

LEARNING INTO A LOW-IMPACT FUTURE: COLLABORATIVE APPROACHES TO STORMWATER MANAGEMENT.

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ABSTRACT

As part of the Low Impact Urban Design and Development research programme (LIUDD)¹, Landcare Research and the University of Auckland are using a collaborative learning approach to support research on stormwater management. This approach is designed to increase the opportunities for reflective practice for a range of people involved with and affected by urban stormwater management in New Zealand. By providing spaces for reflective practice (taking the time to think and talk together about our experiences) we aim to support the building of knowledge across scientists, Iwi and Hapu, development professionals, urban regulators and community organizations.

This paper presents an outline of collaborative learning as a capacity-building process with potential to assist the uptake of low-impact and adaptive management approaches to urban stormwater management. Adaptive management incorporating strong community development perspectives offers opportunities for long-term transformation away from conventional stormwater management practices that have a high impact on the environment. We discuss organisational and community capacity building plus reflective practice as critical elements of these approaches to urban stormwater management.

KEYWORDS

Collaborative learning, adaptive management, community development, stormwater, urban design, capacity building.

1 INTRODUCTION

To move away from conventional approaches to urban development that degrade the environment it is necessary to use approaches to urban management that consider the way the urban environment functions as part of an integrated social and ecological system. Adaptive management approaches that incorporate community development perspectives offer a useful way forward into a low-impact future.

This paper explores these ideas in the context of urban stormwater management in New Zealand. We present an argument for building the capacity for adaptive management and community development approaches through the use of collaborative learning techniques. We believe the collaborative learning process can build the capacity for urban stormwater management organisations, research agencies, and community groups for the uptake of low-impact approaches to urban design and development.

As part of the LIUDD research programme, Landcare Research and the University of Auckland are trialing a collaborative learning approach to participatory interdisciplinary research. Our approach is designed to help build opportunities for multi-stakeholder reflective practice across urban management institutions in New Zealand. By providing these spaces for reflective practice we aim to support the building of knowledge across scientists, development professionals, urban regulators and community organisations to assist with building the capacity for adaptive urban stormwater management.

Reflective practice involves taking the time to stop and think critically with affected people about the work we are doing. It maintains that there is often more than one right way of doing something, that we can be informed

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through our actions and past mistakes (Argyris & Schön, 1978). Reflective practice allows people to work together to understand each other's perspectives; to take history and context into account when planning; to ask questions of what is or is not working; and whether we are achieving what we set out to achieve, why/why not, and what needs changing? In today's organisations the risks of taking time out to reflect are often seen to outweigh the benefits. However, research reveals projects and organisations that incorporate reflective practice are more likely to get longer term buy-in from staff and interested stakeholders, as well as ensure the activities being undertaken achieve their goals (Reynolds, 1998; Schön, 1995; Garratt, 1994).

We begin by introducing the concept of low-impact urban design and development in the context of New Zealand and our focus on urban stormwater management. Next we explore how change is theorized in urban development and propose that an adaptive approach to urban stormwater management is required. A discussion follows of three key elements of effective adaptive management practices; community development; capacity building and collaborative learning. We conclude with a discussion of proposed collaborative learning initiatives aimed to help build the capacity for adaptive stormwater management in New Zealand.

2 BACKGROUND: LOW IMPACT URBAN DESIGN AND DEVELOPMENT

In New Zealand, like in many other countries, we face environmental problems from population growth and subsequent land and housing development. Alternatives to conventional practice are needed if we want to maintain and enhance the environment of which New Zealanders are so proud. Landcare Research (an environmental research organisation) and the University of Auckland have embarked on a 6-year research programme to tackle the barriers to sustainable urban design and development. This programme aims to build knowledge of the technical and economic performance of stormwater management devices as well as learn about how social institutions, development practices and planning instruments can be changed to more sustainable approaches to urban development. Research to date indicates that low-impact urban design and development approaches can make a major contribution to many aspects of urban sustainability (Eason et al, 2004). In New Zealand the concept of low-impact design, a term primarily used in USA (ARC, 2000), is being broadened from its original focus on alternative stormwater management approaches to recognise the interconnectedness of stormwater management with other infrastructure such as energy, biodiversity, waste management, natural bodies, and reticulated and waste water. The concept aims to avoid, at no additional cost, a wide range of adverse effects of conventional urban development, and to protect aquatic and terrestrial ecological integrity while allowing urbanisation or redevelopment at all densities.

