to expose the "contingent" nature of environmental "truths." In both Eindhoven groups, members felt overburdened by information that was often contradictory. In Nottingham, too, "media food scares" for example provoked a real sense of confusion for both men and women. Wanting the best for their families but being dependent on expert advice, and coping with the conflicting claims of different interests as represented through media reports, left everyone feeling very angry and confused. John felt very strongly about this: "We talked last week about aerosols. Why didn't they just ban them straight away if they're dangerous? And if they're not dangerous why scare us? I've actually lost confidence in, um, supposed "experts" on environmental issues. Because . . . then you get politicians coming in and they don't tell you the truth. . .. Suppose I had asked your advice about food, what food I should eat, or whether an aerosol is dangerous. I'd want to know the credibility, that . . . where you're coming from? What experience have you got, er, to make an opinion?" The men struggled to come to terms with their belief that experts such as scientists, politicians, and people in the media couldn't be trusted and how this affected their ability to make justifiable decisions. They all agreed with John when he said: "I live in a period of confusion."

The Dutch men talked about their response to the Dutch government's media campaign. This campaign used an image of a burning globe held in a hand that was accompanied by a message exhorting people to "act locally, think globally." One of the men said: "One person cannot blow out the candle to save the world—it's much more complex than that!" The Dutch women were equally cynical about the media as a purveyor of trustworthy information. One of them said: "Fifty percent cannot be believed, but it's difficult because I don't know which half!" In these circumstances "following your own instinct didn't help either, because there comes a point where that's very difficult

if you are getting so much false or biased information. Often they say something in the morning and in the evening it's retracted."

Given this pervasive conviction that experts could not be trusted and a belief in the contingent nature of "truth" about environmental issues, it is not surprising to learn that people were unwilling to accept personal responsibility for the environment. This was not the passive response of in uncaring or ignorant public but rather an active resistance. It represented their own attempts to separate out environmental problems from the complex web of social, economic, political, and cultural practices people understood these problems to be embedded within. Much as Eden (1995) suggests, having a well-developed sense of "actionable responsibility" enables some committed environmentalists to adopt pro-environmental behavior even in the face of conflicting media reports of the efficacy of particular actions. Many more people when faced with the mixed messages promoted by the mass media feel impotent and do not know what to do for the best. In these circumstances they look to "others" to take the lead.

The Social Contract Between State and Its Citizens

Overall, what was impressive about the in-depth discussions held in the two cities was the extent to which the tenor of discussion in Eindhoven was much more optimistic and positive than in either of the two Nottingham groups. For example, with respect to recycling schemes, participants in Eindhoven linked recycling and reclamation of materials to possible improvements in the local economy. Such schemes were regarded as an industry requiring considerable investment but also as a source of potential new employment; however, although the Dutch groups looked to the national and local government to take these initiatives forward, they also believed that as individuals they had a social obligation to participate in the scheme. Introduction of a compulsory scheme locally had reinforced individual responsibility because as one man put it: "You can't hide from your responsibility at the local level." Organizing a compulsory local scheme seemed a good way of making abstract global problems "real." Although members of the Dutch men's group agreed when Jan said that governments "always promise more than they deliver," they also accepted his metaphor of environmental progress as the moves of a knight in a chess game. As Jan expressed it: "If the worst comes to the worst you go forward one and back two. But we must go on all out and try to keep going through it."

This positive attitude and willingness to accept some measure of self-ascribed responsibility for pro-environmental action especially when national and local governments had taken the lead, contrasted with the seemingly more defeatist attitude that pervaded discussions in the Nottingham groups. Some members of the Nottingham groups had attempted to organize a recycling program in their local school, only to see it fail through lack of effort and the vagaries of the wastepaper market. Others had also tried to make use of whatever local facilities were provided, even though they were poorly run and serviced. These frustrating individual experiences led to a complex and often furious debate about where the responsibility for changing attitudes and practices resided. Was it with individuals, with government, or with commerce? In these discussions there was more disagreement about the nature of individual responsibility than in the Dutch groups, but there was a clear consensus that in the United Kingdom neither national nor local governments were setting an example for people to follow. The imposition of Value Added Tax on domestic fuel in 1993 for example, was interpreted in both Nottingham groups as a means of raising revenue dressed up as an environmental measure; as one mand said, "That's how greedy this government is. It's not green. It points the way down the green road but doesn't go down it!"

