

Guide to using research in sustainability programs

DECC Social Research Series

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59–61 Goulburn Street, Sydney
PO Box A290
Sydney South, NSW 1232

Phone: (02) 9995 5555

Phone: 131 555 (environment information and publications requests)

Phone: 1300 361 967 (national parks information and publications requests)

Fax: (02) 9995 5999

TTY: (02) 9211 4723

Email: info@environment.nsw.gov.au

Website: www.environment.nsw.gov.au

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Glossary

Term	Explanation
Action research	A reflective process conducted by individual practitioners or teams of colleagues about their own programs to improve their knowledge, strategies, practices and the way they address issues and solve problems.
Activities	Specific things produced by, or conducted as part of, an education program e.g. training packages, posters, workshops, media campaigns. They are used to meet the program objectives.
Adaptive management	A process whereby elements of an education program, such as its design, plan or management systems, are changed during implementation (or in subsequent phases) in order to produce better results. It is a response to new evidence or knowledge as it emerges.
Behaviour change	Observable changes in individual behaviours or practices.
Capacity building	Development of an individual's, group's, organisation's, institution's or society's ability to identify and address environmental/sustainability problems. It includes strengthening their knowledge base, competence, resources, networks and infrastructure.
Community	A group of people that live in the same place or share a common interest or identity. It is also used to describe those affected by or interested in a particular issue.
Communities of practice	Created by sharing knowledge between people working in the same field. This is a form of capacity building and important for improving professional practice in education for sustainability.
Critical thinking	Examines the way we interpret the world and how our knowledge and opinions are shaped by those around us. It aims to give us a better understanding of the influences of power, politics, information flows, hierarchies and organisational structures.
Data collection methods	How existing information is gathered or new data generated. Techniques vary according to research methods (e.g. observing behaviour, questioning informants, examining historical records), each of which includes a suite of data production techniques. Methods and techniques are often mixed and matched within research and education programs/projects.
Education	Any process or activity that engages people in learning by sharing and developing knowledge, skills and attitudes. It can occur through formal and non-formal processes.
Education for sustainability	Also known as EFS and sometimes referred to as 'learning for sustainability', it involves people working together to: envision a sustainable future; critically think and reflect about the power, politics, structures and information flows in society that influence change; think systemically and broadly about issues; and work in cross-sectoral partnerships to achieve change.
Environmental education	Any process or activity that assists the development of awareness, knowledge, attitudes and skills leading to environmentally responsible practices and behaviour and more sustainable societies.
Environmental educators	People involved in creating learning opportunities to better equip others to think and act in a way that will create sustainable societies. They are concerned with a range of aspects of sustainability in the economic, social and environmental domains.
Knowledge	What we know about something. It can be data, information or understanding. This guide is about how to use existing knowledge and undertake research to add to this knowledge base.
Learning for sustainability	A term used interchangeably with 'education for sustainability', especially at state government level e.g. NSW Council for Environmental Education, <i>Learning for Sustainability, NSW Environmental Education Plan 2007–10</i> ¹

¹ See <http://www.environment.nsw.gov.au/cee/lfsPlan0710.htm>

Term	Explanation
Mentoring	Support, understanding and advice for people, one-on-one or in small groups, in order to build their capacity for change (see also 'capacity building').
Needs	The difference between the desired and actual state of the issue.
Objectives	A clear definition of what the program is intending to achieve in an observable form. Achieving the objectives will ensure that the aim of the program is met.
Outcomes hierarchy	A thinking tool that organises short- and long-term outcomes of a program in an ordered sequence that have a cause and effect relationship with each other. At the lowest level are the 'needs' of the program and at the highest level are the 'ultimate outcomes'.
Reflective practice	A process where we think about what happened and why and what we learnt from the process. It can be done by an individual or in a group. The new learnings and understanding are incorporated into our day-to-day work and this builds our capacity for change.
Research	The process of gathering existing data or generating new data, information or understanding, analysing the findings and formulating new ideas, recommendations and strategies, in a systematic, planned and verifiable way.
Research strategy	A broad statement of the approach used to conduct research.
Social context	The cultural, political, societal, organisational and geographical influences on change. It includes the norms, values and behaviours inherent in these areas of influence that create its dynamic and complex nature.
Social change	Change in the nature, institutions, behaviours, norms or social relations of a society or community.
Stakeholders	People or groups of people with an interest or stake in the program and/or its outcomes, such as program participants/audiences, community groups, colleagues, those delivering programs, funding bodies, partners and people to whom the program is accountable. Stakeholders may be internal or external to an organisation and may be directly or indirectly affected by the outcomes.
Sustainability	A goal to live within resource limits and minimise impact on the physical environment, to achieve social justice and foster positive environmental, social and economic outcomes.
Sustainability educators	People involved in creating and implementing education programs with a sustainability focus, usually in a community or organisational context.
Sustainability practitioners	People involved in making change for sustainability – usually in an organisational context – who may or may not be using an education program to achieve their aims. See also 'environmental educator' and 'sustainability educator'.
Systemic thinking	Involves thinking broadly and holistically to see the bigger picture. It also recognises the linkages, processes and the relationships between individual parts and the broader context.

NOTE: In this guide:

'**Sustainability education**' is used to cover a wide range of terms including education for sustainability, learning for sustainability and environmental education.

'**Sustainability educators**' is used to cover the wide range of people involved in sustainability education including environmental educators and sustainability practitioners.

An **education program** is taken to be a combination of resources, processes, activities and approaches which may include formal and/or informal education. A program is divided into sub-programs or projects. A **project** is a smaller scale set of activities that contribute to achieving the aims of an education program.

1 About this guide

1.1 What is this guide about?

This guide is about how to:

- Plan to do research
- Source existing research
- Conduct new research and
- Integrate research in sustainability or sustainability education programs.

This guide will help you to understand:

- How research builds knowledge – an important ingredient of successful education programs
- What types of knowledge you can develop from research – either existing or new research
- The role of research in change
- How to incorporate research throughout sustainability or sustainability education programs.

This guide does not include specific details about how to conduct various types of research but some useful resources are provided in Appendix A.

Box 1: Who should use this guide?

Program managers – to understand how research contributes to successful programs

Program developers – to learn how to plan for research during the program cycle

Educators (sustainability, community, environmental, etc) – to learn how to plan for and use research and incorporate it into their education program

Funders of education programs – to understand why it is important to allocate funding for research

Sustainability practitioners – to learn how to plan for and use research in change

Project coordinators – to understand how to feed knowledge back into the project as it progresses

1.2 Why do research?

Research has an important part to play in sustainability programs, however, there is some confusion about when to do it and how to use it. Some people think that research is primarily an academic exercise, mainly done by educational institutions. This is not the case. This guide aims to demystify research and explain how research leads to successful outcomes.

Specifically, using research in your program will help you:

- Better understand the context for change
- Meet the needs of your stakeholders
- Get your program right the first time
- Ensure activities are 'fit for purpose' and that you will achieve your desired outcomes
- Enable you to better establish priorities within your program
- Incorporate continuous improvement into existing programs and practice
- Have a better chance of securing funding (either internally or externally). Typically 10–15% of your budget should be allocated for research and evaluation, and may be expected to be included by program funding organisations.

1.3 Who is this guide for?

This guide can be used by a wide range of people in any type of sustainability, or sustainability education, program or project. It can be used both by those who source research and those who conduct research as part of their program or project (see Box 1).

1.4 How can it be used?

You should use this guide to:

- Get ideas on how to do research and when to do it (research is not just about evaluation)
- Improve your own knowledge to help you to convince program funding bodies of the need for research
- Start a discussion or debate with colleagues about the value of obtaining and sharing knowledge
- Source further reading about the theories relating to different approaches to research, how to do research or examples of where others have successfully used research in their education programs.

1.5 How to navigate this document

This guide is divided into sections as follows:

Section	Title	Content
1	About this guide	Gives a background to, and explanation of, the guide
2	Sustainability programs and research	Provides an overview of research and examples of how others have used research in sustainability programs
3	When to do research	Uses a typical program cycle to show when to conduct research and introduces the outcomes hierarchy as a way to plan for research
4	Research in the planning stage	Shows how research can help define your issue and context in order to plan an effective program and incorporate research at various stages in the program cycle
5	Research in the implementation stage	Shows how to use research during the implementation of the education program and how it helps ensure the program is on track
6	Research in the review stage	Shows how to use research to evaluate the program and how to share learnings and outcomes about the program and research with others
–	Appendices	Includes resources for research, more information about research theory and details of the case studies used

This guide also uses colours to differentiate between research at different stages in the program cycle as shown below and in Figure 1:

Colour	What the colour means
Orange	Activities in the planning stage
Blue	Activities in the implementation stage
Green	Activities in the review stage

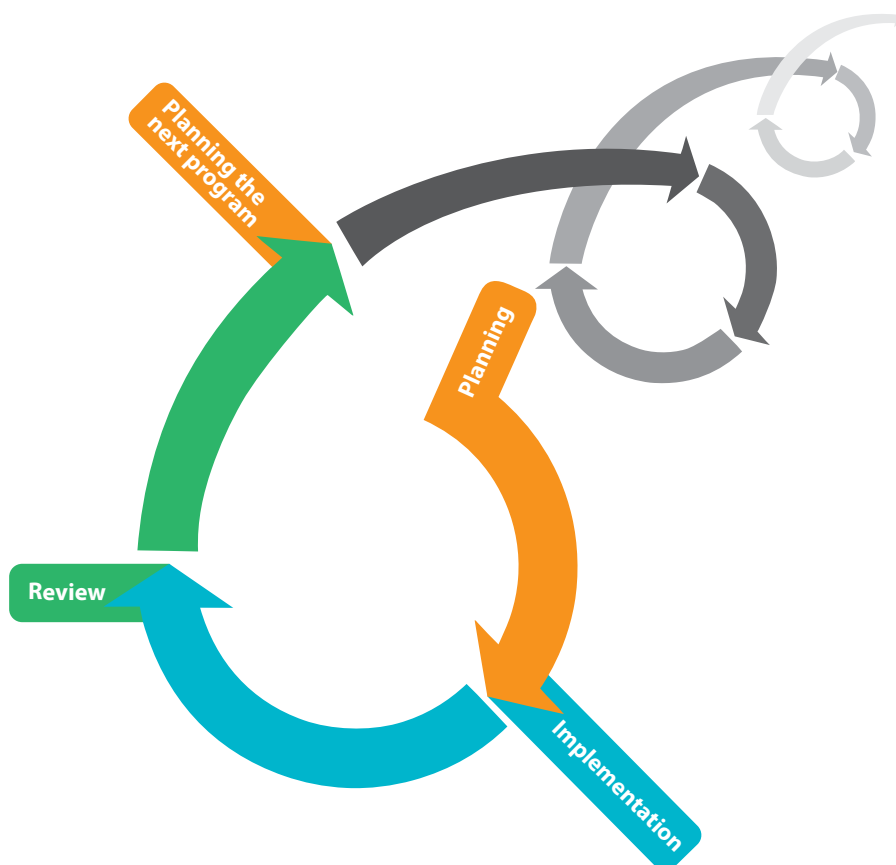


Figure 1 – The program cycle

1.6 The case studies

Hypothetical case studies of typical scenarios in program planning and implementation are used in Sections 4, 5 and 6 to help illustrate how research can be used throughout the program cycle and where appropriate research improves programs. They are documented in full at Appendix B:

- Sunny Coast Council: Litter reduction program
- Ngura Council: Domestic water consumption reduction program
- Freshfield community groups: Action for climate change.

These case studies present the planned outcomes hierarchy for each program with the research first planned and conducted for the program, how further research was identified as needed to support the program and the improvements that resulted from the additional research.

2 Sustainability programs and research

2.1 Overview

Imagine you are about to embark on a sustainability or sustainability education program. Do you know the answers to these questions?

- What is the key issue?
- What do you want to know about it?
- Which organisational levels are relevant to your problem?²
- Who are your stakeholders? (see also Box 2)
- Do your stakeholders see and understand the issue as you do?
- What do people know or not know/what conceptions do they hold about the issue?
- What are their current practices and reasons for these?
- Have views and practices been changing?
- What might motivate them to do things differently, what are the barriers to change?
- What are you trying to achieve?
- What approaches might work?
- How will you measure the success of the program?

If you know the answers to only some of these questions then your program will benefit from research.

2.2 What is research and why is it important?

Research is the *planned, systematic* collection of existing, or generation of new, data, information and understanding which is analysed and used to develop new ideas and build *knowledge* about a specific issue. This knowledge is then used to plan sustainability programs.

New knowledge is vital to the ongoing process of social change as it:

- Enables critiquing of existing ideas, methods, visions and goals, and development of new ones
- Assists in understanding the various cultural, political, societal and organisational influences on people's norms, values and behaviours and on sustainability programs themselves.

Research develops your knowledge base and provides the foundations for change. Different disciplines have unique knowledge contributions to make in constructing and resolving environmental issues, for example:

- *The natural sciences* enable the scope of environmental problems to be identified and described and solutions to be developed
- *The social sciences* contribute to understanding the social causes of problems in order to propose processes for change and facilitate the solutions.

Box 2: Who are our stakeholders?

Stakeholders may be those who want to see a particular problem resolved and/or who are the part of the community relevant to or contributing to the problem.

They can be both internal and external people and interest groups such as program participants/ audiences, community groups, colleagues, those delivering programs, funding bodies, partners and those to whom the program is accountable. See also *Stakeholders* in the Glossary.

Research helps to identify who our stakeholders are and to understand their issues in order to develop an education program that meets their needs.

² Sustainability education needs to take into account changes directed at sustainability that are needed at a range of levels: by individuals and groups, organisations, institutions and society.

While research is vital to programs, it does not provide the solutions to program design, rather it is a basis on which to make decisions about options for that design.

Research, therefore, helps explain the physical, social and organisational context for sustainability programs. Sustainability education aims to achieve change in the way we do things and it may draw on knowledge and perspectives from all these areas.

Figure 2 (below) shows the crucial role of research in underpinning the different knowledge elements of sustainability programs. It shows how the research areas contribute to understanding the programs at different stages – planning (orange), implementation (blue) and outcomes (green). (You will find more detail on these stages later in this guide.) A research plan ensures an adequate knowledge base in each of these areas of your project.

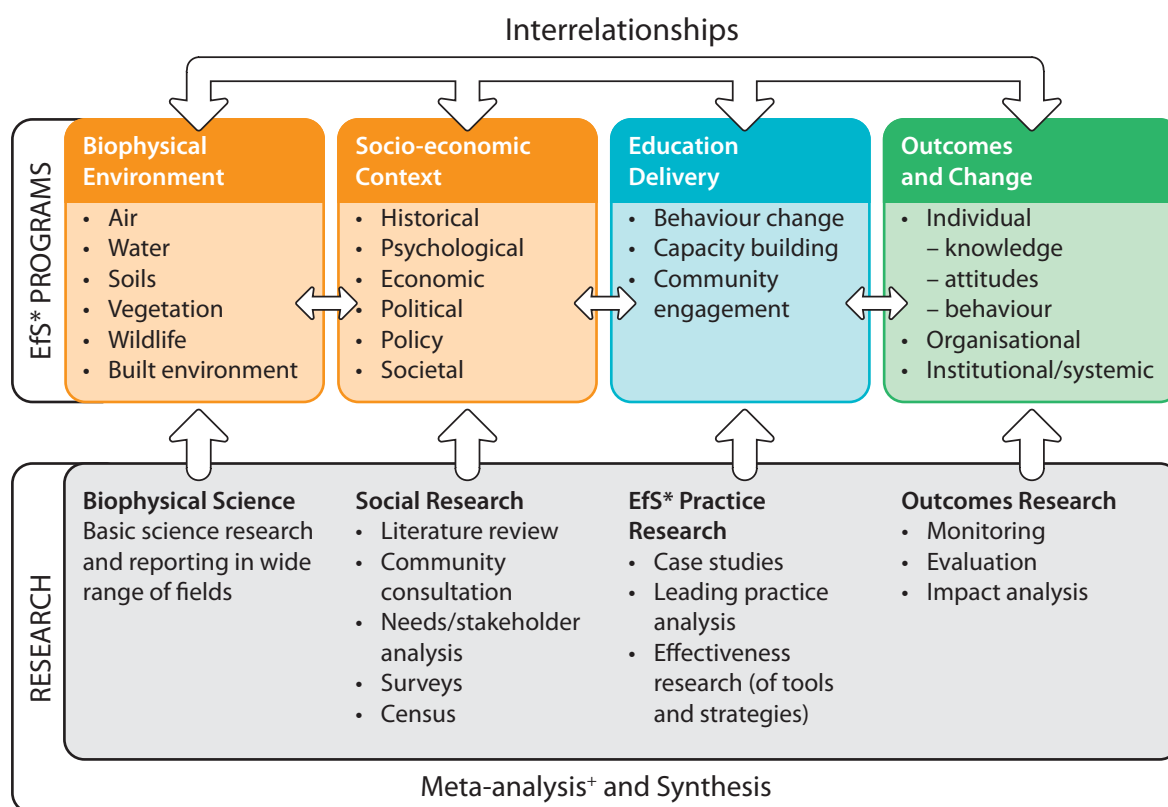


Figure 2 – Change programs are built on research

Notes:

* Efs is Education for Sustainability, see Glossary.