Low-impact and water-sensitive approaches to urban development have been evolving in New Zealand since the late 1990s, and reach beyond alternative stormwater management to an integrated urban design and development process. We see LIUDD as comprising urban sustainability outcomes that can be achieved by (Eason et al, 2004).

- more sustainable subdivision design and development (and to a lesser extent, lot design and redesign)
- approaches that maximise natural values and minimise sediment runoff and impervious areas (including roads)
- the reduction of the environmental footprint of urban areas on natural and reticulated waters, terrestrial and aquatic biodiversity, energy and materials use and waste.

3 CREATING CHANGE IN URBAN DEVELOPMENT

To advocate for a shift away from conventional urban development practices degrading the environment it is necessary to understand how change happens in urban development in New Zealand. Urban development forms and practices result from and comprise a complex interplay of social systems. To achieve change in the physical urban environment people must change their behaviour, and this can only happen if we change our social environments. Public awareness of air quality problems or degraded beaches, for example, is not enough to result in a large-scale shift in the behaviour of householders, car owners, company officials, public servants etc. Just as high levels of awareness of the health effects of smoking did not result in significant decreases of people smoking. Instead changes are needed to the way our urban development and management institutions function at

a range of levels, including policy making, norms of practice, knowledge development, and training (Scott, 1995). It is therefore necessary to pay attention not just to the behavior of individuals and households but also to that of the organisations that manage urban development. Social and organisational learning (the broad range of processes and practices that people engage with to build knowledge) must be taken into account when attempting to create change. If we view the process of creating knowledge as a social system we are better able to see how people learn and the contexts in which they do so (Argyris & Schön, 1978).

4 ADAPTIVE URBAN STORMWATER MANAGEMENT

There is growing recognition today that there are multiple and often competing visions of and pathways towards sustainable urban management (Guy & Marvin, 1999). Effective urban management requires the many participants or stakeholders associated with environmental problems to develop solutions co-operatively rather than acting as advocates purely in their own interest (Allen, 1999). Adaptive urban management is increasingly looked to as a means to enable a shift towards more integrated approaches to management that address the range of elements that comprise urban systems. As outlined in a United Nations University report (2003)

Adaptive management accommodates learning, uncertainties associated with limited knowledge, unexpected outcomes, surprise, vulnerability, and outside shocks. The importance of understanding that 'things change' must be incorporated into urban management to facilitate the mediation or accommodation of these changes (page 18).

Adaptive management approaches to urban development are process oriented (as opposed to output) and ideally involve moving through a cycle of problem identification (which includes attempting to find a common way of understanding and articulating the problem); action planning, modeling the system as a whole (which may include social elements as well as physical and economic); monitoring, management and experiment; redefining of the problem; attempting new actions... and so on, repetitively through the cycle. Once experienced with this model of environmental management participants no longer frame problem-solving as creating a definitive end point but as a step in the ongoing process of learning about the urban system and exploring management options (Allen et al., 1998).

In an evaluation of the adaptive management approach to water management on the urban fringe researchers at Macquarie University (Johnson, 1999) emphasised the importance of the role given to educating both community representatives and narrowly focused specialists, and the provision of a setting for principled negotiation. Johnson (1999) also found that the effectiveness of adaptive management process was enhanced by:

- exploring the difficulties and uncertainties of ecosystem management, while at the same time exciting participants with the potential to invent new methods of managing;
- emphasizing the role of workshops as forums for negotiation from the start, with the intention of signing off on a management strategy if a consensus emerges; and
- making a self-conscious commitment to community development as an aspect of projects, to develop skills in holding key stakeholders accountable in an assertive way.

