CRC for
Water Sensitive Cities

Community engagement in the water sector

An outcome-focused review of different engagement approaches

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Australian Government
Department of Industry, Innovation and Science

Business Cooperative Research Centres Programme

Community engagement in the water sector:
An outcome-focused review of different engagement approaches
Engaging communities with Water Sensitive Cities (Project A2.3)
A2.3 – 1 - 2016

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Publisher

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Date of publication: April 2016

An appropriate citation for this document is:
Dean AJ, Fielding KS, Ross H and Newton F. (2016) *Community Engagement in the Water Sector: An outcome-focused review of different engagement approaches*. Melbourne, Australia: Cooperative Research Centre for Water Sensitive Cities,

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Executive summary

Purpose of the review

The purpose of this review is to highlight different approaches available to organisations wishing to work with communities, and to examine the types of outcomes that these different approaches can generate. There is a focus in the review on research that evaluates the effectiveness of different ways of engaging with communities. The review also provides guidelines for each of the key types of engagement processes (see below).

Background

Community engagement is increasingly encouraged as a method to improve project outcomes, build trust in organisations or reform processes, and support transition to water sensitive cities. This review aims to highlight the degree to which different engagement techniques can achieve these and other outcomes.

Community engagement incorporates a diverse range of initiatives including:

1. ***Initiatives that provide input to the community***, which aim to:

- Inform, educate, or raise awareness
- Change individual or household behaviour
- Build policy support

2. ***Initiatives that seek input from the community***, which aim to:

- Gauge community opinion and preferences about current water practices and specific policy options, or explore their broader visions for the local area

3. ***Initiatives that build active and connected communities***, focusing on

- Participation in decision making, which may include a range of different engagement approaches
- Building trust and effective long-term relationships, both between and within water organisations and communities
- Building active community stewardship, using restoration or citizen science programs, where community members conduct environmental monitoring or community management programs

Findings

Engagement that provides *inputs to the community*

In this section we reviewed research focused on information and education programs, behaviour change programs and strategies to build policy support.

Studies that have evaluated the effectiveness of face-to-face and mass media water education and awareness campaigns generally suggest that they are successful at increasing knowledge and improving attitudes to more sustainable water practices and policies. What is missing is conclusive evidence of whether these improvements can be maintained over time.

In terms of behaviour change programs, overall there is good evidence for the effectiveness of a range of approaches to reducing household water demand management. Although the effectiveness of these programs likely depends on the social and environmental context, studies have shown that public behaviour change campaigns can result in substantial reductions in household water use; estimations range from 2-25%. Studies suggest that programs that encompass multiple approaches may be more effective. Research about behaviour change programs aiming to address water quality and stormwater management are less conclusive about what works and what does not. Intensive workshops and awareness raising media campaigns may increase the number of people engaging in specific behaviours, however, research is needed to also assess whether these programs have impacts on water quality.

Studies indicate that effective communication techniques, combining good information and suitable message framing, can build support for new policies. For complex issues, it is recommended to consider face-to-face or social mobilisation initiatives rather than relying on advertising alone.

Engagement that seeks inputs from the community

Generally, community consultation occurs when an organisation needs information about community opinion. Methods include surveys, polls, online discussions, focus groups or public meetings. More intensive consultation methods are more likely to generate new ideas and learning opportunities for both communities and the project team. It is important not to 'over-promise' when planning consultation and to be transparent about how the feedback may (or may not) influence planning.

Engagement to build active and connected communities

There are many different processes and models used to support community participation. The processes and outcomes that are considered in community participation initiatives are diverse, making it difficult to identify 'effectiveness' of specific types of initiatives. Nonetheless, studies demonstrate that community participation can

- Improve outcomes of apartment retrofitting
- Support local government financial planning
- Integrate scientific information and community preferences into catchment management planning
- Build long term relationships and trust.

The effectiveness of participatory initiatives may depend more on how the initiative is implemented, rather than the choice of method used.

Two main types of stewardship programs relevant to water management are restoration programs and citizen science programs. Stewardship initiatives are popular with communities. They can be very effective at attracting participants and generating social learning. Some research also indicates that stewardship activities can generate short-term improvements in habitat restoration and support broader advocacy initiatives.

Principles of engagement

Throughout the review we provide principles to increase the likelihood of the effectiveness of the different engagement processes. Although these principles vary depending on the type of engagement process, some important principles common to many of the processes are:

- *Know your audience/community:* the effectiveness of engagement processes rests on ensuring that you understand who you are targeting with the engagement program. A consideration of the audience's current issues, constraints, knowledge, and behaviour will help to ensure you develop a program that is relevant to the audience/community.

- *Use diverse mechanisms to reach diverse communities:* Because communities are made up of diverse groups who vary in their ability to engage and participate, it is important to provide diverse outreach pathways to maximise your reach.

- *Frame the issue carefully:* think carefully about how to frame messages and information, that is, what aspects to draw out that will guide people's thinking about the issue. For example, messages that appeal to closely held values usually have more traction.

Background to the review

Background to the review

1.1 Introduction

1.1.1 Purpose of the current review

In the water sector, government departments, water utilities, local governments and non-government organisations frequently work with community members to support the transition to water-sensitive cities. This might involve awareness-raising campaigns, initiatives to change individual behaviour, or initiatives to build institutional trust or support for new investment in technology. These diverse activities are often referred to as 'community engagement'.

The purpose of this review is to highlight the different approaches available to organisations wishing to work with communities, and to examine the types of outcomes that these different approaches can generate.

1.1.2 Who is the community?

There are many different ways to conceptualise individuals who might be targeted for engagement initiatives. Different research or practice disciplines use different terms and concepts. These include (Doron et al., 2011, Aslin and Brown, 2004):

- Consumers: water users who pay for water and related services
- Citizens: individuals with a right to access clean water and related services
- The public: any individual or group of individuals
- Communities of place: groups of individuals linked by shared location (Figure 1)
- Communities of interest: groups of individuals linked by a shared interest (Figure 1)
- Stakeholders: individuals that have an 'interest' in the issue. This may include those directly or indirectly affected by the issue, or those whose interest is personal, financial, moral or legal.

In this review, we will use the term 'community' inclusively, to refer to either the public, citizens, stakeholders or specific communities.

Communities of interest *Groups of individuals linked by a shared activity or interest*
Members of a club or environment group
Renters
Public transport users
Residents sharing a cultural identity

Communities of place *Groups of individuals linked by a shared location, where they live, work, or gather together*
Residents of a suburb
Residents of a particular street
Users of a particular park
Workers in an urban office block

Figure 1. Different concepts of community: communities of place and communities of interest

1.1.3 What is engagement?

Engagement is a process of establishing effective and productive relationships to enable a shared understanding of goals or a shared commitment to change. Engagement processes are those that inform communities, consult with communities, and get communities actively involved. Effective engagement needs to consider diverse dimensions: engaged individuals understand the issue, have supportive attitudes towards the issue, and are actively involved in the issue.

Much of the literature discussing concepts in this area focuses on participation in decision making. For example, Arnstein's Ladder of Participation describes eight different levels of participation, including non-participation, tokenistic participation, and more genuine degrees of citizen power (Arnstein, 1969). Some participation frameworks consider dimensions other than power sharing. For example, a typology of natural resource management in Australia classifies participation based on factors such as the degree of community agency in the process, the nature of community control (if any) over resources, the nature of the community participants, the task at hand, and the intended duration of the participation process (Ross et al., 2002). The International Association for Public Participation (IAP2) describes a spectrum of public participation with five key levels of public impact on decision making (see Figure 3.) (IAP2 International Federation, 2014).

Some commentators infer that greater participation is more preferable to less intensive forms of participation; however, more participation is not automatically better - it is important to match the degree of engagement with the desired engaged outcomes (Ross et al., 2002, Hurlbert and Gupta, 2015).

Although some organisations use the concepts of engagement and participation interchangeably, it is important to note that participation is one component of broader engagement initiatives. Water organisations do conduct participatory activities; however, they also conduct engagement activities covered by other aspects of the engagement process. For example, water organisations may run an information campaign about issues not relating to policy decisions, such as those that aim to increase community awareness about the water cycle and impact of household activities on waterway health. Water organisations may also draw on the principles of psychology and social marketing to promote behaviour change or actively build support for policy initiatives. This review will consider all elements of the engagement process, including, but not limited to, participation.

Increasing impact on the decision

Inform	Consult	Involve	Collaborate	Empower
To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.

Figure 2. The IAP2 Public Participation Spectrum (Adapted from the IAP2 Public Participation Spectrum, (IAP2 International Federation, 2014))

In this review, we focus on both the types of activities that are used to engage communities, and the diverse outcomes that these activities can target. Within this framework, this includes:

1. ***Initiatives that provide input to the community***, which aim to:

- Inform, educate, or raise awareness
- Change individual or household behaviour
- Build policy support

2. ***Initiatives that seek input from the community***, which aim to:

- Gauge community opinion and preferences about current water practices and specific policy options, or explore their broader visions for the local area

3. ***Initiatives that build active and connected communities***, focusing on

- Participation in decision making: this may include a range of different engagement approaches
- Building trust and effective long-term relationships both between and within water organisations and communities
- Building active community stewardship, using restoration or citizen science programs, where community members conduct environmental monitoring or community management programs

In practice, many community engagement initiatives are dynamic, incorporating multiple activities across their duration. For example, a policy-focused engagement initiative may include: an information campaign to raise awareness of both the issue and the policy solution; a marketing-style campaign to promote support for the policy; surveys to gauge community opinion about the policy, and some participatory processes inviting communities to contribute to aspects of policy development. A behavioural-focused initiative may assess current community practices, invite the community to participate in processes informing policy development, followed by a behaviour change initiative.

1.1.4 Why engage communities in water-related issues?

Engagement is encouraged by policy

There is increasing recognition that public participation in policy development or organisational practice is important and desirable. Many international organisations such as the United Nations promote participation as beneficial for good governance and social outcomes (Head, 2007a). Many international conventions contain statements requiring public participation, such as the EU Water Framework Directive (Carr et al., 2012). Within the U.S., the Clean Water Act specifies that public input and participation are required for catchment management processes (Kaplowitz and

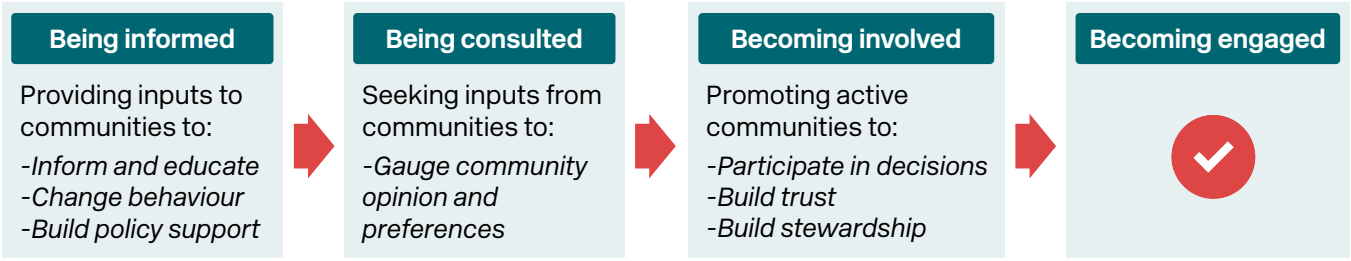

Figure 3. Processes of engagement, and different outcomes that these activities may achieve, adapted from (Aslin and Brown, 2004).

Lupi, 2012). In Australia, there is no Commonwealth statutory requirements for public participation. In general, public agencies in Australia typically provide guidance rather than statutory requirements for public participation (Momtaz and Gladstone, 2008, Head, 2007a). Nonetheless, such guidance reflects a culture which places increasing value on public engagement.