+ A meta-analysis brings together and analyses the results of a group of studies that address a set of related research hypotheses.

The diagram colours correspond to the three stages in the program cycle (see Section 1.5).

Figure 2 also illustrates the interdisciplinary nature of the research needed for sustainability programs and the feedback from monitoring and evaluation of programs to program design. This feedback is discussed in more detail in Sections 5 and 6.

By working collectively and sharing research, we build up a body of knowledge which enables us to identify what works where, how and why. It helps us to better understand the barriers and levers for change and how to turn ideas into actions.

This guide does not examine research frameworks, research theory and research strategies in detail. There are many existing sources that do this. However, Appendix D provides a framework for thinking about research and some examples of further reading. It illustrates the way in which data collection methods derive from your research purpose, philosophy, approach and strategies, along with the available timeframes.

2.3 How research helps sustainability programs

Research provides knowledge about a particular issue in order to develop and deliver an effective program. Research can be used to:

- **Start discussions** with colleagues/project partners about the aims of the program and the best way to achieve them
- **Create a strong evidence base** to design a targeted program most likely to achieve the desired outcomes
- **Improve programs and their outcomes** through evaluation of both the process and outcomes including, reflection on what was more or less effective or successful – especially during the implementation stage – as a basis for adaptive management (amending and improving) of the program
- **Contribute to a body of knowledge** that can be used and shared with others. Sharing research and program outcomes is vital to create a robust body of knowledge to develop effective programs
- **Inform policy development to drive behaviour change.** Policies can only be effective if a concrete idea of people's perceptions of sustainability and what motivates them to alter their behaviour exists
- **Involve practitioners** in researching, developing and changing their own practice.

2.4 Types of sustainability education

Sustainability educators undertake a wide range of activities, many of which are used in combination with each other (see Box 3). These activities often involve coordination with other departments in their own organisation such as media, human resources, infrastructure and planning, as well as working in partnership with other organisations.

However, the design of programs, including effective sustainability education program is more than selecting a range of activities. Sustainability programs, including education, should not be designed without appropriate research. Research is vital to understand social norms, values, priorities and attitudes so that the program can be tailored to meet the needs of both stakeholders and the target community or community sector. Research will also identify people's gaps in awareness, knowledge, attitudes and skills, which can then be addressed in the education program.

Depending on the context, sustainability education may not be the only tool for change. It often needs to be integrated with economic incentives, regulatory guidelines and infrastructure planning to drive change in broader sustainability programs. Research assists in identifying the best mix of these tools for a particular problem.

Box 3: Types of sustainability education

Sustainability education can include:

- *Public communication programs* e.g. advertising, energy/water efficiency labelling, internet site information and media liaison
- *Community events* e.g. one-off, a series of, or annual events around a sustainability theme
- *Community development programs* e.g. establishing discussion groups and networks and creating opportunities for participation
- *Learning and development* e.g. mentoring and training, whether in groups or for individuals, formal and informal courses
- *Community workshops* e.g. forming groups of stakeholders to discuss and resolve a specific issue
- *Community activities* e.g. hands-on environmental conservation/restoration activities, such as Bushcare
- *Formal education* e.g. courses relating to the environment or sustainability in primary, secondary and tertiary education, including TAFE and the VET sector
- *Change campaigns and advocacy* e.g. campaigns to change local values and save natural areas from development: learning by participants/ advocates about social change processes and by the community about the campaign issues

2.5 Research in sustainability programs

Research in sustainability programs falls into three major types:

- The collection and analysis of existing information and/or generation of new information and knowledge (basic research)
- The application of this information and knowledge, including evaluation (applied research)
- A process for change (action and participatory based research).

See Box 4 for further detail.

Various data collection methods and tools are used across all three types of research in a range of situations, depending on the program objectives and target groups (see Table 1). They can be used where research is an information gathering process (existing or new information and knowledge) and also where it is a process of change, critical thinking and reflection.

Table 1 – Commonly used research methods

Research methods/tools	Key features
Surveys	<ul style="list-style-type: none"> • Most commonly used method • Used for qualitative and quantitative data collection • Includes questionnaires and interviews (written and oral forms) • Can be paper-based, phone or face-to-face interviews or online surveys
Focus groups	<ul style="list-style-type: none"> • Used for qualitative data collection • Usually an open, facilitated discussion with a group of people on a particular issue • Good for exploratory research to delve deeper into issues
Observations	<ul style="list-style-type: none"> • Vision and hearing are the main methods of data collection, usually without the participant knowing they are being observed • Can also involve audio recording • Ethics questions may be an important consideration, particularly for observation that is not in public places or for video/audio recording (see Section 2.6)
Desktop research	<ul style="list-style-type: none"> • Involves collating data and research done by others and analysing it • Includes online searching to source data, journals, conference papers, reports • Includes documentary research, literature reviews and content analysis
Participatory research	<ul style="list-style-type: none"> • Involves people collaborating to critically examine and understand levers and barriers to change to develop and implement plans for change • Usually involves a group of participants, led by a facilitator • Often used in action based learning where participants ‘plan-act-reflect’ in an iterative cycle, sharing knowledge to improve practice during the program cycle
Case studies	<ul style="list-style-type: none"> • Stories told in a structured way. Case studies are often used to examine complex issues in real-life applications. They are ideally suited for understanding phenomena that require a holistic view, where cause-and-effect relationships are likely influenced by a number of factors • Can be used to understand good practice in sustainability programs. They help participants review their experiences, draw out lessons and share ideas.³

3 CIDA (2007) ‘Guide to Writing Governance Case Studies’, Canadian International Development Agency, <http://www.canadacorp.gc.ca/CIDAWEB/acdicida.nsf/En/EMA-218122155-PRC#notes>. Also Australian Association for Environmental Education (NSW) 2007 *Write it Up: A Guide to Writing Sustainability Education Case Studies*. <http://www.aaeensw.org.au/>

Box 4: Types of research

Basic research is conducted to address fundamental or theoretical issues related to a specific question or field. Also called 'fundamental' or 'pure' research, it provides a foundation for further research.

Applied research is more than generating new knowledge. It is solution orientated and assesses existing policies, practices and behaviours to develop ways of responding to the issues in a particular context.

Action and participatory based research is a systematic process of critical inquiry and reflective practice to make informed decisions about how to implement changes in thinking, practice and program development. It is highly collaborative and uses experiential learning and exploration by practitioners and learners.

2.6 Ethics and standards in research

There are important ethical considerations to bear in mind in both the conduct and use of research. Some key issues are:

- Informed consent of participants
- Maintaining cultural sensitivity
- Taking particular care in conducting research with special groups such as children and young people, Aboriginal and Torres Strait Islander peoples, people with a cognitive impairment or an intellectual disability or people who may be involved in illegal activities
- Respecting privacy of subjects/respondents and confidentiality of their data
- Appropriate retention and storage of data
- Securing permission for audio, photographic or video recording and for any public use of these recordings
- Accurate representation and reporting of research undertaken and its findings
- Understanding and respecting intellectual property rights, including appropriately acknowledging all research sources in reports and indicating any directly quoted material.

All researchers should comply with the National Statement on Ethical Conduct in Human Research 2007 and The Australian Code for the Responsible Conduct of Research (see links in Appendix A).

Research conducted by universities is subject to internal processes for ensuring compliance with the above and their ethics codes and approval processes are available on the university websites. The Australian Market & Social Research Society Limited (AMSRS), the professional body for market researchers, also has a series of codes governing professional behaviour and privacy.

From 1 January 2007, the Australian market and social research standard is ISO 20252, covering a range of matters including research ethics. AMSRS and the Association of Market and Social Research Organisations (AMSRO) jointly sponsor Market Research Quality Assurance (MRQA) initiatives. For more information and links see Appendix A.

2.7 Examples of how research has been used by others

Table 2 provides examples and web links to programs that have used different research methods.

Table 2 – Using research in sustainability programs

Research types	Description	Examples
Literature review Secondary data analysis Desktop research	<ul style="list-style-type: none"> This is often the first step to understand what knowledge currently exists. Existing research is used to analyse the current state of knowledge from a range of sources It could include assessing current models and approaches for sustainability education, understanding how different programs have been implemented or examining the barriers and levers to successful programs 	<p>A Review of Air Quality Education, Australian Research Institute in Education for Sustainability</p> <p>The report for this review included nine case studies to demonstrate types of education for sustainability including awareness-raising, community based social marketing and community engagement programs.</p> <p>www.aries.mq.edu.au/pdf/AirQualityComEdMar07.pdf</p> <p>Hastings Council SWEEP program</p> <p>Preliminary catchment analysis was undertaken including a review of existing biophysical data, and Council policy and practices.</p> <p>www.hastings.nsw.gov.au/www/html/423-stormwater-pollution-.asp or www.elton.com.au/sweep.htm</p> <p>Community Education Programs for Reducing Greenhouse Gas Emissions</p> <p>An analysis of ABS Census data was undertaken to help define the community and target group for an education campaign about greenhouse gas emissions in the Rockdale Local Government area.</p> <p>www.ies.unsw.edu.au/partnerships/pdfs/K_Hole_Paper.pdf</p>
Stakeholder identification and analysis Stakeholder/participant observation Stakeholder interviews	<ul style="list-style-type: none"> Identifying stakeholders and their relationship to/interest in the issue is vital to understand the full range of factors that impact on community attitudes and behaviour Observing stakeholders helps understand the culture or social environment and the different power structures/relationships that could influence change Stakeholder one-on-one interviews, similar to a questionnaire but generally less structured and more qualitative in nature. They cover pre-determined issues or themes requiring in-depth exploration 	<p>Bronte Catchment Project, Waverley Council</p> <p>A stakeholder mapping exercise was undertaken involving observation of key community and environment groups to understand the network of social relationships that had an impact on community attitudes and behaviour in relation to stormwater.</p> <p>In-depth stakeholder interviews were carried out with 50 key community figures.</p> <p>www.environment.nsw.gov.au/stormwater/casestudies/citizensjury.htm</p>

Research types	Description	Examples
Survey Pre and post test survey	<ul style="list-style-type: none"> • This can include structured interviews, telephone questionnaires and self administered questionnaires (in hard copy or electronically) • Every respondent responds to the same set of questions (can be qualitative or quantitative) • Useful if you want to: <ul style="list-style-type: none"> – Gauge how people feel or believe and act in relation to an issue either at a single point in time, as part of a longitudinal study or before and after an education campaign – Know what people do (behaviour) and what they think (attitude) – Examine and explain relationships between variables and investigate cause-effect relationships 	<p>Who Cares About the Environment? research series, NSW Department of Environment and Climate Change</p> <p>This research has been conducted every three years since 1994 to measure and track the environmental knowledge, attitudes and behaviour of the people of NSW through surveys and focus groups. The most recent survey was undertaken in 2006.</p> <p>www.environment.nsw.gov.au/community/whocares.htm</p> <p>Hastings Council SWEEP program</p> <p>A pre-test Community Survey identified community values and environmental concerns, established baseline measures of knowledge, attitudes and behaviour and identified community preferences for communicating with them regarding these issues. A post-test survey (after the education campaign) across the sub-catchments assessed changes in knowledge and awareness as a result of the education campaign.</p> <p>www.hastings.nsw.gov.au/www/html/423-stormwater-pollution-.asp</p> <p>www.elton.com.au/sweep.htm</p> <p>Educating the Community about Litter 2000-2003, NSW Department of Environment and Climate Change</p> <p>A quantitative survey was conducted pre and post the media campaign to measure changes in knowledge, attitudes and behaviour.</p> <p>www.livingthing.net.au/rc/research/2005608_LitterReport.pdf</p>
Observation survey	<ul style="list-style-type: none"> • Vision and hearing are the main means of data collection, recorded statistically on data sheets, by hand-written notes or by video/audio recording • Quantitative or qualitative surveys that involve systematic observation and include recording, describing, analysing and interpreting people's behaviour • They tend to focus on collecting information about the frequency, location and pattern of certain actions and events (rather than why they are happening) 	<p>Bronte Catchment Project, Waverley Council</p> <p>Physical and behavioural monitoring was undertaken in four sub-catchments to identify the key behaviours and issues that needed to be addressed as part of an education program.</p> <p>www.environment.nsw.gov.au/stormwater/casestudies/environedn.htm#audits</p>

Research types	Description	Examples
Focus groups	<ul style="list-style-type: none"> • Also called a 'group interview'. This is a non-standardised facilitated discussion involving a group of people coming together around a particular issue • The facilitator leads the discussion around particular focal points and topical issues • It can be used to develop questions to be included in other data collection methods (such as questionnaire or interviews) • It is often useful if you want to explore specific issues in more detail and combine this with the findings of broad based surveys 	<p><i>Educating the Community about Litter 2000-2003</i>, NSW Department of Environment and Climate Change</p> <p>Focus groups were conducted test key concepts to be included in an education campaign to change community littering behaviour.</p> <p>www.livingthing.net.au/rc/research/2005608_LitterReport.pdf</p> <p><i>Cool Communities</i> program, Leichhardt Council,</p> <p>Focus groups and workshops were undertaken with local community members to better understand the local context and levels of understanding of energy efficiency and climate change in order to develop a program to reduce greenhouse gas emissions in the council area.</p> <p>www.aries.mq.edu.au/pdf/Cool_CommunitiesJan06.pdf</p>
Action research	<ul style="list-style-type: none"> • Used more and more frequently as it aligns with core principles of education for sustainability i.e. critical thinking, systemic thinking and participation • Used to both improve outcomes and also reflect on the process of change • It involves collaboration and cooperation of researchers and practitioners • It uses a cyclical approach to change in which researchers and participants plan, implement, reflect and adjust throughout • It is useful to monitor progress (evaluation) while at the same time engage program participants and stakeholders 	<p><i>Sustainability Street</i>, various Australian cities – educating and engaging the community in sustainable living practices and initiatives</p> <p>The program involves creating local environmental action experiences and learning processes as a foundation for people to develop new, meaningful local relationships. Households support each other in implementing sustainability plans and actions.</p> <p>www.voxbandicoot.com.au/about_sustainability_street.html</p> <p><i>Industry Sustainability Project: Shifting Towards Sustainability</i>, Australian Research Institute in Education for Sustainability</p> <p>The 12-month project involved 10 major corporate and government organisations making changes for sustainability. It used a learning based approach to change management, guided by an action research process to engage and empower people to implement systemic organisational change.</p> <p>Participants kept a reflective journal, had mentoring sessions and took part in highly participative workshops. Key components were visioning, critical thinking and reflection, and systemic thinking.</p> <p>www.aries.mq.edu.au/pdf/InsightsBooklet.pdf</p>
Action learning	<ul style="list-style-type: none"> • This usually involves a group of practitioners who come together to critically reflect on how they learn and how to develop a learning program • It is useful as a professional development exercise for practitioners 	<p><i>The Guide Beside: Assisting You to Facilitate Sustainable Futures Now!</i> Victorian Association for Environmental Education & Victorian Government</p> <p>A guide for practitioner-based professional learning and development. It provides guidance for sustainability facilitators to research the process of change, emphasising visionary and collaborative approaches.</p> <p>www.vae.vic.edu.au/about/projects.html#TheGuideBeside</p>