5 COMMUNITY DEVELOPMENT AS STORMWATER MANAGEMENT PRACTICE

The promotion of community development as key practice for adaptive water management recognizes that to achieve an integrated systems approach it is necessary to go beyond community consultation to community involvement in management decisions and practices. Community development is a practice that incorporates a philosophy of 'how things are done is just as, if not more, important than what is done' (see Barr, 1991, 1996; Derrick, 1993). Therefore management process as opposed to management outputs requires a high level of critical attention to ensure opportunities for involving the broader community are taken up.

A community development approach to stormwater management offers opportunities for groups of interested and affected people, not typically involved in conventional decision-making processes, to be incorporated as key

stakeholders (e.g., householders affected by flooding, health care providers). In doing so, opportunities for more integrated approaches are likely to be developed. Incorporation of community development practices can build the knowledge required for low-impact stormwater management across a broad section of society. This enables the growth of identification² with stormwater management issues and accountability for solutions, and therefore the likelihood of greater uptake of low-impact approaches over the longer term.

Core elements of community development practice are: building knowledge across a broad range of perspectives; developing participation and leadership in affected communities; forming networks across stakeholders that enable participation in decision making as well as information and resource sharing; building the capacity of individuals, interest groups, and community and governmental organisations to work together. In addition, an effective community development process will also build the community's capacity for reflective practice to ensure the work being undertaken is effective, the objectives of collaboration and participation are being met, and a range of stakeholders are able to learn what is working and not working as initiatives are developed.

6 CAPACITY BUILDING FOR ADAPTIVE STORMWATER MANAGEMENT

It is widely understood that the barriers to uptake of sustainable urban water management practices are primarily socio-political and will therefore not be resolved through technological research and development alone (Brown, 2003; Parliamentary Commissioner for the Environment, 2004). One of the key socio-political impediments to progress towards low-impact or sustainable approaches is the capacity of stormwater management organisations, such as the regulatory authorities, to put into practice new ways of operating in order to make a shift away from conventional practices. Another commonly identified barrier to progress is the inconsistent and often conflicting practices within organisations (Beca Planning, 2001). The most frequently reported example in Auckland is the tension between council roading divisions³, who are structured and funded to create and maintain roads to particular standards, and the stormwater engineers who would like to see roads built in different ways. This example reveals the constant interplay and negotiation of priorities currently taking place in councils in New Zealand.

Having the technology and policies to reduce the impact of urban development on the environment is obviously not sufficient. What is needed is an approach to building knowledge and practices that links across technological design, policy formation, implementation, enforcement and use in order to transform the way stormwater is managed in New Zealand.

Capacity building is not only important in traditional stormwater management organisations but is also critical for the broader community to ensure participation in adaptive management processes is possible. For adaptive management to be effective, a range of stakeholders needs to be involved so that diverse perspectives are integrated. This approach requires a shift from stormwater management perceived as a task exclusively of regulatory professionals and technical experts. Participation by various interest groups requires not only opportunities for people to participate but also fostering of the means and desire for participation.

Capacity building can be seen as comprising three levels (Laverack & Labonte 2001⁴):

- The capacity of interest groups⁵ to define, assess, analyse and act on concerns of importance to their members.

² Identification refers to the attachment people have to an issue and whether it is something that resonates with their sense of self and life experience and therefore whether they are willing to become involved with the issue (see Bloom & Gundlach, 2000).

³ Landcare Research (unpublished) LIUDD Getting buy-in interviews Nov 04–Feb 05.

⁴ Laverack and Labonte developed these categories in the field of health promotion. The connection to health promotion is made because public health approaches often argue that to achieve change in health behaviours you need to change the social environment in which those behaviours are constituted. I am extrapolating this theoretical analysis to argue that to achieve environmental change we need to make changes to our social environments (this is the subject of a forth coming article, contact author for more details).

- The capacity of the staff in management organisations to engage and assist community organisations to help design and participate in management processes.
- The capacity of the management organisations to support participatory and collaborative practices, and to enable their staff to engage with and respond to community organisations as well as multiple perspectives in and across management organisations.