Engagement is ethical

There are many arguments supporting public engagement and participation as an ethical and democratic process (Newig and Fritsch, 2009). Effective engagement may promote social justice outcomes, providing equitable treatment of minority or disenfranchised social groups (Moglia et al., 2011). It can ensure public institutions (or those receiving public funding) are open and accountable. It is important to note that the way engagement initiatives are implemented may influence whether they promote ethical outcomes (Mostert, 2006).

Engagement can improve project outcomes

It is commonly stated that effective community engagement can lead to a range of superior project outcomes. These outcomes include more creative decision making, greater public acceptance of decisions, reduced conflict – with less project delays and more efficient implementation, strengthened democratic processes, and greater social learning (Newig and Fritsch, 2009). However, engagement initiatives that target individual behaviour or attitudes may also inadvertently frame the issue as one of individual behaviour, rather than recognising the importance influence of social or technical context. Individuals are just one element to consider when planning for change (Weiss and Tschirhart, 1994).

Does engagement benefit communities?

It is often argued that encouraging individuals and communities to become 'active citizens' generates a range of benefits, such as a better 'fit' between policy outcomes and community needs, a stronger influence to create positive change, or greater social capital – the networks that facilitate cooperation within or between groups (Newig and Fritsch, 2009). These benefits may not necessarily occur across all types of community engagement. It is important to distinguish between engagement processes that are driven by the needs of the community or those of an organisation. Sharing 'responsibility' for management of complex social and environmental problems may allow organisations to share the blame for poor outcomes (Head, 2007a). In some circumstances, engagement or participation activities can be (mis)used to constrain community demands, delay difficult decisions.

Does engagement benefit the environment?

It is sometimes assumed that greater input into decisions or 'more creative' decisions will generate positive environmental impacts (Newig and Fritsch, 2009). There is very little research that has examined the effects of engagement on environmental or ecological outcomes. A meta-analysis focusing on European decision making suggests that community involvement leads to a slight improvement in environmental standards or outcomes, but suggests that this is a result of participants with strong environmental motivations, rather than the participation per se (Newig and Fritsch, 2009).

1.1.5 Scope of the current review

The current review aims to identify a diverse range of community engagement techniques, and examine their effectiveness, as identified by the research and evaluation evidence. This review is not intended to be exhaustive, but to provide a thorough overview highlighting the diversity of research in this area. The focus in the review is on evidence of the effectiveness of different engagement strategies. We will focus on literature that relates to sustainable urban water management in developed countries, but will also draw on broader literature when informative.

Effectiveness of engagement techniques

Effectiveness of engagement techniques

2.1. Rationale for the current focus on effectiveness

There is no single 'best approach' to community engagement. The choice should be guided by many factors, but most importantly, the desired engagement outcome. In terms of the effectiveness of an approach, this may depend on the particular issue, the project stage, and the social and geographic context (Vantanen and Marttunen, 2005, Abelson et al., 2003). For example, is your organisation trying to reduce household water use, identify community concerns about stormwater harvesting, or build long term environmental stewardship? Are you working in a large urban centre, or a small community precinct? The question of 'what community engagement techniques are effective', should be rephrased as 'what engagement techniques are most effective to achieve a particular outcome?'

2.1.1 Defining effectiveness

The potential outcomes that can be achieved by community engagement are very diverse. In this report, we adopt the following framework for considering different types of outcomes. It utilises three levels of results: processes, outcomes, and impact (Figure 4).

- *Processes* incorporate the different ways that the initiative was implemented. It may include quantifying 'how many' aspects of an intervention were carried out – such as how many public signs were installed, how many public workshops were held, or how many community members responded to an online survey. Processes may also assess 'how' the initiative was implemented, such as the degree to which community members could direct the engagement process.
- *Outcomes* represent the specific issues that the initiative seeks to change. This can include changes in awareness or behaviours at individual, household or community levels or strengthened relationships within and between stakeholder groups. Sometimes these are referred to as 'intermediate outcomes'.
- *Impacts* represent the longer-term, 'bigger picture' goals of the program, such as improvements in water quality, sustained reductions in water use, active environmental stewardship, or water policies that foster community wellbeing. These often occur across time frames that extend beyond the period of engagement. For this reason, they may be difficult to assess.

For many engagement initiatives, it can be difficult to identify whether any observed outcomes or impacts are due to the engagement initiative or other factors such as changes in political context, weather or composition of the community (Chess and Purcell, 1999). Many initiatives that focus on participatory process actually focus on the processes as the key goal (Honkalaskar et al., 2014, Chess and Purcell, 1999). Some commentators recommend that 'successful' engagement initiatives should aim to achieve both positive processes and positive outcomes, and to assess both process and outcomes when evaluating engagement initiatives (Chess and Purcell, 1999, Carr et al., 2012).

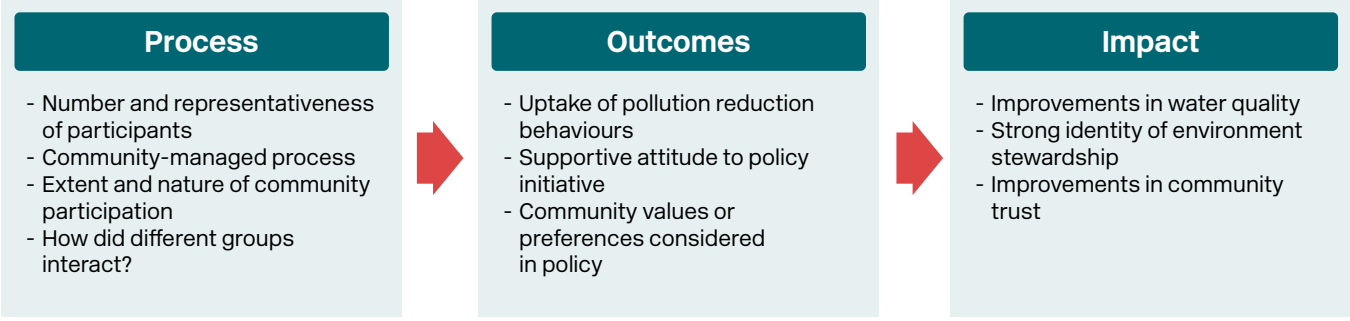

Figure 4. Examples of aspects of processes, outcomes and impacts that can be measured to assess effectiveness of community engagement initiatives.

2.2 Engagement that provides inputs to the community

This section focuses on engagement processes that provide input to communities including information and education programs, behaviour change programs and strategies to build policy support. A brief description of these different types of approaches is provided along with case study examples and a review of the literature of the effectiveness of these approaches. These initiatives tend to be found at the 'starting end' of both our engagement framework, and other models of engagement.

2.2.1 Building knowledge, awareness and concern

What is involved?

There are many different techniques available to build knowledge, awareness and concern. These techniques can be targeted to the broad community, or specific community subgroups of interest. Each of these techniques provides information via different channels:

- *Mainstream media* for public messaging campaigns, social media
- *Specific sites,* such as websites, online fact sheets, community notice boards, site specific signage
- *Targeted distribution*, such as mail-outs, newsletters , targeted direct mail, letterbox drop
- *Face-to-face initiatives*, such as seminars, workshops, community events, or site tours

In the context of water management, information campaigns typically include both information about the issue, and information about recommended behaviours or actions. Media campaigns may also use principles of persuasive communication. These are discussed in more detail in the following section (Motivating Behaviour Change).

Examples of programs

The Effective Environmental Education Project was an education campaign conducted by Waverly Council, in the eastern suburbs of Sydney (NSW Government, 2011). This campaign was conducted in four specific stormwater catchments within the local government area, and focused on raising awareness about stormwater pollution and changing behaviours. A control site was also assessed to enable evaluation. The early stages of the project surveyed residents to gauge existing knowledge and attitudes, identify community preferences for sources of information, and to identify potential demographic characteristics that could inform development of the educational materials.

Figure 5. 'Is washing your car dangerous?' Example of postcards used to raise awareness of sources of stormwater pollution

The community campaign included a series of catchment specific postcards, highlighting specific issues (see image), directly addressed mail, activities with school children, and a "Keeping it off the Streets" street party. No media campaigns were used, to avoid influencing the control site.

Postcards and directly targeted mail were the most remembered components of the campaign. Evaluation indicated that the campaign led to significant improvements in knowledge about stormwater pollution. For example, the number of respondents correctly identifying that washing cars on the road affects stormwater quality increased from 45% to 63%. Similarly, rates of correctly identifying that dog faeces affects stormwater quality increased from 61% to 77%. Not all issues exhibited increases in knowledge. For example, no major changes were exhibited in correct responses about impact of leaves and organic matter (41% to 43%), or silt, soil and sand (from 52% to 47%) on stormwater quality.

Evidence of effectiveness: face-to-face education programs

It is generally assumed that providing face-to-face education, using lectures or workshops will increase awareness and knowledge in attendees, yet, very little research has documented the outcomes that such events can generate.

One community education program about water involved a series of public events that included a one hour presentation and question session, focusing on the water cycle (Cockerill, 2010). Of the 145 attendees that completed the evaluation, 97% indicated that they "have a clearer understanding of how water works than I did before this presentation", and half indicated that information provided in the presentation was new, and differed from their previous knowledge about how water works.

Taylor and Wong review a number of studies that have provided intensive training or workshops to community members about garden and lawn care practices and their impact on catchment health (Taylor and Wong, 2002). They report that these programs can generate improvements in knowledge of specific issues (such as best season to apply fertiliser) by 26-41%, and increase positive attitudes by 17%.

A review of outcomes of environmental education—which is usually targeted at children—includes one study focusing on adult education (Leeming et al., 1993). The US study compared two educational approaches for communicating hazardous waste-management to community leaders: a workshop involving a visit to a hazardous waste facility, or a workshop involving classroom-style content. Compared to baseline ratings, post-workshop ratings of knowledge and attitudes improved significantly in both groups. However, this improvement had largely disappeared when participants were reassessed three months later.

The Better Water Workshop Series (2009) did not specifically target community groups, but focused on those involved in natural resource management, including some community participants. The majority of participants (90%) reported at least some improvement in knowledge about the National Water Quality Management Strategy, while approximately 76% of attendees reported at least some improvement in knowledge about water quality issues.

An adult education program focusing on ecosystem-based resource management involved 40 hours of education and some volunteer service. Attendees exhibited an increase in knowledge - the percentage of correct responses to a series of knowledge questions increased from 69% at the pre-testing, to 84% at the post-testing. Attendees also exhibited more positive ratings about resource management practices (Van Den Berg et al., 2011). One evaluation compared 50 students attending a field-based wetlands education program, with 50 attending a traditional classroom session. Both groups exhibited similar increases in knowledge after the program, although the field-based group reported more positive attitudes about conservation (Cachelin et al., 2009).

Research from health disciplines indicates that both low (3-4 hours per year) and high intensity (52 hours per year) group education can generate strong improvements in knowledge, and sometimes health outcomes (Deakin et al., 2005), but that these effects may not persist for extensive periods (Sarkadi and Rosenqvist, 2004)

It is important to note that educational events can potentially contribute to a range of other outcomes, such as raising an organisation's profile, building social capital in communities, or providing opportunities to recognise and celebrate community activities (e.g. (Player and McDonald, 2015)) but these are rarely documented by research.

Evidence of effectiveness: public messaging and media campaigns

A review of campaigns targeting stormwater pollution and related issues reported that media campaigns targeting community awareness typically generate 15% increase in knowledge or awareness about the issue (studies report between 3-24% increase), and an 8% increase in positive attitudes (Taylor and Wong, 2002).