3 When to do research

3.1 Research in the program cycle

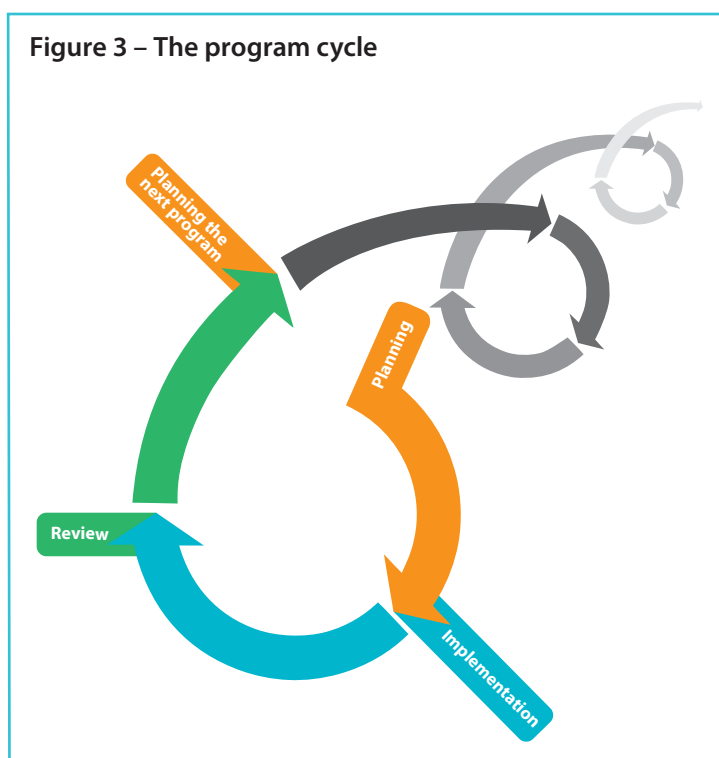
Research is an ongoing and essential part of any sustainability program and is an integral part of the traditional program cycle of planning – implementation – review – planning the next step/phase/program, as shown in Figure 3. Research should be conducted during these stages to inform both current and future actions. A key feature of the program cycle is adaptive management (see Glossary), both within and throughout the cycle.

Each stage in the program cycle impacts on:

- Why research is required
- What knowledge is required
- How this knowledge should be gained
- How the knowledge should be used.

If you have taken over a program (completed or planned) from another group or person, you should also review the program's research base and assess whether it will provide sufficient knowledge or whether you need to do more research.

Figure 3 – The program cycle



3.2 Using an outcomes hierarchy to plan research

This guide uses an outcomes hierarchy tool to create a research plan that aligns with the program plan. An outcomes hierarchy is a thinking tool useful for planning programs and ensuring that the needs of the program are clearly defined. It also identifies activities that deliver outcomes which meet the program needs. These outcomes are reviewed over time to assess whether the needs are being met, then the activities can be adjusted if required and/or more knowledge gathered.

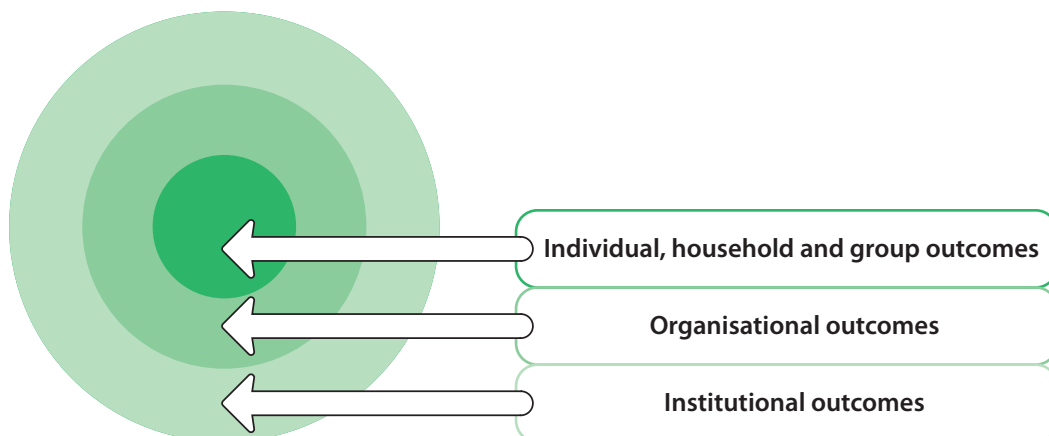
Ideally the hierarchy of outcomes should be used in the planning stage but even if you inherit a program in the middle of implementation, applying this tool will assist in understanding the program and its direction.

A sustainability program often overlays complex economic, ecological and social issues and there may be numerous factors external to the program which influence its success. In this complexity there may be different levels of outcomes for research, see Figure 4.

For example, research for programs to drive a change in household behaviour around recycling will require different research at all stages compared to a program aiming to build organisational capacity for change for sustainability. An outcomes hierarchy helps understand this complexity and ensures that activities directly address the issues in the particular program and lead to desired program and project outcomes.

The program plan should include **knowledge generating** research questions in the planning stage and **evaluation** questions in the implementation and review stages. It may also incorporate **action-based** research at any stage. Evaluation questions are important for checking back and making sure the program meets stakeholder needs.

Figure 4 – Different levels of outcomes for research⁴



3.3 The outcomes hierarchy

The outcomes hierarchy can be used for planning research. As indicated by the arrows in Table 3, the outcomes hierarchy template should be completed and read row by row from the bottom row (planning, issue and context) to the top row (review, ultimate outcomes).

Table 3 – How to read an outcomes hierarchy template

	Program stage	Outcomes hierarchy	Research focus	Research questions
6	Review	Ultimate outcomes	→	→
5	Implementation and review	Intermediate outcomes	→	→
4	Implementation	Immediate outcomes	→	→
3	Implementation	Activities	→	→
2	Planning	Needs	→	→
1	Planning	Issue and context	→	→

↑ ↑ ↑ ↑ ↑ ↑

Table 4 presents an outcomes hierarchy template which will be used throughout this guide and is explained further using the three case studies in Sections 4, 5, and 6. The questions in the table are important questions to ask at each stage in the project cycle and have been included as a checklist at Appendix C.

For more information on project planning using the outcomes hierarchy, see *Does Your Project Make a Difference?* (2005) at www.environment.nsw.gov.au/community/projecteval.htm.

The next three sections cover research activities in the planning (Section 4), implementation (Section 5) and evaluation (Section 6) stages using the three cases studies to illustrate how to use the hierarchy of outcomes.

⁴ Adapted from NSW Council on Environmental Education, *Learning for Sustainability, NSW Environmental Education Plan 2007–10*, p12 www.environment.nsw.gov.au/resources/cee/2006347_lfsenvdedplan20072010.pdf

Table 4 – Using an outcome hierarchy to plan for research

Stage	Outcome hierarchy	Research focus	Sample research questions
Review	Ultimate outcomes Overall impact of the program in biophysical, social, economic or organisational terms	<ul style="list-style-type: none"> Evaluate the overall impact of the program Document and disseminate the demonstrated outcomes of the program Share research findings with others to inform policy and practice outside the program 	<ul style="list-style-type: none"> Are the outcomes repeatable and/or sustainable? Can the program be shared? How are the outcomes valued by key stakeholders? How do the outcomes link with ongoing initiatives? Was the program well managed? What impact has the program had on the problem, and on other contexts? How effective was the program in addressing the need?
	Intermediate outcomes Changes individual/group/organisational knowledge, skills, attitudes, behaviours	<ul style="list-style-type: none"> Evaluate initial effect of the program, reflect on progress Facilitate ongoing learning and reflection Identify and fill any gaps in knowledge Determine where adjustments to activities are needed 	<ul style="list-style-type: none"> Is the program achieving desired change in knowledge, skills or behaviour? To what extent is the program having the anticipated effect/impact? What is the response to the program from stakeholders? What additional information is needed?
Implementation	Immediate outcomes Reactions to activities Level and nature of participation and engagement	<ul style="list-style-type: none"> Assess the appropriateness and effectiveness of processes in place to plan, design, implement and review the program Monitor and reflect on progress of the program with others Understand how stakeholders are responding to activities Identify and fill any gaps in knowledge Determine where adjustments to activities might be needed 	<ul style="list-style-type: none"> What is the response to the program from our stakeholders? To what extent is the intended audience engaging with the program? What is the program delivering? Is this consistent with anticipated impact? Are appropriate and effective processes in place to monitor progress, share learnings and manage the program? What additional information is required?
	Activities Program outputs, products, services	<ul style="list-style-type: none"> Assess whether program addresses the need and is effectively producing the desired activities relative to costs 	<ul style="list-style-type: none"> Are the resources (time and money) producing the planned activities? Is the program appropriate to need – should the approach be adjusted?
Planning	Needs The difference between the desired and actual state of the issue you are seeking to address	<ul style="list-style-type: none"> Establish the need for my program Plan for research activities 	<ul style="list-style-type: none"> What is the aim of my program? How does my program relate to other programs or initiatives? Whose actions, behaviour and attitudes are impacting on this issue? What research do I need to do – when, how and why?
Planning	Issue and context Also known as the 'problem'. It is the thing you are trying to change and its context	<ul style="list-style-type: none"> Clearly identify the issue or problem Identify stakeholders (both those who want the problem fixed and the part of the community relevant to/involved in the problem) Identify and explore the context for change 	<p>The issue</p> <ul style="list-style-type: none"> What is the issue/problem and what do we know about it? What previous research/programs (by the organisation or others) exist for this area and what were the findings? <p>The context</p> <ul style="list-style-type: none"> What is the social context? How could the organisational context affect my research or program? <p>The stakeholders and the change process</p> <ul style="list-style-type: none"> Who are our audience/stakeholders and what do we know about them? What are their views – do they see and understand the issue as we do? What are their current practices and reasons for these? Have their views and practices been changing? What are their barriers to, and motivators for, change? What do people need?

Planning 4 Research in the planning stage

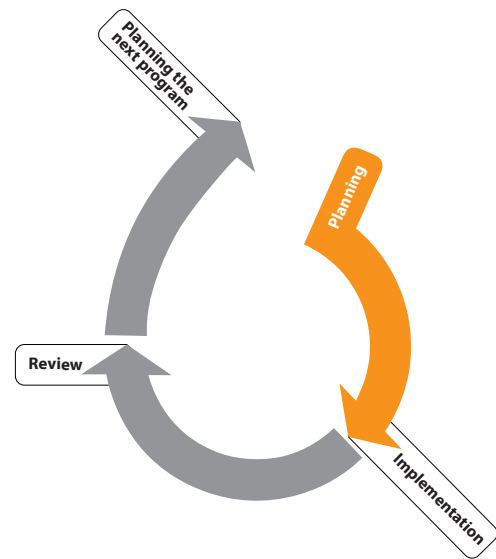
4.1 Why do research now?

Although the planning stage is traditionally seen as something which happens at the start of a program, the initial plan should be revisited and potentially revised at different stages in the program cycle.

Research in the planning stage builds knowledge about the issue, its context and the activities you plan to undertake. This helps demonstrate the need for, or **plausibility** of, the program – whether it is appropriate, relevant and responds to the issue.

The purpose of research in the planning stage is to:

- Understand the problem or need
- Consult and engage the relevant communities and stakeholders
- Understand the context for change
- Define a clear research strategy
- Assess the evidence and confirm the plausibility of the program
- Define the intended outcomes of the program
- Identify appropriate activities to achieve the outcomes
- Develop an evaluation plan
- Identify measures of success, sources of information and how they will be used



4.2 Issue, context and needs

In the planning stage you should develop your knowledge in order to understand both the nature of the issue that you need to respond to and the social context in which you are operating. (Box 5 also gives examples of organisational contexts.) By clearly identifying the issue, you confirm the need for the program.

It is also important to remember that how you (or your stakeholders) see the issue or define the problem depends on a range of factors. Different people may see the problem very differently (see Box 6). Understanding this and being clear about which aspects of the problem the program addresses and getting agreement from your stakeholders, is critical to achieving good program design and relevant outcomes.

Box 5: Organisational contexts

Different organisational contexts may influence program design, for example:

- Local community
- Government (at various levels)
- Academia
- Science community
- Business/industry (small, medium or large and private or public)
- Not for profit organisations.

These contexts determine the sources of existing knowledge and the basis of new research. They may also determine whether knowledge is shared with others and whether effective communities of practice (see *Communities of practice* in the Glossary) can be established.

If you do not have enough knowledge then you will need to do some research and the form of this research depends on what you see as the issue. You need to review existing knowledge, identify gaps in this knowledge and probably do your own research to fill these gaps. Then you will have the evidence that confirms the need for your program.

To make sure you have this knowledge you should consider a range of questions. Refer to Table 4 in Section 3.3 for some key research questions. Your answers to these questions will build the need for the program, identify appropriate activities and shape the research.

Box 6: How people’s backgrounds influence the way they see the issue

The way you define the issue depends on your world view, your background and your disciplinary lens. You need to be aware of this because it will flavour the questions you ask and your actions.

For example, your state government has funded a community project in a drought-stricken rural area examining the options to treat and reuse waste water for human consumption. The table below shows clearly how different backgrounds and disciplines influence how people see the issue. This in turn determines the research they do and drives potential solutions, options and programs.

Discipline or role	How they see the issue
Community – parents	Is the water safe to use?
Science – biologist	How can I make waste water microbe free?
Science – chemist	What are the components of greywater?
Applied science – engineer	How can I make the system work so that it delivers clean water?
Applied science – land surveyor	How can I plan land use to ensure water is effectively captured for treatment?
Social science – behavioural psychologist	What are people’s attitudes and behavioural responses to recycled water?
Social science – economist	What are the cost/benefits of the various options?
Social science	Are there any equity issues in accessing this water?
Town shopkeepers and tourism operators	Will using this water deter people from visiting this town?

We also know that sustainability is complex. It needs systemic thinking (see Glossary) and requires a range of responses. This means sustainability demands an interdisciplinary approach and an understanding of the different ways people approach ‘the problem’ (e.g. Box 6) is important in designing and delivering a well thought out ‘solution’.

4.3 Planning when, how and how much research to do

What do we need to know?

In the planning stage, in addition to undertaking research to gain knowledge about the issue, context and needs, you should also plan when and how to conduct research during the program. As outlined in Section 3, the outcomes hierarchy will help you do this.

Planning for research throughout your program will ensure it continues to address the issue and meet the identified needs. At different stages of the project you should ask questions about:

- Appropriateness (does it make sense?)
 - Does the program address the right issues, is there an identified need the program is meeting?
 - Are the objectives framed to meet the need?
- Effectiveness (is it working?)
 - Is the program achieving the desired objectives/outcomes?
- Efficiency (is it cost effective?)
 - Could better use of resources (time, people, and money) be made?
- Process (was it well managed?)
 - Does the method for making decisions and managing the project ensure its success?

Thinking about these questions in the planning stage means that data can be collected through the project to provide answers. See Table 4 in Section 3.3 or Appendix C.

How do we do it?

