Redesign of government sustainability education programs for business personnel – *from awareness raising to changing behaviour*

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Dedication

I would like to dedicate this thesis to:

My family, especially Dad and Gail, whose support and encouragement has been fundamental to my happiness and the completion of this thesis.

Thank you so much for your unconditional love, for being there for me when I needed you, and for helping me to see the beauty in life. Your love has been, and always will be, greatly appreciated. I love you both dearly.

Abstract

The purpose of this thesis is to redesign government sustainability education programs for business personnel to improve their effectiveness in obtaining behaviour change. To achieve this a range of literature was reviewed to identify the factors that affect the capacity of business personnel to change the practices used within their organizations. This included a review of the business sustainability literature to identify what it means to be a sustainable business, the processes to use to become one, and the constraints to change that business personnel face. The systems thinking and organizational learning literature was reviewed to identify ways to understand complex issues and implement large-scale change successfully within business organizations. The environmental education literature was reviewed to identify the different educational methods that government officers can use, and their effectiveness in obtaining behaviour change.

The findings from these literature bodies were combined to outline how to design, implement and evaluate an effective sustainability education program for business personnel. A literature review of past and current Australian government sustainability education programs, and case studies reviewing the educational efforts of staff in three local governments were then undertaken. These reviews identified the practices used by Australian government educators, and compared them to those of the ideal approach developed from the literature.

This revealed that the majority of Australian government educators are not using the ideal approach, despite the fact that Environment Australia (1999, 2000) and the NSW Council on Environmental Education (2001, 2002) have been calling for the use of many of its components. The educators in the case study councils were not even aware of the alternative education methods. The review of the practices within their councils revealed many issues that negatively impacted on their ability to implement effective sustainability education programs.

Together the findings from the literature reviews and the case studies highlighted many actions that could be taken to improve the effectiveness of Australian government sustainability education programs in obtaining behaviour change.

It is suggested that to maximise the ability to obtain behaviour change in business personnel, will require changes not only to the educational methods used by government educators, but also the funding, and institutional arrangements for government sustainability education programs within Australia.

Calls are made:

- To move from using positivist, expert-controlled, awareness raising approaches to participative, problem solving approaches. With such an approach the educator works with business personnel to address the sustainability issues that they want to address. Together they identify the constraints to change and ways to overcome them. The educator builds their capacity to take action, and coaches them with their efforts, thereby making it as easy as possible for the business personnel to implement the changes within their organizations.

- To move from the current fragmented government sustainability education system to a whole-of-government approach. At the moment there are many separate government sustainability education programs for business personnel being implemented. All of these programs compete against each other for the attention of business personnel. This confuses business personnel about which actions are the most important for them to take. If a whole-of-government approach was adopted and a single sustainability education program implemented for business personnel, this confusion and competition would be reduced. It will be recommended that a single program be implemented at the local level, with staff at the relevant state and federal government agencies undertaking specific roles to support the local level educators and maximise the effectiveness of the program.

- To move from the current fragmented grant system, to a dedicated funding source enabling each local government within Australia to implement the outlined ideal sustainability education program for business personnel. This will ensure that business personnel have access to the same assistance regardless of the location of their business. Suggestions for funding sources will be made.

How such an approach can be achieved, and the roles each level of government could undertake are outlined. Guidelines explaining how to design, implement, and evaluate the ideal sustainability education program for business personnel are also developed.

The research conducted for this thesis suggests that this type of approach to government sustainability education programs will be the most effective way in which to obtain behaviour change in business personnel.

Certification

I certify that the substance of this thesis has not already been submitted for any degree and is not currently being submitted for any other degree or qualification.

I certify that any help received in preparing this thesis, and all sources used, have been acknowledged in this thesis.

Jodi-Anne Michelle Smith

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Glossary

ACF	Australian Conservation Foundation
ANTA	Australian National Training Authority
ANZECC	Australian New Zealand Environment Conservation Council
APEC	Asia Pacific Economic Cooperation
CBSM	Community Based Social Marketing
CEO	Chief Executive Officer
CSR	Corporate Social Responsibility
EPA	Environmental Protection Authority or Agency
ERB	Environmentally Responsible Behaviour
EREP	Environmental Review and Education Program
ESD	Ecologically Sustainable Development
IISD	International Institute for Sustainable Development
IUCN	International Union for Conservation of Nature
MSP	Multi Stakeholder Process
NGOs	Non Government Organizations
NSW	New South Wales
OECD	Organization for Economic Cooperation and Development
SA	South Australia
SMEs	Small and Medium Sized Enterprises
SWMPs	Soil and Water Management Plans
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNESC	UN Economic & Social Council
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNEP	United Nations Environmental Program
WBCSD	World Business Council for Sustainable Development
WCED	World Commission on Environment and Development
WRI	World Resources Institute
WWF	World Wildlife Fund

Notes on the Case Study Text

To protect the anonymity of the participants of the study, fictitious names have been assigned to those interviewed, the local government areas and their communities. The data collected for the case studies was undertaken as a part of paid employment of the author, prior to transferring enrolment to the University of New England. Ethical clearance was therefore not provided by the University and was deemed to have been the responsibility of the employer authorising the case studies.

Notes on the Australian context

Australia has three levels of government – Commonwealth or federal government, state government and local government. The many local governments are also referred to as councils. Each level of government has set duties under the constitution and / or legislation of Australia. There are many overlaps in responsibility with power often being devolved from one level of government to the next, through conditioned funding or legislation. The environment is one such area where all three levels of government have responsibilities.

The Commonwealth department with the majority of responsibility for environmental issues is called Environment Australia, while the state-based departments with the majority of environmental responsibility are called Environment Protection Authorities or Environment Protection Agencies.

Chapter 1. Introduction

1.1 Problem perspective

1.1.1 The importance of education for sustainability [1]

The state of the global environment has continued to degrade, despite significant efforts of governments worldwide to halt degradation and repair the environment (UNEP 1999; World Watch Institute 2001; Yencken & Wilkinson 2000). The UN, through reports such as the UNESCO-UNEP (1977) *Tbilisi Declaration*, UNCED (1992) *Rio Declaration* and *Agenda 21* and the UNESCO (1997) *Thessaloniki Declaration* have called on governments to educate their communities, including business personnel, on sustainability. What it means for a community or a business to be sustainable is still being widely debated. There are many different definitions, which will be discussed in detail in Chapter Two. Most definitions refer to the triple bottom line of sustainability, where a business is expected to be operated in a way that minimises its environmental impact, and maximises its social benefit – improving quality of life – while still being managed in an economically profitable manner (ACF 2000; Dunphy & Beneviste 2000; Elkington 1997; GEMI 2002; Hawken, Lovins & Lovins 1999; Robert et al 2001; The SIGMA Project 2001).

The Australian federal government has accepted the role of educating the community and business personnel on sustainability. They have called for staff in both state and local governments to take action in documents such as the Commonwealth of Australia (1992) *National Strategy for Ecologically Sustainable Development*, the Environment Australia (1999) discussion paper on environmental education, and the Environment Australia (2000) *Environmental education for a sustainable future – national action plan*. It is espoused in these documents that education is the key to success in gaining behaviour change towards more sustainable practices.

[1] The terms 'education for sustainability' and 'environmental education' are used interchangeably in this thesis. Environmental education is evolving into education for sustainability as shown in Table 2.

UNESCO (1997 p.13) claims that:

> It is widely agreed that education is the most effective means that society possesses for confronting the challenges of the future. Indeed, education will shape the world of tomorrow.

UNCED (1992 Chapter 36 of Agenda 21) contains the statement that:

> Environmental education is critical for promoting sustainable development and improving the capacity of people to address environment and development issues… education, raising of public awareness and training are linked to virtually all areas in Agenda 21.

Environment Australia (1999 p.2) highlights that 'the Agenda 21 framework, and education's key role are vital to resolving our domestic environmental challenges'. It believes that Australia's ability to meet these environmental threats is ' … inextricably linked with the priority it places on effective environmental education'. It recognises that ' … many current environmental problems have solutions, but we often lack the information and understanding we need … the knowledge, values, skills and tools … to meet environmental challenges' all of which, it states, are sourced from formal and informal education.

In addition to governments believing that education is the key to obtaining environmentally responsible behaviour, social research has shown that the community also feels this (NSW Council on Environmental Education 2002). The New South Wales Environment Protection Authority (NSW EPA) (2000) survey of the attitudes, knowledge, and behaviours of the people of NSW, found that the people believe education is the most important initiative the government can take to protect the environment. Similar sentiments were echoed in the findings of the Cooks River education program, where 80 per cent of people surveyed thought that lack of education was the major contributing cause of water pollution (Salier 2000).

1.1.2 Problems with the current sustainability education system

Governments around the world have responded to the calls for education, spending millions of dollars on sustainability education programs (Hawken, Lovins & Lovins 1999; NSW EPA 2000). It was estimated in UNCED (1992 Chapter 36 of Agenda 21) that $1.2

billion worldwide would need to be spent to implement the recommended education and awareness raising activities.

In Australia significant amounts of money have been, and continue to be, spent on sustainability education by a range of agencies, in each of the three levels of Australian government.

The NSW EPA (2000) through its Stormwater Trust Grants has allocated AUS$7.3 million to 30 projects, focussing on community education since 1998. The Patawalonga and Torrens Catchment Water Management Board in South Australia spend AUS$835,000 per annum on education programs for business personnel (Probert, 2001 pers.comm. 27 March). This is expenditure on one aspect of sustainability: environmental management, specifically stormwater pollution. Further funds are spent on education relating to other environmental issues: waste management; land, air and noise pollution; biodiversity; salinity; energy efficiency; cleaner production, and many more (NSW EPA 2000).

Such expenditure is occurring within each state of Australia, by that state's environment protection agencies, their catchment management boards, waste management boards, and other agencies with environmental responsibilities. Together, this adds up to significantly large amounts of money being spent on education for sustainability. Despite this expenditure, there are calls for more education. Authors such as Clarke (2001) and Hunter (1997) feel that expenditure on education for sustainability is likely to increase in the future, as governments realise the escalating costs and limited technological capabilities of treating pollution at the end-of-pipe. Indeed the NSW government has recently announced allocation of a further AUS$25 million towards new environmental education initiatives from 2002-2005 (NSW Council on Environmental Education 2002).

While all this money is being spent on education for sustainability, there are no Australian guidelines for the design of such programs, or processes in place to ensure that the many different providers are not duplicating each other's efforts (Environment Australia 1999). The many different education providers naturally focus on educating business personnel about the area of their own department or agency's responsibility, whether that is water, waste, energy, or other environmental issue. The result is that the educators of the many

different education programs compete for the attention of business personnel, and ask them to undertake a range of different actions. While convenient for the government agencies and other education providers, this is not likely to be convenient for business personnel who are only prepared to dedicate limited time to the issue (Hawken, Lovins & Lovins 1999; Por & Molloy 2000).

More importantly, this fragmented approach by government educators suggests to business personnel that they can make their practices more sustainable by addressing each individual environmental medium and its related pollution. The triple bottom line – social, environmental, and economic focus of sustainability – is not explained, and its potential benefits to business are lost. In explaining the significance of this, Hawken, Lovins and Lovins (1999 p.157) use a house cleaning analogy. They state that:

> The gap in understanding would be comical were it not potentially tragic. It's as if you are intent on cleaning your house, which is situated on a flood plain whose river is rising. Cleaning house is an admirable activity, but it's not an appropriate response to the immediate problem.

Yencken (2000 p.10) agrees. He highlights that in a UNEP report on the future of the global environment, it was reported that continuous improvement or pollution reduction approaches to sustainability would not be effective in stopping environmental degradation. The UNEP modelling programmes have determined that:

> … the actual efficiency improvements required within the next half century are estimated to be in the range of five to twenty fold. This can only be achieved by increase in technological efficiency and the 'dematerialisation' of production and consumption.

This requires business personnel to go beyond pollution reduction to the redesign of their products, so that they are designed to have minimal impact throughout many lifecycles[2]. Despite the need for such a focus, the majority of government sustainability education programs promote simple pollution reduction techniques (City of West Torrens 2000; Salier 2000; Newland 2000).

[2] Products can have many lifecycles since their components can be designed to be recycled, remanufactured, or reused at the end of their first useful life.

Three main types of environmental education approach dominate the literature. These are commonly known as education *about* the environment (the positivist approach), education *in* the environment (the interpretivist approach) and education *for* the environment, also known as education *for* sustainability (the critical approach) (Fien 1993; Fien & Tilbury 1996; Greenall Gough 1993, 1997; Linke 1980; Lucas 1979; Palmer 1998; Sterling 1996). A less commonly discussed approach, problem based methodology, and its implications will also be explained within this thesis. Different philosophies underpin the different approaches, resulting in the use of different methods by environmental educators.

The positivist approach has been the most commonly used (Environment Australia 1999). Positivist education programs are developed by the educator and then delivered across a mass geographical area. The educator determines what behaviour the audience members should undertake, and motivates or manipulates them to change through awareness raising, incentives and disincentives. In the case of business sustainability, educators have focussed upon providing to business personnel information on the consequences of environmental degradation, equipment and process changes that they could make, the savings and other benefits that could be received, and the penalties for failing to comply with environmental laws. Brochures, case studies, demonstration programs, and training sessions are commonly used (McAllister et al 1999; McKenzie-Mohr & Smith 1999; Newland 2000).

Many of these positivist education programs are based on the underlying assumption that information will lead to awareness, and awareness will lead to behaviour change (Layrargues 2000; Jenkins 2000; McKenzie-Mohr & Smith 1999; Paden 2002; Said 1998; Smith 2000b). In particular, the assumption is that business personnel will be motivated to change their behaviour once they become aware of the financial advantages of sustainable activity (Ferrer-i-Cabonell & Munda 2000; McKenzie-Mohr & Smith 1999; van den Bergh). CERI (1995 quoted in Layrargues 2000 p.173) call making such assumptions ‘absolutely simplistic and risky’.

Said (1998 p.98) agrees, explaining that:

> Our approaches have been based on assumptions that: Australians are very concerned about the environment and would like to change their ways for the better... that the first step is education...and that empowerment is

> essential...however, we can not rely on a linkage between environmental concern, knowledge, empowerment and behavioural change.

Layrargues (2000 p.174) emphasises that social psychology research shows no link between information and behaviour change. He states that this is demonstrated by research on smoking, speeding, drink driving and other behaviours that are detrimental to a person's own health, where information provision has failed to convince those undertaking the activities to stop.

Many educators, who question the effectiveness of the positivist approach, call for the use of a combination of the various education methods. They believe this will increase the likelihood of obtaining behaviour change towards sustainability (Connell 1997; Fien 2000; Gough 1997; Walker 1997). Some educators call for an emphasis on the critical approaches (Fien & Tilbury 1996; Greenall Gough 1997; Kaplan 2000; Sterling 1996). With critical education approaches the educator works with the targeted stakeholders to take action to change society. They choose a problem to solve, investigate the constraints to change that exist, develop an agreed way forward and then take the agreed upon actions to solve the problem (Kaplan 2000; Scriabine 1996). Practitioners of a problem based methodology undertake a similar process. They use critical dialogue to work with the targeted stakeholders to identify their constraints to change, discuss what goals they would like to achieve (this may not necessarily be the one the educator wants), and then helps them to achieve their goal within their current constraint structure or by providing them with the skills to change their constraint structure (Walker 1995, 1997).

With the problem solving approaches the educator is no longer the expert designing and delivering the program, telling people what to do. The educator becomes a facilitator, helping those involved to solve their own problems. This process recognises that everybody has expertise to contribute, and that learning is a social process; human beings construct meaning through discussing issues with others (Greenall Gough 1997; Grieser 2000; Monroe & Kaplan 1990). The problem solving approaches are believed to lead to greater ownership and commitment for implementation of the solutions developed. They recognise the complexity of the issues that affect behaviour, the need to remove the constraints to change, and the need to build the capacities of individuals to take action (Fien 1993; Robottom & Hart 1993; Smyth 2002; Stakeholder Forum 2002; US AID 2002;

Walker 1995, 1997). The similarities and differences between critical approaches and problem based methodology will be discussed in Chapter Four.

The effectiveness of such approaches is confirmed within the business management literature. It is explained that achieving behaviour change is a complex process, dependant on a range of factors such as: organizational politics, management style, competing tasks, resources, history, attitudes, and beliefs; not just information (Ackoff 1994; Berdish 2001; Cairnes 1998; De Geus 1997; Handy 1995; Jaworski, Gozdz & Senge 1997). Together, these and many other factors interrelate to form a 'system' around each business organization, which affects the ability of the business personnel to initiate action and have their staff members change their behaviour.

In order to instigate change effectively, business personnel need to understand the system affecting the actions that could be taken within their organization. They need to remove the constraints to change, and make it as easy as possible for staff to embrace the issue and alter their behaviour accordingly (Argyris 1993; Kim 2001; Senge 1999). However, management in many organizations do not realise this and expect their staff to change as a result of a management directive. This is often referred to as the mechanistic approach to change: managers expect people to react like machines and automatically adopt the changes (Ackoff 1994; Argyris 1993; Cairnes 1998). They fail to realise that many people see change as scary, confusing and threatening. The result is significant amounts of defensiveness and resistance, which often results in the failure of the change attempt (Berdish 2001; Jaworski, Gozdz & Senge 1997; Johnson & Wilson 1998; Yankelovich 1999).

These autocratic managers fail to realise that this resistance to change can largely be overcome if staff members are involved in the decision making process. If staff members are provided with an opportunity to discuss the issue and to understand why the changes are needed, if they are given a say in what changes will occur, and believe that the changes can be implemented successfully, then they have no reason to be afraid of them. Once the changes to be made have been decided upon participatively, the management need to provide staff members with the opportunity to implement the changes, time to reflect, learn, and refine their efforts. If such a 'safe' environment is created, then change can be

successfully implemented. Such an approach is often referred to as the organizational learning approach to change (Coghlan 2000; Gerard & Ellinor 2000; Isaacs 1999; Kofman & Senge 1995; Suarez 1993). This difference in management styles is paralleled with the differences between the positivist (mechanistic management) and the problem solving education approaches (organizational learning focused management).