Trying to separate issues of individual responsibility for the environment from broader changes in social values was difficult because these broader changes seemed to inhibit any real shift toward

the kind of altruistic behavior that was required. For some of the Nottingham women it seemed that "People now are just so greedy and selfish. . .. It's like our country is selfish, we don't want to stop our people driving cars and stopping acid rain, because we want to drive our cars and we've got a right to do it. You know, we don't seem to have a moral conscience." Others felt that the free-market, individualistic ideology pursued by the national government was more to blame. Overall, however, they agreed that the absence of both personal and national commitment to the shared responsibility meant that there was no basis upon which a social contract between individuals and their neighbors and between the U.K. government and its citizens could be built. Under these circumstances the prospects for achieving sustainable development in the United Kingdom seemed more remote than in the Netherlands.

In Nottingham, people's frustration, alienation, anger, and in some cases despair, were all implicated in explanations for the contrast between the high level of environmental awareness reported in the questionnaire survey and the lower levels of reported pro-environmental behavior. In the Netherlands the discussion groups revealed a firmer basis to the social contract between the state and its citizens than was the case in the United Kingdom. Despite public scepticism about the effectiveness of the national government's mass media campaign designed to promote pro-environmental behavior, Dutch people were encouraged by the fact that state had taken the lead in acting responsibly towards the environment. By comparison, the ad hoc and laissez faire approach to promoting pro-environmental policy pursued by the U.K. government was often ridiculed by Nottingham residents. Taken together, such findings serve to highlight the multiple and pervasive influences that social, political, and cultural factors play in developing effective environmental communications—much as the contextualist conception of society suggests.

Conclusions

Summarizing and illustrating complex ideas in this brief way fails to do justice to the subtleties of both contextualist and reductionist conceptualizations of society. We suggest, however, that contextualist perspectives offer new insights about how individuals are engaged with society and how more effective strategies for environmental communication can be developed. Most obviously contextualist approaches ask natural scientists and policy makers to be more critical about their framing of who their publics are and what they will and will not do. In terms of developing a communication strategy for understanding urban ecosystems, educators and policy makers need to recognize the limitations of reductionist conceptions of society, which tend to assume a linear process of learning based on offering "the correct information." Numerous studies suggest that such an approach is not effective.

Working with contextualist conceptions of society means accepting that individuals are socially engaged actors whose environmental understanding and behavior is contingent on where they live, the history of events, their social networks, and social and moral norms. These approaches also recognize that the way society "works" depends upon a reflexive process of mutual trust through which individuals and structures (e.g., organizations, legal processes, rights and responsibilities) come to constitute each other. Gaining peoples' trust and support for education programs which seek to convert high public awareness of environmental problems into pro-environmental behavior, for example, is thus likely to require new ways of working. More participatory approaches to environmental communication and decision making that encourage face-to-face deliberation are capable of forging new social relations through a process that is based on mutual respect and trust. In this way, knowledge claims of experts such as educators, natural scientists, and politicians will add to, rather than displace, the legitimate knowledge claims of other groups in society.

In conclusion therefore, a contextualist approach to society suggests that effective education strategies which seek to promote a shared understanding of the inter relationships between lifestyles and environment will be:

- Heterogeneous in nature and content;
- Localized rather than universal in the scale of their delivery;
- Action-led rather than based on exhortation;
- Supportive of new public forums and arenas which encourage participatory democracy rather than reliant on existing structures and processes of representative democracy;
- Inclusive rather than exclusive in terms of the range of knowledges, experiences, and understandings they respect and accommodate.

Approached in this way, the task of understanding urban ecosystems is not simply one of information gathering and transfer, but one that also needs to acknowledge the influence of a range of other social, political, and cultural processes.

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