First develop your research questions – these will help to clarify what you need to know. Then identify the type of information needed to answer the questions as this will influence the methods you use to conduct your research. For more about research purpose, strategy and data collection methods see Appendix D and Section 2.5.

At this point you should be able to identify the data collection methods for both research in the planning stage and research through your program that will provide evidence of change. The most suitable methods generally depend on the type of data required and this, in turn, depends on how it will be used. Ask the following questions:

- What data do we need to determine progress and change against outcomes throughout the program?
- Does the information already exist or will we have to collect it?
- At what stages do we need to collect this data, who will collect it and how?
- How will the research be used?
 - At all stages – how will it be used throughout the entire program to plan, monitor and reflect on progress and adaptively manage the program (see *adaptive management* in the Glossary)
 - How will it be used to share, communicate and report – engage program participants, share knowledge, report on the program and/or research or inform practice and policy elsewhere.

How do we resource the research?

Collecting existing research can often be done by you or a member of your team. However, if further research needs to be undertaken you need to consider whether to do this in-house or to outsource it (especially if the scale of the program is large).

If you have limited capacity (time, skills and resources) to do the research, you should consider using external consultants or academics, or work in partnership with other organisations that are concerned about the same issue. For either of these options, you will require a clear brief that covers the issue, the context, why research is needed and what the research is for. Appendix E provides a sample template to prepare a research brief.

Employing consultants

There is a wide range of consultants available who conduct research through avenues such as telephone interviews, focus groups or literature reviews. They can be academics, individuals with particular skills or specialist social research consultancies. (See Appendix E for a template for preparing a consultant's brief to conduct research.)

Partnering with others

Partnering with others allows organisations to:

- Pool resources (human and financial)
- Share expertise
- Compare and contrast practice.

Partnerships can be with similar organisations in terms of interests, aims and objectives; with organisations in the same geographic area; or organisations in other sectors e.g. private, non-government organisations, local or state government. For these to work it is important that all partners understand their respective roles and responsibilities and agree on the issues and the need for the research.

How much research is enough?

The answer to this will vary according to the size of the project and for each stage of the project cycle but in planning for research and evaluation you would generally allocate overall about 10–15% of the total project budget for research and evaluation.

In terms of research outcomes, you might consider you have enough research if you:

- Can answer the questions in the hierarchy of outcomes template (see Table 4 at Section 3.3 and the summary questions in Appendix C)
- Have covered the risk that 'you don't know what you don't know' by seeking expert input to ensure there are no major knowledge gaps
- 'Know what you don't know' i.e. you understand where there are gaps in your information and you have determined that the cost of addressing those gaps is greater than the potential benefits to the project.

The amount of research you undertake will also take into consideration:

- The scale of the project
- The amount of readily available existing research
- The degree of sensitivity and risk involved in the project (what will be the consequences if your project is badly designed due to insufficient research?)
- The strategic intent of the project (more research will be needed if the intention is to build knowledge).

Planning stage – Case study 1: Sunny Coast Council

(Note the table below includes only the Planning stage – see Appendix B for the full outcomes hierarchies for the case studies. See Section 1.6 for explanation of the case studies.)

Program stage	Planned outcome hierarchy	Planned research conducted and results	Improving the program with additional research
Planning	<p>Needs</p> <ul style="list-style-type: none"> To reduce cigarette butt littering by 80% over six months To build community capacity to create solutions for sustainability issues To build support for sustainability education programs at Council level 	<ul style="list-style-type: none"> Daily observations at key locations on the beach and coastal strip over one month including two weekends and one week school holiday period on who litters, where and when Interviews with key tourist groups – local tourist office, camping ground, representative group of bed and breakfast owners and real estate agents for short stay accommodation to determine what activities might give the best outcomes Questionnaire of locals and tourists who smoke to understand what they do with their butt litter and if necessary, what would change their habits if they do litter Desktop review of cigarette butt litter programs highlighted successful campaigns at state government level. Handouts and posters available on government websites 	Initial research supported planned activities
Planning	<p>Issue and context</p> <ul style="list-style-type: none"> Significant litter on coastal strip – on soft sand, streets close to the beach and in the sea. Survey of local people the previous year showed litter as key environmental concern. Locals believe litter caused by tourists Recent litter audit revealed 40% of litter is cigarette butt litter Little community engagement or involvement in sustainability planning 	<ul style="list-style-type: none"> Literature review of litter research and education programs to reduce litter – confirmed that cigarette butt litter is key issue for many councils and identified various strategies to reduce it Analysis of visitor numbers over the past five years – indicated significant increase in population over weekends and holiday periods Litter volume data from waste management contractor confirmed volumes increase by 120% on weekends and holiday periods and 40% is butt litter 	Initial research had insufficient focus on the social aspects of littering

Planning stage – Case study 2: Ngura Council

(Note this includes only the Planning stage – see Appendix B for the full outcomes hierarchies for the case studies. See Section 1.6 for explanation of the case studies.)

Program stage	Planned outcomes hierarchy	Planned research conducted and results	Improving the program with additional research
Planning	<p>Needs</p> <ul style="list-style-type: none"> • Aim to decrease householder water usage by 30% over two years 	<ul style="list-style-type: none"> • Desk review of water authority's previous research on cultural values of water. Manager concludes that primary motivator for water use is price 	<ul style="list-style-type: none"> • Reflective practice at end of project concluded that a literature review should have been performed at this stage • In addition, more contextual information was required to fully understand the program needs
Planning	<p>Issue and context</p> <ul style="list-style-type: none"> • Lack of certainty over water supply in area experiencing reduced annual rainfall • Decreasing dam levels from only source of water in catchment • Increasing household water use • Low Council capacity for research as a basis for sustainability education programs • No partnerships for change between Council, other councils and resource providers e.g. water, waste, energy 	<ul style="list-style-type: none"> • Analysis of quantitative data on household water use over the past five years from water authority • Analysis of spatial maps showing housing types in the Council area 	<ul style="list-style-type: none"> • Initial research had insufficient focus on the social aspects of water use e.g. behaviours, values etc.

Planning stage – Case study 3: Freshfield community groups

(Note this includes only the Planning stage – see Appendix B for the full outcomes hierarchies for the case studies. See Section 1.6 for explanation of the case studies.)

Program stage	Planned outcome hierarchy	Planned research conducted and results	Improving the program with additional research
Planning	<p>Needs</p> <ul style="list-style-type: none"> • To build increased sense of community by working together • To build community capacity for change towards sustainability (with a focus on climate change) • Reduce greenhouse emissions in Freshfield • Build capacity of the partners to work together in the future • Increase Council commitment to engaging and consulting with community in change for sustainability 	<ul style="list-style-type: none"> • Community survey of 200 residents showed residents had limited understanding of the links between their own activities and climate change • Stakeholder analysis identified key stakeholders: three community groups (Freshfield's Landwatch, Parents Group and Migrant Centre) and the Council Sustainability Unit 	<ul style="list-style-type: none"> • Initial research supported planned activities
Planning	<p>Issue and context</p> <ul style="list-style-type: none"> • Feedback from Landwatch composting session participants identified climate change and its impact were not well understood • Little community engagement or involvement in climate change action • No Council led programs with community groups • With three active community groups there were opportunities to create a partnership for this project which would endure in the long term 	<ul style="list-style-type: none"> • Desktop review of Australian Greenhouse Office reports on household attitudes to climate change 	<ul style="list-style-type: none"> • Initial research had insufficient focus on the community perceptions and understanding of climate change at a broad level and required a community survey to provide local level knowledge

5 Research in the implementation stage

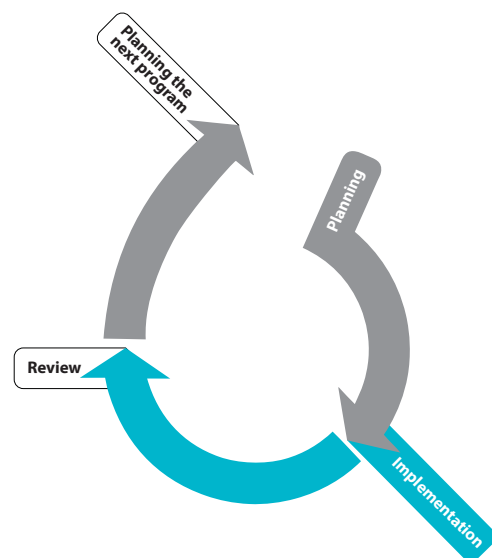
5.1 Why do research now?

In the implementation stage, you put your plan into action to achieve the program outcomes. Effective implementation also requires ongoing learning and monitoring and this is where research plays an important role. Research at this stage is to measure progress, respond to new knowledge and adjust the approach if necessary. This process is known as adaptive management.

Research does not just involve gathering or generating knowledge – it is also a way of engaging people which leads to **participation** and increases the opportunities for long-term results and shared learnings and experiences.

The purpose of research in the implementation stage is to:

- 'Check in' and monitor progress against immediate and intermediate outcomes
- Engage program participants in monitoring and reflection
- Allow for continuous learning and improvement
- Identify gaps in knowledge
- Collect information to communicate back to stakeholders
- Demonstrate achievements/impacts, identify opportunities for change and ensure the strategic relevance of the program
- Apply new knowledge to improve the program, tweak the approach and identify future directions



5.2 Checking the program and responding to new knowledge

Research in this stage should be focused on generating knowledge that determines progress towards the outcomes and the effectiveness and appropriateness of the activities. It requires all stakeholders to think critically and reflectively and identify any emerging gaps in knowledge so the program stays on track or is adjusted if necessary.

Research here is about monitoring program effectiveness to inform ongoing management. It can act as an early warning system to identify emerging problems or issues. Knowledge acquired in this stage should allow you to confidently adjust the program at any time to ensure it is responding to the issue. Adjustments may lead to changes in the research plan, which should then be adapted where the type of knowledge required and/or the data collection methods are affected.

The outcomes of research in this stage may have implications for:

- The **processes** used to manage the program – how decisions are made and the governance structure e.g. working group, steering committee, reference group and the stakeholders involved
- The **methods** of stakeholder communication and consultation – including how progress is reported and monitored e.g. email newsletters, formal reports, face-to-face meetings
- The specific **activities** e.g. written materials, media formats, public events.

See Table 4 in Section 3.3 or Appendix C for some key research questions to ask at this stage.

Implementation stage – Case study 1: Sunny Coast Council

(Note this includes only the Implementation stage – see Appendix B for the full outcomes hierarchies for the case studies. See Section 1.6 for explanation of the case studies.)

Program stage	Planned outcome hierarchy	Planned research conducted and results	Improving the program with additional research
Implementation and review	<p>Intermediate outcomes (changes)</p> <ul style="list-style-type: none"> Substantial progress in butt littering towards 80% target in all locations 	<p>Waste audit four months into education program over one week to monitor whether butt litter had reduced – showed it had reduced by 80% on soft sand. No change in cigarette butt litter around pubs, restaurants and cafes. Marginal reduction in litter in stormwater</p> <p>Focus group with Council Rangers – showed that although issuing fines was effective way to reduce butt litter on beach, it was highly confrontational and did not reduce smoking</p>	<p>Focus groups with local businesses to workshop ideas on how to reduce butt littering outside restaurants, cafes and pubs</p> <p>Focus groups with residents, local beach clean-up group and surf lifesaving group to investigate more effective approaches</p> <p>This research led to:</p> <ul style="list-style-type: none"> Patrol captains from surf lifesavers trained to ask people not to smoke on beach, explaining impact of cigarette butt litter – found to be less confronting for beachgoers and enforcement officers Butt bins mounted on walls in eating district and free hand-held bins given to patrons by owners of pubs, restaurants and cafes Web search of effective mesh and filter mechanisms with council infrastructure group to install in stormwater drains to trap butts
Implementation	<p>Immediate outcomes (participation)</p> <ul style="list-style-type: none"> Council Rangers increase enforcement activities, fines double in first four months Tourism Office and estate agents agree to participate: butt litter flyers included with short stay rental agreements and tourist brochures Funding from Council obtained 	<ul style="list-style-type: none"> Fines issued by Rangers monitored – showed substantial increase in activity Assessment of effectiveness of program at Stakeholder Steering Committee after 4 months – found that it seemed that not all of the community was sufficiently involved in the anti-littering effort 	<p>Stakeholder analysis by Steering Committee to confirm all key stakeholders (influencers, decision makers, participants) are identified and their relevant roles understood – found Steering Committee did not represent all key stakeholders. Committee expanded to include representatives from local residents' group and owners of pubs, restaurants and cafes</p>
Implementation	<p>Activities</p> <ul style="list-style-type: none"> Communications campaign conducted: <ul style="list-style-type: none"> Littering posters placed at regular intervals along the beach Butt littering article and 'advert' in local tourist guide Butt littering posters placed on side of existing rubbish bins on the coastal strip No smoking signs placed in prominent places close to the beach Council Rangers requested to enforce smoking ban on beach and issue fines Stakeholder Steering Committee formed, cooperation in anti-littering measures invited 	<ul style="list-style-type: none"> Personal reflection by Sustainability Manager using diary to ensure activities will meet the needs of the program Stakeholder analysis by the Sustainability Manager identified key stakeholders Focus group held with Stakeholder Steering Committee to workshop the program design and agree on best approach and funding available 	<ul style="list-style-type: none"> Focus group with key stakeholders to debrief on the program and reflect on process undertaken and success of activities

Implementation stage – Case study 2: Ngura Council

(Note this includes only the Implementation stage – see Appendix B for the full outcomes hierarchies for the case studies. See Section 1.6 for explanation of the case studies.)

Program stage	Planned outcomes hierarchy	Planned research conducted and results	Improving the program with additional research
Implementation and review	<p>Intermediate outcomes (changes)</p> <p>Reduction in water consumption towards 30% over trial period of six months (two quarters)</p>	<ul style="list-style-type: none"> • Quantitative data analysis – water use data from water authority reviewed after trial period (two quarters) to calculate change in use – showed only 5% fall in water consumption, mainly in single rather than multi-unit dwellings • Quantitative analysis of number of households taking up water tank offer – showed only a few households had 	<ul style="list-style-type: none"> • Initial assessment of effectiveness of program showed little success. More knowledge required about behaviour and motivations of residents to reduce water use • Decision made to conduct a more detailed survey of renters to understand motivations for reducing water use and enable changes to the incentive scheme • Contracted research, phone interviews of 300 renters to better understand how water is used in the multi-unit dwellings, showed: <ul style="list-style-type: none"> – Renters not motivated by price – Need for education and incentives – Most water used in common gardens and in clothes washing • This led to a change in approach: <ul style="list-style-type: none"> – Incentive program for renters to buy water-efficient washing machines – Home audit package offered by water authority to retrofit water-saving devices in units, including educational material and water use data – Landlord group formed to identify residential blocks of high water usage and develop appropriate action – More information on bills for body corporates – Water tank incentive scrapped for single dwellings, introduced at multi-dwelling level for maintenance of common gardens
Implementation	<p>Immediate outcomes (participation)</p> <ul style="list-style-type: none"> • Water authority becomes a program partner • Households received information about pricing and methods for saving water 	<p>Water authority complaints line and council enquiries line monitored for feedback – found owners of multi-unit dwellings unhappy with stepped price</p>	
Implementation	<p>Activities</p> <ul style="list-style-type: none"> • Stepped pricing arrangement for water consumption for six-month trial. Mail out to households explained the issue and reasons for new pricing scheme • Mail out included \$200 water tank rebate offer from council 	<ul style="list-style-type: none"> • Focus group with water authority staff to explore approach to reducing domestic usage • Stakeholder analysis identified key stakeholders households and water authority as key stakeholders • Records kept of mail out activities – information sent to households. 	<p>Further analysis showed landlords were a stakeholder group. Focus group of key landlords held to understand how they could work with Council to reduce water use</p>

Implementation stage – Case study 3: Freshfield community groups

(Note this includes only the Implementation stage – see Appendix B for the full outcomes hierarchies for the case studies. See Section 1.6 for explanation of the case studies.)