Sustainability requires significant changes to business operations, and is therefore likely to face resistance to its adoption, unless a safe learning culture is created and staff members are involved in designing and implementing the changes. Johnson and Wilson (1998 p.3) explains that becoming more sustainable requires:

> … negotiation between stakeholders (or between people in organizations) to set parameters for action. Moreover negotiation is likely to involve power relations and conflict, as well as engaging with uncertain and even turbulent social contexts. However, the negotiation is not a once and for all event. It needs an ongoing process involving participation of key stakeholders in which they can a) monitor, review and evaluate processes, outputs and outcomes (performance assessment) and b) engage in a dynamic process of learning and innovation, in ideas, technologies and organizational practices (capacity building). This task requires participative management and implementation, and the ability to investigate and evaluate.

Infotech and Australian Centre for Cleaner Production (1997 p.15) agree, highlighting that for cleaner production to work all staff members have to see the need for:

> … culture change; teamwork for continuous improvement; structure and organization to accept responsibilities; decentralisation of knowledge; and skill development in general technical knowledge, experience in how things are actually done, working with people (organization and communication skills), problem solving and ability to get things done.

The amount of change involved depends on what each person believes sustainability to be. Depending on one's view, it could involve a range of small incremental changes or larger transformative changes. Examples of the possible differences are shown in Table 1.

Table 1: Selection of actions that can be taken to move a business towards sustainability (These terms will be explained in Chapter Two).

Small Changes	Transformative Changes
End-of-pipe controls. Minor process and equipment changes.	Total rethink of products and services.
Waste minimisation, monitoring of practices, and training of staff to modify practices slightly.	Life cycle analysis – cradle to cradle, design for the environment.
Applying findings from case studies.	Industrial ecology, natural capitalism and The Natural Step approaches to business sustainability.
Focussing on sustainability as a way to improve financial success – reducing waste, increasing efficiency.	Focussing on the role of the corporation as being to help improve quality of life in society, and the state of the environment, while still being economically successful.

Since there are many different definitions of sustainability and approaches to take to become more sustainable, it is not surprising that each person will have a different view of what sustainability actually means (Gilding 2000; Smith 2002). Based on their definition, each person will then form an opinion about whether it is worth taking action towards sustainability, whether it is achievable, and what they would need to do to take that action.

Whether the positivist, awareness raising approach to environmental education would be effective in capturing the individual's attention would largely depend on this opinion. If a business person has a positive attitude towards sustainability and their ability to take action towards it, then it would seem reasonable to assume that they would respond favourably to the positivist awareness raising materials, which highlight process and equipment changes that can be made to achieve sustainability. Examples of such positive attitudes could include:

- It is my responsibility to ensure my company is doing the right thing;
- The actions taken within my company do make a difference;
- I am willing to take action; I just need to know what to do.

However, if a business person has a negative attitude towards sustainability, then it is likely that they will not respond to the positivist, awareness raising education programs, unless the educator provides information that convinces them to change their attitude. Such negative attitudes could include:

- It's too hard, I don't have the money or time to do it;

- It's not worth the hassle, there are other more important issues that need to be addressed;
- It's not relevant as our company doesn't pollute; or
- We don't need to. Our competitors aren't doing it, the customers aren't demanding it, and no one is punishing us for not taking action.

Since positivist educators develop their education programs without the involvement of the targeted stakeholders, they cannot identify these attitudes and beliefs of business personnel, or discover the needs that they have and the constraints that they face, which affect their ability to change (NSW Council on Environmental Education 2001; Ryan & Brown 2000b; Stave & Cloud 2000). Positivist educators fail to identify and understand the system surrounding business personnel and their decision to take action. This makes it impossible for the positivist education program to be designed to remove the constraints to change, and effectively build the capacity of business personnel, enabling them to take action.

Educators focussed on problem solving recognise the need to do this. They work with targeted stakeholders to help them understand the system surrounding them, build their capacity to take action, remove the constraints to them changing, and coach them with their efforts. Hence, they make it as easy as possible for the targeted stakeholders to take action and change their behaviour.

1.1.3 Reviews of environmental education effectiveness

The above limitations of the positivist approach to education programs has been widely recognised within the academic literature, as well as within government reviews of environmental education. Two examples will demonstrate the limited impact of these positivist approaches. First, the efforts of the Patawalonga and Torrens Catchment Water Management Board in South Australia will be reviewed. They fund many education programs that are delivered by educators at local governments within their catchment areas. The City of West Torrens[3] has been implementing one of these programs for

[3] The author designed, implemented, and managed this project from its conception in 1996 to 1998.

business personnel since 1996. While the education program has resulted in many small improvements to business operations, a review of it in 2000 found that only 47 per cent of the management of the businesses involved could identify the main differences between the stormwater system and the sewerage system, despite stormwater issues being the major focus of the project.

The project officers (the educators) had visited the business sites, provided the managers with case studies and advice, invited them to attend training and seminars, held annual awards programs, provided grants for improvement, and delivered a bi-monthly newsletter to their premises. Yet after all of this, only 47 per cent of them knew the answer to one of the most basic issues the project addressed (City of West Torrens 2000). Despite the concerning results of the evaluation survey, the project is seen as a vast improvement to the traditional regulatory approaches of government, and has been duplicated throughout the state (Newland 2000).

The aim of the Patawalonga and Torrens Catchment Water Management Board's education projects is to influence and change the habits of industry and the community in order to significantly reduce pollution deposited in the stormwater system, thereby achieving compliance with the Environment Protection Act 1993 (Newland 2000). The findings from the City of West Torrens education program are extremely disappointing considering the time, effort, and money spent. It suggests that the aim of the project has not been achieved.

The second program to be highlighted was an OECD and UNEP cleaner production demonstration program. It was held in eight OECD countries at a cost of US $350 million over the period 1990-92. The results were disappointing with a slow flow-on effect, particularly in smaller businesses (ANZECC 1998). Aquatech (1997 p.24) points out that many government programs focus on demonstration, but there has been ' … no systematic rigorous evaluation of the extent to which the programs are successful … there is no information on the extent to which the success of one company has encouraged other companies to adopt cleaner production'.

The disappointing results from the many positivist education programs being implemented, like the two examples provided above, has led many authors to question the effectiveness

of environmental education (Layrargues 2000; Ryan & Brown 2000; Santopietro 1995; Smith 2000; Walker 1995). Ryan and Brown (2000) and Dwyer et al (1993) undertook separate, comprehensive literature reviews. They found that there was very little evidence of success in traditional community education activities. Dwyer et al (1993 p.291) states 'There is little convincing evidence that even intensive mass-media campaigns promoting conservation have had appreciable effects'. Ryan and Brown (2000 p.1) warn that this lack of success ' … has resulted in considerable disillusionment at both the levels of the community and the implementing officials'.

In response to the questioning, several government reviews of environmental education in Australia have been undertaken. These have also recognised the need for improvements to environmental education practices. A 1993 review found that ' … environmental education in NSW is relatively unplanned and uneven in quality and its delivery uncoordinated' (NSW Govt 1996 p.ii). This led to a larger review of environmental education practices, and the release of a discussion paper in 1996, in which it was reported that:

> … in general, the scope of environmental education and its aims and methods have not been well articulated in either government or non-government sectors, nor is there a mechanism for involving stakeholders and providers in determining strategic directions for delivery (NSW Govt 1996 p.13)

> … the links between sectors are weak, with few shared assumptions, values or notions of quality; and furthermore, the system of environmental education does not link effectively with the system of environmental protection. It has not progressed through the constructive phase ... to become truly proactive in promoting ESD (NSW Govt 1996 p.29).

The NSW Government (1996 p.28) concluded that 'It is clear that the current system of environmental education in NSW is not adequately developed or structured to meet the needs of educators and the community'. Concerns about institutional arrangements were also echoed in an inquiry by the Healthy Rivers Commission of NSW (2000 p.9), which found:

> … there are concerns that government and community programs and actions are being conducted in a fragmented fashion, without clear goals and objectives and progressive assessment of actual results, frequently leading to a waste of taxpayers money.

Environment Australia (1999 p.7) has also recognised the limitations of the current sustainability education system, highlighting problems with coordination and the focus on positivist awareness raising. They refer to a model developed in the Netherlands, which suggests a series of stages in the evolution of environmental education. This model has also been used by the IUCN, UNEP and WWF (1991) in their document *Caring for the Earth: a strategy for sustainable living*. The four stages of evolution of environmental education are:

> Stage 1 Reactive: providing particular products and programs in response to limited demand. Education is often instigated by isolated individuals, specialists, voluntary organizations or the information/community relations/education units of some government agencies. Education aims at reducing ecological ignorance.
>
> Stage 2 Receptive: in which organizations include environmental education objectives in their policies and planning. School curriculum development bodies become involved, but programs are implemented without reference to work elsewhere in the education field. Objectives emphasise changing knowledge and attitudes.
>
> Stage 3 Constructive: in which programs and objectives are more thoroughly implemented. There is wide dissemination of developments; links are made across sectors. There is community participation and objectives are oriented towards sustainable living.
>
> Stage 4 Pro-active: in which the culture of all organizations is defined in terms of ecologically sustainable living supported by comprehensive, lifelong environmental learning integrated within education systems, industry, social organizations / neighbourhood groups and government.

Environment Australia (1999 p.7) argue that:

> Environmental education in Australia is generally in the second stage described by this model with some evidence of progress towards the third. Further substantial action is required to take us towards the fourth stage.

Despite the concerns about the effectiveness of education, it is still recommended as a useful mechanism for obtaining behaviour change towards sustainability. Santopietro (1995) lists four reasons why education is a preferable option. First, it is politically more acceptable to educate and to ask people to voluntarily change rather than to regulate and deal with the unpleasantness of forcing them to act. Second, some business personnel may deliberately refuse to comply with new laws, if they see them as an unjustified intrusion into the way they manage their operations. Third, education can be cheaper than regulation,

if it does in fact obtain the desired behaviour change; the larger the population you are trying to influence, the more expensive and difficult regulation becomes. Fourth, once people have accepted the importance of one environmental issue, this may lead to changes in their behaviour on other issues that affect the environment.

1.1.4 Calls for reform to the current sustainability education system

The poor results obtained from many environmental education programs have led some educators, such as the Patawalonga and Torrens Catchment Water Management Board (2000), to call for stronger enforcement of environmental laws. They feel that the time for education has passed; that business personnel have had their chance to change. Others such as Robinson (1998 p.1) call for changes to the methods used within education programs. He points out that the term:

> … education is really a misnomer - our aim is not to get people to KNOW MORE THINGS. We are trying to get people to CHANGE WHAT THEY DO.

He explains that:

> Many of the techniques and tools of 'education' have been developed in the advertising and public relations industries. But these fields have quite different goals to 'education'. Advertising, for instance, is mostly NOT about changing behaviour. It's about changing *brands*. We still drink beer…We still buy the car… We just buy a different brand of beer or car. PR, on the other hand, has nothing to do with behaviour at all, it's is [sic] about manipulating the media to project your interests into the public realm.

Robinson (1998 p.3) calls for a ' … much wider definition of what we mean by 'education''. He and other authors call for the use of the participative, capacity building, problem solving approaches to sustainability education programs that involve stakeholders in identifying the system around them, their constraints to action and ways to overcome or change them (Hudson 2001; Jenkins 2000; Layrargues 2000; McKenzie-Mohr & Smith 1999; NSW EPA & DLWC 1997; Ryan & Brown 2000b; Said 1998; Smith 2000, 2000c, 2002b; Smyth 2002).

Calls are also being made to reform the institutional arrangements of the environmental education system. The NSW Government (1996 p.30) called for reform to obtain:

> … a broad, cohesive and cooperative environmental education system which is characterised by: the integration of education and other strategies for environmental protection, clarity among providers about the roles and responsibilities of other players, less duplication of resources across programs and clear criteria for quality programs, clear messages from government agencies better able to target audiences on particular issues, closer alignment between environmental priorities and education programs.

Environment Australia (1999 p.21) has called for fostering 'greater coordination, effectiveness, and ownership in environmental education across Australia'. They explain that 'There is a need at the Commonwealth level to foster new linkages between departments, so that environmental education activities being pursued by different federal agencies are part of a coherent whole-of-government approach' (Environment Australia 1999 p.16).

Smyth (2002) has called for the formation of an international learning community where educators can interact in order to learn from each other and share their findings, thus ensuring that knowledge on the most effective educational methods is continually refined and utilised. Stakeholder Forum for Our Common Future (2002 p.3) echoed this call at the Earth Summit. They suggested the establishment of 'an international strategic alliance' in relation to the promotion and development of environmental education initiatives.

Smyth (2002 p.12) emphasises the need to clarify the purpose of education. He states that there seems to be two main beliefs about the role of education:

> The first [the positivist approach] is that education is a means of fitting people to live in conformity with government policy (*e.g*. towards their environment and its exploitation) and that educators are primarily trained people carrying out this task as directed by others, in formally recognised institutions. The second [the critical approach] is that education is a means of guiding people's development so that they can understand better their own relationships with their social and biophysical environment, so as to provide active and informed participation in the formulation and implementation of policy, and that educators are in effect everyone concerned with other people and the future quality of their living space.

Environment Australia (1999 p.5) has also recognised the need to clarify the purpose of environmental education, and has proposed five principles on which programs should be based:

1) ‘Environmental education must involve everyone’,

2) ‘Environmental education must be lifelong’,

3) ‘Environmental education must be holistic and about connections’. They highlight that:

> In order to address environmental challenges, we need people who think broadly and who understand systems, connections, patterns and causes. The challenges themselves frequently have social, scientific, cultural, economic and ethical aspects, all of which must be considered for their effective management. Specialist discipline-based knowledge, while contributing critically, is no longer adequate by itself – holistic appreciation of the context of environmental problems is essential.
>
> … [Education should] help learners discover the symptoms and real causes of environmental problems; emphasise the complexity of environmental problems and thus the need to develop critical thinking and problem-solving skills. (Environment Australia 1999 p.27 – referring to the Tbilisi Declaration of 1977)

4) ‘Environmental education must be practical’. They explain that:

> One of the most fundamental defining characteristics of effective environmental education is that it must lead to actions, which result in better environmental outcomes, not simply the accumulation of inert knowledge or impractical skills. This is ultimately the yardstick by which we are able to measure the effectiveness of our efforts in environmental education.

5) ‘Environmental education must be in harmony with social and economic goals’. They call for education to provide:

> … people with the knowledge, understanding and capacity to influence mainstream society in a way which progresses environmental objectives along with other legitimate social and economic objectives.

The NSW Council on Environmental Education (2001 p.5) believes that environmental education is changing from ‘… the reactive approach of the past to a more proactive, holistic, and systemic perspective on environmental issues’. They report:

> Most notably, the focus has moved from specific, local environmental problems (such as water pollution and waste disposal) to the underlying causes of problems (such as human values, behaviour and lifestyles or the

policies, practices and infrastructure of organizations, communities and societies).

These changes in environmental education are summarised in Table 2, and shown diagrammatically in Figure 1.

Table 2: The shifting emphases in environmental education over time (From: NSW Council on Environmental Education 2002 p.15)

Aspect	From:	To:
Problem	Pollution / end of pipe	Pollution / source reduction
Solution	Environment protection	Sustainability solutions
Connectedness	Humans separate from ecosystems	Humans as part of ecosystems
Time frame	Present / short term	Future / long term
Goals	Awareness and knowledge	Changed behaviours, practices, and structures
Education methods	Predominantly information-based	Participatory and experiential learning, community development, and capacity building
Learners	Audiences / target groups	Participants / stakeholders
Implementation	Mainly top down	Through partnerships / networks
Legitimacy	Predominantly technical	Based on different ways of knowing

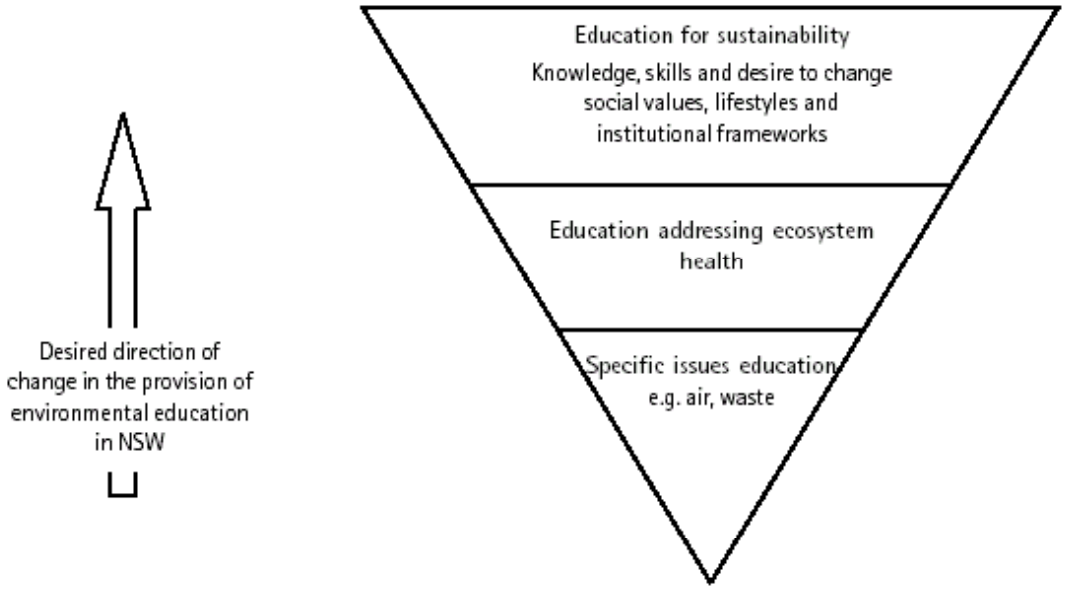


Figure 1: Strategic directions in education for sustainability (From: NSW Council on Environmental Education 2001 p.7)

The NSW Council on Environmental Education (2001 p.5) stress that:

> … it is essential that environmental education into the future continues to move towards broader more integrated goals, and uses methods which are participatory and involving, rather than didactic and solely information-based.