A US study randomised 2255 individuals within a region to receive either (i) information and education materials about local ecosystems and their management, or (ii) no information (Marynowski and Jacobson, 1999). Information materials included posters, brochures, and youth activity booklets which were mailed out to residents. This was accompanied by a mass media campaign in television and print media, and an exhibit used at a number of local events, attended by more than 35,000 people which all individuals in the region may have had exposure to. Evaluation indicated that individuals randomised to the 'education' group exhibited stronger knowledge than those in the control group. When analysis examined individuals' self-reported exposure to different information sources, those who reported being exposed to posters and mass media reported greater knowledge and more positive attitudes than those reporting no exposure. Those who reported being exposed to brochures and the youth activity book exhibited higher knowledge but no differences in attitudes (Marynowski and Jacobson, 1999).

A study included in a review of environmental education (Leeming et al., 1993) examined the impact of watching a 30-rninute Cousteau documentary on marine mammals, using a 'real world' study design. Compared to control participants not exposed to the documentary, those who watched the documentary reported higher knowledge and attitudes immediately after the documentary. When assessed two weeks later, the beneficial effects only remained for knowledge, with attitude ratings returning to baseline levels (Leeming et al., 1993).

Moving outside of the water domain, a US Department of Energy advertising campaign targeted awareness about energy use in 8-12 year olds, called "Lose your excuse" (Bertrand et al., 2011). It used a series of television and radio advertisements, billboards and web internet banners, all suited for the target age group. This campaign ran for one year. The post-campaign evaluation indicated that 47% of children surveyed could recognise at least one aspect of the campaign, with television advertisements being the most highly recognised. Overall, no changes in attitudes or energy use behaviours were detected over time. Individuals who said that they remembered the campaign reported more positive attitudes and behaviours than those who didn't remember the campaign; while this could represent an effect of the campaign, it may also indicate that those with more positive attitudes are more likely to notice or remember the campaign (Bertrand et al., 2011).

Another example from outside of the water domain comes from a small-scale campaign in New Zealand which aimed to promote public understanding of issues related to sustainable consumption, advertising, and the negative social and environmental consequences of consumerism (Kolandai-Matchett, 2009). A specific message-framing strategy avoided use of negative messages, and instead emphasised local relevance, provided positive emotional appeals and reinforced the importance of individual action. Messages were contained in a series of articles in a local newspaper, distributed to 5000 households in a suburb of Christchurch. Limited data is provided in the evaluation, but the authors suggest that exposure to the campaign increased knowledge and concern about consumerism and advertising.

Research from other disciplines also indicate that mass media campaigns can generate improvements in knowledge and awareness. For example, a one-month mass media campaign about the eye disorder glaucoma generated an increase in awareness of the disorder from 23% to 53% (Baker and Murdoch, 2008). A Brisbane-based campaign using advertising inside buses raised awareness about aspects of a child-health service from 69% to 77% (King et al., 2005).

There is limited data on the impact of distribution of printed education materials, such as fact sheets or inserts in water utility bills. A review of health-related studies suggests that direct provision of printed materials can change attitudes or behaviours (Campbell et al., 2000). Within an environmental context, fact sheets may effectively convey information (Burger and Waishwell, 2001), but one of the key challenges is disseminating information and ensuring that it is read by the broader population of interest. One study reported that 80% of individuals read the brochures distributed by utilities, although authors acknowledge this rate is higher than typically expected (Carlson and M.J., 1991). Provision of information is unlikely to trigger change in individuals who are not engaged in water-related issues; rather, these individuals exhibit characteristics which makes them less likely to notice or retain information provided (Weiss and Tschirhart, 1994).

A number of studies, largely conducted in the U.S., have examined how different types of written information influence concerns about drinking water quality. One postal study examined the impact of three different information types on water quality concerns: (i) qualitative (a short report with no quantitative information), (ii) basic (contained minimal standards of content and design and included table of water quality results), or extended (inclusion of additional reading aids and additional information) (Johnson, 2003). Participants who received the reports did not differ in their concern with drinking water quality compared to controls who received no information. The most important predictor of drinking water quality concern was risk perceptions.

Summary

The studies that have evaluated the effectiveness of face-to-face and mass media water education and awareness campaigns generally suggest that they are successful at increasing knowledge and improving attitudes to more sustainable water practices and policies. What is not clear from the evidence is whether these improvements in knowledge and attitudes can be maintained over time.

Principles for raising awareness

Despite the diversity of approaches to enhance knowledge and awareness, there are a number of key principles for their use (Weiss and Tschirhart, 1994, Cockerill, 2010):

- **Know your audience:** Identify who you need to target for the education initiative towards, and know their understanding of the issue and likely ways to attract their attention and maximise their message exposure (or program attendance).
- **Remember that taking in information is not a passive act:** It is often, incorrectly, assumed that disengaged individuals just need greater exposure to information to promote awareness or engagement. Often disengaged groups exhibit characteristics that reduce exposure to water-related information, or the comprehension, interpretation, and retention of this information. Targeting 'hard to reach' individuals will need additional efforts focusing not just on exposure but on how to make the messages relevant to that group.
- **Frame the message carefully:** Making messages relevant to your audience will enhance motivation to take on new information. Frame your message using local examples, or link content to issues known to be important to your target audience. Choose words and images that enhance motivation and reduce negative responses.
- **Deliver clear and credible messages:** Message clarity is essential for building knowledge and awareness. Information is more likely to be trusted and retained if it 'fits' with individuals existing perceptions or experience about the issue. For challenging or controversial content, consider using experienced science communicators. Ensuring credibility of the message presenters is also important for building trust and information retention.
- **Maintain consistency:** Where possible, develop agreements with other organisations delivering public messages to ensure consistency of core messages.
- **Use diverse methods to deliver content:** For educational programs, use a mixture of videos, small group discussions or site visits, in addition to (or instead of) traditional lecture formats. For public messaging initiatives, use a mix of media types.
- **Consider a new angle:** Individuals are often more receptive to new ideas than being asked to remember or change an old idea. Consider applying a new rationale or context for the particular message.

2.2.2 Motivating behaviour change

What is involved?

Traditionally, behaviour change campaigns focused on information provision, are based on the rationale that increasing people's knowledge about an issue would promote concern and subsequent behaviour change. Although information is important, more recent behaviour change initiatives have moved beyond the provision of information; drawing from research in the areas of psychology and social marketing, current approaches emphasise persuasive communication and behaviour change tools (McKenzie-Mohr and Schultz, 2014, Fielding et al., 2013). These include:

- *Commitments and goal setting:* committing to an activity, in writing or verbally, can change self-perception and increase the likelihood of acting consistently with stated commitment. Similarly, asking people to specify when they are likely to start engaging in a behaviour can increase the chance of adopting the behaviour and asking people to set a goal, for example, reducing water use by a certain amount has been shown to motivate behaviour change.
- *Social norms:* norms are common and accepted behaviours within a group – what other people do, or what they approve of doing. Norms have a strong influence on behaviour – highlighting the number of people already doing a behaviour (or who approves of doing a behaviour) can create pressure to conform and increase the likelihood of others adopting the behaviour. For social norms to work, it is important not to reference unpopular or extreme groups, as this can generate counter-productive effects. A more reliable approach is to use broad identities, such as 'Perth residents', 'Queenslanders', 'inner-city residents' or 'those who commute into Melbourne'.
- *Prompts:* frequency of behaviours that need to be conducted regularly (turning off taps, disposing of litter) can benefit from provision of reminders, usually placed at the site of action.
- *Incentives:* this includes providing incentives or disincentives for behaviour. In the water context, incentives usually involve provision of rebates for water-saving initiatives. Some incentive strategies operate beyond the spectrum of typical engagement activities, such as implementation of regulations and fines, or changing water pricing structures.
- *Feedback:* especially important for difficult to measure outcomes, such as water consumption. Providing feedback about behaviour, for example amount of water used, is an important component of reinforcing and sustaining behaviours

- *Increasing convenience:* this recognises that contextual factors may influence uptake of certain behaviours, for example, increasing the number and visibility of recycling bins can increase recycling behaviour.

- *Message framing:* different ways of framing messages can influence the likelihood of behaviour change. For example, message can emphasise either the benefits of acting, or the consequences of not acting. Effective framing creates a favourable definition of both the issue and promoted solutions

Many engagement campaigns that aim to change behaviour use a range of these techniques, including provision of information.

Examples of programs

A key example of using community engagement to change water-related behaviours is the Target 140 campaign, implemented by the Queensland Water Commission in 2007, in response to drought and critically low dam levels (Walton and Hume, 2011).

Marketing research at the time of campaign development indicated that residents didn't think they could make any further reductions to water use, didn't think that households were the primary problem, and didn't think the drought was severe. Because a lot of existing water restrictions had also limited outdoor water use, the campaign focused on indoor water behaviours. This multifaceted campaign contained the following elements:

- *Setting a target:* Akin to goal setting that is outlined above, a key component was establishing a measurable target that was meaningful for individuals – so a 'per person measure' was selected, which was 140 litres, per person, per day.

- *Diverse media messaging:* television advertising incorporating strong visual elements, focused on three key messages – that water supplies were critical, that households use 70% of water, and that individual change could make a difference. These ads were supplemented by direct mail, print media, online advertising and outdoor billboards.

- *Clear and purposeful messaging:* the campaign focused on 'one big behaviour' which was the four-minute shower. In addition to all the campaign content, more than 1 million households were provided with a four-minute shower timer.

- *Clear information:* information about options for saving water was provided via booklet & brochures, print media, television news and radio features

- *Feedback:* current dam levels were incorporated into daily weather reports and other media, overall residential consumption was updated weekly, and quarterly water bills provided a clear indication of household consumption, with comparisons to quarters of the preceding year.

- *Promoting water saving devices:* this promoted installation of water efficiency devices, such as low-flow shower heads or water tanks, via use of rebates, home audits, and new building codes of practice.

- *Workplace strategies:* an element of the campaign extended beyond the household and encouraged workplaces to adopt water efficiency devices and promote water saving behaviours.

Figure 6. Example of campaign material for the Target 140 campaign.

This campaign ran for 8 months, from May to December 2007. Over this time, it generated a 22% reduction in average daily water consumption. The Queensland Water Commission reported that during the 2007-2008 financial year, average daily water consumption fell to 129 litres per person. During the following financial year, the daily per person target was relaxed to 200 litres. Despite this, average daily water use remained low, at 132 litres per person. It is thought that the multidimensional nature of the campaign contributed to its success, in which it addressed costs and benefits of action, social factors, and enabling factors (Walton and Hume, 2011). This campaign was considered an important success, instilling long-term water conservation behaviours into everyday routines.

Evidence of effectiveness – water demand management

A number of reviews have been conducted that assess the effectiveness of behaviour change programs to reduce household water use. One review suggests that public awareness campaigns can reduce water use by approximately 2-5% (Inman and Jeffery, 2006) whereas another review concluded that information campaigns to promote voluntary household water conservation can produce savings of between 10 and 25% (Syme et al., 2000). Specific studies mirror this variation in conclusions. A US campaign that focused on distribution of water saving messages via water bill inserts and pamphlets generated a 4.8% reduction in use. An analysis from Utah (US), reported that a public information campaign decreased water consumption by 7% (Coleman. A comparison of demand-side water 2011). On the other hand, a UK campaign involving public posters, direct mailing, advertisements in radio and print media generated no change in water use, and only 5% of an evaluation group reported that they had noticed the campaign (Inman and Jeffery, 2006). The effectiveness of information campaigns is likely to vary with the environmental and social context, existing water use and awareness of scarcity, and the nature of the campaign.

One Australian study conducted in south east Queensland experimentally compared a no information control group with three treatment conditions: a group who were provided only with information about how to save water in the household, a group who got this information plus detailed feedback of their household water use (i.e., via smart water meter end use feedback), and a group who received information plus social norms that communicated that similar people in the region engage in water conservation (31). Participating households had smart water meters installed and those in the treatment conditions received one postcard per month over four months with each postcard focusing on a different area of the house (e.g., bathroom, outdoor watering). Compared to the control group, all three intervention groups demonstrated reduced water consumption over time, with an average daily reduction of 11.3 litres per person during the intervention period. Reduced water use persisted for some months after the intervention period, but gradually returned to pre-intervention levels after approximately 12 months (Fielding et al., 2013).