Program stage	Planned outcome hierarchy	Planned research conducted and results	Improving the program with additional research
Implementation and review	<p>Intermediate outcomes (changes)</p> <p>Increased engagement by community groups in climate change discussions</p> <p>Increased empowerment to plan and implement change</p> <p>Identification of barriers (and levers) to change</p> <p>Engagement by the Council and changes in purchasing policy and initiatives to assist households</p>	<ul style="list-style-type: none"> • Workshop feedback forms showed high degree of engagement in climate change and a willingness to contribute to group discussions. It also showed that people valued being in a supportive environment where they could create their own action plans and feel motivated to achieve them • Workshop feedback forms from third workshop highlighted barriers to household change as being lack of Council leadership and incentives for change • Group reflective practice during Steering Committee meetings confirmed workshop approach, activities and enabled learnings to be shared across the partners • Group reflective practice at the end of each workshop to discuss what, if anything, was changing and how, why/ why not. This deepened understanding of change processes at an individual and community level 	<ul style="list-style-type: none"> • Data from feedback forms led to: <ul style="list-style-type: none"> – Council purchasing 100% electricity requirements from renewable sources – Council offered three free energy-saving light bulbs per household
Implementation	<p>Immediate outcomes (participation)</p> <p>Workshop participants self selected for each community group</p> <p>Council agrees to fund Sustainability Officer for one day per week during the program</p> <p>Steering Committee formed and met in the week following each round of workshops</p>		<p>No additional research undertaken although later reflections highlighted that local media should have been identified as an effective way to promote the project and share its outcomes and learnings</p>
Implementation	<p>Activities</p> <p>Action-based learning approach 4 x 3-hour workshops for each group planned over a six-month period</p> <p>Participative learning activities in small groups building on experiences over time</p> <p>'Commitment to Change' forms completed in second workshop</p>	<ul style="list-style-type: none"> • Facilitation course attended by the Community Education Officers increased knowledge about successful participative learning activities for change • Baseline data collected for greenhouse emissions depending on 'Commitment to Change' form focus for each individual • Critical and systemic thinking activities in workshops to broaden understanding of sustainability and climate change and develop action for change • Reflective practice undertaken individually in journals and collectively in monthly meetings by Steering Committee member to monitor process and outcomes of the program 	<p>Additional discussion forums set up after first workshop to allow participants to discuss issues more deeply</p>

6 Research in the review stage

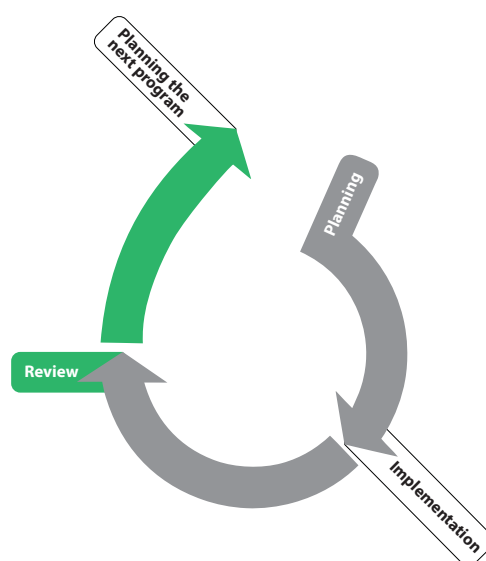
6.1 Why do research now?

In this stage it is important to determine whether or not the program has made a difference and to share these findings in a way that informs policy and practice elsewhere.

At the end of the program you should evaluate its overall impact and reflect on how the outcomes and learnings, in particular the research, can be shared and communicated to demonstrate its effectiveness. The **persuasiveness** of your program refers to the acceptance of its effectiveness by others and will ensure it is supported and sustained to deliver on the program needs. This is typically done in a final program report.

The purpose of research in the review stage is to:

- Establish the demonstrated outcomes of the program
- Evaluate the overall impact of the program
- Enable you to make judgements about the program and be accountable for the program to stakeholders
- Inform design of the next program
- Inform further funding proposals
- Communicate and share outcomes and learnings
- Understand the implications of the research and the program for others



6.2 Evaluating the program and its outcomes

In the planning and implementation stages the program is assessed to ensure it is achieving its planned immediate and intermediate outcomes and, if not, adjusted accordingly. In this review stage, research is used to evaluate the program against its ultimate outcomes and to get an overall sense of its effectiveness and how efficiently it was delivered.

By analysing the information collected throughout the program, you can draw conclusions about how the program performed. By comparing these findings against the evaluation research questions, you can make judgements about the success of the program and make recommendations to inform future programs and/or the work of others.

Again, it is important to test and reflect on your findings, conclusions and value judgements with others.

See Table 4 in Section 3.3 or Appendix C for some key research questions to ask at this stage.

Review stage – Case study 1: Sunny Coast Council

(Note this includes only the Review stage – see Appendix B for the full outcomes hierarchies for the case studies. See Section 1.6 for explanation of the case studies.)

Program stage	Planned outcome hierarchy	Planned research conducted and results	Improving the program with additional research
Review	<p>Ultimate outcomes (impacts)</p> <ul style="list-style-type: none"> • Decrease in butt littering towards 80% in all locations • Evaluation shows program was effective and efficient • Capacity building at council level • Program contributes to body of work on litter programs • Increased community capacity for change to sustainability • Increased support from Council for sustainability education programs 	<ul style="list-style-type: none"> • Waste audit eight months after previous audit – showed cigarette butt litter reduced by 90% (compared to 80% target) • Questionnaire sent to stakeholders requesting feedback about the process of engagement and whether they felt the program had been well managed – showed high levels of engagement and satisfaction with program management • Survey of 50 local residents undertaken to evaluate their perceptions of the program and of Council's running of the program – gave positive feedback 	<ul style="list-style-type: none"> • Formal program and evaluation report presented to Steering Committee • Sustainability Manager presented paper at state-based environmental educators' forum to share learnings and outcomes. Led to the formation of a working group of eight councils with sea frontage to further explore shared issues on a range of topics. Group meets twice a year • Stakeholder group reformed the following year to investigate ways to further reduce take-away food container litter in the eating district

Review stage – Case study 2: Ngura Council

(Note this includes only the Review stage – see Appendix B for the full outcomes hierarchies for the case studies. See Section 1.6 for explanation of the case studies.)

Program stage	Planned outcomes hierarchy	Planned research conducted and results	Improving the program with additional research
Review	<p>Ultimate outcomes (impacts)</p> <ul style="list-style-type: none"> • Reduction in water consumption by 30% at end of two years • Evaluation shows program was effective and made efficient use of resources • Outcomes and learnings shared with four other councils • Other forums formed for future programs • Increase in Council capacity to run change programs and to value research as an integral component of these programs 	<ul style="list-style-type: none"> • Quantitative data on household water use over the next two years obtained from water authority and analysed – showed 25% fall (compared to target of 30%) in household water use • Program evaluated to assess effectiveness and efficiency and formal report presented to Council and water authority • Environmental manager compiled a summary of the program and shared outcomes and learnings with four other councils 	<ul style="list-style-type: none"> • Reflective practice and evaluation review with environmental group at Council and water authority concluded that time was lost at the start of the program by not doing a literature review of other education programs or by talking to water users and finding out how water was used and by whom as well as various behavioural aspects of water use • Identifying landlords as stakeholders, conducting specific research with this group and involving them in the program has led to the landlord group now working with the local energy authority to reduce energy consumption

Review stage – Case study 3: Freshfield community groups

(Note this includes only the Review stage – see Appendix B for the full outcomes hierarchies for the case studies. See Section 1.6 for explanation of the case studies.)

Program stage	Planned outcome hierarchy	Planned research conducted and results	Improving the program with additional research
Review	<p>Ultimate outcomes (impacts)</p> <ul style="list-style-type: none"> • Reduction in greenhouse gas in the participating community groups • Capacity building at individual (participants and Steering Committee members) and community/partner level • Program contributes to body of work on participative processes for change • Increased community capacity for change for sustainability • Formal community consultation and engagement strategy formed by Council • Increased support from Council for further partnership programs 	<ul style="list-style-type: none"> • Data collected for greenhouse emissions and compared to baseline data to calculate reduction on greenhouse emissions • Evaluation form after fourth workshop included questions on the process adopted during the program and on what basis the participants viewed the program as 'successful' • Reflective journals were summarised by each Steering Committee member and circulated amongst the group to share learnings and reflections on the program • Collage posters placed on public display documented the reflections of the group and their learnings during the workshop process 	<ul style="list-style-type: none"> • Additional stakeholder identified as a partner i.e. local media which could have been used to further 'spread the word' and build broader community capacity for change

6.3 Evaluating your research

In the same way that research helps assess the progress and outcomes of the program, it is important to apply the same kind of thinking to your research. You need to reflect on the effectiveness and efficiency of the research planning process, the research strategy and the data collection methods and analysis to understand how research has contributed to the outcomes.

As with most research, evaluation is more effective if undertaken in conjunction with others. It does not have to be an extensive or a time-consuming process. It simply involves you and other relevant stakeholders answering questions such as those in Table 5.

Table 5 – Key research questions to evaluate research

Research questions	Sub questions
Did we have enough information on which to base good program/project design?	How could further information have been obtained within the budget? Was additional budget required to produce an adequate evidence base?
Did our research strategy retrieve the knowledge we needed to measure the impact of the program?	If not, why not?
Were the research strategy and data collection methods appropriate given the time and money allocated to the project?	Would they have differed under different resource constraints? Would this have made a difference?
Were we able to adapt the research plan as the program progressed?	If not, why not?
How effective was the process of doing the research e.g. collecting and storing knowledge?	Was the research plan too ambitious? Did we have adequate resources to collect and store the information effectively?

6.4 Documenting and disseminating research

The documentation and dissemination of outcomes and learnings from research is fundamental to engage stakeholders, sustain the outcomes of the program and participate in the debate about what constitutes effective sustainability and sustainability education programs.

The key questions to ask are:

- How can the research be best documented and disseminated to continue to engage with the stakeholders during and at the end of the program?
- What is the most appropriate and effective way to share the outcomes of the research?
- How can the research be used to contribute to the work of others?

Reporting to stakeholders

A key document at the end of the program is the program report. Reporting on the research is equally important and can be done within in the program report or as a separate report (for example for a large project with multiple pieces of research). A research report is the main way to summarise the knowledge gained during the program and give feedback to stakeholders. It contributes to your organisation's knowledge base for reference by future programs. While the form and nature of the report will vary depending on its audience and its purpose, a separate report should include the sections suggested in Table 6, while a research section within a program report will address most of these areas in a more concise or summary format.

Table 6 – Research report table of contents

Section	Contents
Executive summary	A summary of key findings, conclusions and recommendations
Research undertaken	A description of the research objectives, research strategy and data collection methods
Research findings	The results of research and how knowledge was gathered, including critical success factors/barriers to conducting research
Conclusions	Summary of the key implications of the research for the broader body of knowledge
Recommendations	How this research can be used by others to inform policy and practice

A research report is a good basis from which to produce other written materials such as summary documents, newsletters, presentations and conference papers.

Sharing your research to set future directions

Communicating more broadly and making your research accessible:

- Ensures that other individuals and organisations (such as industry, non-government and government organisations) can benefit from your research
- Increases the likelihood of your research informing program design, practice and policy elsewhere
- Allows you to take part in an important discussion about what constitutes an effective sustainability program and builds evidence-based practice
- Promotes debate and reflection that is informed by evidence and improves professional practice, supports other educators and practitioners and provides an opportunity for networking and the creation of communities of practice (see *Communities of practice* in the Glossary).

Knowledge management

You should also think strategically about the most appropriate forum(s) in which to share and promote your research. The forum(s) you choose will be influenced by the aspect of your research you wish to focus on and who you wish to communicate with. You could consider some of the following:

- Peer reviewed journals e.g. *Environmental Education Research*, *Australian Journal of Environmental Education*, *International Journal of Geographic and Environmental Education Research*, *Journal of Environmental Education*
- Sustainability education or sustainability-related conferences, forums and workshops such as those organised by the Australian Association for Environmental Education, Victorian Association for Environmental Education and NSW environmental/sustainability educators
- Sustainability or sustainability education-related newsletters/magazines/websites e.g. Ecos Magazine.

Refer also to publications and websites listed in Appendix A.

Appendix A

Annotated bibliography for conducting social research

The two main dimensions of social research are quantitative research (e.g. surveys) where the data is primarily numerical, and qualitative research (e.g. in-depth interviews, focus groups) where the data is primarily text. However, in both dimensions, a critical aspect is the ability to ask questions. Therefore, this bibliography focuses on these three key segments: research using quantitative data, research using qualitative data, and how to ask questions. There is also a segment on accessing online web survey tools and accessing information on ethics and standards in social research.

The resources below are only a small selection of many available resources and were identified as useful by members of the review team for the guide development project.

Two main sources are included: books available for purchase and free internet-based resources. The advantage of books is that they are linear and complete. The advantage of the tools available on the internet is that they are free. However, they can be confusing to the novice because accessing them in a linear way can be challenging as one moves from one web page to another, often losing the sense of process that is needed to conduct research. However, for a quick overview of a particular part of the research process, they are invaluable. Another potential disadvantage of web materials is that the links may change and render access difficult if not impossible.

Available for purchase

- Bryman, Alan. 2008. *Social Research Methods*. 3rd ed. Oxford University Press. 748 pages, retail price: \$99.95
While there are many social research methods texts available, there are few that are comprehensive yet easy to follow. This third edition of Bryman's *Social Research Methods* is both, being designed for first-year university students. While it may have too much depth for those wanting to conduct a simple research project, it has excellent chapters on everything anyone would need to know. Chapters are in sections: quantitative research including sampling, structured interviewing, self-completion questionnaires, asking questions, structured observation, content analysis, secondary analysis and official statistics, and quantitative data analysis. Another section addresses qualitative research, ethnography and participant observation, interviewing, focus groups, language in qualitative research, documents as data sources, and qualitative data analysis. It also has chapters about SPSS (quantitative computer package), NVivo (qualitative computer based data analysis) and online social surveys. It also has online resources which accompany the purchase.
- Somekh, Bridget and Lewin, Cathy (eds) 2005. *Research Methods in the Social Sciences*. London: Sage Publications. 376 pages, retail price approx. \$59
This book introduces the key qualitative and quantitative research methodologies and methods and includes critical reflections on research processes by leading scholars in their respective fields. It provides a balance between theory and practical application with numerous 'stories from the field' which explore the ways that methodology shapes research design and methods and the knowledge and understanding produced. It includes Australian content and examples.
- Davies, Martin Brett. 2007. *Doing a Successful Research Project: Using Qualitative or Quantitative Methods*. Palgrave Macmillan UK. 274 pages, retail price approx. \$25 (UK £12.99)
Davies's book is useful for its simplicity of approach and would be good for someone planning a research project for the first time. It is engaging in style and has frequent checklists to help the novice researcher think through the stages of the research process and their approach. It raises awareness of potential pitfalls and gives useful examples of both good and bad research. When discussing a particular technique, e.g. focus groups, the author offers a recommendation 'for just one book' that would be useful for learning more. The author has also included a chapter that discusses testing for statistical significance that is easily understandable, even for the statistical novice.

- Neuman, W. Lawrence. 2006. *Social Research Methods: Qualitative and Quantitative Approaches*. 6th ed. Boston: Pearson Education, Inc. 592 pages, retail price \$110.00.

This 6th edition of a classic social research text is designed for first-year university students. It is well laid out and deals with all dimensions of research including quantitative and qualitative designs, and quantitative and qualitative data collection and analysis. Although this is a classic, the newer text by Bryman has greater appeal with its use of boxed examples and good layout.

- Wadsworth, Yoland. 1997. *Do It Yourself Social Research*. 2nd ed. St Leonards, NSW: Allen & Unwin: 114 pages, retail price \$27.95.