7 COLLABORATIVE LEARNING: BUILDING KNOWLEDGE FOR URBAN STORMWATER MANAGEMENT

As discussed above, the level of reflective practice that is encouraged and takes place through the day-to-day work of an organisation is an indicator of the organisation's capacity to engage with community development and adaptive management practices (Greenaway & Witten, 2005). Collaborative learning is a method of building reflective practice across scientists, environmental managers, business professionals and community organisations. We believe this method can help develop adaptive urban management approaches and improve uptake of low impact urban design and development.

The LIUDD programme fosters a stakeholder approach to the concept of moving from conventional stormwater management practices towards more sustainable approaches. A project or management team can learn about a given LIUDD strategy based on their own experiences over time. But there is probably another team in the next city, a few more teams in the same country, and even more teams around the world that are using and gaining experience in the use of a similar approach.

A learning group is designed to bring these teams together to share experiences and knowledge, learning about the conditions under which the strategy works, does not work, or can be modified and supported. The basic assumption is that by developing some common learning frameworks, collecting an agreed set of data and information, sharing stories and taking the time to reflect and analyse across experiences, members of the network can learn about the strategies they are using, improve their capacity to manage these strategies, and ultimately, implement more effective projects or management efforts.

If we are to make sure we learn, then such learning needs to be planned for and facilitated. The following steps provide an initial guide to design an action-learning programme (Guijt et al):

- Setting goals
- Articulating the theory of action (the assumptions you are making about how change will occur)
- Identifying specific action learning questions, investigation methods and case studies
- Facilitating (or moderating) critical reflection about the outcomes of first three steps
- Documenting and communicating conclusions and lessons
- Using the lessons to improve the next actions taken

Adopting a collaborative learning methodology shifts the methodological emphasis from observing then describing the situation after events have happened, to action-oriented participatory methods. For our research to be responsive to the needs of end users, stakeholders are invited to participate in and help guide the process of enquiry. Learning groups provide a space for innovative action planning to address commonly experienced concerns or gaps in knowledge, and, through an action-reflection process, test and review the assumptions behind the actions taken.

⁵ Here 'interest groups' refers to community-based organisations as well as agencies, private companies or consultants who operate outside of the core management organisations.

8 LIUDD LEARNING GROUPS

As part of the LIUDD programme we are initiating four learning groups this year. The group themes have developed from our interactions with stakeholders over the last 2 years. We are inviting people to work with us through learning groups on the following themes:

- How do household rain tanks perform (socially, economically, and technically) as a stormwater management device as well as an additional source of household water?
- What are the practices councils and infrastructure providers can use to manage the transition of their organisations towards more low-impact approaches to urban development?
- How are we and other organisations measuring progress towards more low impact approaches? We are forming a group to explore how to measure the outputs, uptake and outcomes of low-impact initiatives and how to support building of capacity for this form of monitoring and evaluation across organisations involved in stormwater management in Auckland.
- Building knowledge of Maori approaches to LIUDD – another learning group is designed to incorporate indigenous (Maori) knowledge into the way we build knowledge and practices for low-impact approaches to urban design and development. This group will work to incorporate Maori perspectives into the way we undertake our research and ensure Maori stakeholders are involved in the knowledge we build and the practices for implementation that are trialed.

The learning groups will attempt to find ways of:

- involving people from across a range of technical, professional and stakeholder perspectives
- building knowledge collaboratively
- using a process for collaboratively planning actions and reflecting on the work people are doing
- feeding lessons learnt and bright ideas back into the participant's organisations and across our research programme.

9 CONCLUSIONS

Stormwater management in New Zealand currently receives a high degree of attention and/or resourcing from councils, central government, and research organisations. In Auckland we are set to enter a new era of urban stormwater management; there is potential to give high priority to approaches that reduce the impact on the environment and on people's lives. This paper has argued that adaptive management, collaborative learning, and community development techniques provide a useful way forward into this low-impact future.

By finding ways to manage stormwater through a systems approach, integrating across stakeholder organisations and creating opportunities for collaborative learning we are more likely to be able to adapt our management approaches as we increase our knowledge of the system and build this knowledge more broadly across society. Community development approaches offer techniques for building knowledge as well developing the capacity of individuals and organisations to become involved in management practices.

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