There are also examples of water demand management programs that incorporate multiple approaches. A recent study from the ACT describes a campaign run by a water utility, which focused on raising awareness about water shortages, emphasising individual responsibility, and providing weekly updates about current water storage levels (Aisbett and Steinhauser, 2014). The campaign was also accompanied by water restrictions (level of restriction varied across the duration of the campaign). Analysis examined changes in water use over time (December 2005 to 3rd of March 2010) and how different elements of the campaign influenced water demand. The authors report an estimated reduction in water use of approximately 17% (Aisbett and Steinhauser, 2014).

The Living Smart Household Program, implemented in two regions of Western Australia, provided information, feedback and advice via mail and telephone to more than 10,000 participating households over an eight month period (Ashton-Graham and Newman, 2013). In addition to a range of information, this initiative provided telephone coaching, building self-efficacy, encouraging households to set goals about their water usage, and supporting interpretation of meter reading feedback. The information provided utilised social norms, was targeted to link with values identified by each participant, and used dissonance between identified values and actual behaviours to motivate change. Home sustainability consultations were also provided. Analysis of water consumption data for 12 months prior to the program compared to 12 months during/post-program demonstrates water savings of between 28-68 litres per household per day. This program was not restricted to water use, and also generated reductions in energy consumption and car use (Ashton-Graham and Newman, 2013).

In comparison to more information-oriented campaigns, the Every Drop Counts program (Sydney Water Corporation) which promoted residential retrofitting of water-saving devices, generated approximately 8% reduction in water demand (equivalent to a reduction in daily use of 57.3 litres per household) comparable to the reductions that have been shown in some information campaigns (Inman and Jeffery, 2006).

Evidence of effectiveness – non-point source pollution and stormwater management

Much of the research and evaluation examining community engagement for stormwater management has focused on catchment level interventions, comparing outcomes within the catchment receiving the intervention, to a control catchment.

One US study ran an intervention for 22 months, focusing on resident education (Dietz et al., 2004). This involved a series of public seminars about stormwater pollution and provision of home site assessments to residents, where assessments and recommendations were made about behaviours such as garden care and pet waste management. In some instances, support was provided to redirect downpipes to flow onto gardens, or to install rain barrels or rain gardens. Outcomes were assessed before and after the intervention. When all behaviours were combined, residents in the intervention area reported an increase in overall behaviours (best management practices) compared to those in the control group. However, when behaviours were examined separately, no differences between intervention and control groups was observed. Water quality measurements indicated a significant reduction in one specific indicator (nitrates) but no changes in other indicators, including total nitrogen and phosphorus.

A more recent study examined the effect of an 8-month education campaign in a suburban commercial district in Melbourne, Australia, compared to a control area which did not receive the intervention (Taylor et al., 2007). One-on-one meetings were run with merchants to promote the project and gain feedback on its implementation. Merchants were provided with brochures and fact sheets for distribution, and posters for display in shop windows. This education component was complemented by stencilling of stormwater drains, improved maintenance of the local council infrastructure (including removal of dumped rubbish), and a cooperative clean-up event. Compared to the control area, this campaign led to some minor improvements in littering rates and in use of rubbish bins, but no consistent beneficial effects were observed in knowledge or attitudes of merchants or community members. Over time, both the intervention and control area exhibited worsening litter loads collected in stormwater. The intervention area appeared to demonstrate a smaller increase in litter loads and a reduction in the proportion of litter contributing to overall pollutant load, but these findings were not statistically significant.

Although the two studies above do not provide conclusive evidence of the effectiveness of behaviour change approaches for addressing non-point source pollution and stormwater management, a review of different approaches to change behaviours influencing stormwater pollution reported that intensive training programs (such as workshops on garden care practices) can increase the number of people reporting engaging in a specific behaviour by approximately 29% (overall range 10%-75%; most common range 20%-40%) (Taylor and Wong, 2002). The review also concludes that awareness raising media campaigns generated an increase in the number of people engaged in specific behaviours of 12% (range 8%-48%) (Taylor and Wong, 2002).

Summary

Overall there is good evidence for the effectiveness of a range of approaches to reducing household water demand. Although its effectiveness likely depends on the social and environmental context, studies have shown that public awareness and information campaigns can result in substantial reductions in household water use; estimations range from 2-25%.

Studies suggest that programs that encompass multiple approaches may be more effective.

Research about behaviour change programs aiming to address water quality and stormwater management are less conclusive about what works and what does not. Intensive workshops and awareness raising media campaigns may increase the number of people engaging in specific behaviours, however, research is needed to also assess whether these programs have impacts on water quality.

Principles for changing behaviour

There are a number of principles for implementing behaviour change programs (McKenzie-Mohr and Schultz, 2014, Syme et al., 2000, Taylor and Wong, 2002):

- **Educate, but don't stop there:** most research indicates that improvements in knowledge or attitude alone, while important, are unlikely to lead to changes in behaviour. Nonetheless, education initiatives are considered important: community members need to be informed about the issue, and what they can do to solve the problem. Education may also contribute to building support for other components of the initiative.
- **Implement broad-based programs:** in general, the effectiveness of multi-dimensional behaviour change initiatives is thought to be greater than initiatives that rely on a single approach. Informational or persuasive techniques are commonly integrated with changing regulations and provision of incentives.
- **Consider long-term approaches:** the impact of the most effective initiatives does not persist indefinitely, and positive behaviours are likely to wane within 12 months. Ensure that you assess how the behaviour changes (for better or worse) over time, and consider strategies to refresh or boost outcomes.
- **Support broad participation:** target a mix of social groups, recognising that promoting behaviour change in disengaged groups may require more intensive interventions.
- **Get community input:** ensure that the messages and interventions are piloted and tested with representatives from the community of interest. Larger scale programs will require larger scale testing and feedback from diverse community and organisational representatives.
- **Build in processes to recognise and reward positive achievements:** individual feedback is an important component of supporting change. Providing feedback at a community level is also an important strategy for sustaining awareness and motivation.
- **Consider the social, environmental and policy contexts:** although many of the principles of changing behaviours are universal, interventions should be targeted to the local setting. This includes considering the social and demographic characteristics of the target community, local issues that may limit capacity to engage in desired behaviours (such as availability of recycling opportunities).
- **Promote diverse community benefits:** many strategies that aim to change environmental behaviours such as water use or pollution management also offer a range of other benefits for participants, such as financial benefits or reduced water use, reduced timed needed to water climate-suited gardens, or greater aesthetic appeal of public spaces. Strategies that promote personal benefits to community members can generate greater support for behaviour change programs than reliance on environmental benefits alone.
- **Flexibility:** be prepared to adapt to changing needs or emerging demands of the project, including any negative early evaluations.

2.2.3 Building public support for new policies

What is involved?

Public support is more than just public awareness or interest in a policy issue. It involves community members actively taking on the view that an action should be taken, with responses exemplified as 'Of course we should do that!' (KU Work Group for Community Health and Development, 2014). The transition to water sensitive cities requires adoption of new technologies, investment in new infrastructure, and implementation of new regulations. Many of these initiatives require community support to ensure their acceptance and success. The importance or potential benefits of these initiatives do not guarantee automatic public support; public support for new policies often needs to be actively cultivated.

Similar to engagement initiatives which target individual behaviour change, information and awareness provide important foundations for building policy support, which are then strengthened by use of persuasive communication techniques (McKenzie-Mohr and Schultz, 2014). For example, social norms are commonly discussed with reference to the 'approved' behaviours within a group. The concept of social norms can also be extended to attitudes about policy support. For example, increasing the number of people who publicly support a policy position sends a signal to others about importance of the issue, and increase the likelihood of others adopting support for this position. Similarly, principles of social diffusion proposes that individuals are influenced by others in their social network, and will often adopt similar attitudes about policy positions to those within their network (McKenzie-Mohr and Schultz, 2014). As discussed in the previous section, careful message framing, focusing communication content on a motivating aspect of an issue and positive aspect of solutions, is also a useful and widely used technique.

Building policy support using information and persuasive communication is usually conducted via media campaigns. However, the potential range of tools for building policy support is not limited to marketing-style approaches. Another strategy for building public support is social mobilisation. Social mobilisation uses dialogue with specific groups of people to raise awareness and motivate demand for particular action or policy shift. In regions affected by a particular policy, this may involve doorknocking programs, which use face-to-face conversations with residents about the policy issue, in which concerns are raised and discussed, and information is provided.

Government information or advertising?

Government communication of potential policies can be controversial: debate centres on whether communication represents suitable information provision that strengthens democratic process or inappropriate government propaganda that misuses public funds (Gelders and Ihlen, 2010, Head, 2007b). For example, the US Environmental Protection Agency (EPA) recently solicited public comments about a proposed clean water ruling, which aimed to adjust Federal jurisdiction to prevent pollution of waterways that feed into water sources; at the same time, the EPA engaged in a social media outreach campaign, aligning with other grassroots campaigns to build support for this issue. Some commentators suggested that this breached restrictions on the engagement of federal agencies in 'substantial grass-roots lobbying' (Davenport and Lipton, 2015, Shandas and Messer, 2008).

Examples of programs

Perth aquifer recharge trial – Australia

Water Corporation is the principal supplier of water and related services throughout Western Australia. To address future water security in the context of a drying climate, Water Corporation developed a plan: Water Forever: Towards Climate Resilience. This plan included use of new water sources, including groundwater replenishment. Groundwater replenishment is a process where treated wastewater undergoes further treatment to drinking water standards, this water is then reintroduced, or 'recharged' to an aquifer, where it is stored for later use as drinking water.

The engagement strategies were informed by research that indicated trust was a major factor influencing support for recycled water schemes (Water Corporation, 2013). To focus on building trust, the strategy utilised face-to-face approaches rather than traditional mass media campaigns, in a two-step process. The first step focused on engaging with experts and opinion leaders; the second step focused on engaging with communities. This was based on theories stating that most individuals form their opinions based on the views of opinion leaders in the media. Step 1 involved briefings with more than 160 health environment and local government stakeholder groups.

Face-to-face approaches used to engage communities focused on tours of the Visitors Centre for the replenishment trial, and presenting to numerous community events. Almost 400 tours of the Visitors Centre were conducted during the trial, involving more than 7,400 visitors.

> ***Support for groundwater replenishment increased from 74 per cent before a Visitors Centre tour to 93 per cent at the end of a tour.***

These strategies were supplemented by information packs, website, social media campaign, advertising, and media releases. School-based engagement was promoted by extending the existing Water Education Program to include content on groundwater replenishment. Water quality reports were regularly provided to the public.

Importantly, this campaign regularly sought feedback form the community, using annual community surveys, surveys of visitor centre and events, email surveys, focus groups and online forums. The information gathered was then provided to engagement experts and fed back into the engagement campaign. Regular community surveys indicate that:

- Support for groundwater replenishment remained steady between 70-76%.
- Groundwater replenishment is not a key concern for community, with unprompted awareness being only 5%. On contrast, rate of prompted awareness in the community surveys was 44%
- Indicators of trust in Water Corporation remained high

Introduction of NEWater - Singapore

An example of successful cultivation of public support for recycled water is the NEWater initiative in Singapore (Guan and Toh, 2012, Leong et al., 2011). During the 1970s, despite demonstrating the feasibility of wastewater reclamation and introducing recycled water for industrial use, a Singapore experiment promoting recycled water for toilet flushing was unsuccessful due to negative feedback about the smell and appearance of the water. Two decades later, growing pressure on water security prompted the government to re-examine the opportunities for recycled water. Alongside the process of optimising and testing technologies for water reclamation, the Public Utilities Board developed a deliberate communications campaign that aimed to get the public to overcome their psychological barrier towards drinking recycled water. This involved careful message framing that shifted attention away from the source of the water, to the state-of-the-art technology. Terms that had a negative connotation, such as wastewater or sewage, were avoided. The Public Utilities Board chose the term NEWater for the recycled water product, emphasising its 'new and improved' characteristics.