> Environmental education must continue to move towards integrated and holistic approaches that reveal connections between different aspects of systemic environmental problems. Integrated approaches assist learners to investigate issues using different disciplines and modes of learning, in order to link their personal values and responses to wider spheres. They are then able to apply this learning in a variety of day-to-day situations and to make appropriate behavioural choices. (NSW Council on Environmental Education 2001 p.6)

As a result of the calls for reform, the NSW Council on Environmental Education has developed an action plan for its state for 2002-2005, and Environment Australia has developed a national environmental education action plan. The key focus of the national plan is the:

> … move from an emphasis on awareness raising to an emphasis on providing people with the knowledge, values and skills to actually make a difference to the protection and conservation of Australia's environment. (Environment Australia 2000 p.5)

As a part of the action plan, a National Environmental Education Council was established in 2000. This Council is comprised of '… experts in environmental education in different sectors as well as eminent community leaders' and advises the Minister on environmental education issues. The Council is responsible for identifying priority environmental education issues, research needs and ensuring a coordinated national approach (Environment Australia 2000). Business and industry personnel have been identified as a priority area for an education program focussing on ' … ecologically sustainable development, eco-efficiency within industry and the application of best practice environmental management principles' (Environment Australia 2000 p.10).

1.2 Research problem and objectives

1.2.1 Research Problem

Many of the above calls for reform refer to the need for a systems approach to sustainability education; the need to address sustainability holistically and to understand the complexity and interconnections involved. They state that action that addresses the real reasons for problems, not just their symptoms, is needed. They also call for educators to build the capacity of individuals to think critically and take action. They encourage a move away from educator-developed, positivist, awareness raising programs to participatively designed, problem solving education programs. In addition to the above, improved coordination between government education programs is called for; with Environment Australia (1999) recognising the need for a whole of government approach to environmental education at the federal government level. Despite these calls there are no Australian government guidelines on how to design, implement and evaluate an environmental education program utilising these preferred approaches. Nor is there guidance on how to achieve the changes to institutional arrangements that are required in order to maximise the effectiveness of government sustainability education programs within Australia.

Through this thesis the author aims to outline how to design, implement and evaluate a sustainability education program for business personnel based on these preferred approaches. Recommendations for changes to the funding and institutional arrangements of the many Australian government departments involved in sustainability education programs for business personnel, and ways to obtain these changes, will also be made. In addition it will be emphasised that maximising the effectiveness of education programs will require governments to address the many factors that make it difficult for business personnel to take action, such as the failure of governments to adequately enforce environmental legislation, the inappropriate pricing of resources and energy, the existence of subsidies for environmentally irresponsible practices and other such conditions within the market system. These factors make it more difficult for business personnel to take action and hence make business personnel less likely to change their behaviour and participate in education programs. To maximise the effectiveness of sustainability education programs governments will need to address these issues.

1.2.2 Research Objectives

Objective One:

To show that current and past Australian government sustainability education programs for business personnel have not been effective in obtaining substantial behaviour change towards sustainable practices.

Objective Two:

To review the literature on business sustainability, on obtaining behaviour change in business organizations and on obtaining behaviour change through environmental education, in order to identify why government sustainability education programs for business personnel have not been effective in obtaining substantial behaviour change and what will be required to improve their effectiveness.

Objective Three:

To synthesise the recommendations identified through the literature review in order to outline the ideal educational methods, funding, and institutional arrangements required for an effective government sustainability education program for business personnel within Australia.

Objective Four:

To critique prevailing government sustainability education programs against the ideal approach developed, to show where they comply and fail to comply, and to make recommendations for improvement.

1.3 Justification for the research

The need for this research has been explained in section one of this chapter, where it was observed that millions of dollars are being spent on environmental education programs that are widely acknowledged as ineffective and in need of improvement. It was shown that positivist awareness raising methods are used in the majority of education programs, that there is a lack of coordination, and that there are no Australian government policy or

guidelines to ensure quality or to prevent duplication of effort. It was also shown that those who have reviewed the environmental education system have called for a more systemic and holistic process that focuses on understanding interconnection and complexity. They have called for educators to use processes that involve the stakeholders in the design and implementation of the education programs; processes that will improve their critical thinking and problem solving skills, and processes that will build their capacity to take action. Despite the calls for these reforms, there are no Australian government guidelines outlining what such an approach to environmental education would be. Within this thesis, the necessary approach for educators to use with business personnel will be clarified.

The need for this research is also highlighted by the fact that minor improvements that have been made to reduce pollution within industry, have been negated by increases in consumption throughout the world (Cunningham, Sinclair & Burritt 1997; Hawken 1993; Hawken, Lovins & Lovins 1999; UNEP 2002). For example the improvements made in cleanliness and efficiency of vehicles have been offset by the sale of more and more vehicles (UN Economic & Social Council 1997). This pattern of increasing consumption, environmental degradation, and ultimately the impact of pollution in reducing quality of life, will continue to occur unless business personnel take action to redesign their products and processes to be more sustainable. Current education approaches have been largely unsuccessful in achieving this. This research will clarify what sustainability means for business personnel, and develop ways to make it easier for them to take action and implement changes to their operations.

A further demonstration of the need for this research is provided by the many water and energy utilities who have recognised that it is cheaper to educate the public to reduce demand for water and energy derived from fossil fuels than it is to increase the capacity of their dams or power stations. The costs for supplying such resources will continue to increase as the resources become scarcer. The utility companies spend millions of dollars each year on education programs, attempting to influence the public to change their behaviour and use less of the resource (White & Fane 2001; Day & White 2002). If the educational methods they use are ineffective, they will result in minimal changes to behaviour, like many of the government sustainability education programs. White (2001

p.6) suggests that this is already occurring, with many of the programs being implemented by utility companies '… under performing'.

Reducing demand for resources such as water and energy not only provides benefits to utility companies, it also provides benefits to the community in the form of lowered water and energy bills, as well as longer guaranteed resource supply. In the case of energy, health benefits result from less fossil fuel being burnt. Day and White (2002 p.1) add that environmental benefits from reducing water demand include '… increased allocation of water for environment flows, reduced demand on groundwater sources, reduced wastewater flows, and associated pollution'. Utility companies could also use the recommendations from this thesis to improve the effectiveness of their demand management education programs.

Finally, the need for this research is shown by the fact that the National Environmental Education Council has identified business and industry as a priority area for further research and implementation of further government sustainability education programs. The Council has posed the following two priority research questions in relation to industry: 'What is the most effective means of working with industry to achieve sustainability?' and 'Why has behavioural change not occurred in industries in line with the reported increase of awareness regarding the importance of sustainability?' (Environment Australia 2003 p.17). These questions are answered within this thesis.

1.4 Methodological framework

A review of three main literature fields will be undertaken: literature exploring what a sustainable business is (the business sustainability literature); literature on how to obtain behaviour change within business organizations (the systems thinking and organizational learning literature); and literature on how to obtain behaviour change through environmental education programs (the environmental education literature).

The review of the above mentioned literature fields will enable identification of the many factors which affect the decisions business personnel make about sustainability, and subsequently the actions that they take. The purpose of such a review 'is to depict a

complex problem, with its many, interconnected variables, in a way that amplifies and clarifies our understanding of that problem' (Pegasus Communications 2001 p.1). Once the factors that interrelate and form the system surrounding business personnel are identified, the results can be used to understand why government sustainability education programs have been ineffective in obtaining substantial changes to behaviour, and how to make them more effective.

The recommendations from the reviewed literature will be collated to produce an ideal approach to government sustainability education programs for business personnel. A literature review of past and present Australian government education programs will then be conducted to identify whether these theoretically more effective approaches are being used and whether they have indeed proven more effective in obtaining behaviour change. Finally three case studies will be undertaken. These will involve the current author reviewing the environmental education practices at three local government organizations to identify the educational methods used, and the implications from this for the theoretically ideal approaches developed. Suggestions for improvement to the practices conducted within the three local government organizations will be made.

1.5 Prospective contributions of the study

1.5.1 Conceptual contribution

The conceptual contribution will be:

- A conceptual synthesis of recommendations from the literature on business sustainability, systems thinking and organizational learning, to enhance the theory and practice of environmental education for business personnel.

1.5.2 Applied contribution

The applied contributions will be:

- Production of the ideal approach to government sustainability education programs for business personnel within Australia. This will include outlines of the ideal educational methods, funding and institutional arrangements required within

Australia to maximise effectiveness of government sustainability education programs for business personnel; and

- Specific recommendations for improvement to the design and operation of the sustainability education programs at the three case study local governments.

1.6 Outline of the study

The focus area of this thesis has been highlighted within this first chapter: government sustainability education programs for business personnel. It has been demonstrated that education is believed to play an important role in obtaining sustainability, and that the positivist awareness raising approaches, which are the most commonly used, have had limited success. Concerns about the current institutional arrangements for sustainability education programs and the methods used were detailed. These concerns have led many educators to recognise the need to utilise alternative approaches and thus to call for reform. There are however, no Australian government guidelines to help educators design and implement these alternative approaches. How to do so will be clarified within this thesis.

What a sustainable business consists of will be explored in Chapter Two. It will be shown that there are many different definitions and approaches that business personnel can take to move their companies towards a more sustainable state. These multiple definitions and approaches add confusion to the issue, making it more difficult for business personnel to act. It will be shown that this confusion can be reduced if the similarities between the sustainability approaches are highlighted. All of the sustainability methods that will be reviewed aim to achieve two main outcomes: dematerialisation and substitution. Dematerialisation involves increasing resource productivity and the removal of waste. There are four main types of substitution. The first involves the use of different materials and practices. The second involves a move from selling products to leasing services. The third type of substitution involves a move from supplying goods for manufacturing to supplying performance based services, while the fourth type of substitution involves a move from unfair to fair distribution of materials to meet the needs of all humans. These will all be explained in detail in Chapter Two. Seen in this light the many different approaches do not need to compete – they are complementary tools to achieve

sustainability, which could be synthesised into one simplified approach, thereby making it easier for business personnel to understand what they need to do.

Other reasons for the slow adoption of sustainability by business personnel will also be explored within Chapter Two. These include conditions external to business organizations that affect the actions of their staff members, such as the market conditions, legislation, the existence of technology and the cost of solutions. These and many other constraints to change that will be discussed in Chapter Two limit the effectiveness of sustainability education programs, as they make it difficult for business personnel to take action. Governments should remove as many of these barriers to change that business personnel face as possible. This will increase the likelihood that sustainability education programs will be effective in obtaining behaviour change in business practices.

There are also a range of internal factors or constraints that affect the actions that business personnel take such as the beliefs of business personnel about sustainability and the difficulty of implementing change within organizations, overcoming politics, and overcoming defensiveness. It will be explained throughout the thesis that sustainability education programs will be more effective if such issues are addressed within them. The internal and external constraints outlined above form a complex system around business personnel that influences the actions they take. By understanding this system, it makes it easier to see why business personnel have behaved the way that they have, and the actions needed to make it easier for them to adopt sustainability.

The theory that underpins systems approaches will be explored within Chapter Three. It will be shown that implementing change in business organizations is often difficult, facing many individual and organizational impediments to learning and change. Many businesses are operated using a machine metaphor, with strict management control that leads to resistance and often failure of change attempts. The alternative approach, which uses a learning metaphor will be explored. This approach uses the application of systems theory to involve staff, to address attitudes and emotions, to identify all factors that affect the system, and remove the constraints to change. The implications of systems theory for becoming a sustainable business will be explained, and a definition for business sustainability according to systems theory will be developed. This will include a list of

conditions that need to be in place to enable successful action to be taken to achieve sustainability, according to systems theory.

Environmental education theory will be explored within Chapter Four. This will include a detailed review of the three main approaches to environmental education programs (the positivist, interpretivist, and critical approaches) plus commentary on problem based methodology. The effectiveness of these different approaches to achieve behaviour change will be discussed. It will show that positivist awareness raising approaches continue to be the most common approaches used, however there is wide recognition of the need to utilise the more effective problem solving approaches.

The implications from the different literature fields for developing effective education programs will be synthesised in Chapter Five. This will result in recommendations for the design, implementation and evaluation of the ideal approach to sustainability education programs for business personnel, according to the literature. The funding and institutional arrangements required to enable implementation of the ideal educational approach will also be outlined. Once discussed, existing Australian policy, institutional arrangements, and sustainability education programs for business personnel will be assessed against the ideal approach developed. This will show that the institutional arrangements and educational processes currently used in the majority of government education programs are different to those recommended in the ideal approach. This is despite the fact that Environment Australia (1999) and the NSW Council on Environmental Education (2001, 2002) have recognised the value of many of its components and have been calling for educators to alter their practices for several years.

The case studies of the thesis will be presented in Chapter Six. Three case studies will be undertaken, reviewing the educational efforts of the staff at three separate local governments. Their efforts will be reviewed to identify factors that have added to or hindered the success of their programs, and to explore where the programs do and do not comply with the ideal approach developed in Chapter Five, and the consequences of this. The result will be recommendations for improvement to each of the case study education programs.

In Chapter Seven the findings of the case studies will be discussed. This will include a comparison between the actions being taken at the case study local governments and the outlined ideal approach. They will also be compared with the findings reported in the literature review of Australian environmental education programs undertaken within Chapter Five. The findings from the thesis, the implications, conclusions, and calls for further research will be presented within Chapter Eight.

1.7 Conclusion

The focus of this thesis and its specific objectives has been outlined in this introductory chapter. The study has the potential to inform governments worldwide on how to improve the sustainability education approaches they use with business personnel. If implemented, it is likely that this would lead to better value for money from such education programs, cleaner industry which benefits from the resultant savings, and less pollution.

Chapter 2. The Theoretical Foundations

In search of business sustainability.

> *'Progress towards sustainable development makes good business sense because it can create competitive advantage and new opportunities. But it requires far-reaching shifts in corporate attitudes and new ways of doing business. To move from vision to reality demands strong leadership from the top, sustained commitment throughout the organization, and an ability to translate challenge into opportunities'.* (Schmidheiny 1993, quoted in Huckle & Sterling 1996 p.164)

2.1 Introduction

In this chapter the concept of a sustainable business and the reasons for business personnel's slow transformation to it, will be explored. It will be shown that there is no universally accepted definition of sustainability, sustainable consumption, or sustainable business. In addition, there are many approaches that business personnel can undertake to address this unclear notion of sustainability. This lack of consensus on definitions and best approaches is confusing for business personnel and hinders them from taking action.

It will be shown that this confusion can be overcome by recognising that the different sustainability methods actually relate to two underlying principles: dematerialisation and substitution. Seen in this way, the approaches change from competing against each other to being complementary tools that can be used to achieve common objectives. Combining the approaches, simplifying the jargon, and explaining this to business personnel will help reduce the confusion, making it easier for them to understand what they need to do to make their companies more sustainable.

It will be revealed that in addition to the confusion created by the many definitions and approaches, there are many other factors that affect the actions that business personnel take on sustainability. These include external factors, such as laws and perverse subsidies that support non-sustainable activity, as well as other issues competing for business personnel's attention. These competing issues include factors such as globalisation, information technology development and the transition to a knowledge economy. All of these issues

have implications for business practices and require significant amounts of learning and change by staff. Internal issues that complicate the actions business personnel take to make their practices more sustainable include: the need for a participative management style, the need for staff to look beyond the actions taken within their departments to see the whole business and the opportunities for improvement throughout it, as well as the difficulty of implementing change.

It will be shown that because of this complexity, many authors have called for a systems approach to sustainability. Such an approach will be developed in Chapter Three.

2.2 Defining a sustainable business

There is no universally accepted definition for sustainability, sustainable consumption, or a sustainable business. There is no clear point after which a business can be called sustainable. Ehrenfeld (2000) explains that this is because it is impossible to prove whether or not at a certain point in time a business or society *is* sustainable. He states that this can only be done in hindsight, to prove whether or not it *was* sustainable. Others suggest that there is no end point for sustainability, because technology and innovation will continue to improve, enabling business practices to be further improved (Allen et al 2002; Johnson & Wilson 1998; Senge & Carstedt 2001). These authors conclude that because of this, sustainability is not a destination for business organizations to reach, but an ongoing learning journey or process (Allen et al 2002; Fien 2002; Gough 2002; Johnson & Wilson 1998; Senge & Carstedt 2001). Allen et al (2002 p.35) conclude that 'How sustainable a system is ultimately becomes a measure of the learning capacity of the community in relation to its environment.'

Most definitions that have been developed for sustainable business or sustainable production are interpretations of the definition contained in the WCED (1987 p.87) *Brundtlandt Report - Our Common Future,* 'Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs'.

The IISD (2001 p.1) quote a definition that was developed at a symposium on sustainable consumption in Oslo, Norway 19-20 January 1994:

> … [Sustainable production and consumption is] the use of goods and services that respond to basic needs and bring a better quality of life, while minimising the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardise the needs of future generations.