This book was first published by the Victorian Council of Social Service in 1984. By 1997, when this 2nd edition was published it had sold 33,000 copies. It is ideal for community-based organisations and human services practitioners as well as students. It is accessible and takes the reader through managing a research project, choosing methods, and analysing or interpreting data.

Free resources from the internet

All links checked as at May 4, 2008.

- Trochim, William & James P. Donnelly. 2007. *Research Methods Knowledge Base*
Available online and in paperback. The Research Methods Knowledge Base is now in its 3rd edition and covers myriad topics.
<http://www.socialresearchmethods.net/kb/contents.php>
- Creative Research Systems. 2006. *The Survey System. Chapter: 'Survey Design'*
This chapter is intended for those new to survey design and focuses on establishing goals, selecting a sample, interviewing methods, mail surveys, computer direct interviews, email surveys, web page surveys, questionnaire design, and pre-testing. It includes both advantages and disadvantages of using these techniques.
<http://www.surveysystem.com/sdesign.htm>
- Analytic Technologies. Undated. *Principles of Questionnaire Construction*
This is a five-page download on writing questions, question placement, and choosing between open-ended versus closed-ended questions. It contains some very good tips for ways to think about developing questions for a survey: how to avoid double-barrelled questions; avoiding emotive language and leading questions; and a reminder to ensure the questions are suitable for the target audience.
<http://www.analytictech.com/mb313/principl.htm>
- Burgess, Dr Thomas F. 2003. *A General Introduction to the Design of Questionnaires for Survey Research*. Information Systems Services, University of Leeds
Another great resource including sections on defining research aims, identifying population and sample, how to collect responses, questionnaire design, pilots, analysis of data, and two appendices with examples of question design, and questionnaires.
<http://www.leeds.ac.uk/iss/documentation/top/top2.pdf>
- Walonick, David S. 1997–2004. *Excerpts from: Survival Statistics*. StatPac, Inc. Bloomington, MN
This download on creating surveys has some useful sections and some key issues to think about in relation to research design. One of the most useful sections is 'Qualities of a Good Question' which is really one of the most difficult parts of survey research (i.e. writing good questions).
<http://www.statpac.com/surveys/>
- **Wikipedia online resource** <http://en.wikipedia.org/>
By far the most comprehensive free resource on the web, Wikipedia provides introductions to research topics in social research. There are overviews of many issues relating to social research, including 'social research' itself: http://en.wikipedia.org/wiki/Social_research
There are also separate entries for:
 - quantitative methods http://en.wikipedia.org/wiki/Quantitative_method
 - key issues in questionnaire construction http://en.wikipedia.org/wiki/Questionnaire_construction
 - qualitative research http://en.wikipedia.org/wiki/Qualitative_research
 - focus groups http://en.wikipedia.org/wiki/Focus_groups

Specific tools for focus groups

- Eliot & Associates. 2005. *Guidelines for Conducting a Focus Group*. This is an excellent and comprehensive guide to conducting focus groups (while the link remains available). It includes the type and design of questions, recruitment of participants and conducting a group, sample flyers, consent forms, and guides for data analysis.
http://cp0.ipnshosting.com/~focusgro/documents/How_to_Conduct_a_Focus_Group.pdf
- Lehigh University, US. Undated. *Conducting a Focus Group*. While this is less comprehensive than the previous item, it is still useful for highlighting the key issues relating to focus group techniques.
<http://www.cse.lehigh.edu/~glennb/mm/FocusGroups.htm>

Online survey techniques

One of the marvellous innovations to arrive in the social research realm is the web survey. Just by sending an email with a link to a website, respondents can be asked to complete a survey online. After completion, the results are collated and returned to the designer.

SurveyMonkey is a very useful instrument for people wanting to undertake a small research survey. It is free for up to 10 questions and 100 responses. There is a cost for larger surveys or numbers.

SurveyMonkey: <http://www.surveymonkey.com/> Access the SurveyMonkey user manual: <http://s3.amazonaws.com/SurveyMonkeyFiles/UserManual.pdf>

SurveyMonkey appears to be the only free resource available of this kind. However, there are commercial firms such as the Australian firm Web Survey <http://www.websurvey.com.au/>. Survey Galaxy is a UK firm with a simple pricing mechanism – see the site for details.

<http://www.surveygalaxy.com/>

Ethics and standards

National links:

- National Statement on Ethical Conduct in Human Research 2007:
http://www.nhmrc.gov.au/publications/synopses/_files/e72.pdf
- The Australian Code for the Responsible Conduct of Research:
http://www.nhmrc.gov.au/publications/synopses/_files/r39.pdf

Some examples of institutions with detailed codes of conduct or ethics guidelines:

- University of Melbourne
<http://www.research.unimelb.edu.au/admin/res.conduct/code.html#record>
- The Australian Museum
http://www.australianmuseum.net.au/about/research_ethics.htm

In the market and social research industry see:

- *Defining Quality Standards*, a summary booklet covering the range of quality standards that have evolved to meet changing needs and community expectations for the market and social research industry in Australia.
http://www.amsro.com.au/files/quality_definitions.pdf
- Market Research Quality Assurance (MRQA), an independent standards body established by the market research industry to set standards and improve the quality of market and social research in Australia.
<http://www.mrqa.com.au/>

Appendix B

Case studies

B.1 Sunny Coast Council: program to reduce littering

About the council

Sunny Coast Council is a medium-sized council based in a coastal area. It has a small, thriving business and retail centre with residential areas extending inland from the coast. Most of the activities in the Council area take place on the beach and coastal strip which extends for 1km along the beach and 200m back from the beachfront. Many businesses are focused on tourism and the population increases by about 100% on weekends and in the holiday seasons.

The issue

There have been significant problems with litter in the coastal strip. Cigarette butt litter in the soft sand is an eyesore on the beaches, in the streets close to the beach and in the sea (carried from the storm water outlets at each end of the beach).

A survey of local people conducted by Council a year ago showed that litter was a key area of concern. Many locals believe the litter – in particular cigarette butt litter – is caused by tourists.

The Council recently conducted a litter audit on the coastal strip over an eight-week period, including a two-week school holiday. The Sustainability Manager analysed the results of the audit and found that 40% of litter was cigarette butts.

The Council decided to address cigarette butt litter as a priority before the summer holiday season and allocated \$35,000 in funding over six months.

The program

The Sustainability Manager was given the job of developing a program to reduce cigarette butt litter. The aim of the program was to reduce cigarette butt littering by 80% over six months.

The Sustainability Manager used state-based littering research to better understand the profiles of specific types of litterers and the effectiveness of existing anti-littering activities (media campaign, bin placement and issuing of fines). However, in the context of Sunny Coast she had little knowledge about who littered, when and why.

She identified the stakeholders and formed a representative Steering Committee:

- Internal local: Sunny Coast Council Environmental Education, Infrastructure, Finance, and Media & Communications and the Council Rangers
- External local: Businesses in the coastal strip especially restaurants, cafes and pubs, local residents, the tourist office, visitors and the local 'Keep our Beach Clean' group
- Other: Adjacent councils who face similar coastal litter issues, the state government agency responsible for litter legislation and policy, and the state-based environmental educators' group.

The research

The Sustainability Manager took a mixed methods approach to research. The data collection methods were:

- Daily observations at key locations on the beach and coastal strip over one month – including two weekends and one week of school holiday period – to observe who litters, where and when. These were undertaken by staff in her team

- Interviews with key tourist groups – the local tourist office, camping ground and local representative group of bed and breakfast and real estate agents who let short stay accommodation to determine what activities might give the best outcomes. Again, these were undertaken by staff in her team
- A questionnaire for locals and tourists who smoke to understand what they do with their butt litter and if they do litter, what would change their habits. The questionnaire was administered, collated and analysed by the Media & Communications section
- Focus groups with local businesses to workshop ideas on how to reduce butt littering outside restaurants, cafes and pubs. These were conducted by the Sustainability Manager herself.

Activities

Based on her research, the Sustainability Manager decided to undertake the following activities over the remaining four months of the program:

- Engage Council's interest in the issue to ban smoking on the beach and in beachfront parks
- Run a communications campaign with assistance from the Media & Communications section and with the following elements:
 - Put littering posters at regular intervals along the beach
 - Place a butt littering article and 'advert' in the local tourist guide
 - Place butt littering posters on the side of existing rubbish bins on the coastal strip
 - Hand out butt litter flyers with short stay rental agreements and tourist brochures from the tourist office
- Place no smoking signs in prominent places close to the beach with assistance from the Infrastructure section
- Use Council Rangers to enforce the smoking ban on the beach and issue fines.

During the program

In order to find out if the activities were making a difference, the Sustainability Manager followed up with a week-long waste audit to identify whether cigarette butt litter was reducing. She found that cigarette butt litter:

- On the beach soft sand it had reduced by 50%
- Around the pubs, restaurants and cafes it had not reduced at all
- In stormwater it had reduced marginally.

In addition, although issuing fines was effective at reducing cigarette butt litter on the beach, the Council Rangers found it uncomfortable and confrontational to issue fines for people smoking on the beach. This activity seemed to cause stress and antagonism with beachgoers. Also, it did not seem to prevent people from smoking.


The Sustainability Manager reflected on the results with the Steering Committee. They decided to:

- Liaise with the local residents using the beach. This involved the local beach clean group and also the surf lifesaving group who had not previously been involved. The surf lifesaving group devised a solution. Patrol captains were specifically trained and a more 'softly, softly' approach was trialled – asking people not to smoke and explaining the impact cigarette butt litter had on the beach
- Find a better way to engage with owners of pubs, restaurants and cafes to communicate the results of the audit and explore ways to stop the cigarette butt litter in these locations. This led to specific cigarette butt bins being mounted on the walls outside these establishments and small hand-held bins being provided at the doors for patrons who go outside to smoke
- Liaise with the Council Infrastructure section to explore solutions to cigarette butts entering the sea from the stormwater drains. This led to the Infrastructure group installing finer meshes and filters in the drains to catch the cigarette butts and scheduling a twice-weekly filter cleaning process.

The outcomes

At the end of the program, another week long waste audit was conducted which found that cigarette butt litter reduced by 90% (more than the expected 80%). A formal report was prepared for the stakeholder group. This group has now joined together to work on other environmental initiatives relating to waste, including an education program on reducing waste to land fill (especially waste from local businesses).

The Sustainability Manager presented a paper on the program and the research performed at the state-based environmental educators' forum. This increased her networking capacity and made valuable contacts for future programs. She also shared her outcomes and learnings with eight other councils with sea frontage, and this led to the creation of a working group that meets twice a year to discuss common issues related to beachside councils.

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Impacts	Improving the program with additional research
<p>Program audit – showed cigarette butt litter reduced</p> <p>Requesting feedback about the process of the program had been well managed – showed high levels of engagement with program management</p> <p>Participants asked to evaluate their perceptions of the program and gave positive feedback</p>	<ul style="list-style-type: none"> • Formal program and evaluation report presented to Steering Committee • Sustainability Manager presented paper at state-based environmental educators' forum to share learnings and outcomes. Led to the formation of a working group of eight councils with sea frontage to further explore shared issues on a range of topics. Group meets twice yearly • Stakeholder group reformed the following year to investigate ways to further reduce take-away food container litter in the eating district
<p>Monitoring program over one week to monitor whether cigarette butt litter had reduced by 80% on soft sand, beaches, pubs, restaurants and cafes. Marginal reduction</p> <p>Research showed that although issuing fines was effective, it was highly confrontational and</p>	<p>Focus groups with local businesses to workshop ideas on how to reduce butt littering outside restaurants, cafes and pubs</p> <p>Focus groups with residents, local beach clean-up group and surf lifesaving group to investigate more effective approaches.</p> <p>This research led to:</p> <ul style="list-style-type: none"> • Patrol captains from surf lifesavers trained to ask people not to smoke on beach, explaining impact of cigarette butt litter – found to be less confronting for both beach goers and enforcement officers • Butt bins mounted on walls in eating district and hand-held bins given to patrons by owners of pubs, restaurants and cafes to use outside • Web search of effective mesh and filter mechanisms in conjunction with Council Infrastructure group to install in stormwater drains to trap cigarette butts
<p>Program showed substantial increase in activity</p> <p>Program at Stakeholder Steering Committee after</p> <p>Level of community involvement was sufficiently involved</p>	<p>Stakeholder analysis by Steering Committee to confirm all key stakeholders, (influencers, decision makers, participants) are identified and their relevant roles understood – found Steering Committee did not represent all key stakeholders.</p> <p>Committee expanded to include representatives from local residents group and owners of pubs, restaurants and cafes</p>
<p>Program Manager using diary to ensure activities meet</p> <p>Program Manager identified key stakeholders</p> <p>Steering Committee to workshop the program</p> <p>and funding available</p>	<p>Focus group with key stakeholders to debrief on the program and reflect on process undertaken and success of activities</p>
<p>Program on beach and coastal strip over one month –</p> <p>Program school holiday period – on who litters,</p> <p>Program local tourist office, camping ground, representative</p> <p>Program and real estate agents for short stay accommodation</p> <p>Program to give the best outcomes</p> <p>Program who smoke to understand what they do with their</p> <p>Program their habits if they do litter</p> <p>Program participants highlighted successful campaigns at state</p> <p>Program resources available on government websites</p>	<ul style="list-style-type: none"> • Initial research supported planned activities
<p>Program provided education programs to reduce litter – confirmed</p> <p>Program for many councils and identified various strategies</p> <p>Program over past 5 years – indicated significant increase in</p> <p>Program littering periods</p> <p>Program management: contractor confirmed volume increased</p> <p>Program over periods, 40% is butt litter</p>	<p>Initial research had insufficient focus on the social aspects of littering</p>

B.2 Ngura Council: program to reduce domestic water consumption

About the council

Ngura Council is centred on a large country town, with the majority of the population living in the town. The Council is responsible for water supply within its area and sources its potable water from the only dam in its local government area.

The issue

The Council has recorded ever-decreasing dam levels but increasing household water use over the past five years. This period has also experienced lower than average annual rainfall.

The residents in the Council area are from a wide range of incomes and cultural groups. However 50% of the housing stock is multi-unit dwellings. The Council planned to run an education program and allocated \$120,000 in funding to address the issue.

The program

The Environmental Manager was responsible for scoping the program, which aimed to reduce household usage by 40% over two years. The focus of the program was to better understand behaviours and attitudes towards water use among different social groups in order to develop a program for change. The Manager had access to a number of reports from another water authority about water use and water users and their motivations towards changing their behaviour.

He identified the stakeholders as:

- Internal: Billing department, Council's water supply authority
- External: Domestic, business and industry water users, farmers, state government body with state-wide oversight over water.

The research

The Environmental Manager obtained quantitative data on high water users (which was sourced from the water authority's internal billing system). He held focus groups with the water authority staff to explore approaches to reducing water use in conjunction with the authority's previous research on different cultural views of water. Using this knowledge he concluded that the primary motivator for reducing water use was price.

The activities

Using the data on water usage the Manager trialed a stepped pricing arrangement for water over the following two quarters (with the agreement of the water pricing authority and the water authority). He supported this with a mail-out to households explaining the approach and offering a \$200 rebate on water tank installation for tanks with a capacity of 2,000 or more litres linked to washing machines and toilets (currently matched with a similar amount from the state government).

During the program

After the trial period, the Environmental Manager reviewed the water consumption data. He found:

- A 5% fall in water consumption, mainly attributable to single dwellings
- Only a handful of householders had taken up the water tank offer.

In addition, statistics from the water authority customer line recorded a substantial volume of complaints relating to the stepped pricing agreement. The complaints were primarily from the landlords of multi-unit dwellings. They are responsible for the water bills and feel they have no control over water use.