Sewage treatment plants were renamed 'water reclamation plants'. In addition to message framing, there were many other elements of successful campaigns, including:

- Significant media coverage
- Link with water security, where the campaign was framed as providing Singapore secure water supply, which would minimise dependence on Malaysia
- Endorsement by leaders, with government officials becoming *'NEWater ambassadors'*, drinking NEWater publicly
- Public displays and exhibitions
- Public sampling, with bottled NEWater distributed to the public at various events.
- Ongoing public education, via the NEWater Visitors Centre which has had more than 700,000 visitors

Public acceptance of NEWater is very high: 82% of survey respondents indicated that they would drink NEWater directly, and an additional 16% indicated that they would drink it when mixed with reservoir water. NEWater now contributes to 30% of Singapore's water supply (Guan and Toh, 2012).

Figure 7. NEWater products

Evidence of effectiveness

In the water domain, the best evidence that providing information can increase policy support is in relation to the issue of recycled water for potable use. A number of experimental studies have demonstrated the effectiveness of information provision (Fielding and Roiko, 2014, Kemp et al., 2012, Price et al., 2015). For example, one study that presented minimal information on how wastewater is recycled showed increases in support for this water source (Dolnicar et al., 2010).

Another study tested whether providing information about individuals' key concern about water recycling, that is, the potential health risks influences support. Community participants provided with information that described (i) how purified recycled water is cleaned and purified to high standards using advanced technologies, (ii) that it meets strict water quality and health standards, and (iii) a star rating system where recycled water was defined as 'six star water' and suitable for use in procedures such as kidney dialysis. Those receiving information reported more positive emotions and less negative emotions about recycled water, lower risk perceptions of recycled water, and greater support for recycled water schemes, including increased likelihood of voting in favour of such a scheme (Fielding and Roiko, 2014).

In fact the provision of information doubled the number of people willing to vote in favour of the introduction of a potable recycled water scheme. The importance of addressing community members' health risk concerns to increase support is demonstrated in another study (Price et al., 2015) and a further study shows that support may also be increased if the information comes from a trusted member of the 'in-group', for example scientists living and working in the region where the scheme would be introduced (Schultz and Fielding, 2014).

Health research stresses the importance of grass-roots engagement activities to build support for policy changes, rather than relying only on marketing activities. In fact, evidence of effectiveness of social mobilisation initiatives typically come from the health sector. For example, in the early 2000s, there were a number of setbacks to polio elimination programs in India. Children in certain areas were more likely to miss vaccinations, due to poor understanding about the process, and emerging suspicions about safety.

In addition to media campaigns, an intense social mobilisation initiative was implemented. This involved collaboration between specialist communicators and project workers, who met with community leaders and local authorities, and conducted repeated family visits in high-risk areas. These activities led to improved support for vaccination and improved health outcomes (Whittaker et al., 2014).

Summary

Studies indicate that effective communication techniques, combining good information and suitable message framing can build support for new policies

For complex issues, consider face-to-face or social mobilisation initiatives rather than relying on advertising alone.

Principles for building policy support

There are a number of principles for building policy support (KU Work Group for Community Health and Development, 2014, Huang et al., 2015)

- **Know your community:** use consultation to gauge existing public support and identify awareness, preferences and concerns about the issue. The most suitable approach to build public support may depend on whether it is an issue with established or expected support, or an issue with known or expected conflict or low public support. More controversial issues will usually need more intensive strategies that extend beyond media campaigns.
- **Provide good information:** ensure benefits, costs and impacts are clearly explained. Avoid using jargon, and ensure the information is relevant to your target audiences.
- **Use diverse mechanisms to reach diverse communities:** using a small number of engagement techniques will limit the number of people exposed to your message. Consider diverse outreach pathways to maximise your reach.
- **Gain the support of community leaders and use them as spokespersons:** public figures can raise the profile of your issue and enhance the persuasiveness of your message. Consider a range of other influential individuals, such as high profile journalists, individuals directly affected by the issue, or community leaders such as business leaders, local teachers, religious leaders, local opinion leaders, or individuals with high community credibility. Recognise community members who contribute to the issue or the campaign.
- **Frame the issue effectively:** define the issue and the solutions in a way that will generate the greatest number of people supporting it. This includes: defining it clearly, frame it as mainstream (rather than extreme or radical), don't make insupportable claims, and where possible, emphasise universal or near-universal values (e.g. we all want healthy waterways for our children).
- **Build supportive partnerships:** strong partnerships are a key feature of effective advocacy or change programs. Working with other organisations (including departments within an organisation) not only ensures that your messaging is consistent and reinforced by multiple partners, it can extend the networks of active supporters able to indirectly build public support. Individuals within these networks may be asked to contribute to building support via activities such as hosting meetings or writing letters to the editor. Recognise organisations or staff members who are pivotal in supporting your campaign.
- **Demonstrate existing support for your initiative:** high rates of demonstrated support can mobilise additional support via activating social norms. In general, the public like to 'back a winner'. Regularly gauge changes in support; as your support grows, share this as part of the campaign.
- **Consider grassroots mobilisation campaigns to build on-the-ground support for your issue:** these are more likely to be useful for more controversial campaigns. The time required for effective mobilisation is often underestimated - it is important that these processes are given adequate time and budgeting in the design phase.

2.3 Engagement that seeks inputs from the community

2.3.1 Gauging community opinion and preferences

What is involved?

Generally, community consultation occurs when an organisation needs information about community opinion. This may be conducted at various stages of project or policy development; early consultation can generate diverse views indicating acceptability of different options and potential concerns, whereas later stage consultation usually generates feedback for specific policy initiatives. The methods used for consultation are diverse, and include:

- Surveys and polls – can be conducted online or targeted via mail-outs or event attendees
- Online discussions and internet-based forums
- Interviews
- Focus groups
- Public meetings and workshops
- Public events such as street stalls, open days or road shows.

Community consultation is a commonly used tool. The rationale for use is that decisions which are informed by community views are likely to generate better outcomes, although some consultation processes are criticised for being tokenistic. It differs from more participatory methods in that the process and agenda are managed by the lead organisation and there is typically less ongoing dialogue between groups. It is suitable for projects of all sizes and types. It can address issues such as: strategies for improving river accessibility; provide information about raingarden benefits and identifying preferred locations, perceptions of demand management policies, or providing feedback on long term plans for urban development. Most of the research into consultation focuses on process that aim to generate community feedback on specific policy options. However, some initiatives will seek to gain community opinion about a broader issues, such as exploring the community's vision for use of a local area or a local resource.

Research into community perceptions of water sensitive urban design (WSUD) indicates that lack of consultation is key concern for communities. The authors suggest that two-way consultation is vital for notifying residents about WSUD installations, providing information about their function and benefits, and considering community preferences about WSUD features and locations to optimise implementation and future innovation (Leonard et al., 2014).

Examples of programs

An example of consultation for water planning is drawn from the Metropolitan Water Directorate (NSW Government), which led a whole of government process for developing the Lower Hunter Water Plan (Metropolitan Water Directorate, 2014b, Metropolitan Water Directorate, 2014a). This plan aimed to ensure adequate water security for domestic and commercial use, and it is notable for describing how community consultation influenced the planning process. Although this example involves higher levels of participation than is typical for many consultation processes, we have included it here as an example of consultation because all stages of the consultation process were controlled and managed by the water organisation.

Community consultation involved four workshops held over a 10-month period. The activities at each set of workshops were designed to integrate with the planning framework, by providing data to incorporate into the decision-making process. A dedicated workshop also engaged the Aboriginal community. Feedback from each workshop was fed into the following workshop. The workshops assessed community values about water planning, perceptions of supply and demand management options, and the cost, drought security and environmental trade-offs across management options. The workshops were also supplemented by online processes, including surveys and web forums. The outcomes of each workshop and input into planning processes is highlighted in Table 1. The program description does not indicate how people were selected for consultation workshops and whether they were representative of the broader population. Although not part of the specific engagement process, we note that this engagement initiative occurred during a time of dispute about the proposed Tillegra dam. The resultant plan states that this dam is no longer an active strategy within the Lower Hunter Water Plan, which has received support from a range of political and community groups (ABC News, 2014).

Table 1. The nature of community input to each stage of the consultation process for The Lower Hunter Water Plan

Workshop date	Examples of what was asked	What community said	How we used the feedback
Dec 2012	What are your values about water planning?	Values included (but not limited to): a process we can trust, sustainable solutions, a fair and affordable system, and respecting Aboriginal culture of 'life water'.	Became a reference point for developing the *Lower Hunter Water Plan.*
Feb 2013	What do you think about different supply and demand measures?	Mainly focused on information sharing to support later workshops.	
Apr – May 2013	How well do specific management options reflect the stated community values?	Options most consistent with values were non-residential water efficiency, stormwater harvesting, inter-regional transfers, drought restrictions, industrial use of recycled water, and Water Wise Rules.	These findings entered into multi-criteria analysis to assist planning team rank options and build short-list of portfolios.
Sep 2013	Which of the options in the portfolios short-list do you prefer? What do you think about the trade-offs between drought security and environmental needs?	Strong support for demand management and water efficiency measures in each portfolio. Favoured portfolios that provided greater drought security.	Community preferences generated a recommendation on the final portfolio.

Evidence of effectiveness

Consultation processes are considered an ethical approach to planning and policy development, important for building or maintaining community satisfaction and trust, and creating understanding that community views have been considered. Minimising conflict is a commonly stated aim of consultation, although it is important to acknowledge that absence of complaints does not in itself indicate robust acceptance (Russell and Hampton, 2006).

Although it is generally accepted that consultation can achieve these outcomes, there is very little research or evaluation data that specifically measures consultation outcomes such as trust or satisfaction. Many evaluations of public consultation describe the specific content and preferences provided by the public, rather than whether the consultation process met pre-defined criteria for effectiveness. It is likely that, in practice, outcomes of many routine consultations are not formally reported for external readers. There are examples where consultation was not genuine, or perceived to be not genuine, which lead to worsening trust and policy acceptance (Caulfield and Minnery, 1994).

A Belgian study compared four examples of public consultation, which differed in their scope and processes such as the degree of participant interaction and autonomy, and degree of management involvement (van Damme and Brans, 2012). For example, one case described a 'notice and comment' consultation for a regional nature development plan, where the public were informed of the plan and were invited to submit comments. Another case involved a plan to manage heavy metal pollution in a regional pollution 'hotspot'. This consultation involved a series of public consultation workshops, which were managed by local health workers. The results of each consultation case differed according to the consultation process – consultation processes with greater degrees of participant involvement generate better outcomes (Table 2).