Schley and Laur (1998 p.16) define an ecologically and economically sustainable business as one that '… continuously increases shareholder value – while simultaneously decreasing the energy and material density required by the products and services it provides'. ACF (2000b) report that they believe a sustainable corporation is one that has entirely eliminated its negative impact on the environment. Reinhardt (2000 p.27) provides a similar perspective defining a business as sustainable when:

> … it involves no net decrease in total assets or, equivalently, if it involves the creation of value. Total assets include both human-made assets such as roads and factories, and natural-resource stocks, such as forests and oil deposits.

Dunphy and Beneviste (2000 p.6) divide the definition of a sustainable business into two separate areas: ecological sustainability and human sustainability. They state that ecological sustainability refers '… to redesigning organizations to contribute to sustainable economic development and the protection and renewal of the biosphere', while human sustainability refers '… to building human capability and skills for sustainable high level organizational performance and for community and societal well-being'.

Robert et al (2001) recommend the definition used within 'The Natural Step' approach to business sustainability. They state that a sustainable business is one that helps society move towards sustainability. This requires business personnel to ensure that their practices:

1. Do not subject nature to systematically increasing concentrations of substances extracted from the Earth;
2. Do not subject nature to systematically increasing concentrations of substances produced by society;
3. Do not subject nature to degradation by physical means; and
4. Help to meet human needs world wide – that is they are fair, efficient, and responsible.

The Business Council of Australia (2001 p.2) has pledged to encourage its members to become more sustainable. They state that business personnel can work to achieve the Brundtlandt definition of sustainability ' … through excellence in the management of the financial, environmental, and social dimensions of all corporate activities, products, and services'. Excellence however, is not defined.

In attempting to define what business sustainability means, the Australian New Zealand Environment and Conservation Council has developed Table 3, which shows the links between ecologically sustainable development (ESD) and sustainable business practices.

Table 3: Links between the five principles of ESD developed in the Australian National Strategy for ESD and cleaner production (ANZECC 1998 p.19)

ESD Principle	Cleaner Production Approach
1. Integrating economic and environmental goals in policies and activities.	1. Measuring and valuing *all* inputs, outputs and by-products from the production process.
2. Ensuring that environmental assets are properly valued.	2. Improved identification and costing of environmental inputs.
3. Providing for equity within and between generations.	3. Reducing consumption of inputs. Redesigning products and processes. Improved costing of resource inputs to ensure that they reflect the full cost of the input.
4. Dealing cautiously with risk and irreversibility.	4. Ensure that the long-term impacts of production are considered in decision making.
5. Recognising the global dimension.	5. Identifying and improving upon the world's best practice in production processes.

The above definitions and descriptions, while differing, contain a number of common themes that highlight the three main components of sustainability: environmental, economic and social. These three components are often referred to as the triple bottom line (ACF 2000; Dunphy & Beneviste 2000; Elkington 1997; Hawken, Lovins & Lovins 1999; Robert et al 2001; The SIGMA Project 2001).

There are currently many different approaches that business personnel can use to move towards a more sustainable state. Most approaches address either environmental and economic issues or social and economic issues. There is little overall integration between the three pillars of sustainability (The SIGMA Project 2001; UNEP 2002). The result is a fragmented approach of individual actions to address the environmental component, such

as reducing pollution, improving efficiency, and providing funds to repair degraded ecosystems (Hawken 1993; UNEP 2002). The social component is often seen to relate to improving working conditions within the business, producing products that improve the quality of life that the purchaser experiences and occasionally to taking actions that improve the living conditions within society. Internal improvements include better occupational health and safety, appropriate reward systems, training opportunities, flexible working conditions and more participatory management. Products that improve quality of life are those that make it quicker, easier or more enjoyable to undertake particular tasks. Societal improvements are often addressed through the provision of funds or staff time to help charitable causes and undertake activities that will raise the quality of life within the community (UNEP 2002; Waddell 2001). All of the above are undertaken whilst concurrently pursuing economic profitability.

2.3 Approaches business personnel can take to become more sustainable

The approaches for social sustainability are less well developed than those of the environmental arena. The main approach currently in use by business personnel is Corporate Social Responsibility (CSR) (Deni Greene Consulting Services, Standards Australia & Ethical Investment Services 2001; UNEP 2002; Waddell 2001). CSR uses the '… power of society to exert pressure upon business to act in ways that consider issues beyond businesses narrowly defined financial interests' (Waddell 2001 p.12). This has led to social auditing, where the performance of a business is measured against these expectations. UNEP (2002 p.3) state that 'There is no general agreement yet on what corporate social responsibility means in practice'.

The approaches that business personnel can take to become more environmentally sustainable are more numerous, and can be roughly divided into four main categories. The required effort and amount of change to business practices increases across the categories.

The categories involve those approaches that:

1. Simply reduce pollution to gain compliance with laws;

2. Focus on making the production of current products more efficient;
3. Require redesign of the products and practices to reduce their environmental impact throughout their whole lifecycle(s); and
4. Transform not only the practices and products of the company, but also its purpose. These approaches often involve business personnel working with those from other companies, even entire industrial sectors, to reduce their overall environmental impact.

The methods reviewed in this chapter, and the category of sustainability methods to which the author believes they belong, are shown in Figure 2.

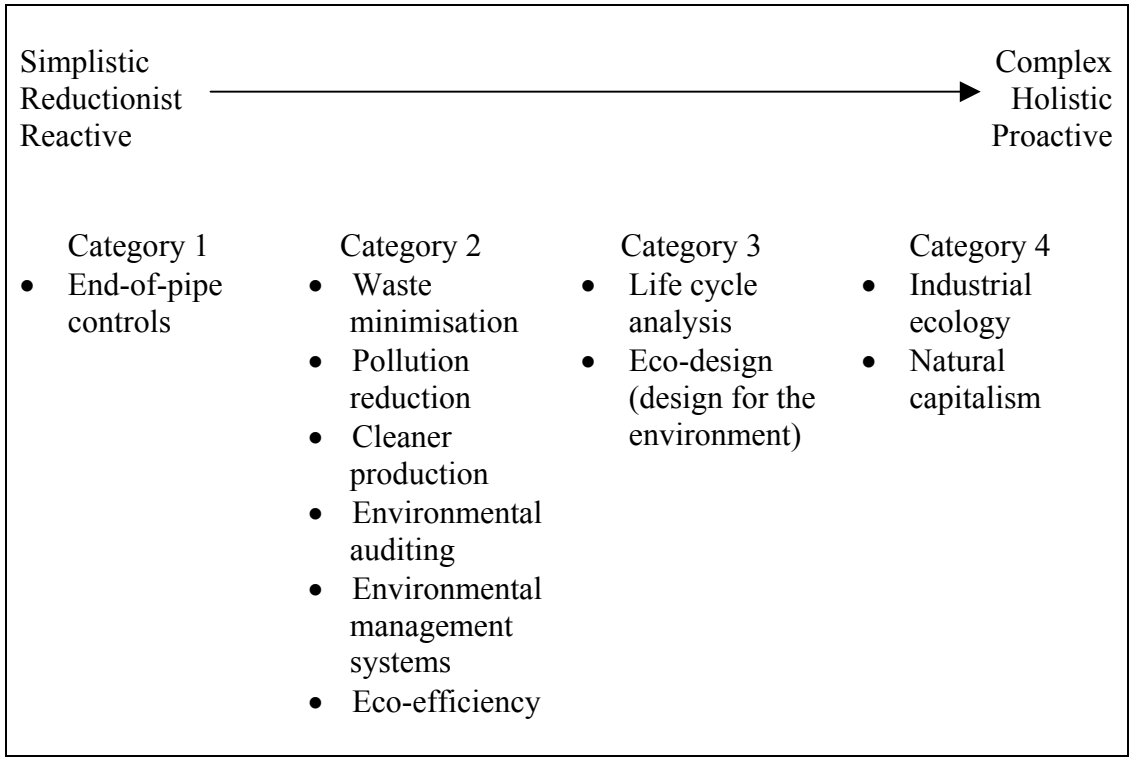


Figure 2: The sustainability method continuum

End-of-pipe approaches generally fall into the first category of simply reducing pollution to gain compliance with laws. They are reactive and involve making changes to industrial processes just before a pollutant would have entered the environment (O'Rourke, Connelly & Koshland 1996; Pears 2000). Tools used include filtration devices, water treatment plants and waste facilities where pollutants and wastes '… can simply be collected, stored or disposed of elsewhere' (Cunningham, Sinclair & Burritt 1997 p.2).

While this can result in compliance with the law, the costs of end-of-pipe measures tend to increase over time as regulations tighten and further controls are necessary. This is in contrast to the approaches in the other categories that are proactive, preventing the production of waste. These proactive approaches result in reduced costs over time, as the business saves money through improved efficiencies and decreased waste disposal costs (UNEP 1994a in Aquatech, 1997). Hawken (1993) warns that addressing single issues at the end-of-the-pipe is ineffective and misses the major need of sustainability: the prevention of waste and the more efficient use of materials.

Pollution reduction, cleaner production, waste minimisation, eco-efficiency, environmental auditing, and environmental management systems are all processes that fit into the second category of sustainability approaches that business personnel can take. These approaches all aim to make the production of current products more efficient. Some authors argue that these approaches do more than this, however it depends on which definition is being used, as will be explained in Section 2.5.1. For the purposes of this thesis the above approaches will be placed in this second category; they constitute forms of continuous improvement to existing products and practices, which result in both financial and environmental benefits.

Many authors argue that while a more beneficial approach than end-of-pipe measures, this second category will not be effective in moving society towards sustainability (Andrews 1999; Cohen-Rosenthal 2000; Ehrenfeld 2000; Hawken 1993; O'Rourke, Connelly & Koshland 1996). Senge and Carstedt (2001 p.28) explain:

> … thinking about the larger system shows that ecoefficiency innovations alone could actually worsen environmental stresses in the future. Ecoefficiency innovations reduce waste from production, but this does not alter the number of products produced nor the waste generated from their use and discard. Indeed, most companies investing in cost-reducing ecoefficiency improvements are doing so with the aim of increased profits and growth.

This certainly appears to be the situation being promoted to business personnel by Environment Australia (2002b p.5) who explain that:

> Eco-efficiency is a combination of economic and ecological efficiency, and is basically about "doing more with less". Eco-efficiency means

> producing more goods and services with less energy and fewer natural resources, resulting in less waste and pollution.

Hawken, Lovins and Lovins (1999 p.x) warn that:

> … without a fundamental rethinking of the structure and the reward system of commerce, narrowly focussed eco-efficiency could be a disaster for the environment by overwhelming resource savings with even larger growth in the production of the wrong products, produced by the wrong processes, from the wrong materials in the wrong place, at the wrong scale, and delivered using the wrong business models.

Schley and Laur (1998 p.17) agree, but explain that the focus on reduction of waste and improving efficiency can be useful initially, since it can provide short-term returns, which can '… give companies the confidence and the finances they need to invest in and design for the environment for the long-term'. Pears (2000) disagrees; he believes that if a company's personnel are focussed on continuous or incremental improvement, they are simply not likely to see the many beneficial possibilities that could come from more radical changes. He calls for the use of the sustainability methods in the third and fourth categories outlined in this thesis.

Approaches that fit into the third category of requiring the rethinking of business products and practices to reduce their environmental impact include life cycle analysis and design for the environment, which is also referred to as eco-design. These focus not only on making the production processes more efficient, but also on redesigning products so that they are made of less material, are more durable and efficient when used by the consumer, and are able to be recycled or remanufactured at the end of their useful life (Centre for Design at RMIT 2002; Environment Australia 2001).

This is achieved through adoption of the following strategies:

- Raw materials – design for resource conservation and low impact materials;
- Manufacturing – design for cleaner production;
- Use – design for energy efficiency, water conservation, minimal consumption, low impact use, service and repair and durability;
- Distribution – design for efficient distribution;
- End of life – design for reuse, remanufacture, disassembly, recycling and safe disposal. (ANZECC 1998 p.57)

The fourth category involves approaches that can totally transform the practices and fundamental purpose of a business organization. Often this results in managers of several businesses, even entire industrial sectors, working together to reduce their overall environmental impact. The two main approaches reviewed that belong in this category are industrial ecology and natural capitalism. Industrial ecology refers to imitating the closed loop, cyclical processes of nature where any waste created becomes food for a further process, as shown in Figure 3 (O'Rourke, Connelly & Koshland 1996; Senge & Carstedt 2001). Senge and Carstedt (2001) refer to this as a systems approach to business sustainability.

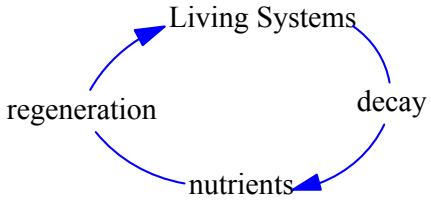


Figure 3: Living Systems Follow Cycles (Senge & Carstedt 2001 p.27)

As does nature, industrial ecology aims to remove all wastes from the entire life cycle(s) of products. Figure 4 shows that the current linear, industrial-age systems produce significant amounts of waste.

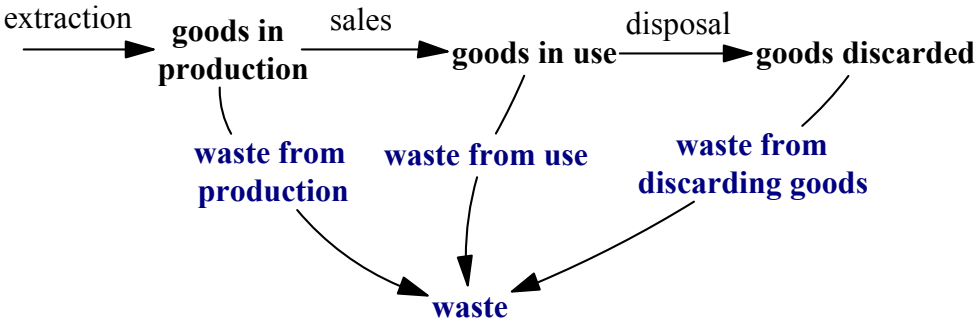


Figure 4: Current linear industrial-age system (Adapted from Senge & Carstedt 2001 p.27)

Senge and Carstedt (2001 p.28) highlight that currently:

> … less than 10% of everything extracted from the Earth (by weight) becomes usable products. The remaining 90 to 95% becomes waste from production'.

Lovins (2001) claims that when you add to this figure the fact that the products made become waste when the consumer no longer has a need for them, the total is more like 99 per cent of resources extracted from the Earth ending up as waste. Clearly, there is much room for improvement. Industrial ecology achieves this improvement through many of the processes from the earlier categories of sustainability methods, such as resource productivity, clean product design, remanufacturing, recycling, reuse, and composting, as shown in Figure 5.

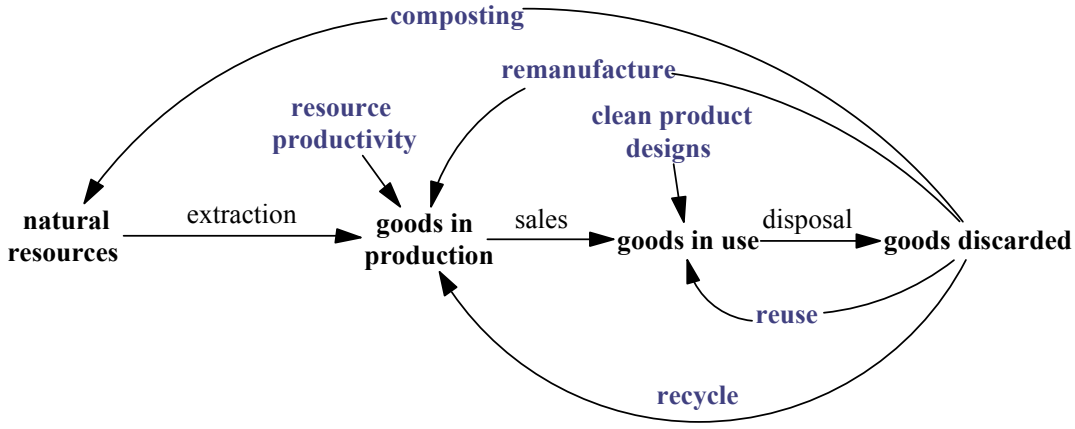


Figure 5: Industrial Ecology – cyclic systems mimicking nature (Adapted from Senge & Carstedt 2001 p.29)

The result is a cyclical process that dramatically reduces the demand for new raw materials (Andrews 1999; Braungart 2002; Cohen-Rosenthal 2000; Ehrenfeld 2000; Hawken 1993; O'Rourke, Connelly & Koshland 1996; Senge et al 2000; Senge & Carstedt 2001; Tibbs 2000). Where wastes cannot be prevented, practitioners of industrial ecology seek symbiotic relationships with other companies who could use the wastes in their production processes. Thus, as in nature, the waste of one organism becomes the raw material for another. This saves the companies money through reduced waste disposal costs and lower raw resource purchase costs, as well as benefiting the environment (Andrews 1999; Cohen-Rosenthal 2000; Ehrenfeld 2000; Hawken 1993; O'Rourke, Connelly & Koshland 1996; Senge et al 2000). To maximise such situations, industrial ecology often leads to the co-location of industries that can use each other's by-products (Andrews 1999; Cohen-

Rosenthal 2000; Tibbs 2000). An example of industrial ecology in practice is shown in Figure 6.