Fast action was required. The Manager decided to employ a consultant to conduct phone interviews of renters in multi-unit dwellings. The consultants used a questionnaire to determine how water was used in units and what might motivate the renter to reduce consumption. The survey found that:

- Renters were not motivated by price and many had ignored the letter informing them of the new stepped arrangement
- Renters wanted to 'do their bit' to reduce water consumption but felt they needed education and incentives to do so
- Most water was used in the common gardens of the units (not under the renters' control) and in clothes washing (under their control).

This resulted in the program being revised to:

- Include an incentive program for renters to buy water-efficient washing machines (dishwashers being part of the unit fixtures)
- Include a home audit package conducted by the authority over 12 months to retrofit water-saving devices in the units (shower heads, tap flow), including educational material on water use
- Include key landlords in the stakeholder group and work with them to identify blocks of high water use, to identify the source of water usage and develop an appropriate plan of action
- Provide more information on water bills for the body corporates
- Replace the water tank incentive for single dwellings with a subsidy for tanks for multi-unit complexes (although not matched by the state government) to capture rainwater for use in common gardens.

The outcomes

At the end of the program water usage had dropped by 25%. Time was probably lost at the start of the project because the knowledge gathered did not really assist in understanding the particular context. It would have been more appropriate to spend more time in research at the beginning, given the longer program timeframe. It is hoped though, that the benefits realised from the adjustment of the program will flow into later years although the incentive programs are no longer running.

The Environmental Manager shared his outcomes and learnings with four neighbouring councils, which created a forum to share information and research on other environmental issues. The program also resulted in a landlord forum, which is now working with the local energy authority to reduce energy consumption in the catchment. The Manager also prepared a formal report which was presented at Council and to the water authority. This led to an increased understanding within Council of the value of research and to the Council funding and specifying a specific research component on attitudes and behaviour towards waste as part of a new waste education program.

Table 8 – Ngura Council hierarchy of outcomes

Program stage	Planned outcome hierarchy	Planned research conducted and results
Review	<p>Ultimate outcomes (impacts)</p> <ul style="list-style-type: none"> Reduction in water consumption by 30% at end of two years Program evaluation shows program was effective and made efficient use of resources Outcomes and learnings shared with four other councils Other forums formed for future programs Increase in Council capacity to run change programs and value research as an integral component of these programs 	<ul style="list-style-type: none"> Quantitative data on household water use obtained from water authority and analysed (compared to target of 40%) in household Program evaluated to assess efficiency and formal report presented to Council and Environmental Manager program summary and learnings with four other councils
Implementation and review	<p>Intermediate outcomes (changes)</p> <ul style="list-style-type: none"> Reduction in water consumption towards 30% over trial period of two quarters 	<ul style="list-style-type: none"> Quantitative data analysis – water use data reviewed after trial period (two quarters) showed only 5% fall in water consumption than multi-unit dwellings Quantitative analysis of number and household tank offer – showed only a few households
Implementation	<p>Immediate outcomes (participation)</p> <ul style="list-style-type: none"> Water authority becomes a program partner Households received information about pricing and methods for saving water 	<ul style="list-style-type: none"> Water authority complaints line and Council monitored for feedback – found owners unhappy with stepped price
Implementation	<p>Activities</p> <ul style="list-style-type: none"> Stepped pricing arrangement for water consumption for a trial period of two quarters Mail-out to households explained the issue and reasons for new pricing scheme. Mail-out included \$200 water tank rebate offer from Council 	<ul style="list-style-type: none"> Focus group with water authority staff to reducing domestic usage Stakeholder analysis identified households as key stakeholders Records kept of mail-out activities – which information.
Planning	<p>Needs</p> <ul style="list-style-type: none"> Aim to decrease householder water usage by 30% over two years 	<ul style="list-style-type: none"> Desk review of water authority's previous values of water. Manager concludes that water use is price
Planning	<p>Issue and context</p> <ul style="list-style-type: none"> Lack of certainty over water supply in area experiencing reduced annual rainfall Decreasing dam levels from only source of water in catchment Increasing household water use Low Council capacity for research as a basis for sustainability education programs No partnerships for change between Council, other councils and resource providers e.g. water, waste, energy 	<ul style="list-style-type: none"> Analysis of quantitative data on household the past five years from water authority Analysis of spatial maps showing household

Improving the program with additional research

<p>use over the next two years ysed – showed 35% fall ld water use and effectiveness – water authority nary shared outcomes</p>	<ul style="list-style-type: none"> • Reflective practice and evaluation review with environmental group at council and water authority concluded that time was lost at the start of the program by not doing a literature review of other education programs or by talking to water users and more clearly researching how water was used and by whom as well as various behavioural aspects of water use • Identifying landlords as stakeholders, conducting specific research with this group and involving them in the program has led to the landlord group now working with the local energy authority to reduce energy consumption
<p>data from water authority) to calculate change in use; on, mainly in single rather households taking up water lds had</p>	<ul style="list-style-type: none"> • Initial assessment of effectiveness of program showed little success. More knowledge required about behaviour and motivations of residents to reduce water use • Decision made to conduct a more detailed survey of renters to understand motivations for reducing water use and enable changes to the incentive scheme • Contracted research – phone interviews of 300 renters to better understand how water is used in the multi-unit dwellings – showed: <ul style="list-style-type: none"> – Renters not motivated by price – Need for education and incentives – Most water used in common garden and in clothes washing <p>This led to a change in approach:</p> <ul style="list-style-type: none"> • Incentive program for renters to buy water-efficient washing machines • Home audit package offered by water authority to retrofit water-saving devices in units, including educational material on water use • Landlord group formed to identify residential blocks of high water usage and develop appropriate action • More information on bills for body corporates • Water tank incentive scrapped for single dwellings and introduced at multi-dwelling level for common gardens
<p>ncil enquiries line of multi-unit dwellings</p>	
<p>o explore approach to olds and water authority ich households received</p>	<ul style="list-style-type: none"> • Further analysis showed landlords were a stakeholder group. Focus group of key landlords held to understand how they could work with Council to reduce water use
<p>us research on cultural primary motivator for</p>	<ul style="list-style-type: none"> • Reflective practice at end of project concluded that a literature review should have been performed at this stage • In addition, more contextual information was required to fully understand the program needs
<p>hold water use over ng types in the Council area</p>	<ul style="list-style-type: none"> • Initial research had insufficient focus on the social aspects of water use, e.g. behaviours, values etc.

B.3 Freshfield community groups: action for climate change

About Freshfield and the community groups

Freshfield is an older inner city suburb with a diverse housing mix, people from diverse cultural backgrounds and a range of household types. It has a number of community groups who are active in a range of different areas from women's groups to specific culturally based groups and environmental groups.

Three community groups in Freshfield became involved in a climate change project. They were:

- Freshfield Landwatch (Landwatch), an environmental group that operates two community gardens in Freshfield and runs monthly education sessions on gardening, composting and worm farming
- Freshfield Parents Group (Parents Group), which runs daily playgroup sessions for parents with preschool aged children, based in the local community hall
- Freshfield Migrant Centre (Migrant Centre), which runs programs for migrants to increase their literacy and help them find jobs in the local area.

The current issue

Landwatch identified an opportunity to partner with other community groups in order to build overall community capacity for changing towards sustainability. Landwatch had conducted a series of questionnaires over six months with participants from its composting sessions and found that the issue of climate change and its impact was not well understood. It approached the other two community groups and collectively they applied for a state-based grant (\$60,000 over one year) to develop a partnership to produce tangible outcomes for climate change.

The program

The community groups formed a Steering Committee consisting of the Education Officers from each group and the Freshfield Council Sustainability Officer. The Sustainability Officer was seconded from the Council for one day per week during the project.

The purpose of the program was to:


- Build an increased sense of community by working collectively
- Build community capacity for change towards sustainability (with a focus on climate change issues)
- Reduce greenhouse gas emissions in Freshfield Council area
- Build the capacity of the partners to continue working together on other programs.

The research

The Steering Group used existing research from the Australian Greenhouse Office on household attitudes to climate change to better understand people's perception of what climate change means, how people relate to it, whether they see it as an issue and what actions, if any, they take to reduce their household impact. They also decided to undertake a broad community survey to better understand Freshfield residents' perceptions of climate change, the greenhouse effect and whether/how they took action at a householder level.

A phone survey of 200 residents was conducted by a specialist research agency which also provided a detailed report. The survey supported the Landwatch survey findings and showed that the residents had limited understanding of the links between climate change and their own actions.

The Steering Group decided to adopt a highly participative action-based approach and run a series of four 3 hour workshops each of up to 15 participants with each community group over a six-month period. Each Community Education Officer ran their group workshop, which was scheduled at a time convenient for the participants. The aim of the workshops was to gradually increase the participants' capacity for change by getting them to think critically about the barriers and drivers for change and empower them to work together

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to achieve their goals. At the start of the program, the Steering Committee developed a series of questions in order to frame the design of the workshops while ensuring the design could be adapted if required.

At the end of the first workshop, the participants decided to record the following as baseline data:

- Their car mileage each week
- Energy used in the home each quarter (gas and electricity)
- The number of light bulbs in their home (energy efficient and normal ones)
- How full their non-recyclable and recyclable waste bins were each week.

At the end of the second workshop each participant completed a 'Commitment to Climate Change' form detailing the specific actions they would undertake to reduce their greenhouse emissions based on the baseline data they had collected. At the end of the fourth workshop this data was collected again to evaluate the percentage reduction and calculate the greenhouse emissions saved.

At the end of each workshop the participants completed a workshop evaluation form to assess their changed levels of knowledge and understanding, and allow them to provide input into the next workshop.

In addition, the last activity in each workshop involved the group reflecting on how their activities, both during and between the workshops, were contributing to their vision for sustainability for their community. The discussions involved reflecting on what had happened and why; what enabled change to happen and what prevented change from occurring; if, how and why their perceptions, thinking and behaviour as individuals and as a group were changing; and what they could share with others. These discussions were recorded as collages in poster form and were stuck up on the walls in their meeting place in order to record their 'journey' and their learning, and to communicate their project with their wider community group.

In addition, the Steering Committee members kept reflective journals throughout the program to record their thoughts, experiences and the learning process for both themselves and the participants. They summarised their individual journals at the end of the program and circulated these summaries within the Steering Committee.

Activities

The Community Education Officers attended a workshop facilitation course to better equip them with techniques for running participative learning workshops. This course was run by the state-based environmental educators' group, which enabled them to make connections with a wider network of educators.

The workshops were conducted for each group as follows:

- Workshop 1: What does sustainability mean to me? What is climate change? What part does climate change play in achieving sustainability? What is our vision for our community?
- Workshop 2: What can we do to address climate change? What can we commit to doing?
- Workshop 3: How are we going? What are the barriers and levers to change?
- Workshop 4: What changes have we made? What have we learnt? What can we share with others? What shall we do next?

The aim of the workshops was to create a highly participative environment where the participants could share their ideas and work together to achieve change. The facilitator's role was to maximise interaction and enable participants to develop their own conclusions and responses by working in both small and large group settings.

The Council Sustainability Officer sourced support materials for the workshops and also attended the workshops in a co-facilitator role. This allowed the Council Sustainability Officer to have a broader perspective on the process and outcomes and provide feedback on this basis.

The Steering Committee met in the week following each workshop. They discussed both the process and the outcomes of the workshops and reflected on what worked or did not work and why. Sharing experiences meant they could adapt future workshops if required and support each other through the program.

During the program

The participants at first struggled with defining 'sustainability' and understanding their role in climate change. The first workshop was very intense and participants found this challenging. They thought they needed more opportunities to discuss the issues. Based on this, a secure web forum was created for the Landwatch and the Parents groups on the Council's website, which allowed the participants to post entries and discuss issues between workshops. This was moderated by the relevant Community Education Officer.

Such a forum was not considered appropriate by the Migrant Centre participants, primarily because they had lower literacy levels in English, spoke different languages and had limited access to the internet. As they also met on a more frequent basis, they decided to dedicate one morning per week for an informal focus group led by a participant with assistance where required from the Community Education Officer.

These discussion forums added significantly to the process and by the end of the second workshop each participant had completed a 'Commitment to Climate Change' form which detailed specific action to be undertaken at the household level. The commitments were under three headings of reducing car use, reducing energy consumption and reducing waste to landfill.

After the third workshop, one of the perceived barriers to change was the lack of incentives from Freshfield Council and lack of leadership on green energy by the Council. The Council Sustainability Officer reported back to colleagues and the Council decided to purchase 100% of its electricity from renewable sources and offer three free energy-saving light bulbs for each household to help them meet their commitment. These two actions were seen as critical to supporting the community groups.

The Steering Committee members believed their monthly meetings were vital for supporting each other through the program, especially in terms of working through barriers and levers to change.

The outcomes

At the end of the fourth workshop, the participants reported back on the outcomes they had achieved:

- Individual capacity for change was built throughout the program. This included skills around critical and systemic thinking and on working together to achieve a goal
- Community capacity for change was built via the workshops which provided a basis for ongoing discussions about sustainability, the realisation that collaboration and partnering was a key success factor in change and by better understanding the barriers to change
- Increased Council engagement with and leadership in sustainability and support for further partnership programs
- Specific measurable outcomes to reduce climate change impact.

In addition, the Steering Committee members reflected on the program outcomes and concluded that:

- Strong partnerships were built between the four partners in the program. In particular, the three community groups are now working collaboratively to lobby Council to increase the number of cycleways within the Council area to reduce car mileage and reduce greenhouse gases
- The reflective journals helped build the Community Education Officers' capacity to engage their community groups in change programs (not just for climate change but on a wide range of issues). Two of the Steering Committee members have continued to keep journals and all members are using reflective practice in their education programs
- It was decided that the process and outcomes of the program should be shared more widely by writing it up as a case study and presenting at a range of sustainability forums. The writing up was done co-operatively by the Council Sustainability Officer in conjunction with the three groups' Community Education Officers. This case study was presented by the Council Sustainability Officer at a local government education forum and jointly by the Community Educators at the state-based environmental educators' conference (following from their introduction to this network in the facilitation course).

- There is now much broader community engagement with climate change and therefore an opportunity to extend this program further. Based on this, the Council developed a formal community consultation and engagement strategy and decided to fund another community group partnership to undertake a similar program in the following year
- Local media could have been included as a partner to communicate the program to the wider community and inspire others to take action.