Table 2. Comparison of outcomes generated by two different consultation processes (van Damme and Brans, 2012)

Case 1: Notice and Comment	Case 2: Consultation Workshops
No new insights were generated, and only one comment considered in final plan.	Many new insights identified. Most ideas selected for detailed development were included in final plan
Limited social learning – both participants and organisers did not learn about perspectives of others	Strong social learning – both participants and organisers learnt about perspectives of others, and in some cases, adapted their own perspective
Participants are not satisfied with the content results or the process, with some deterioration of relationships	Most participants are satisfied with the content results and very happy with the process
Organisers are satisfied with content results and the process	Organisers are 'reasonably' satisfied with the content results, and most are satisfied with the process

An example of consultation delivering enhanced risk communication focused on the Hawkesbury Water Recycling Scheme (Attwater and Derry, 2005). This scheme uses treated wastewater and stormwater for irrigation of crops and sporting fields. Instead of focusing on stakeholders (people affected by recycled water), the research team focused on communities of practice – individuals who were likely to have direct contact with recycled water via their work roles. This focus allows engagement practitioners to consider the social context of water practices, and how these practices generate shared knowledge. Two key communities of practice were horticulture workers and childcare workers, who took children to visit horticultural facilities. Each professional group participated in a series of focus groups to identify concerns about recycled water, and potential strategies for addressing these concerns. Each group had different perspectives on risks, but both identified the need for simple and accessible information about recycled water and support to identify suitable risk management practices. Horticultural workers requested support to develop risk assessment protocols and occupational health and safety (OH&S) materials and hygiene information. The focus was on improving risk awareness and behaviour, and demonstrating due diligence to OH&S responsibilities. In contrast, the concern of childcare workers were related to health risks for children and potential risk of gastroenteritis. These concerns led to the development of tools to interpret and communicate monitoring outcomes, using a simple 'traffic light' system, where red light indicated significant bacterial health risk (Attwater and Derry, 2005).

Some consultation processes are notable for their lack of success. One example of unsuccessful consultation involves the decision to ban commercial fishing in an estuarine area in regional Australia (Momtaz and Gladstone, 2008). The consultation process involved a series of meetings, some with specific subgroups of stakeholders, and some public meetings with mixed stakeholder groups. Subsequent feedback and interviews with one stakeholder group – commercial fishers – describe how they felt that consultation had no impact on the policy outcomes, and that the consultation meetings were really just information meetings, referring to the meetings as 'so-called consultation meetings' and 'lies and propaganda'. Many respondents reported not being directly informed of the final policy decision, and not understanding how compensation packages were determined. The authors also raise the issue that there was limited consideration of social impacts, and highlight that consultation is not a surrogate for other processes, such as thorough social impact assessment. Concerns that emerge during consultation may highlight the need for additional engagement strategies to address these concerns appropriately. The authors conclude that this consultation process did not achieve its intended outcomes – that the consultation was conducted to fulfil institutional obligation, rather than consider diverse policy options and diverse community needs in the decision making process (Momtaz and Gladstone, 2008). This study highlights the importance of consultation being 'genuine' and transparent about the scope and aims.

Summary

Consultation processes are commonly used by organisations. More intensive consultation methods are more likely to generate new ideas and learning opportunities for both communities and the project team.

There is evidence that if consultation processes are conducted poorly, that they can lead to negative outcomes.

Principles for effective consultation

The negative examples above highlight the importance of selecting an appropriate engagement process for the context, and to ensure it is well implemented. Despite the absence of research evidence informing consultation guidelines, there are a number of accepted principles to consider when embarking on consultation initiatives (Ross et al., 2002, Head, 2007a):

- **Be clear about the goals and limits of consultation:** can community preferences or concerns influence the decision, or has the core decision been made? It is essential to be clear about this to ensure the community has accurate understanding and expectations about the process. Not doing this can lead to loss of trust or consultation fatigue.
- **Provide suitable information about the issue:** define the issues and decisions for consideration using simple language and avoid jargon. Recognise that the community can bring diverse experience to the issue and provide good background information to ensure that individuals with limited knowledge on the issue can still contribute.
- **Be transparent about the consultation outcomes:** make the results of the feedback public, highlighting why you have responded (or not responded) in the way you have.
- **Use more than one type of forum:** ensure adequate representation by incorporating diverse consultation methods. For example, supplement face-to-face community meetings with emails and online feedback, and opportunistic measures such as street stalls.
- **Use inclusive strategies to maximise participation from diverse communities:** recognise diverse groups within the community of interest, and ensure these groups can participate. For example, provide translators for linguistically diverse groups, ensure public meetings are in a culturally suitable location, or provide child care support if you are targeting parents of young families.
- **Ensure appropriate facilitation for public meetings:** effective facilitators are prepared to listen, accept criticism, and ensure that diverse viewpoints are raised, welcomed, and considered. In some circumstances, it can be difficult for organisational staff to deal with 'two hats' – representing both their organisation and community needs. Perceptions of bias can undermine trust. If there are concerns about conflict or politicisation of the process, consider involving a neutral facilitator in the larger facilitation team.
- **Be prepared to adapt to changing project needs:** if new issues or project needs emerge during consultation, recognise the limitations of consultation and be prepared to consider new engagement processes. For example, if conflict emerges during consultation, consider more intensive participatory strategies to manage conflict.

2.4 Engagement to build active and connected communities

2.4.1 Community participation

What is involved?

There are many different processes and models used to support community participation, all with different labels or theoretical approaches. The methods described here are just examples of what is available. Methods include: community reference groups, community advisory groups, citizens juries, design workshops, active partnerships, or policy action teams (Hare et al., 2006). Many different forms of these methods have emerged in the research and engagement literature - all with slight differences in the group processes.

Programs also differ in their intended outcome. Some programs focus on participation to improve implementation outcomes, or engaging communities in decision making processes. In contrast to 'consultation' as discussed above, where organisations gauge community views, participation in decision making involves active dialogue between communities and decision makers. Other programs focus on building relationships and trust, focusing on longer-term engagement. For example, formal partnerships can be used to promote communication between individuals and groups, about issues such as catchment management. Establishing effective relationships and communication channels prior to emergence of a problem can help ensure timely and coordinated responses when problems do arise (Leach and Pelkey, 2001)

The processes and outcomes that are considered in community participation initiatives are diverse, making it difficult to identify 'effectiveness' of specific types of initiatives. For this reason, we will highlight examples of different approaches to community participation, although not all of these relate specifically to water management.

Participation for improved project implementation

Retrofitting urban residential apartments – China

A case study from China describes three different programs in Beijing which provided retrofitting of residential apartments to improve energy efficiency (Liu et al., 2015). The retrofitting included wall insulation, energy efficient windows, and energy efficient heating systems. The three programs described all differ with respect to the degree of community participation:

- Site 1: This program was led by the central government, and involved partnerships with the private sector. In the early planning stages, information and notices were distributed to residents, who were typically disinterested or opposed to retrofitting. Residents strongly opposed to retrofitting and who were considered local 'opinion leaders' were invited to visit a demonstration project, where they could see and experience the effects of retrofitting. A series of community meetings were also held. These initiatives increased support for retrofitting, and households agreed to make a financial contribution to the retrofit. After completion, satisfaction with the retrofit was 94%.

- Site 2: This program was led and fully financed by local government. Other than notices and displays providing information, this site involved minimal public participation. The whole complex was provided with wall insulation, and residents could choose whether they wanted energy efficient windows. The satisfaction with this retrofit was 84%, which the authors attribute to minimal changes to the living environment, and free-retrofitting which would increase value of their apartments.

- Site 3: This program integrated retrofitting with a renewal project for very old apartments, and required residents to move out of their apartments for a number of months. Participation was limited to notices and a resident meeting. Residents who opposed the retrofit were visited by a neighbourhood committee who then persuaded them to accept the retrofit. Although satisfaction with the retrofit was rated as 74%, subsequent interviews with residents indicated that many felt pressured to accept the retrofit, and some residents destroyed or removed energy saving devices once they returned to their apartment. Compared to residents at Site 1, those at Site 3 were more likely to report not knowing how their adjustable heating worked, or not realising that it was adjustable.

In China, residential retrofitting projects are usually implemented through 'top down' processes, where all levels of government play a dominant role. The authors conclude that not engaging residents in apartment retrofitting will limit the potential success of these initiatives. Another factor not discussed by the authors relates to financial contribution by residents at Site 1; it is possible that contributing financially to retrofitting motivates greater awareness and creates a greater sense of ownership (Liu et al., 2015).

Participation for decision-making processes

Financial planning for local government - Australia

An Australian example of community participation in decision making comes from Victorian local government. In 2014, the City of Melbourne implemented a citizen's jury to make recommendations about the 10 Year Financial Plan. In addition to broader engagement activities, 43 individuals that were representative of the broader community participated in the Melbourne People's Panel. This panel met for six assemblies between August and November 2014. To inform discussions about policy options, panel members received presentations, engaged in question and answer sessions, and met with experts and advisors. In November 2014, the panel provided a report to the council. A key feature of the recommendations involved specific initiatives to address climate change and promote long-term liveability, including new strategies for waste management and recycling, drainage, tree coverage and adoption of new technologies. Other recommendations included a specific schedule of rates rises; retaining CityWide, the Council facility that builds and maintains natural and civic assets; improvements to bicycle lanes and footpaths.

Early stage evaluations suggest that jury members support greater citizen involvement in policy making, and reported increased levels of trust and confidence in Council, and greater satisfaction with future plans for Melbourne. The full impact of these recommendations on actual council policy is still emerging (Reece, 2015).

Science-based catchment management – United States

One management program aimed to identify a process that can successfully integrated the best available management science, with community values and preferences. The Tillamook Bay Estuary Program, part of National Estuary Program, aimed to develop a conservation and management plan to restore functioning and health of the Tillamook Bay catchment, which was based on science and supported by the community (Gregory and Wellman, 2001 181). Previous community engagement using surveys and public meetings had not been adequate for planning processes, and some 'stakeholder burnout' was reported. Early planning for this project highlighted the need for a structured process that enabled community members to work through complex information about social and ecological benefits, economic costs, and risk of different management options.

The process began with 'value elicitation sessions', in which potential management actions were identified, and linked with potential outcomes using a 'why does this matter' questioning process. This identified the fundamental goals of management initiatives and generated a core list of potential actions. During this process, it became clear that a particular goal could be achieved via different management options. Managers and experts then quantified the impact of each of these actions, including benefits of incremental action. The next stage was to develop a tool that enabled communities to clarify and rate trade-offs for different management actions that varied substantially across different dimensions. The project team decided to use a workbook with detailed choice tasks, where the benefits, costs and risks of different options were highlighted. Information about economic values was elicited using social willingness to pay ('Is this a good use of society's scare funds…") rather than individual willingness to pay.

Individuals completed these workbooks within small group sessions that would permit discussion and clarification. The authors provide an in-depth discussion of community preferences. Overall, community members indicated that they preferred more intensive interventions to protect estuary health, even if they were more costly. Although this case study highlights a positive way to integrate community participation into scientifically-informed decisions, further publications demonstrate that effective participation may not prevent ongoing challenges. Another study describes how during this period, the local county changed its riparian regulations to align with Federal regulations. When local landowners were informed about these regulatory changes, they formed a landowners association and held the largest public meeting held in the area for more than five years. As a result, the change in county regulations were reversed (Smith and Gilden, 2002).

Participation for building relationships and trust

Integrated catchment management – New Zealand

An alliance between local government, Landcare groups and non-government organisations in New Zealand undertook a range of engagement initiatives, focusing on integrated catchment management (Allen et al., 2011). The goals of this program were to develop an active engaged community and to strengthen relationships between science providers and stakeholders, and within community networks, to support effective long-term management. A key component of this was to move beyond stakeholder meetings, and to foster communities of practice – bringing people together with a sense of shared purpose to promote social learning opportunities.

To achieve these outcomes, the group utilised multiple engagement approaches. Some of these included:

- *Community reference group:* this reference group involved 8-10 residents who met 3-6 times annually with researchers and policy makers. This group met for more than 10 years, highlighting the long-term nature of some engagement approaches. This reference group provided an informal forum for discussing new management approaches, and encouraged participants to appreciate diverse perspectives on different issues. It also provided an opportunity for community contribution to a model for assessing environmental outcomes.

- *Online discussion groups:* these were intended to provide an opportunity for conversations and questions about catchment management issues. It was found that a lack of interest in the early stages was due to individuals concerned about asking 'dumb questions'. This highlights the importance of trust when promoting genuine discussions, and the importance of experienced facilitation of public discussions.