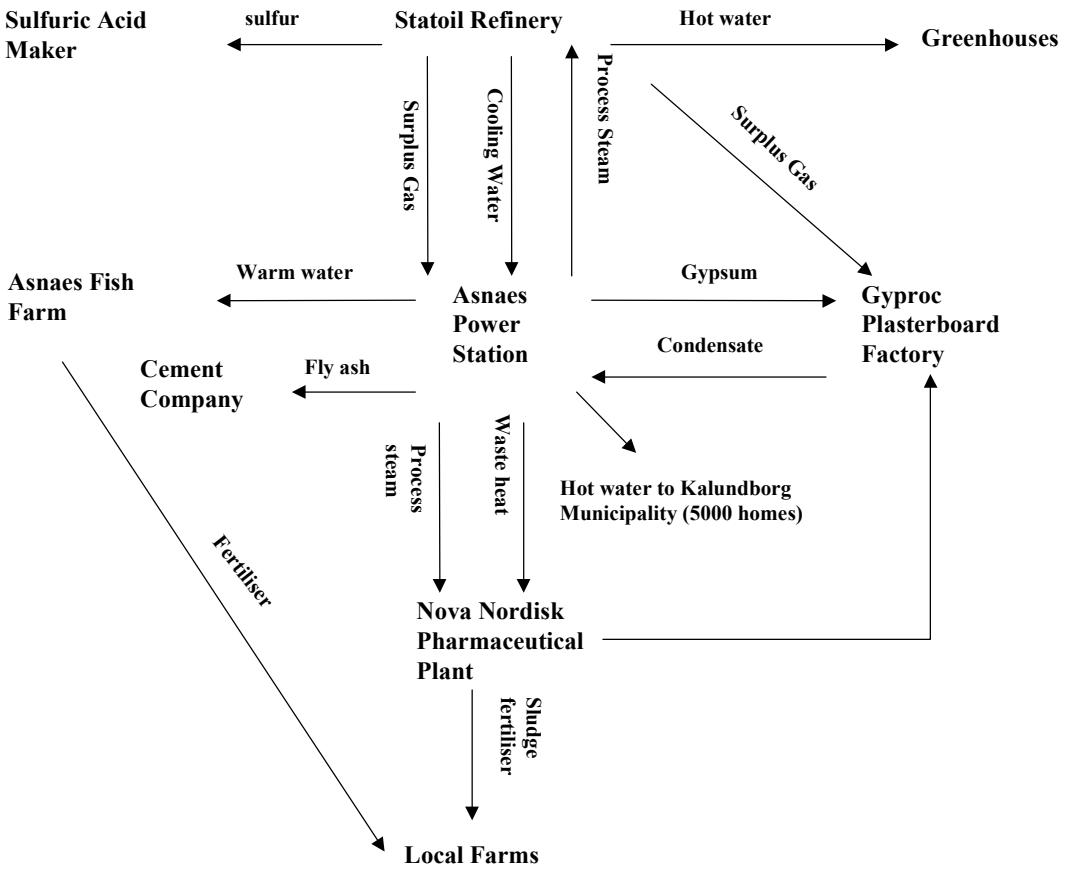


Figure 6: Co-located firms in Kalundberg, Denmark (Adapted from: Andrews 1999 p.370 & Cohen-Rosenthal 2000 p.255).

O'Rourke, Connelly and Koshland (1996) support the industrial ecology concepts, but are quick to point out that at the centre of the above example is a coal fired power station. They state that while it is beneficial to have the wastes being used by others, it is important to recognise that unsustainable businesses, such as those relying on fossil fuels, will still need to be replaced with businesses that are more sustainable, such as energy companies using renewable resources. Similarly, other 'dirty technologies' will need to be replaced, even if this means loss of the wastes created from the process that could be used by other companies.

Clearly industrial ecology approaches can require not only major review and redesign of an individual company's operations, but also significant planning and co-operation between multiple industries. An example of where such cooperation is required is in the redesign of the plastics industry. The WRI (2001 p.5) explain that '… processes that depolymerize, or "unzip," used plastics' are being developed that enable used plastic to '… yield materials equivalent in quality to virgin plastic that could be used in all the applications of the original material'. It greatly decreases '… the need for virgin materials and ultimately saves on production costs'. They state that this can already be done with polyester and that work is underway to enable it to be done with nylon and other common polymers. To make use of this technology the materials need to be returned to the plastics manufacturers for reuse.

WRI (2001 p.5) report that:

> DuPont is working toward this goal, at least with polyester, by licensing its recycling process to others in the industry and jointly developing a comprehensive collection system for used polyester. In other words, DuPont is enlisting the help of the entire industry to reshape the polyester business into a more sustainable and profitable form, allowing the business to expand into new applications while trading on polyester's reputation as the "greenest" of polymers.

Natural capitalism is the second major approach reviewed, which fits into this fourth category of actions business personnel can take to make their organizations more sustainable. Hawken, Lovins and Lovins (1999) explain that natural capitalism involves four main ways that business personnel can achieve sustainability. The first two are similar to industrial ecology concepts, referred to as radical resource productivity (using materials more efficiently) and biomimicry (mimicking nature's closed loop systems and eliminating waste).

Examples of what is currently possible through the first principle of natural capitalism – namely radically increased resource productivity – include the hypercar which can 'save 80-95 percent on fuel and cut 90-99 percent of smog' (Schley & Laur 1998 p.4) and the retrofitting of old buildings to:

> … improve their energy and water efficiency by a factor of around three or four. And in new buildings you can get energy savings more like a

> factor of ten, a 90% reduction, with typically better performance and lower construction costs. (Lovins 2001 p.2)

The furniture giant Steelcase provides an example of what can already be achieved using the second principle of natural capitalism – redesigning industry to mimic nature to remove toxicity and waste. Steelcase redesigned processes they use to manufacture textile material, which had been declared a toxic waste by the Swiss Government. They were able to reduce the original 8,000 chemicals used to 38 safe chemicals, making the liquid discharge from the production process cleaner than the Swiss drinking water that is used in the beginning of the process. The result was a cloth that looked, felt, and wore better and cost less to produce, with reduced regulatory and occupational health and safety costs (Lovins 2001).

The third process in natural capitalism that business personnel can use involves totally changing their perspective about their company's purpose. Instead of focussing upon selling products they focus upon leasing services. That way the industry remains responsible for products at the end of their useful life, thus having an incentive to make products last longer and to make them easier to dismantle for reuse or recycling (Braungart 2002; Hawken, Lovins & Lovins 1999).

Examples of companies using this approach include Schindler lifts who lease "vertical transportation services" rather than selling elevators, Dow and Safety Clean who lease "dissolving services" rather than selling solvents, and Carrier who lease "comfort services" rather than selling air conditioners (Lovins 2001). Carrier recognised that buildings could be made comfortable through insulation and other alterations, thereby removing the need for air conditioning or heating. Facing the potential loss of their industry they reframed their thinking to lease comfort services. This means they can now achieve comfort within a building using the most suitable method, while the customer still gains the service they want (Lovins 2001).

Interface, the world's largest carpet tile manufacturer, is another company that has embraced this concept. They lease the service of floor coverings – comfort, look, and feel – rather than selling the product. This enables Interface to collect the carpet at the end of its useful life and remanufacture it into new carpet, saving on the need for raw resources and large amounts of space at landfill sites (Schley & Laur 1998). Lovins (2001 p.9) reports

that this results in carpet 'four times as durable as regular carpet…[with a] 97% total reduction in materials used'.

Senge et al (2000 p.5) explain that Fuji-Xerox has also embraced this approach. The company has redesigned its products to make them easier to recycle and now lease them to customers rather than sell them. An example of what they have been able to achieve is '… the new Xerox 265 digital copier, whose 200 parts are 96% recyclable'. This enables Fuji-Xerox to quickly turn one customer's waste into a new product. Dunphy (2001) explains the benefits gained by Fuji-Xerox as a result of this approach. Not only does it save significants amounts of money by reusing materials (over AUS$50 million saved in the first two years of operation of the Fuji-Xerox Australian Eco Manufacturing Centre), but it also enables the company to identify the faults that occurred in the discarded products. This makes it possible for staff to then improve the product designs, making future products more reliable – a definite win-win for the company.

A similar concept is used with the suppliers of parts or services to manufacturing companies. Their contracts are changed from 'supplying goods' to 'delivering performance-based services'. They obtain a set financial amount for producing certain outcomes. If they can improve the process to supply the outcomes in a cheaper way, the supplier can keep a high percentage of the savings, creating motivation for improvement. Examples of where this process has been used include:

- Holden's Engine Company, which has contracted out their chemical management to Castrol Plus for a set amount. It is now in Castrol's interest to reduce chemical usage to gain extra income. This has occurred with significant savings and reduced chemical disposal to the environment. (ANZECC 1998 p.57)

- In the United Kingdom, Ford Motor Co. used this approach to reduce costs and environmental impacts associated with painting its new vehicles. It hired DuPont to manage its entire paint shop operation, rather than simply to supply paint. Ford pays DuPont not for the amount of paint it applies, but for the number of vehicles painted. DuPont's incentive now is to use its chemical expertise to minimize the paint used per vehicle and to develop a more durable finish, rather than simply increasing the volume of paint it sells. (WRI 2001 p.4)

The fourth way that Hawken, Lovins and Lovins (1999) recommend business personnel can take action to make their businesses more sustainable is to invest in natural capital. This means restoring, sustaining and expanding stocks of natural capital – the natural resources and ecosystems of the planet – so that life and business can continue. This is not just a feel good tactic where business personnel take action to balance their company's environmental impact, such as by planting enough trees to counteract their greenhouse emissions, but a strategic business tactic where by restoring and expanding the stocks of natural capital they are also ensuring that there will be materials available for their companies' use in the future. It also involves reinvesting some of the savings made from sustainability initiatives back into developing further manufacturing process improvements based on nature. For example trying to learn how spiders make silk that is stronger than bullet proof vests, or how abalone make shells that are '… twice as tough as our best ceramics', or how diatoms make glass. All of these are made within the natural ecosystem, requiring no additional energy or chemicals and producing no toxic waste (Lovins 2001 p.10).

The sheer number of approaches that can be used to make business practices more sustainable creates confusion for business personnel, who do not know which approach to use. The above review has shown that the approaches use many of the same techniques, just aiming for different goals or end-points. Robert et al (2001 p.1) argue that because of this, the approaches do not need to be seen as competing against each other. They promote seeing the sustainability approaches as '… complementary pieces of the puzzle that can be used in parallel for strategic sustainable development'. They explain that the purpose of all of the sustainability methods reviewed is to achieve two main outcomes: dematerialisation (through increasing resource productivity and the removal of waste) and substitutions (through the use of different materials and practices, a move from selling products to leasing services, a move from supplying goods to supplying performance based services, and a move from unfair to fair distribution of materials to meet the needs of all humans).

Robert et al (2001) believe that explaining the interconnections between the different sustainability approaches this way makes it easier for business personnel to understand the general actions that need to be taken. To help business personnel identify the specific actions to take in their own organization, Robert et al (2001) recommend the use of the

four system conditions of 'The Natural Step'. These are shown in Table 4 (The Natural Step 2001). Schley and Laur (1998 p.11) refer to these as '… a set of shared mental models that act like a compass in guiding dialogue and reflection on issues of sustainability'.

Table 4: The Natural Step approach to sustainability (Adapted from Schley & Laur 1998 p.11 & The Natural Step 2001 p.30)

	System Condition	Solutions	Questions to ask
1	In the sustainable society, nature is not subject to systematically increasing concentrations of substances extracted from the Earth's crust e.g. fossil fuels, heavy metals and minerals.	Substituting minerals scarce in nature with others that are more abundant, using all mined materials efficiently and systematically reducing dependence on fossil fuels.	How can my organization take steps to decrease its dependence on underground resources?
2	In the sustainable society, nature is not subject to systematically increasing concentrations of substances produced by society e.g. PCBs, CFCs, HCFCs, and PVC.	Substituting persistent and unnatural compounds with ones that are normally more abundant or break down more easily in nature, and using all substances produced by society efficiently.	How can my company take steps to decrease its dependence on persistent, human-made compounds?
3	In the sustainable society, nature is not subject to systematically increasing degradation by physical means e.g. dams to change river flows, clearing rainforests, intensive monoculture agriculture, and overfishing.	Drawing resources only from well managed ecosystems, systematically pursuing the most productive and efficient use both of those resources and land and exercising general caution in all kinds of modification of nature.	How can my company take steps to decrease its dependence on activities that destroy productive natural systems?
4	And, in that society human needs are met worldwide e.g. access to food, water, health care, shelter, and education.	Using all our resources efficiently, fairly and responsibly so that the needs of all people on whom we have an impact, and the future needs of people who are not yet born, stand the best chance of being met.	How can my company increase the efficiency with which it uses resources? How can we waste less?

Practitioners of The Natural Step recommend that after having identified the unsustainable factors in their operations using the above four system conditions, the second step for business people to take is to envision their company as a sustainable entity; to work out what they want to become and what they want to achieve – to develop a shared vision. They can then decide what steps to take to move their company towards that vision and achieve their goals. (The Natural Step 2001). A combination of the sustainability methods previously identified would be used to achieve this.

Bradbury and Clair (1999 p.68) provide examples of companies who have used The Natural Step approach. These include Interface, whose achievements have already been presented, '… IKEA international, a furniture manufacturer; Scandic, a hotel chain; OK, an oil company; and Electrolux International, an electric appliance manufacturer'. They state that as a result of their involvement with The Natural Step:

- IKEA has taken steps to provide eco-friendly furniture which contains '… no metal or persistent glues and is built of wood from sustainable forestry' (Bradbury & Clair 1999 p.69). It also undertook an extensive campaign in Sweden to promote the use of compact fluorescent light globes, which use less energy than traditional light globes, but whose uptake had been restricted by higher prices.

  They teamed up with environmental groups to promote the issue and advertised in all major newspapers. They gave away globes during a two-week period and cut the price to a third for the rest of the time. Recognising that the globes contain mercury, they worked with their suppliers to ensure that the globes they sold contained as little of the substance as possible – three milligrams of mercury per lamp – compared to the Economic Union (EU) limit of 10 milligrams. They educated consumers about mercury and set up a program whereby globes could be returned to their store to be recycled by 'a German specialist company that recovers 98 to 99 percent of the mercury'.

  The result was higher sales of compact fluorescent globes, the use of which '… saves electricity consumption by roughly a factor of five and increases product life by a factor of eight to ten'. This greater demand for the globes led to greater production volume, enabling the manufacturers of the globes to reduce their price.

This also led to other globe suppliers decreasing their prices. It also showed that low mercury globes were possible, which has led other manufacturers to produce them. They are even researching the total elimination of mercury. The lowered energy consumption also helps to reduce mercury emissions as these are released from burning coal to create energy (Broman, Holmberg & Robert 2000 p.23).

- Scandic Hotels have replaced '… soap bars and plastic shampoo bottles with liquid refillable containers'. They have provided education to encourage guests to reuse towels and linen. Scandic has also '… reduced the use of plastic and metal by 70 percent and 50 percent, respectively, and is redesigning its hotel rooms using sustainably harvested woods for flooring and unbleached natural fiber linens' (Bradbury & Clair 1999 p.69).

- OK Petroleum produced the world's cleanest gasoline, Optima, reinvesting the profits from that into alcohol production research and plants. They have redefined their business as '… an energy provider rather than as an oil supplier' (Bradbury & Clair 1999 p.68).

- Electrolux International has changed from solvent-based paints to water-based and powder paints. 'They prioritise the use of recycled materials, such as steel and cardboard, and have reduced consumption of virgin materials'. They have '… introduced the first family of refrigerators and freezers free of chlorofluorocarbons … [and have] also developed a sun-powered lawnmower, and a chainsaw that runs on vegetable oil' (Bradbury & Clair 1999 p.69).

Practitioners of The Natural Step point out that creating a vision and a shared understanding of sustainability between staff members fosters enthusiasm and commitment to implement the changes within the organization. All parties know what needs to be done and can work towards it (Robert et al 2001). Hawken, Lovins and Lovins (1999 p.320) agree, stating that such an approach

> … creates a renewed sense of purpose and mission. For the first time employees activities at work are fully aligned with what is best for their children and grandchildren at home.

Bradbury and Clair (1999) claim that business personnel like The Natural Step approach to sustainability because it uses a strategic planning framework that is familiar to them and it simplifies the issue of sustainability and its many methods. It provides a way to understand what sustainability means for individual businesses and a way to justify actions taken.

Within this section it has been shown that there are many processes that business personnel can use to move their companies towards a more sustainable state. How these processes interrelate and how business personnel can identify the actions to take within their own organization has been explained. In the next section, the rate of adoption of sustainability issues by business personnel will be explored.

2.4 Business adoption of sustainability

Dunphy and Beneviste (2000) outline six phases that business personnel pass through in relation to sustainability of their companies. They point out that different business units within a single business may be at different phases. Similarly, a business may be at different phases overall in relation to the social aspects of sustainability and the environmental aspects of sustainability. The six phases are:

1) Rejection – non-acceptance of the idea of sustainability and its importance;
2) Non-responsiveness – failure to act, with the issues seen as irrelevant;
3) Compliance / risk reduction – minimal action taken to comply with legislative requirements and reduce risk;
4) Efficiency – recognition that wastes equal a waste of money, taking action to remove waste and maximise efficiency;
5) Strategic sustainability – recognition that sustainability can be used as a competitive advantage, action taken to be a leader in sustainability; and
6) Ideological commitment – where the business personnel do all of the above and promote sustainability to others, encouraging politicians to change market structures and tighten laws, recognising that this will give them further advantage over their competitors while benefiting society and the environment.

The World Resources Institute has been monitoring business personnel's adoption of sustainability since the 1970s. They agree with Dunphy and Beneviste (2000) that business

personnel progress slowly through phases of sustainability. Their research has shown, however, that the majority of firms in industrialized nations were still focussing on compliance (phase 3) in the mid-1990s (WRI 2001). This is despite the growing pressures on business to act and the many benefits they can receive from acting, as shown in Table 5.