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Table 9 – Freshfield community groups hierarchy of outcomes

Program stage	Planned outcome hierarchy	Planned research conducted and results
Review	<p>Ultimate outcomes (impacts)</p> <ul style="list-style-type: none"> Reduction in greenhouse gas in the participating community groups Capacity building at individual (participants and Steering Committee) and community/partner level Program contributes to body of work on participative processes for change Increased community capacity for change for sustainability Formal community consultation and engagement strategy formed by Council Increased Council support for partnership programs 	<ul style="list-style-type: none"> Data collected for greenhouse emissions on greenhouse emissions Evaluation form after fourth workshop program and on what basis the participants Reflective journals were summarised by the group to share learnings and reflections Collage posters placed on public display to share learnings during the workshop process
Implementation and review	<p>Intermediate outcomes (changes)</p> <ul style="list-style-type: none"> Increased engagement by community groups in climate change discussions Increased empowerment to plan and implement change Identification of barriers (and levers) to change Engagement by the Council and changes in purchasing policy and initiatives to assist households 	<ul style="list-style-type: none"> Workshop feedback forms showed participants wanted to contribute to group discussions. Feedback was used to create a safe environment where they could create change Workshop feedback forms from third workshop highlighted lack of Council leadership and incentives Group reflective practice during Steering Committee activities and allowed learnings to be shared Group reflective practice at the end of the program and how, why/why not. This deepened learning at community level
Implementation	<p>Immediate outcomes (participation)</p> <ul style="list-style-type: none"> Workshop participants self selected for each community group Council agreed to fund Sustainability Officer for one day per week during the program Steering Committee formed and met in the week following each round of workshops 	
Implementation	<p>Activities</p> <ul style="list-style-type: none"> Action based learning approach: 4 x 3 hour workshops planned over a six-month period for each group Participative learning activities in small groups building on experiences over time 'Commitment to Change' forms completed in second workshop 	<ul style="list-style-type: none"> Facilitation course attended by the participants as a successful participative learning activity Baseline data collected for greenhouse emissions Critical and systemic thinking activities used to understand climate change and develop action Reflective practice undertaken individually by Steering Committee members to monitor progress
Planning	<p>Needs</p> <ul style="list-style-type: none"> To build increased sense of community by working together To build community capacity for change towards sustainability (with a focus on climate change) Reduce greenhouse emissions in Freshfield Build capacity of partners to work together in future Increase Council commitment to engaging and consulting with community in change for sustainability 	<ul style="list-style-type: none"> Community survey of 200 residents identified key concerns between climate change and their own actions Stakeholder analysis identified key stakeholders and Council Sustainability Unit
Planning	<p>Issue and context</p> <ul style="list-style-type: none"> Feedback from Landwatch composting session, participants identified climate change and its impact were not well understood Little community engagement or involvement in climate change action No Council-led programs with community groups With three active community groups, there were opportunities to create a partnership for this project which would endure in the long term 	<ul style="list-style-type: none"> Desktop review of Australian Greenhouse Gas Emissions

Improving the program with additional research

...ions and compared to baseline data to calculate reduction
 ...op included questions on the process adopted during the
 ...icipants viewed the program as 'successful'
 ...d by each Steering Committee member and circulated among
 ...ections on the program
 ...isplay documented the reflections of the group and their
 ...ess

- **Additional stakeholder** identified as a partner i.e. local media which could have been used to further 'spread the word' and build broader community capacity for change

...high degree of engagement in climate change and willingness
 ...eedback also showed people valued being in a supportive
 ...e their own action plans and feel motivated to achieve them
 ...d workshop highlighted barriers to household change as being
 ...ives for change
 ...eering Committee meetings confirmed workshop approach,
 ...e shared across the partners
 ...of each workshop to discuss what, if anything, was changing
 ...ed understanding of change processes at an individual and

- **Data from feedback forms led to:**
 - Council purchasing 100% electricity requirements from renewable sources
 - Council offered three free energy-saving light bulbs per household

No additional research undertaken although later reflections highlighted that local media should have been identified as an effective way to promote the project and share its outcomes and learnings

...Community Education Officers increased knowledge about
 ...ivities for change
 ...se emissions for individuals via 'Commitment to Change' form
 ...ties in workshops to broaden understanding of sustainability
 ...ion for change
 ...vidually in journals and collectively in monthly meetings by
 ...onitor process and outcomes of the program

- **Additional discussion** forums set up after first workshop to allow participants to discuss issues more deeply

...showed residents had limited understanding of the links
 ...wn actions
 ...stakeholders i.e. the three community groups and the

- Initial research supported planned activities

...house Office reports on household attitudes to climate change

- Initial research had insufficient focus on the **community perceptions and understanding** of climate change at a broad level and required the community survey to provide local level knowledge

Appendix C

Checklist of research questions

Research questions to ask during the program cycle – these are also found in Table 4.

Planning

The issue

- What is the issue/problem?
- What is the state of knowledge about this issue?
- What previous research or programs have been done in this area (by the organisation or others) and what were the outcomes/learnings?

The context

- What is the social context?
- How could the organisational context affect your research or program?
- How does your disciplinary background affect how you see the issue?

The stakeholders

- Who are your audience/stakeholders?
- What is known about them?
- Do they see and understand the issue as you do?

The change process

- What understandings do people have about the issue and what else do they need?
- What are their current practices and reasons for these?
- Have views and practices have been changing?
- What are their barriers to, and motivators for, change?

Implementation

Developing activities

- Are the resources (time and money) invested in the program producing the planned activities?
 - Is the program appropriate to the need?
 - Does the approach need to be adjusted?

Immediate outcomes

- What is the response to the program from your stakeholders?
- To what extent is the intended audience engaging with the program?
- What is the program delivering? Is this consistent with the impact originally anticipated?
- Are appropriate and effective processes in place to monitor progress, share learnings and manage the program?
- What additional information is required?

Implementation and review

- Is the program achieving desired change in knowledge, skills or behaviour?
- To what extent is the program having the anticipated effect/impact?
- What is the response to the program from your stakeholders?
- What additional information is needed?

Review

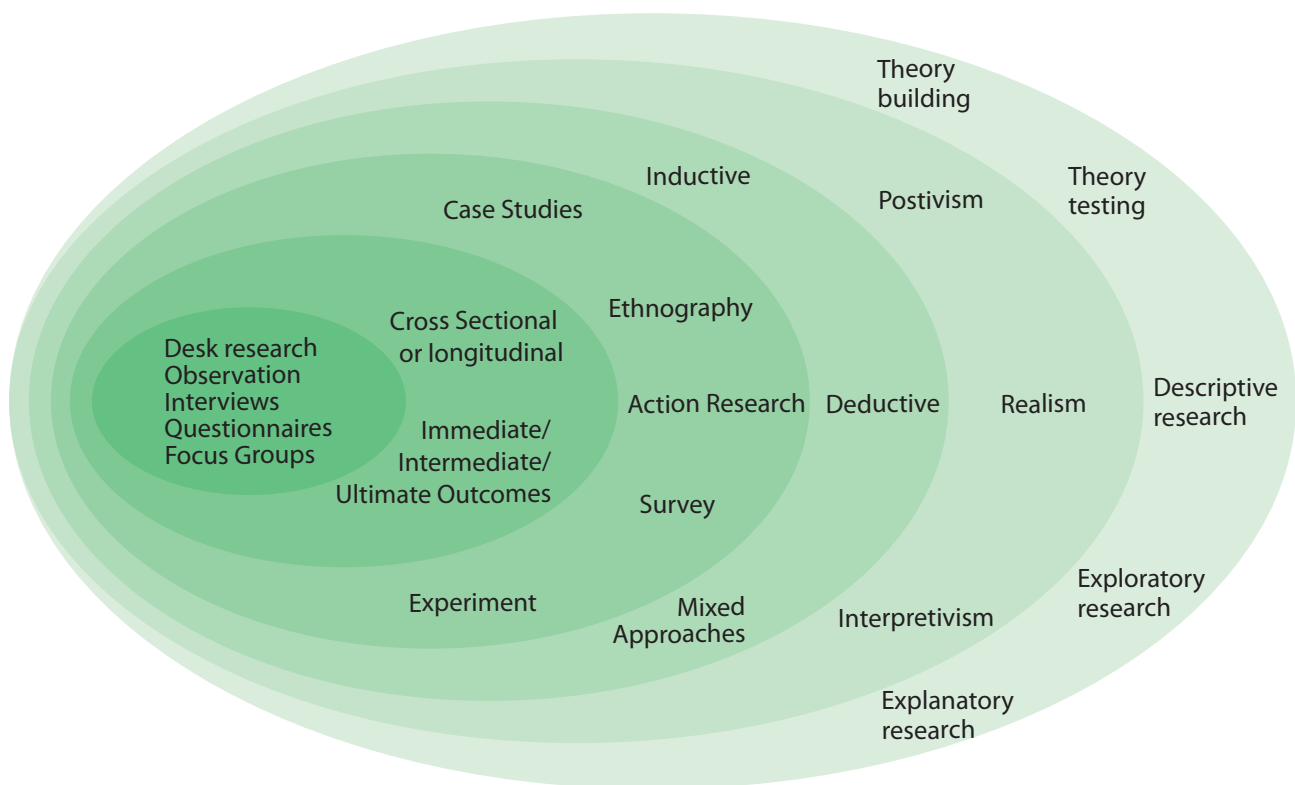
- What can be shared with others?
- Was the program well managed?
- Are the outcomes repeatable and/or sustainable?
- How are the outcomes valued by key stakeholders?
- How do the outcomes link with ongoing initiatives?
- What impact has the program had on other contexts?
- What impact has the program had on the problem?
- How effective was the program in addressing the need?

Appendix D

A framework for thinking about research

When first thinking about research, there is a tendency to believe it is about how to administer a questionnaire or how to run a focus group. However, these activities or 'data collection methods' belong in the centre of the 'research onion' (see Figure 5). The methods chosen result from consideration of the the purpose of the research, the research philosophy under which you are working, the type of approach you wish to use, the strategies that best fit that approach and the timeframe for the research. To get the whole picture you need to peel away the layers of the onion to expose the elements that make up research.

Figure 5 – The research onion



- Research purpose or rationale
- Research strategies
- Research philosophy
- Time horizons
- Research approach
- Data collection methods

Adapted from Saunders, M., Lewis, P., and Thornhill A. (2003) *Research Methods for Business Students*, Pearson Education Limited, Harlow, England. p. 83

Table 10 explains these layers in more detail.

Further reading

Bryman, A. (2001), *Social Research Methods*, Oxford University Press, Oxford, England

Creswell, J. (2003), *Research Design, Qualitative, Quantitative and Mixed Methods Approaches*, second edition, Sage Publications, California, USA

Neuman, W.L. (2000), *Social Research Methods*, fourth edition, Allyn and Bacon, Mass., USA

Sarantakos, S. (1998), *Social Research, second edition*, MacMillan Education, South Yarra, Australia

Saunders, M., Lewis, P., and Thornhill, A. (2003) *Research Methods for Business Students*, Pearson Education Limited, Harlow, England

Wadsworth, Y. (1997), *Do It Yourself Social Research*, Allen & Unwin, Sydney, Australia.

Table 10 – Layers of the research onion

Concept	Description
Research purpose or rationale	<p>Research questions and objectives should not stand in isolation but should be directly linked to the rationale or purpose for your research. Research rationales can be categorised into the five types explained below. These categories help to understand why you are asking the questions you are asking and what it is that you want to get out of your research.</p> <ol style="list-style-type: none"> 1. Theory building, a 'bottom-up' approach – you are doing this in order to try and infer a theory or explanation of how people think/ behave in relation to a particular issue based on the data you collect. It involves establishing and formulating new theories that emerge out of your data and is also called a 'grounded theory approach'. 2. Theory testing, a 'top-down' approach – you are doing this to test an existing theory or an assumption. You want to clarify your understanding of a problem against the knowledge you gather. 3. Descriptive research – you want to describe an issue and provide background information about it. You can then use this as a basis for explanatory and exploratory research (see below). 4. Exploratory research – You want to explore an issue that you might not know a lot about. You gather knowledge to further your understanding in order to develop a clear picture about an issue and its context. This often forms the basis of further research, especially where you want to understand cause-effect relationships. 5. Explanatory research – you want to explain social relations or events and build on the knowledge you already have about an issue.
Research philosophy	<p>Your research philosophy depends on the way you think about how we develop a body of knowledge. This may seem a weighty topic but it does affect, often unconsciously, how we go about doing and using research. There are three dominant research philosophies; positivism; interpretivism; and realism. Neither is 'better' than the others – it depends on the problem. You do, however, need to know a bit of background.</p> <ol style="list-style-type: none"> 1. Positivism – if you are a positivist you take a scientific 'cause and effect' approach in looking at the world. You'll tend to have a detached, structured approach to research and assume that humans are rational beings and that people interpret the world in the same way. You will use research to explain and predict behaviour patterns 2. Interpretivism – if you are an interpretivist you see things more subjectively. You will use a more inductive approach to research and assume that people see the world differently. You will use research to interpret and understand behaviour patterns 3. Realism – if you are a realist you also assume that people interpret the world differently but that there are also other things that affect people too, without them necessarily being aware of them. You will use an inductive approach to research and use research to interpret, understand and explain behaviour patterns, especially with regards to the power, politics and processes which influence people's views and behaviour
Research approach	<p>There are three research approaches. You will probably use either the inductive approach or a mixed methods approach. Neither approach is better than the other, it just depends on how you define the problem.</p> <ol style="list-style-type: none"> 1. Deductive approach – is usually scientific. It involves the development of a theory and then testing it. It concentrates on cause and effect 2. Inductive approach – is used in the social sciences and is based on the assumptions that things happen because of the way humans interpret the social world i.e. cause and effect is too simplistic 3. Mixed approaches – is a combination of the two. It is possible and often the best approach to use both inductive and deductive approaches
Research strategies	<p>This is a general plan about how you will do your research. It will:</p> <ul style="list-style-type: none"> • Have clear objectives, linked to your research question/problem • Specify the sources from which you will collect the knowledge • Identify the constraints you may have (time, money) • Drive the approach you chose
Time horizon	<p>Depending on your problem, you may want to do research over the long term (a longitudinal study) or at a point in time (a cross section)</p> <p>In addition, your timeframe should be linked to the immediate, intermediate and ultimate outcomes you are trying to achieve</p>
Data collection methods	<p>You'll need to collect data, information or understanding from either the whole group you are looking at (e.g. the Census) or select a sample. Your sample may need to be statistically relevant. You can collect data by:</p> <ul style="list-style-type: none"> • Desk research (reviewing other people's research) • Observation • Questionnaires (written, oral or electronic) • Interviews (structured with defined questions or semi-structured so you can explore more) <p>You should consider conducting your own research (primary research) or using the research of others (secondary research) to gather knowledge at various stages in your program cycle.</p>

Appendix E

Preparing a research brief

Table 11 includes suggestions for sections to include in a research brief. A brief is invaluable for programs with multiple partners to ensure everyone understands the background to the research and the work required. It is also useful where consultants are being asked to tender to conduct research.

Table 11 – Sections for a research brief

Section of brief	Summary
Summary	<ul style="list-style-type: none"> • Include a broad statement of why the research is required and who it is for
Background on your organisation and the context of the research	<ul style="list-style-type: none"> • Describe your organisation and your program. Include a clear description of the purpose of your research and perhaps some information on other people's research you have uncovered as part of the program
Research objectives	<ul style="list-style-type: none"> • Include what you are trying to find out and why
Research task	<ul style="list-style-type: none"> • If you know what method(s) of research you want to use, state this, e.g. four focus groups, 600 phone interviews, a literature review • If you are seeking advice from a consultant you should note this and request the consultant to identify how they propose to meet the research needs
Outputs: meetings, reporting and presentations	<ul style="list-style-type: none"> • Your project will require at least a scoping meeting with the steering committee/partners/consultants, and possibly project review meetings as the project progresses. If you have a specific requirement regarding meetings, include this here • Outline the reporting requirements e.g. six hard copies, a Word version, a PDF version, bound copies and unbound copies etc. • Your requirements regarding the data should also be stated • Often it is helpful to have the research findings presented to help with skills and/or technology transfer between your organisation and others
Timetable	<ul style="list-style-type: none"> • State the timeframe for the research, including start and finish times, milestones and indicate whether there is any flexibility in the dates. You should plan for draft report review and final document production and also schedule in dates for progress reports
Budget	<ul style="list-style-type: none"> • There are three approaches to this: <ul style="list-style-type: none"> (d) if you know how much money is available and are conducting the research yourself or in conjunction with partners, state this so everyone is aware of the funding position (e) if you know how much money is available and wish to engage consultants to perform the research, you should indicate the budget so those tendering can compete on methodology rather than directly on price. (f) if you wish to engage consultants and are clear on the approach and methodology then the budget should not be named so those tendering can compete mainly on price
Project management	<ul style="list-style-type: none"> • Give contact details for the project manager or the key point of contact for the consultant
Selection criteria (if relevant)	<ul style="list-style-type: none"> • State the basis on which you will select the consultant e.g. proven track record, understanding the brief, ability to deliver on time, cost and appropriateness of method
Legal and administrative requirements	<ul style="list-style-type: none"> • Some of this will be covered by your organisation's existing requirements. You need to cover: <ul style="list-style-type: none"> – Confidentiality – Copyright and intellectual property rights – Contractual arrangements and any conditions of engagement – Insurance – Conflict of interest – Referees required