- *Art-Science collaboration:* a collaboration between scientists and artists aimed to build understanding about cultural and biophysical interconnections at the catchment scale and involved the Travelling River Exhibition. The exhibition, and related media exposure, generated community dialogue about catchment management and connectivity within catchments and communities.

"While the formal platforms are vital to establishing this community... many critical conversations occur in the 'spaces in between', as a result of the relationships established and the spontaneous opportunities that arise"

These suite of ongoing engagement initiatives generated a range of outcomes including stronger capacity in all stakeholder groups, including the research team. There is now regular representation of local tribal groups in resource management issues, and a new pan-tribal resource management committee was formed to provide a coordinated and proactive contribution to catchment management. The diversity of engagement initiatives, and the time allocated to building working relationships were considered critical to program success. This is not just about meetings, but often requires policy makers and managers to mix outside of their comfort zone, engaging in community spaces (Allen et al., 2011).

Social learning is learning that occurs during formal or informal social interactions.

When social learning occurs in a group, it can foster changes in the group processes, and create **communities of practice.**

Summary

The research evidence on participatory initiatives is diverse. Communities can be engaged in processes that support particular decisions, or longer term activities to support trust.

The effectiveness of participatory initiatives may depend more on how the initiative is implemented, rather than the choice of method used.

Principles for effective participation

A study examined what elements of public participation were considered important across different types of stakeholder groups (Webler and Tuler, 2006). Points of consensus were that:

- processes should reach out to all stakeholders
- information should be shared openly and readily
- people should be engaged in meaningful (as opposed to tokenistic) interactions
- engagement should attempt to satisfy diverse interest positions.

Additional recommendations for effective community participation include (Gregory, 2000, Haklay, 2014, Honkalaskar et al., 2014, Vantanen and Marttunen, 2005, Mostert, 2006).

- **Be honest about the scope of participation:** only engage the public in decision making if you are willing to use their contribution. Ensure that participation is initiated early in the decision-making process. If communities are not able to influence decisions, provide information and a rationale for the process you have chosen and actively manage community expectations.

- **Provide good information and process to support decision making:** it can be very difficult to negotiate complex decisions with diverse interest groups without adequate information and processes to support the necessary discussions. Make sure the decision is properly framed - define objectives (or include a process for the community to define objectives), identify alternatives and consequences and clarify trade-offs.

- **Align with existing community activities and practices:** when identifying your communities of interest, examine their practices for meeting together. Participation is likely to be higher when engagement events are aligned with existing practices: if particular styles of discussion forums are already used within a community, consider using a similar approach. Use venues that are commonly used by diverse community groups to maximise attendance.

- **Consider cultural issues:** some cultural groups (ethnic, religious or social cultures) may not feel equally confident or empowered to share their opinion, especially in public forums. Consider the potential for multiple engagement events to address the needs of different community groups.

- **Respect and promote local knowledge and existing skills:** understanding the knowledge and skills that the community bring to participation is not only essential for 'knowing your community', respecting community knowledge and experience is essential to building trust and long term relationships. It can also provide a valuable resource base to facilitate social learning for projects workers and other community participants. Encourage reflection and learning throughout the process.

- **Ensure adequate time and resources:** participatory engagement initiatives require long term commitment to ensure processes generate positive outcomes. Cutting short elements of engagement initiatives, such as not providing feedback to communities, or not incorporating their views into organisational processes may undermine the engagement success. Develop a plan for data management and use prior to project initiation. Additional funding may be required to bring in additional expertise part-way through a project or to maximise outcomes, such as providing social learning opportunities for communities and project staff.

- **Consider using neutral facilitators:** while some engagement initiatives are successfully managed within a 'top down' approach, addressing more challenging issues may benefit from use of a neutral facilitator. This builds trust in the process and the outcomes.

- **Build in flexibility:** needs of the community or the project may emerge during the engagement process. Build in capacity to flexible about the procedures used, the groups targeted or the issues addressed. Include early-stage processes for feedback to allow you to gauge whether you are on track.

2.4.2 Participation to build stewardship

What is involved?

There are many different types of environmental stewardship programs, also called volunteer programs. The two main types relevant to water management are restoration programs and citizen science, or monitoring, programs (Measham and Barnett, 2008)

There are many examples of environmental stewardship and restoration programs across Australia. These range from small community organisations that operate in a local area, such as local urban bushcare groups that conduct weeding and tree-planting, through to larger organisations coordinated at a national level. With regard to the *empowered* end of the participation spectrum (Figure 3), there are limited examples of true community empowerment in urban water management in developed countries. In countries such as Australia, water supply and management are typically heavily centralised. Community-based management of water resources is more likely to be used in developing countries to manage rural water supply (Sally et al., 2014), fisheries (Hauck and Youkhana, 2010), or catchments (Mtetwa and Schutte, 2003). An Australian example of community-based resource management is the National Landcare Program, a grassroots, community-based approach to natural resource management (Curtis and Van Nouhuys, 1999). Under this program, and the closely related integrated catchment management, urban community-based organisations have been active in addressing water quality issues in their local areas through strategies such as tree planting.

Citizen science is where community members participate in scientific activities, such as collecting and analysing data, usually contributing to environmental monitoring. Citizen science programs may be managed by scientists or water organisations, where community members are sought out to assist with data collection or other specific tasks. Citizen science programs may also operate within a grassroots approach, where community members initiate monitoring a local issue of concern. The potential outcomes that citizen science programs seek to deliver are diverse. Some programs focus solely on collecting data to pursue scientific outcomes, whereas other programs include a strong emphasis on building issue awareness, scientific literacy, environmental stewardship and community capacity building. Each citizen science program has a different blend of research, monitoring, and educational targets.

Another form of citizen science is community-based auditing (Tattersall, 2010). Community-based auditing provides tools to empower citizens to systematically examine natural resource issues that affect them. It arose out of community concern surrounding industrial and agricultural pollution. While similar in some ways to citizen science, community-based auditing focuses more on converting scientific data into political action (Tattersall, 2010).

Examples of programs

Many catchment management initiatives provide examples of how diverse organisations work in partnership to promote stewardship and healthy catchments. For example, SEQ Catchments (www.seqcatchments.com.au) and Brisbane Catchments Network (www.brisbanecatchments.net.au) are both not-for-profit organisations that partner to host a range of stewardship programs. For example, they host the B*risbane River Corridor Restoration Program* which involves restoration events, focusing on weeding, restoring native vegetation and extending mangrove buffers. Their first *Landcare for Singles* event was held in 2014; in addition to engaging more than 80 people in vegetation planting, this program highlights the potential for diverse social benefits stemming from community stewardship programs.

There are numerous citizen science programs operating in Australia and internationally. *StreamWatch* is a long running water monitoring program initiated by Sydney Water and the then Sydney Catchment Authority (SCA) in 1990 (www.streamwatch.org.au). Beginning as a schools program in 15 schools, it quickly extended, and is now considered a broad-based citizen science program. Monitoring groups operating outside of Sydney Water's area of operation were run under the banner of WaterWatch. Since 2013, *StreamWatch* has been run by the Australian Museum, with support from Sydney Water. There are now almost 100 *StreamWatch* groups, monitoring 453 sites, documenting 28982 site visits. In addition to provision of monitoring data, StreamWatch provides diverse educational programs and materials. There are many other examples of citizen science programs in Australia (Table 3). Many water-related programs focus on health of marine ecosystems, such as coral reefs. Most programs also engage in diverse educational initiatives.

Most of the citizen science programs mentioned in this section engage volunteers in long term monitoring. However, some programs use community members to provide opportunistic environmental ratings, which may also be considered a form of citizen science. For example, a project based in Hauraki Gulf Marine Park (New Zealand) sought to assess public perceptions of environmental health, to inform marine spatial planning (Jarvis et al., 2015). During a seven-week period, the public were invited to rate the health of the environmental at park location that were important to them, and how the health of the environment in that location had changed over the past five years. Hotspot analysis for 4281 rated locations identified areas that were consistently rated 'good health and improved', 'good health but degraded', 'poor health but improved' and 'poor health and degraded', and demonstrated that public engagement could generate fine-scale ratings of trends in environmental health across large spatial scales (Jarvis et al., 2015).

Table 3. Examples of citizen science monitoring programs in Australia

Program	Target for monitoring	Website
Australian Marine Debris Initiative, Tangaroa Blue Foundation	Marine debris	www.tangaroablue.org
CoralWatch, The University of Queensland	Coral bleaching	www.coralwatch.org
Dolphin Watch	Dolphin sightings and behaviour	www.riverguardians.com/projects/dolphin-watch
Eye on the Reef	Health of coral reef ecosystems and sightings of iconic species	www.gbrmpa.gov.au/visit-the-reef/eye-on-the-reef
Fitzroy Partnership for River Health	Water quality and waterway health	riverhealth.org.au
MangroveWatch	Health of mangrove habitats	www.mangrovewatch.org.au
ReefCheck Australia	Health of coral reef ecosystems	www.reefcheckaustralia.org
Redmap Australia	Marine species sightings and geographical range	www.redmap.org.au
Reef Life Survey	Health of rocky and coral reefs	reeflifesurvey.com
SeagrassWatch	Health of seagrass habitats	www.seagrasswatch.org
StreamWatch	Water quality and waterway health	www.streamwatch.org.au

Evidence of effectiveness – restoration programs

Portland's Community Watershed Stewardship Program (U.S.) aims to protect catchments from the negative impacts of urbanisation via community stewardship. It is a joint venture between local government, the local university and the community (Shandas and Messer, 2008). This program arose after the 1998 Federal Clean Water Action Initiative, which required states to work with the public, and facilitated local 'watershed councils' to become official catchment management units.

The overall approach identified key management priorities and potential opportunities for community contribution. Community groups would then submit proposals for activities. Where suitable, graduate students would provide support to community groups using an internship program. The program involved community stakeholders early in the planning process, building ownership from its inception. It was also intended to be adaptable to the needs of community groups. A review of 12 years of activities describes more than 130 community projects, managed by a range of organisations, and thousands of volunteers. The projects diversified as the program continued, and included education initiatives, riparian restoration, monitoring programs, green roof building projects, swales, and bioretention plans.

More than 17 hectares of riparian zones have been restored, and the program is reported to have generated significant learning opportunities for both community members and graduate students participating in the program. The authors state that community participation in this program has also generated support for larger scale infrastructure projects, via improving public knowledge about stormwater management strategies (Shandas and Messer, 2008).

A conservation stewardship program, based in Michigan, provided 40 hours of adult education in ecosystem-based resource management, and required 40 hours of volunteer service (Van Den Berg et al., 2011). In addition to increasing knowledge, participants reported increased positive attitudes to NRM management practices, and increased ratings of confidence across a range of skill sets, including finding suitable information and organising community projects.

Based on interviews with environmental volunteers in Australia, one study described the self-reported benefits of volunteering (Measham and Barnett, 2008). The benefits that volunteers report include:

- Social benefits, including meeting people and learning more about their community
- Environmental outcomes, including reducing weeds, revegetating creek areas, and removing rubbish
- Political outcomes, such as influencing types of local development that occurred
- Learning and gaining new skills, such as technical skills in bush restoration, organising skills in the areas of community engagement, and media engagement, or sustainability skill such as energy efficiency in the home

Interviews with U.S. StreamWatch volunteers indicate that community stewardship and restoration programs can also contribute to 'place-making' – strengthening a sense of connection to the places in which volunteers live, work or spend recreational time (Amsden et al., 2013). This can occur via participation which directly impacts the landscape, such as building boardwalks or removing litter, or via communicating information about the place to visitors or other volunteers.