The WRI (2001) findings are alarming for three reasons. First, they show that business personnel are staying in the reactive phase, at the compliance level, for a very long time, therefore failing to gain the financial and environmental benefits that could be achieved from becoming proactive. Second, they start with the reactive end-of-pipe approaches to sustainability and progress (very slowly) through to the more proactive and transformative approaches. This is inefficient as companies are wasting money and time implementing end-of-pipe controls or making current production practices more efficient, when those same production practices may need to be altered significantly, or even totally replaced, as the laws tighten or the company embraces the proactive approaches to sustainability. Third and most importantly, significant environmental damage is continuing to occur and will not be stopped by implementing the simpler end of the sustainability methods continuum (shown earlier as Figure 2).

Yencken (2000 p.10) refers to a UNEP report on the future of the global environment, in which it was concluded that:

> Given the assumed growth of the world economy between 1990 and 2050, a 4 to 5 fold increase in overall 'efficiency' is needed just to keep environmental pressure at its current level. In many cases this will not be sufficient to prevent environmental degradation of environmental resources. Depending on assumptions made with respect to population growth, economic growth and levels of sustainable use of various natural resources, the actual efficiency improvements required within the next half century are estimated to be in the range of five to twenty fold. This can only be achieved by increase in technological efficiency and the 'dematerialisation' of production and consumption.

The above highlights the importance of understanding why business personnel have been slow to act, and of finding ways to help them undertake the more transformative sustainability actions of category four – industrial ecology and natural capitalism. The present research is intended to help achieve this.

Table 5: Pressures and benefits encouraging business personnel to take action (Compiled by the present author).

Pressures	Explanation
Legislative and regulatory pressures	Resulting from the introduction of stricter pollution limits, material taxes, mandatory recycling targets, and "take- back" requirements which direct manufacturers to collect and reuse products at the end of their useful lives, as well as incentives for improvement such as rebates, scaled licensing and regulation costs, voluntary audits, and agreements (ACF 2000; Alaskan Dept of Environment Conservation 1995; ANZECC 1998; Cunningham, Sinclair & Burritt 1997; GEMI 2002; Little et al 1995; Potter 1996; UN Agenda 21).
Competitor, marketing, and cost pressures	Resulting from advantages that competitors gain from implementing more sustainable practices, such as production savings that they can pass on to customers in the form of lower prices. These can be substantial savings, as in the case of 3M, which has '… prevented more than 750,000 metric tons of polluting emissions since 1975… saving the company more than US$790 million' (WBCSD 2000 p.2). In addition to savings, more sustainable practices are said to result in improved occupational health and safety, better staff morale, lower staff turnover, higher quality, and better customer service. Pressure for business personnel to act also results when competitors start to receive favouritism from consumers for being environmentally focussed (Alaskan Dept of Environment Conservation 1995; ANZECC 1998; CRES ANU & Deni Greene Consulting 1996; Cunningham, Sinclair & Burritt 1997; Deni Greene Consulting Services, Standards Australia & Ethical Investment Services 2001; Diesendorf 2000; Environment Australia 2002b; GEMI 2002; Hawken, Lovins and Lovins 1999; Potter 1996; SA EPA 1996; The SIGMA Project 2001).
Employee pressures	Resulting from employees being willing to change employers to work for an organization that has a higher focus on environmental protection, participatory management, or better working conditions. In today's knowledge economy, business personnel cannot afford to lose key staff members, with the result being considerable pressure to improve the practices used within their companies (Bubna-Litic & de Leeuw 1999; Deni Greene Consulting Services, Standards Australia & Ethical Investment Services 2001; Dunphy 2000; Little et al 1995; Myklebust 1999; The SIGMA Project 2001).
Community, Customer, and Non Government Organization (NGO) pressures	Resulting from information campaigns, boycotts, and demonstrations against polluting companies. These pressures have been heightened by communications technology that enables a company's indiscretions to be transmitted quickly throughout the world. Pressure to improve is also exerted with local authorities taking notice of community complaints and environmental practices, when considering planning permission for new plants and sites (ACF 2000; ANZECC 1998; Bubna-Litic & de Leeuw 1999; CRES ANU & Deni Greene consulting 1996; Cunningham, Sinclair & Burritt 1997; Deni Greene Consulting Services, Standards Australia & Ethical Investment Services 2001; Diesendorf 2000; GEMI 2002; Greater Vancouver Regional District Solid Waste Department 1996; Little et al 1995; Myklebust 1999; SA EPA 1996; Sherry 1994; The SIGMA Project 2001; UNCED 1992).

Table 5 continued: Pressures and benefits encouraging business personnel to take action (Compiled by the present author).

Pressures	Explanation
Supplier and market access pressures	Resulting from clients requiring a certain environmental standard in order to commence or continue business interactions. This is occurring frequently as the management of many multinational companies are implementing ISO 14000 environmental management systems. The process may also result in identification of opportunities to reuse or sell by-products previously disposed of as waste, as well as generate options for new, modified, green products or technology (CRES ANU & Deni Greene Consulting 1996; Cunningham, Sinclair & Burritt 1997; Dunphy & Beneviste 2000; GEMI 2002; Ledgerwood 1997; Potter 1996; Roberts 1995).
Investor / shareholder pressures	Resulting from the trend of investment in green companies and changes to how the stock market lists businesses (Deni Greene Consulting Services, Standards Australia & Ethical Investment Services 2001; Dunphy 2000, 2001; GEMI 2002; Harris Olson & Toyne 2000; Myklebust 1999; Little et al 1995; The SIGMA Project 2001). Stigson (2001 p.6) reports that 'The Dow Jones Sustainability Index, launched in 2000 … has outperformed the broader Dow Jones Global Index in the period to June 2001, with an annualised return of 9.98% compared to 7.42%'.
Banks and insurance pressures	Resulting from recognition by lenders and insurers that there are many liabilities and risks associated with businesses that have a poor environmental record (Deni Greene Consulting Services, Standards Australia & Ethical Investment Services 2001; Environment Australia 2002b).
World business leaders and industry body pressures	Resulting from respected multinational business leaders and industry associations promoting responsible environmental practices through seminars, journals and other material (Graborsky & Grant 2000). Coverage of sustainability has even occurred in traditional business management journals such as the Harvard Business Review (Hart 1997; Magretta 1997; Porter & van der Linde 1995). The result is increasing peer pressure for all business personnel to change and become sustainable.

2.5 Reasons for business adoption trends – constraints to change

2.5.1 Lack of definition and clarity of approaches

One reason suggested for business personnel's inaction or slow action is the many different definitions and the sheer number of approaches that business personnel can take to become more sustainable, as was discussed in Section 2.3. It is suggested that this makes it

confusing for business personnel to know what to do (Elkington 1997; Environment Australia 2002b; The SIGMA Project 2001). Fien and Tilbury (2000 p3) explain '… the different interpretations of sustainability can result in "paralysis by analysis" and in delays in key changes essential for a more sustainable society'. The situation is further complicated by many of the sustainability methods having unclear and / or multiple definitions.

The World Business Council for Sustainable Development provides an example of an unclear definition. They have defined eco-efficiency as:

> … the delivery of competitively priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life cycle, to a level at least in line with the earth's estimated carrying capacity. (Cunningham, Sinclair & Burritt 1997 p.1)

This definition contains many judgements, which may be difficult to quantify. What is the criterion for deciding whether or not a product increases quality of life? What do you use as the earth's estimated carrying capacity? And how do you define a human need? Is it a need or a want? The answers to such questions are likely to vary depending on the perspective taken. A product that brings joy to an individual in a developed country could be said to improve their quality of life, but it could be argued that it reduces the quality of life of those in underdeveloped countries, as that material and energy is no longer available to be used there. It could also be argued that people in underdeveloped countries have a greater need for the materials, suggesting that they should be given priority in this regard according to the sustainability rhetoric that promotes fairness. Such issues have sparked debates around the world, the resolution of which is outside the scope of this thesis.

In explaining what is meant by eco-efficiency the WRI (2001 p.4) state that:

> There are seven key dimensions of eco-efficiency that every business should take into account when developing products, introducing process changes, or taking other actions with environmental implications. They are:
>
> 1) Reduce the material intensity of goods and services.
> 2) Reduce the energy intensity of goods and services.
> 3) Reduce toxic dispersion.
> 4) Enhance material recyclability.
> 5) Maximize sustainable use of renewable resources.

6) Extend product durability; and
7) Increase the service intensity of goods and services.

They state that 'The greater the improvement in each of these dimensions and the more dimensions in which improvement occurs, the more eco-efficient a product or process is (assuming that it also increases one's economic welfare)' (WRI 2001 p.4). The WRI (2001) definition of eco-efficiency contains no mention of cleaner production, yet according to the UNEP definition of cleaner production, eco-efficiency and cleaner production are part of the same process. UNEP defines cleaner production as:

> … the continuous application of an integrated preventative environmental strategy applied to processes, products, and services to increase eco-efficiency and reduce risks for humans and the environment (ANZECC 1998 p.14; Cunningham, Sinclair & Burritt 1997 p.1).

They claim that 'Cleaner production requires applying know-how, improving technology, and changing attitudes' (ANZECC 1998 p.14). Specifically:

> For production processes: cleaner production includes conserving raw materials and energy, eliminating toxic raw materials, and reducing the quantity and toxicity of all emissions and wastes before they leave a process.
>
> For products: the strategy focuses on reducing impacts along the entire life cycle of the product, from raw materials extraction to ultimate disposal of the products.
>
> For services: cleaner production reduces the environmental impact of the service provided over the entire life cycle, from system design and use, to the entire consumption of resources required to provide the services. (ANZECC 1998 p.14; Aquatech 1997 p.3)

The above definition implies that cleaner production is not a process itself, but the over arching goal to be reached, with the many other sustainability approaches, such as eco-efficiency and life cycle analysis, being ways to obtain the goal (Aquatech 1997). Tibbs (2000) agrees that one approach aims to show how all the approaches fit together, but he believes that it is industrial ecology, not cleaner production, that does this. He explains that 'Industrial ecology is – or at least aspires to be – the emerging field of knowledge that interrelates the various environmental tools and management systems that have been devised so far'. The fact that people use these terms to mean different things, and for different purposes, creates confusion for all involved. Further confusion is created by the

subjective nature of some of these definitions, such as the WBCSD definition of eco-efficiency presented earlier.

The SIGMA Project (2001 p.202) report that the '… confusion over the scope and timeframes of sustainability; competing and conflicting approaches to achieve sustainability [and] lack of a systematic framework or guidance' make it extremely difficult for business personnel to know what to do. Many authors argue that the confusion from the many definitions and approaches is no excuse for inaction. They argue that there are many similarities between the approaches and that this indicates the overall direction that business personnel should take. They call for business personnel to act now (Environment Australia 2001; Hawken, Lovins & Lovins 1999; Robert et al 2001; Stigson 2001; WBCSD 2000).

2.5.2 Existence of solutions and cost

Another possible reason for inaction is the belief that solutions do not exist, or are simply too expensive. Through their research ANZECC (1998 p.76) has found that industry personnel:

> … perceive there are three costs involved with the broader adoption of cleaner production: firstly, environmental assessments are considered too costly for most SMEs [Small and Medium sized Enterprises]; secondly, the cost of new clean technology is unaffordable; and thirdly, assessing technology can be difficult and time-consuming, causing uncertainty for firms as to whether they have chosen the right technology to invest in.

While industry personnel may believe that improvements are too costly, both the Merseyside Department of Trade and Industry (1994) and ANZECC (1998) have found that approximately 30 per cent of improvements can be made through simple housekeeping improvements and staff training, at either zero or minimal cost. A further 30 per cent of improvements are possible through minor technical modifications, requiring minimal capital investment and short pay back periods. Only the remaining 40 per cent of changes require more expensive technological investment. These more expensive changes can be partially funded through the savings made from implementing the first two types of changes.

Hawken, Lovins and Lovins (1999 p.13) highlight that if externalities were internalised and companies made to pay for the real cost of their actions, 'The massive inefficiencies that are causing environmental degradation almost always cost more than the measures that would reverse them'. They argue that '90 to 95 percent reductions in material and energy use are possible in developed nations, without diminishing the quantity or quality of the services that people want' (Hawken, Lovins & Lovins 1999 p.176). Taking such action would also result in the additional benefit of creating significant employment opportunities in a range of environmentally protective areas, such as the retrofitting of buildings, and would extend the life of our energy reserves (Hawken 1993; Yencken 2000).

Hawken, Lovins and Lovins (1999 p.63) suggest two reasons why the solutions that exist are not being implemented. First, the long lifecycle of machinery in factories inhibits business personnel from making the changes, and second, '… it's just because people and firms aren't yet learning as fast as they could and should'. They are not aware of the possibilities or the importance of taking action. Therefore they are not implementing the sustainability solutions.

Many authors agree that the technology already exists to improve the majority of industrial practices, and they call for business personnel to take action and implement the solutions now (Greenpeace quoted in ANZECC 1998; Kim 1989; The Natural Step 2001; Speth 2002).

2.5.3 Market Conditions and Legislation

Many authors recognise that the current market system inhibits business personnel from taking action on sustainability (Carley & Spapene 1998; Dietz & Straaten 1992; Hawken, Lovins & Lovins 1999; Swaney 1987; Speth 2002). It is recognised that the usual market self-regulation theory simply does not hold true on sustainability issues. Hawken (1993 p.80) explains:

> Market self-regulation theory says that as resources become scarce, price will increase, which will decrease demand and hence slow the use of the resources. However, we are harvesting resources so quickly around the world that there appears to be a surplus of products, which reduces costs despite the fact that raw resources are becoming rarer.

Many authors call for changes to laws, subsidies and taxes that make it easy for business personnel to continue to operate in an unsustainable fashion (Carley & Spapene 1998; Dunphy 2000; Hawken, Lovins & Lovins 1999; Myers & Kent 1998; Speth 2002; Tibbs 2000). A comprehensive study of perverse subsidies by the IISD found that at a conservative estimate these subsidies '… total in the region of a cool [US]$1.5 trillion a year worldwide' (Myers & Kent 1998 p.ix). Carley and Spapene (1998 p.181) show the uneven distribution of subsidies to business. They refer to a 1996 Oxfam report in which it was claimed that 'The total amount of agricultural subsidies in the OECD countries is about US $175b, compared to the total agricultural aid to developing countries of about US $10b'. Myers and Kent (1998 p.ix) report that action is being taken to remove these subsidies in '… countries as disparate as Canada, The United States, Britain, Poland, Russia, China, Indonesia, India, Brazil and New Zealand'.

Calls have also been made to reform tax systems that hinder sustainability (Hawken 1993; Hawken, Lovins & Lovins 1999; Speth 2002; Tibbs 2000; Yencken 2000). Hawken (1993) describes a system of green taxes that could be applied to a range of polluting practices, such as the use of coal fired power stations and pesticides. He states that such taxes would increase the cost of these non-sustainable practices to reflect their true cost to society. As a result, it would become cheaper to use alternative power sources such as wind and solar energy. Organically grown produce would become cheaper than that covered in pesticides and grown in fertiliser. Hawken (1993) recognises that many businesses would pass on these added tax costs to the customer, which would create an incentive for the customer to use less of the product, or to use its greener rival products. He explains that in conjunction with the green tax, an equal reduction in income tax should occur. This way families would not end up spending any more than they would have originally, and they would have the opportunity to save if they altered their practices. Hawken (1993) also explains that society already bears the expenses associated with unsustainable practices in many ways, for example through increased medical bills and pollution clean up efforts.

Hawken, Lovins and Lovins (1999 p.164) agree, explaining that 'A tax shift is not intended to redefine *who* pays the taxes but only *what* is taxed'. They recommend the removal of taxes from work, business and personal incomes, with a transfer to taxes on waste, toxins and primary resources. They show that this would create a reinforcing loop of

improvement, as business personnel focus on resource efficiency to reduce tax payments. They suggest that such changes to taxes should be implemented over 15 to 20 years, to give business personnel time to adjust. They feel that these changes would also improve employment levels, as people no longer being taxed would be cheaper to hire, making it viable to hire people to disassemble, remanufacture and repair products.

Pears (2000 p.176) is of the same opinion, stating that while there may be a reduction in positions within some industries in Australia, such as mining, many more positions will be created as '… resource recovery and recycling and harvesting of renewable energy resources are inherently more employment intensive than large scale resource extraction and processing'. Speth (2002 p.3) reports that these tax changes have already commenced, with countries such as Germany '… experimenting with shifting taxes from things to be encouraged, such as employment, to things to be discouraged, such as energy consumption'. GEMI (2002 p.2) report that 'The UK recently enacted an energy tax (known as the Climate Change Levy) that penalizes industrial firms if they do not achieve certain levels of energy efficiency'.

Changes that could be made over a shorter time frame include changes to labelling laws. It is currently very difficult for consumers who care about sustainability to determine which products are the most sustainable. They may therefore continue to unknowingly purchase the less environmentally friendly products, which reduces the pressure on business personnel to take action. Research shows that if increased labelling information were available, many consumers would prefer to purchase the more sustainable products, provided that those products were not of inferior quality or more expensive. In fact, some consumers are prepared to pay more for sustainable products (NSW EPA 1994, 1997). To overcome the uncertainty and perceived risk in producing more sustainable products, many governments and large corporations are guaranteeing large purchases of more efficient machinery, in an effort to encourage companies to produce such products (Hawken, Lovins & Lovins 1999).

While the need for changes to those laws that affect the impact business has on the environment are widely accepted, there is much scepticism that governments will introduce the necessary changes (Korten 1995; Meadows 1997; Papadakis 1996; Passey 2001; Pears

2000; Smith 2000c; Yencken 2000). This scepticism relates to three main issues. The first is the fear of governments that stricter laws will hinder businesses, resulting in them moving offshore, leading to high levels of unemployment (Hawken 1993; Korten 1995; Papadakis 1996). Second is the difficulty of thinking long term when governments face pressures to ensure high standards of living and economic security in the short term (Earth Summit 2002-online 2001; Hawken, Lovins & Lovins 1999; Huckle 1996; Yencken 2000), and third is that the changes required affect many different laws and functions of society. They would require a complete overhaul to the legal and taxation systems (Yencken 2000). This complexity makes governments reluctant to act for fear that radical changes would result in loss of votes and power at the next election (Passey 2001; Smith 2000c).

Papadakis (1996) and Pears (2000) highlight that in the face of public pressure to act, governments have introduced stricter laws for business, but then failed to enforce them. This reduces public pressure on the government, as the public believe that the laws are in place, while in fact businesses can carry on their activities unhindered. Papadakis (1996 p.74) cites the laws introduced to restrict the use of DDT as an example of this. The laws to limit the use of DDT '… were introduced in Australia in 1964, however its use increased by a factor of four in 1969'. Papadakis (1996) explains the government only enforced the restrictions on DDT once the US Food and Drug Administration introduced lower limits for acceptable levels of DDT in beef for human consumption. The economic threat from loss of beef exports made it a business priority, and therefore 'safe' for the government to act.

Goodstein (1995 p.4) points out that the type of regulatory requirement is also important. He explains that prescriptive regulations, those that are technology-based regulation, with uniform ambient or emission standards, can hinder business changing in three ways. First, firms bear no cost for emissions below the regulatory standard, thus the incentive and cost of innovation are reduced relative to taxes or permit costs. Second, 'grandfathering', where companies do not have to meet the standard until they purchase new equipment encourages businesses to hold onto their old, polluting equipment. Third, firms may legitimately fear that if they introduce more efficient technology, this may lead regulators to raise the standards. According to Goodstein (1995), prescriptive regulation encourages compliance, rather than innovation and should therefore not be used. Swaney (1987) agrees, adding that

it creates a new pressure for maintaining the status quo: the vested interest of the manufacturers of the prescribed control technology who will lobby to keep their market position.

While concerns that stricter laws will hinder business may seem valid at first, countries that have taken action, for example Sweden, Japan, and Germany, have found that the stricter laws have led to substantial business innovation and benefits. The lowered regulatory and production costs result in competitive advantage, while the sustainability solutions that the business personnel implement can result in new technologies that they can sell to others (Day & White 2002; Hawken 1993; Pears 2000). As an added bonus these results occur without the need for expensive regulation and enforcement, as the laws and taxes make it in business personnel's own best interest to improve (Meadows 1997).

Examples of what has been achieved include

- A 40 per cent reduction in the sulphur product content of fuels in Sweden, just two years after the introduction of a tax on sulphur dioxide (Carley & Spapene 1998).
- A 40 per cent drop in emissions of hazardous air pollutants in the US within four years of the introduction of laws that required factories to publicly report their hazardous air pollution emissions. 'One chemical company that found itself on the top ten polluters list reduced its emissions by 90% just to get off that list' (Meadows 1997 p.7).
- The reuse of construction debris in Denmark increased '… from 12 to 82 per cent in less than a decade, twenty times greater than the 4 percent average rate seen in most industrial countries' (Hawken, Lovins & Lovins 1999 p.167). This increase occurred as a result of the high costs charged for waste disposal at Denmark's landfill sites.

The concerns of government about businesses moving offshore are not totally unfounded. Unscrupulous business personnel have in the past used threats of moving to resist changes to laws and to obtain benefits for their companies. Korten (1995) provides examples of two companies that have used such threats: Proctor Silex and BMW. Proctor Silex established its premises in Moore County, South Carolina after being offered tax breaks, lax environmental regulations and compliant labour. When they wanted to expand their plant:

> Moore County floated a [US]$5.5 million municipal bond to finance necessary sewer and water hookups – even though nearby residents were living without running water and other basic public services. Then in 1990, the company decided that Mexico offered more competitive terms and moved again. It left behind 800 unemployed Moore County workers; drums of buried toxic waste, and the public debts the County had incurred to finance public facilities in the company's behalf. (Korten 1995 p.128)

South Carolina was similarly affected by the practices of BMW, who

> … had spent three years assessing offers from 250 localities in ten countries before deciding to place its [US]$400 million facility in South Carolina. According to Business Week, company officials were attracted by the temperate climate, year round golf, and the availability of a number of mansions at affordable prices. They also liked the region's cheap labour, low taxes, and limited union activity. When BMW indicated that it favored a 1000 acre tract on which a large number of middle class homes were already located, the state spent [US]$36.6 million to buy the 140 properties and leased the site back to the company at [US]$1 a year. The state also picked up the costs of recruiting, screening and training workers for the new plant and raised an additional [US]$2.8 million from private sources to send newly hired engineers for training in Germany. The total cost to the South Carolina taxpayers for these and other subsidies to attract BMW will be [US]$130 million over thirty years. (Korten 1995 p.130)

Fortunately, the increasing speed at which information on the indiscretions of a company's management can be spread around the world makes such behaviour less likely to occur. NGOs, activist groups and even the media commonly report such indiscretions, resulting in consumer boycotts and pressure for business personnel to behave more appropriately (GEMI 2002; Smith 2000c). Despite all of this, it appears that convincing governments to act and to tighten laws will be a slow process. Papadakis (1996) believes that the problem lies in the adversarial nature of politics. He claims that the political parties focus more on finding fault in their opponents' arguments than focussing on what action could be taken to solve the problems being discussed. He calls for the political parties to change their ways, to undertake dialogue and work together to find ways forward.

Many authors feel that because of their nature, governments and the UN will be slow to take action (Dunphy & Griffiths 1998; Earth summit 2002-online 2001; Elkington 1997; Ellyard 1998; Graborsky & Grant 2000; Jaworski 1996; Huckle 1996; Korten 1995; Senge 1996; Smith 2000c; Sutton 2000). These bodies have to gain consensus between their members, which often means accepting the lowest common denominator solution. These

authors state that business personnel, who do not have to seek others' agreement, can innovate and change much more quickly. They expect that business is the most likely to lead the way forward on sustainability.

As Papadakis (1996) points out, business *has* to be more receptive to public opinion than do governments. Governments are re-elected every three to four years, while businesses cannot afford to wait that long in the face of consumer preferences. Jaworski (1996 p.165) agrees, explaining that 'Global corporations can only do business in a peaceful and stable world'. He therefore believes that large, global corporations will actively shape the future of the world to achieve peace and sustainability. He calls this process 'generative leadership' and provides examples of companies such as Shell and Canon, whose management have spent significant money and time working with governments and communities in developing countries in order to improve living conditions and further development.

Business personnel do however face many difficulties in taking action. De Geus (1997) reports that companies face hostile takeover if they do not focus on short-term gains for shareholders. Korten (1995 p.212) concurs and provides the case of Stride Rite Corporation to demonstrate the difficulty. Stride Rite is a shoe company that makes '… generous contributions to charitable causes', and had a

> … policy of locating its plants and distribution facilities in some of America's most depressed inner cities and rural communities to revitalise them and provide secure, well paying jobs for minorities. The policy was a strong personal commitment of the CEO.

In 1984 a drop in income led the Board of Directors to believe that the survival of the company depended on moving production overseas. The CEO fought against this move, but eventually resigned. Korten (1995 p.212) explains that:

> The systemic forces bearing on Stride Rite were enormous. Its US workers averaged [US]$1,200 to $1,400 a month for wages alone, plus fringe benefits. The skilled workers in China who are hired by contractors to produce Stride Rite's shoes earn [US]$100 to 150 a month, working fifty to sixty hours a week. In addition to moving its plants abroad, Stride Rite moved its national distribution centre for the US from Massachusetts to Louisville, Kentucky to take advantage of lower cost US labor there, and an offer of tax abatements from the state valued at [US]$24 million

> over 10 years. Stride Rite sales have doubled since 1986, and the price of its stock has increased six fold.

Korten (1995) believes that if the management had not made the changes it did, it is almost certain that Stride Rite would have been the target of a hostile takeover, and more severe changes would have been made. This example demonstrates the complexity of issues that business personnel face when considering action on sustainability. It also highlights the need for shareholders to support managers in these endeavours. Korten (1995) emphasises that these hindrances frustrate those managers who are committed to sustainability. They feel helpless and trapped. He highlights that contrary to popular belief, the answer to business adopting more sustainable practices is *not just raising the awareness* of managers; it lies in *removing the constraints* that make adopting sustainable practices difficult.

It has been shown within this section that there are many factors external to business organizations that adversely affect the ease with which their personnel can take action on sustainability. Many of these issues are being addressed, albeit slowly, by governments around the world. The fact that some businesses have taken the lead and achieved significant environmental and financial benefits from doing so proves that becoming more sustainable is possible under the current market and legislative system (Hawken 1993; Hawken, Lovins & Lovins 1999).

2.5.4 Complexity and amount of changes required

Another theory put forward to explain the inaction or slow action of business relates to internal factors that make it difficult for business personnel to take action on sustainability. Johnson and Wilson (1998 p.3) explain that becoming more sustainable requires:

> … negotiation between stakeholders (or between people in organizations) to set parameters for action. Moreover negotiation is likely to involve power relations and conflict, as well as engaging with uncertain and even turbulent social contexts. However, the negotiation is not a once and for all event. It needs an ongoing process involving participation of key stakeholders in which they can a) monitor, review and evaluate processes, outputs and outcomes (performance assessment) and b) engage in a dynamic process of learning and innovation, in ideas, technologies and organizational practices (capacity building). This task requires participative management and implementation, and the ability to investigate and evaluate.

Seven Dimensions Pty Ltd (1992c) expands on what is required to undertake changes to work practices. They state that it requires significant amounts of time and effort from both staff and management. Staff should be involved in every step of the process; they need to understand the current operations, identify opportunities for improvement, decide on the action to be taken, implement that action and measure its impact, making adjustments to practices as required. This requires a wide range of skills that not all staff may have, for example problem solving skills, meeting skills, communication, dialoguing, consultation, negotiation, presentation, change management and team based skills. This means that to undertake the changes to work practices, management may also need to invest significant time and resources in training their staff (Seven Dimensions Pty Ltd 1992e).

In addition to requiring changes to the processes used, building the capacity of staff and utilising a participative management style, sustainability also requires significant changes to the way people think about the business and the way in which they problem solve. It requires:

> … a profound shift in management culture, from the board room to the shop floor, away from ad-hoc reactive solutions towards an integrated approach where environmental considerations form a central component of the decision making process. (Cunningham, Sinclair & Burritt 1997 p.2)

> … firms have to get away from thinking about "technological fixes" to every problem and the concept that you can buy cleaner production. They need to be educated to understand how to identify causes of pollution, and to apply a "whole process" mentality to developing solutions. (Infotech & Australian Centre for Cleaner Production 1997 p.15)

Roome and Oates (1996 p.169) summarise these sentiments. They state that

> To cope with changes implied by sustainability it will be necessary for organizations, their managers and workforce to accept the importance of a 'learning' mindset, in which staying attentive to the shifting needs of society and the dynamics of environmental change, will be as important as staying close to the needs of customers. It requires an approach that questions the adequacy of the organization's knowledge, understanding, practices and values so that these are (re)shaped as part of increasingly sophisticated and thoughtful responses to the interconnected concerns we face.

The above authors are highlighting that becoming sustainable requires a lot more than knowledge of the many different approaches to sustainable practices. It requires business managers to be able to understand how the many aspects of their operations interact to produce their products, and to realise that taking action on single issues is not enough. It requires the willingness to explore new ways of operating that may have been previously considered impossible to contemplate. It requires particular skills such as problem solving, systems thinking and dialogue skills. It requires particular management behaviours – participative and communicative practices – that help all involved learn about the current operations, what is possible, and how to implement change. It requires ways to overcome politics and game playing within organizations, and ultimately it involves significant amounts of change and learning. As will be shown, this can be difficult to achieve in traditional mechanistically managed business organizations (Carr 1996; Isaacs 1999).

Together all of these factors form a complex system that affects the decisions that business personnel make on sustainability, as well as their ability to successfully implement it within their organizations. Understanding this system can help business personnel to identify actions that they can take that will make it easier to implement sustainability successfully within their organization. For this reason many authors call for a systems approach to business sustainability (Andrews 1999; Cunningham, Sinclair & Burritt 1997; Dunphy & Griffiths 1998; Ehrenfeld 2000; Hawken 1993; Hawken, Lovins & Lovins 1999; Smith & Yanowitz 1999; The Natural Step 2001; The SIGMA Project 2001). What this means will be further explored in Chapter Three.

2.6 Conclusion

It has been demonstrated within this chapter that there is significant confusion over what a sustainable business is and how to become one. It has been shown that there are many methods that can be used to become more sustainable, and that these are all interrelated, resulting in either dematerialisation or substitution. By focussing on these similarities the confusion can be reduced and the process to undertake simplified.

It has been shown that in addition to the confusion created by the many competing approaches and definitions, there are many other external and internal factors that make it

difficult for business personnel to take action on sustainability. Through improved understanding of all of these issues, governments can more easily see what actions they can take to make it easier for business personnel to address sustainability.

This process of gaining new insight into solving a complex problem, through the identification of the many factors that interact and lead to the behaviour exhibited within it, is the principle behind systems approaches. Many authors have called for a systems approach to business sustainability. What this means will be further explored in the next chapter.

Chapter 3. The Theoretical Foundations

Systems approaches and their implications for business sustainability.

> *"There is nothing more difficult to carry out, nor more doubtful of success, nor more dangerous to handle, than to initiate a new order of things. For the reformer has enemies in all who profit by the old order, and only lukewarm defenders in all who profit by the new order. This lukewarmness arises partly from fear of their adversaries, who have law in their favor, and partly from the incredulity of mankind, who do not believe in anything new until they have had an actual experience of it. " –* Machiavelli, 1532, The Prince.

3.1 Introduction

In this chapter the theory and tools of systems approaches, in particular systems thinking and organizational learning, will be presented. How these can be used to understand the behaviour that occurs within organizations, to solve complex problems and to undertake change will be demonstrated.

Reasons for the failure of many change attempts in organizations will be explored, as will the source of defensiveness and resistance to change within staff. The need to move from mechanistic management practices, where change is expected to occur as the result of a management directive, to participative, learning focussed management practices, where learning-supportive cultures are created and staff members are involved in the design and implementation of changes, will be discussed. Why a learning-focussed management style makes implementing change easier and how to create the necessary learning-supportive culture will be shown.

The implications of systems theory for addressing sustainability within business organizations will be identified, and the chapter will be concluded with the articulation of a systems based definition of a sustainable business, including a list of conditions required within the organization to support action being taken.

3.2 Systems approaches

Systems approaches are used to understand and alter behaviour in complex situations. As Senge (1990 p.128) explains,

> Systems thinking finds its greatest benefits in helping us distinguish high from low-leverage changes in highly complex situations. In effect, the art of systems thinking lies in seeing *through* complexity to the underlying structures generating change. Systems thinking does not mean ignoring complexity. Rather, it means organizing complexity into a coherent story that illuminates the causes of problems and how they can be remedied in enduring ways.

Asomba (2000) points out that as a result of this clarity, systems thinking can lead not only to problem solving, but also to cultural change. Stroh (2000 p.52) explains how this occurs with an intervention with which he was involved:

> It was as if we held up a mirror that communicated a clear, undeniable picture of reality. People saw their own roles in producing the problem and how the whole system operated. Each group understood the words of Pogo "We have met the enemy, and it is (all of) us." Because all parties could see how their actions were inextricably linked, each could acknowledge the futility of simply blaming others for their frustration and recognise how they (and others) needed to change to improve performance. We discovered that systems thinking not only increased understanding and focussed problem solving, but also generated *motivation* for people to change and stimulated *collaboration* instead of blame.

In order to understand the system, one has to identify all of its components and how they interact. This is referred to as the structure of the system. Senge (1990 p.44) explains that:

> The term "structure" as used here, does not mean the "logical structure" of a carefully developed argument or the reporting "structure" as shown by the organization chart. Rather, "systemic structure" is concerned with the key interrelationships that influence behaviour over time. These are not interrelationships between people but among key variables, such as population, natural resources, and food production in a developing country; or engineers' product ideas and technical and managerial know-how in a high tech company.

Slobodnik and Wile (1999 p.2) expand on this:

> In the case of a business, which is a kind of social system, these elements include flows of people, money, information, and material as well as employees' goals, performance and emotions.

Anderson and Johnson (1997 p.2) add that structural items

> … can be physical objects that you can touch, such as the various parts that make up a car. The components can also be intangible, such as processes, relationships, company policies, information flows, interpersonal interactions and internal states of mind such as feelings, values, and beliefs.

All of these factors affect what occurs within an organization. However, the identification of the items that make up the structure of a system is only one step in understanding its behaviour. It is the interconnections between the items – how they interrelate and affect each other – which really explain the behaviour exhibited within the system (Forrester 1994; Papadakis 1996; Senge 1990).

The significance of this is demonstrated by comparing the difference in answers produced from linear thinking and systems thinking. Richmond (1990) explains that most people if asked the question 'What causes what?' would develop a list of factors that are believed to affect the situation under question. For instance if asked: 'What makes a company flounder?' many people would produce a list of factors such as

- Poor management;
- Loss of key employees;
- Intense competition;
- Loss of product quality;
- Maturing markets / industry;
- Excessive government regulation.

The action that they take would depend on which factor they believed to be the main cause of the problem. This could be the issuing of a management directive to focus on quality, or the introduction of a new pay incentive scheme to retain key employees. This is an example of linear thinking, which Richmond (1990) also refers to as laundry list thinking. The same question answered according to systems theory demonstrates the importance of understanding how the different factors interrelate (PwC 2000; Sarah 1999b).