Evidence of effectiveness – community monitoring and citizen science

The Australian Marine Debris Initiative (AMDI), coordinated by the Tangaroa Blue Foundation, engages communities to monitor marine debris and its impacts across Australia (Hastings et al., 2015). Volunteers, recruited via regular networks and special public events, participate in beach cleans, and then analyse the nature of the debris collected. Once key contributors to debris are identified, Source Reduction Plans are developed; these involve working with partners to prevent debris from entering marine environments. Citizen science programs demonstrate success in attracting participants. For example, The 2014 West Australian Beach Clean-Up Report for the AMDI indicates that more than 1000 volunteers are involved annually in their clean-up events, and that almost 300km of beaches were cleaned in 2014. This report also describes two examples of how data generated by community clean-ups have generated successful Source Reduction Plans. One common debris item was hard plastic strapping bands used to secure boxes on commercial and recreational fishing vessels. In response to the Source Reduction Plan, legislation was changed (Western Australian Fish Resources Management Regulations) requiring strapping bands to be removed from boxes prior to being loaded onto vessels. This shift corresponds with a downward trend in the presence of strapping bands in debris collected from beaches. Another type of debris detected was small plastic pellets used by the manufacturing industry.

Investigations by Tangaroa Blue Foundation provided evidence of this pollution emerging from certain factories in Perth. This evidence was provided to the Department of Environmental Regulation (DER) and the Keep Australia Beautiful Council (WA); after additional investigations, two factories were issued direction to cease, prevent and clean-up all plastic materials under the Litter Act 1979. Within seven days, these factories had installed infrastructure to prevent this pollution occurring (Hastings et al., 2015).

Summary – stewardship

Stewardship initiatives are popular with communities. They can be very effective at attracting participants and generating social learning.

Some research also indicates that stewardship activities can generate short-term improvements in habitat restoration and support broader advocacy initiatives.

Principles for building stewardship

A number of guiding principles can optimise stewardship activities (Ross et al., 2002):

- **Recognise diverse benefits:** benefits for communities or individuals may extend beyond the direct target of the stewardship activity. Other benefits that may motivate individuals may include building new friendships and social networks, opportunities for formal and social learning, and benefits for physical or mental health.
- **Support stewards and prevent burn-out:** participating in stewardship activities often involves significant voluntary labour. Recognise and reward individuals and organisations who contribute to stewardship programs, partner with similar organisations to connect volunteers, and link stewardship activities to broader outcomes such as social opportunities or support initiatives. Providing training and official recognition through uniforms or badges can also recognise the contribution made by volunteer stewards.
- **Cultivate supporting and enabling organisational roles:** stewardship volunteers are typically motivated by environmental or social goals, rather than organisational requirements. Consider ways in which your organisation can maintain motivation for volunteers, such as offering training opportunities or events.
- **Recognise intergenerational opportunities with school-based activities:** schools often have programs which foster participation in a range of local activities and may contribute enthusiastic and energetic volunteers. Engaging young people also creates a pathway to raise awareness with parents who may not always have time to contribute directly.
- **Provide meaningful experiences:** avoid tokenistic activities, and provide volunteers with feedback about program outcomes and how their contribution made a difference. Provide opportunities for volunteers to contribute to diverse aspects of the program such as dissemination of findings.
- **Recognise local knowledge and skills:** volunteers bring diverse knowledge and experience to any project. This may include particular technical expertise, knowledge of the local landscape and any recent changes, or knowledge of local community issues that may impede or facilitate greater participation.

Putting engagement into practice

Putting engagement into practice

In this final section we draw out some of the key challenges that can be faced when designing effective community engagement processes.

3.1 Who should be involved?

One of the challenges with planning engagement initiatives is considering who should be involved and ensuring adequate representativeness of participants.

In many communities, certain stakeholder groups have a history of very active engagement or influence in certain issues. While it is important to consider these groups, they may not adequately represent the views of the broader community. Additional efforts may be needed to ensure that less active or influential groups contribute to engagement initiatives (Junker et al., 2007). In some circumstances, individuals may represent more than one stakeholder group or perspective; where engagement processes limit the number of participants, these individuals may provide valuable contributions as they possess diverse experience and perspectives (Ross et al., 2002)

Often in urban settings, there are larger and more diverse groups within communities. In some cases, these groups may have poorly defined networks and very different views on water-related issues. This can make it difficult to target engagement (Burgin et al., 2013).

The literature provides a range of recommendations (Junker et al., 2007, Mostert, 2006, Vantanen and Marttunen, 2005):

- *Identify potential groups of interest well in advance:* Ensure effective analysis has identified all the potential issues, those affected, their needs and perceptions about the issue, and any potential barriers to participation. If necessary, be prepared to actively approach stakeholders to prevent limited engagement or unrepresentative engagement. This is especially important when numbers are limited.

- *Consider diverse perspectives:* target groups that may have new perspectives or information, those that can bring specific skills, and those that stand to be affected by the outcomes.

- *Suitable location:* ensure that the location is accessible, neutral and culturally suitable, especially if you are trying to empower disenfranchised groups

- *Persevere:* some groups may need additional support to participate. For example, if you are targeting new parents, consider providing childcare. Similarly, consider using translators or cultural advisors if you are trying to target specific cultural groups.

- *Use multiple recruitment techniques:* relying on a single method for engaging individuals can limit the scope of your activities. Use diverse media and platforms.

It is important to consider communities as more than just a collection of individuals. Recognising the social structures and networks within communities can reveal more diverse community or stakeholder groups, and allow you to engage with these groups more strategically (Agrawal and Gibson, 1999, May, 2008). One review highlights the importance of distinguishing between groups that represent conflicting interests: for example, recognising that 'fishers' include both commercial and recreational fishers, which each hold different, and potentially conflicting, interests (May, 2008).

3.2 Engaging the disengaged

One challenge when trying to engage a representative community is how to engage the disengaged. Individuals that are easy to reach may not represent the broader community – these groups are typically more difficult to engage, but can be vital to the change process (Webb et al., 2009). Apparent disinterest in engagement activities may occur as a result of (Tasmanian Government, 2013, Webb et al., 2009):

- Low interest in the issue, or perceptions that the issue is not relevant to them.
- Being overwhelmed by too much information.
- The presence of barriers to participation, such as language or time barriers.
- 'Consultation fatigue' in the community, often associated with previous engagement experience that was not successful or perceived as 'genuine'.
- Engagement methods that have not adequately addressed community motivation and ensuring that engagement is targeted to be relevance to the community.
- Limited time or mental capacity to participate, due to busyness and life stressors such as family demands, health issues, or financial pressures.
- Low feelings of efficacy within the community.
- Low levels of trust in organisations.

In some circumstances, it may be possible to identify specific barriers to engagement, which can be addressed by adapting the design of the engagement initiative. One study highlights the need to move away from 'talking heads' to use of more visual imagery, that allows people 'to see' practical examples of the issues (Webb et al., 2009). For example, providing tours of wastewater treatment facilities or a demonstration water sensitive urban design initiative can make these issues more 'real' than just providing written information.

Promoting engagement is more difficult where the source of disengagement reflects more complex social issues – some sectors of the community may be disengaged, not only with your project, but with many social networks. Targeting this group may require additional engagement expertise (Emtage and Herbohn, 2012).

3.3 Importance of evaluation

Formal evaluation provides an important way to assess the outcomes of your engagement initiatives. Evaluation can assess whether you have met initial project goals and objectives. Engagement can lead to a range of positive or negative unexpected or unintended outcomes, so it is useful to consider these possibilities when planning your evaluation.

Evaluation that is conducted throughout the life of your project allows you to adapt the project to meet changing needs. Consider what has been done well, and what has not been done well. Plan how you can learn from this project, and how to share the knowledge across your organisation (Tasmanian Government, 2013).

There are many ways to consider the success of your engagement initiative. Evaluations benefit from including a diverse mix of indicators of success, including processes, outcomes and impacts (Figure 3).

- Process indicators: could include the number of community members engaged with, whether these individuals were representative of the broader community, participant satisfaction with the process, the number of complaints about the engagement.
- Outcome indicators: change in knowledge, attitudes or behaviours, community preferences and values incorporated into a policy or decision.
- Impact indicators: reduced water demand, improved water quality, greater community trust in the organisation, ongoing stewardship activities.

Choosing a mix of outcome indicators can ensure that you don't 'miss' some aspects of your project. For example, choosing only process indicators will not allow you to examine the effects of your engagement on actual target behaviours or long-term impact. Choosing only impact indicators may mean you miss a range of intermediate benefits that prevent you from understanding the pathway to this impact. In some cases, long-term beneficial impacts may occur beyond the time period of the engagement initiative.

3.4. Avoiding adverse outcomes

The processes of how engagement activities are conducted are important determinants of their success. Engagement initiatives that are conducted poorly can generate counter-productive outcomes. For example, inviting public feedback about a decision after it has been made, is a strong trigger for public resentment. If public responses are not considered or addressed transparently and appropriately, this can actually worsen public trust and undermine project implementation. In this way, poor engagement processes can also undermine effectiveness of future engagement initiatives (Vantanen and Marttunen, 2005, Chess and Purcell, 1999).

> ***"...too often decision makers cast a wide net for hearing citizens' views but then disappear behind closed doors to interpret what they have heard and to work out the tough conflicts that inevitably arise across disparate points of view... It is therefore not surprising that there remains a widespread dissatisfaction with the quality and meaningfulness of stakeholder input to many environmental risk-management decisions" — (Gregory, 2000)***

It is essential to be transparent about the potential for communities to influence a project or decision. If community feedback is not able to influence decisions, then be clear about the rationale for engaging their feedback. One challenge can relate to processing the volume of information generated by engagement processes (Hare et al., 2006). When planning engagement initiatives, ensure that you have adequate resources to manage the engagement processes through to a stage that includes processing information, provision of feedback to communities, and consideration of engagement content into the project directions.

Managing conflict effectively

Many people are passionate about their contribution to engagement initiatives; they may be arguing for issues such as: safety, health and well-being, maintaining a sense of place, or livelihoods for themselves or their children. When individuals engage in issues that are emotional, highly technical, controversial, complex or unfamiliar, they may experience feelings of anxiety, fear, frustration, lack of control, or anger.

To minimise the impact of these intense emotions, ground rules can be developed with participants prior to engagement. Being able to refer participants back to the ground rules that they helped to create can help to deal with conflict in a respectful way.

Not dealing with a person's emotions during engagement can lead to wider conflict among participants. You can manage an emotionally charged situation by:

- letting the person express their anger and concerns in a way that is safe for others
- listening to them without interrupting, being defensive or arguing with them
- respecting their opinion
- realising it is not a personal attack
- asking questions to clarify their feelings and concerns;
- find out what is important to them (values) and try to reframe the issue linking to shared values
- summarise what you have heard and seek their confirmation you understand
- ask what they would like done to address their concerns. Agree to a timeframe for when concerns will be addressed or referred on, and commit to providing feedback at an agreed time.

Finding out the core values and priorities that communities hold can assist in finding common ground and reducing conflict. Understanding these values can help you to appreciate where community members are coming from and what type of outcomes they seek.

> ***"Don't exclude individuals or groups to try and avoid conflict – consider a different engagement approach"***

Do not exclude individuals or groups to try and avoid conflict. If a particular issue is very emotive or controversial, it is best to select engagement techniques that do not allow people to behave in a confrontational way. For instance, it may be best to avoid public meetings and use a series of small group discussion or one-on-one interviews before bringing selected groups together to discuss solutions and/or options.

Adapted from (Tasmanian Government, 2013)

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Further reading

Towards Whole of Community Engagement: A Practical Toolkit
Aslin and Brown, Murray-Darling Basin Commission
http://www.collectivethinking.com.au/portfolio/towards-whole-of-community-engagement/

Engaging Queenslanders: A guide to community engagement methods and techniques
Queensland Government, Department of Communities
http://www.qld.gov.au/web/community-engagement/guides-factsheets/methods-techniques/

Engaging Queenslanders: Evaluating Community Engagement
Queensland Government, Department of Communities
http://www.qld.gov.au/web/community-engagement/guides-factsheets/evaluating/

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