A systems approach would show that the stress of floundering leads managers to perform poorly, which further impedes the company's success, leading to even more stress, as

shown in Figure 7. This is an example of a reinforcing loop, a process of continuing decline, also known as a snowball effect or vicious cycle. While in this case company performance is low, leading to stress and poor managerial performance, the opposite could occur. That is if company performance is high, stress levels would decrease and managers could spend more time attending to issues that would lead to further improvements in company performance. In this alternative scenario the snowball works to achieve continuous improvement. This is often referred to as a virtuous cycle.

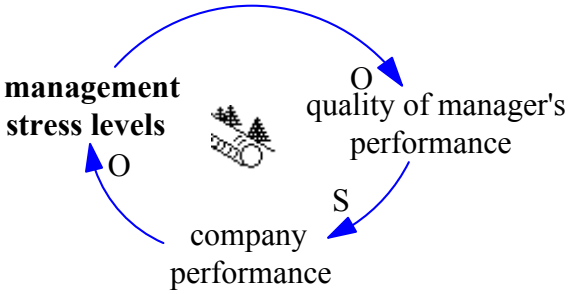


Figure 7: Reinforcing loop showing impact of stress on manager performance (Adapted from: PwC 2000; Sarah 1999b)

NOTE: When reading causal loop diagrams a 's' indicates that if all else is equal, when the item on the left of the arrow increases, the item on the right will increase too. Similarly when the item on the left decreases, the item on the right will decrease e.g. change is in the 'same' direction. When reading loops an 'o' indicates that if all else is equal, an increase in the variable on the left of the arrow, will result in a decrease in the variable on the right and vice versa. That is the 'opposite' change occurs in the variable on the right. One should begin reading the loop from the bolded item.

Looking further at the problem of floundering may indicate that over time, the poor management practices and company floundering would lead to the frustration of key employees who may choose to leave. This would make it even harder for management, who would then have to work with the lowered number of staff to produce the company's products. This is shown in the additional two reinforcing loops of Figure 8. A dashed line on the arrow between two variables represents a time delay. In this example it shows that there is a delay between when the poor performance of the company and management starts, and when it has an impact on staff. Since the consequence is not close in time to the

action, people often do not notice that delays exist or understand their significance (Forrester 1994; Senge 1990).

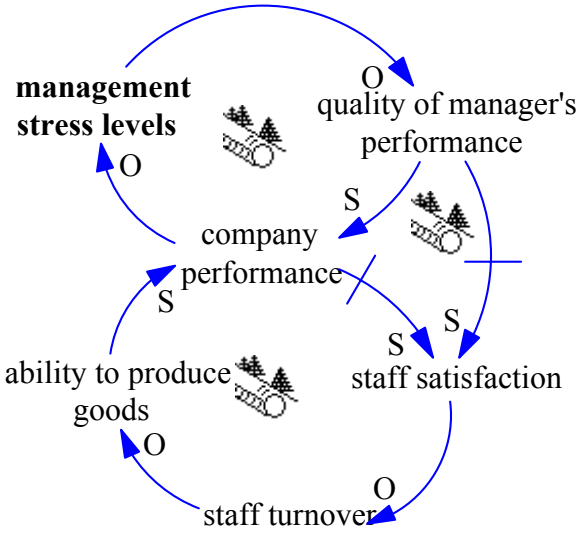


Figure 8: Reinforcing loops showing impact of floundering on staff levels (Adapted from: PwC 2000; Sarah 1999b)

The reinforcing loop of staff turnover is further amplified by the fact that the remaining staff members have to work harder to make up for the missing staff. The remaining staff members become tired and dissatisfied. This leads to further staff losses and / or increased mistakes, both of which affect product quality. Poor product quality leads to further lost revenues and floundering of the organization. This effect on the company's ability to produce its products occurs even if new staff members are hired, as they take time to learn and become effective in their roles. This is shown in the additional loop in Figure 9. The loop that is created by hiring new staff is an example of a balancing loop.

Balancing loops limit growth. As Goodman, Kenemy and Roberts (1994 p.117) point out, they are '… always bound to a target – a constraint or goal which is often implicitly set by the forces of the system'. They work towards achieving this goal. In the balancing loop discussed, the goal is the ideal number of staff to achieve an acceptable company performance. A *high* level of staff turnover necessitates the hiring of new staff, and after a delay these new staff become productive. The result is improved company performance and ability to produce goods. The increased company performance results in less pressure,

increased staff satisfaction and a *lower* level of turnover. Therefore fewer staff members need to be hired. The loop balances the level of employees towards its goal.

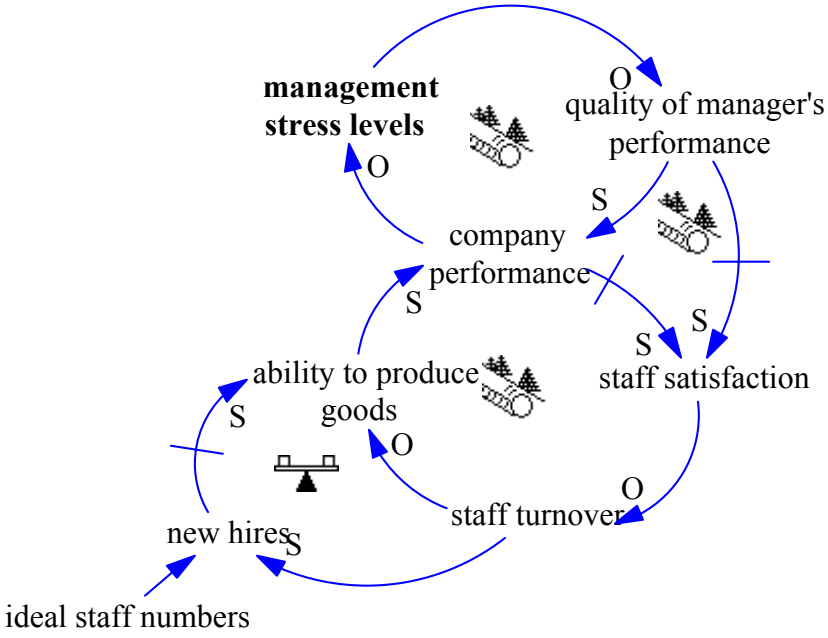


Figure 9: Diagram showing effect of new hires on ability to produce goods (Adapted from: PwC 2000; Sarah 1999b)

Having this more detailed understanding of why an organization is floundering can enable a manager to see that the solutions produced through linear thinking will not be effective. For instance issuing a directive for quality would be ineffective unless management processes and workforce numbers were also addressed. Similarly, offering more money to retain employees will be ineffective if it is the management style that is frustrating them and resulting in them leaving. This kind of thinking – systems thinking – shows that the issues are interrelated, and this interaction needs to be understood before one can determine the most effective action to take (Kim 2001).

The three elements introduced in the above example – reinforcing loops, balancing loops and delays – are the core concepts used to describe system structure (Senge 1990). These elements can be used to describe any system, regardless of how complex it is, or what its focus is.

Slobodnik and Wile (1999 p.2) point out that since the structure of the system leads to behaviour, 'The only effective way to change a team's behaviour is to identify and modify this web of relationships and interconnections'. The points at which action can be taken to change the system are called leverage points (Forrester 1994; Senge 1990). Forrester (1994) believes that there are only a few leverage points, about two per cent, that will lead to significant change within a system. The rest are ineffective.

Systems thinking can help people to identify the high-leverage points and design effective action through understanding and altering the system structure. Richmond (2000) points out, however, that most people are not used to looking for structure or thinking systemically. To see structure, people must look beyond individual events to the underlying causes of behaviour. The systems thinking iceberg, shown in Figure 10, is often used to help people see that there are many different ways of viewing a problem (Duxbury & Anderson 2000; Senge 1990).

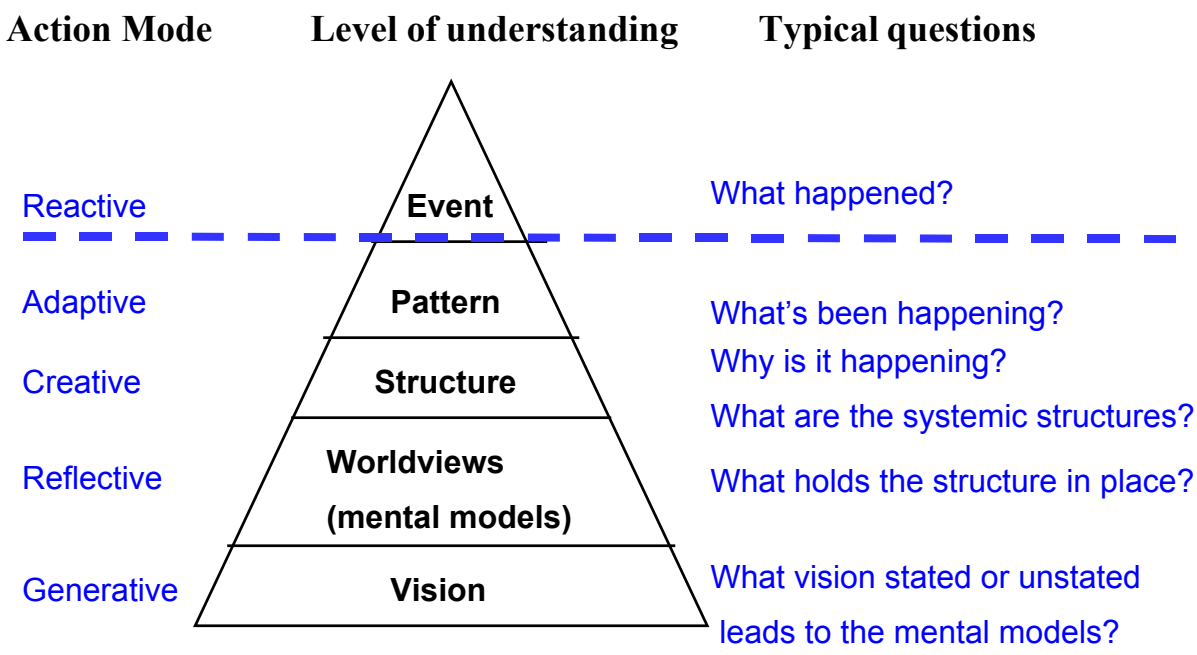


Figure 10: Systems Thinking Iceberg (Adapted from: Kim 2001 p.100)

The iceberg contains five levels at which one can view the reasons for a particular behaviour or outcome. The most common level that people look at is that of individual events. They see something occur, react, then continue with their normal duties. They do not take time to look below the water line, indicated by the dashed line, to see if it has

happened before (the pattern level), or why it is occurring (the structure, mental model, and vision level). Practitioners of systems thinking encourage people to look deeper and find the real source of the problem situation rather than react to the symptoms and individual events (Paul 1998). It shows that only changes at these last three levels will result in a change of behaviour, since these are the only levels that alter the system structure (Kim 2001). Duxbury and Anderson (2000 p.3) highlight that 'This model suggests that, like the submerged portion of an iceberg, systemic structure is difficult to see and much more substantive than we might expect'. An example of using the systems thinking iceberg is shown in Table 6.

Table 6: Iceberg example looking at fire fighting (Adapted from: Kim 2001 p.101-102)

Level and Question	Example
EVENT What happened?	Fires – *react* – put them out.
PATTERN What has been happening?	More fires in some areas than others – *adapt* – anticipate fires and build more fire stations in those areas and staff them accordingly.
STRUCTURE Why is it happening?	No requirement for fire alarms, smoke detectors, or use of non-flammable building materials – *create* – bring in codes of practice, install safety equipment.
MENTAL MODEL What holds the structure in place?	Belief that the way to fight fires is to put them out, belief that fires happen randomly, belief that it would be too costly to retrofit houses – *reflect* – need to change beliefs to see that fires can be prevented.
VISION What is the vision that generates the mental model?	The fire service is responsible for fire issues – *generate* – alter the vision to see everybody as responsible for fire prevention. Envision the fire service, housing departments, building inspectors, and others who deal with housing, working together to change legislation, develop guidelines and implement education programs to promote fire prevention. See householders taking action to reduce the risk to their homes.

When mapping the structure of an organization, it is necessary to consider all factors that will affect what occurs in that organization. This includes the attitudes and beliefs of all people within it, often referred to as the individual's mental models.

Mental models are '… deeply ingrained assumptions, generalisations or even pictures or images that influence how we understand the world' (Senge 1990 p.8). Mental models are usually in the 'form of if-then propositions' They say '… if you act in such and such a

way, the following will be likely to occur' (Argyris 1993 p.3) '… from the prosaic- "if I touch a flame, I will be burned" – to the grand – "the larger the government deficit, the higher interest rates will be"' (Sterman 1994 p.307). The concept of mental models comes from psychology, dating back to the work of Craik in the 1940s (Hutchens 1999; Shields 1999) and Freud and Jung (Dick & Dalmau 1990).

Kim and Senge (1994 p.279) explain that mental models have been called by a range of names, including 'internalised maps (Bostrom et al 1992), schemas (Fiske & Taylor 1984), beliefs and assumptions, stories (Pennington & Hastie 1991), scripts (Schank & Abelson 1977) and routines (Argyris 1990) that influence perception and action'. Vennix (1990 p.16) refers to mental models as implicit models, '… because they reside in a person's head [and] as a result … are not directly accessible for observation or investigation by another person'.

Mental models are simplifications of reality, as the complexity of life is too difficult for any individual to comprehend (van den Bergh, Ferrer-i-Carbonell & Munda 2000). Sterman (1994) explains that human beings cannot understand all factors affecting a situation; they have cognitive limitations that result in them simplifying cause and effect, ignoring feedback processes and failing to appreciate time delays between action and response.

Each person will view a situation and form a different mental model based on a range of factors such as their past experience, beliefs, cultural traditions, childhood and education (Gill R 1999; Jaworski 1996; Morecroft 1992; Smyth 2002; Spender 1985 in Greenall Gough 1993; Thurman 1993; Wals 1990; Werhane 2000). These mental models then filter what information the person sees when they encounter the next complex situation (Kim 2001; Stroh 2000; The 21st Century Learning Initiative 2001; Werhane 2000). This can set up a self fulfilling prophecy, where individuals notice events that support their mental models and discount evidence that challenges those mental models, either by not seeing it or by thinking that it does not count because it is an exception to the rule (Goleman 1995; Hutchens 1999; Kim 2001; The 21st Century Learning Initiative 2001).

This phenomenon can be demonstrated hypothetically by considering a situation in which Rob and John are two managers in a small company. Rob prefers an autocratic style of management with little staff involvement. John, however, believes that empowering staff members results in innovation and commitment to their roles. He is less controlling than Rob in his management style. Rob's mental model is that John's management style is ineffective. Rob therefore notices instances when John's staff members behave in ways that he believes are unacceptable. These instances stand out as proof to Rob that his beliefs about John and his management style are true. These confirm his mental model. However, Rob is unlikely to notice all the actions that John does take to monitor and discipline his staff. He is also likely to dismiss all the times when John's staff do perform effectively, assuming that this was just luck or irrelevant since the poor performances are of more concern.

People are often not aware that their mental models are simplified, flawed versions of reality that determine their beliefs and behaviour. This can result in disagreement, as each person assumes that his or her interpretation of reality is correct (Gill R 1999; Jaworski 1996; Smith 1999). Mental models can also lead to '… confusion, frustration, demoralisation, even anger and sabotage' when people say that they would behave a particular way in a particular circumstance, but then behave differently (Ellinor & Gerard 1998 p.175). For example '… a manager may say that he believes in collaborative decision making, yet consistently make decisions unilaterally' (Kim & Senge 1994 p.279).

Argyris (1991, 1993) explains that individuals have two types of mental models: espoused mental models, being what they say they would do, and mental models in-use, being what they actually do. Conflict between the two types of mental model is common, and studies have shown that the individuals involved may not even be aware of the discrepancy (Argyris 1991, 1993; Isaacs 1999; Jonassen 1995; Rovira 2000). The manager may truly believe that he or she *is* undertaking collaborative decision-making, failing to see that any of his or her actions contradict this.

Furthermore, studies have shown that people will use different mental models under different circumstances (Rovira 2000). Walker (1995 p.46) claims that this is 'due to constraints or choosing on non-rational grounds such as ideology, familiarity or precedent'.

People alter how they react to suit the people they are with and the surroundings they are in. Senge (1990) points out that people will behave differently in a meeting at 9am than they would discussing the same issue in a meeting at 5pm. Similarly, they would behave differently when talking to their friends and family about the issue than they would with their boss.

By understanding the existence of mental models, systems approaches help teams to see that there is no real truth, only different perceptions. It helps them to see that each team member will have a different version of how the system works and what is important. By surfacing all of these views and inquiring into the evidence that each person's view is based on, the team can form a greater understanding of the business operations as a whole system, and the causes of any complex problems that they face. This can lead to new insights on how to improve the operations and solve their problems (Miller 1991; Senge 1990, 2001b; Stroh 2000).

While this sounds simple enough, it can be quite difficult, as it requires skills in communicating and identifying causal factors – the system structure – that may not be prevalent within the staff of the organization. It is also made more complicated if the staff in the organization are used to operating as discrete departments with little horizontal communication. If this is the case, seeking to understand the business as a whole system may violate the current culture and involve addressing the politics of the organization. Furthermore if the organization is highly management controlled, staff may not have an understanding of the operations outside of their own roles and may be uncomfortable considering a wider view.

Senge (1990 p .231) explains an additional complication:

> Systems thinking is especially prone to evoking defensiveness, because of its central message that our actions create our own reality. Thus, a team may resist seeing important problems more systemically. To do so would imply that problems arise from our own policies and strategies – that is from us – rather than from forces outside our control.

The tendency to blame others is a common phenomenon (Sarah 1999a; Sterman 1994). Forrester (1994 p.16-17) provides examples:

> When Detroit was losing market share to Japanese Automobiles, executives of American companies blamed Japan for dumping at low prices, when the real cause was Detroit's own declining quality. Parents blame schools for low competence of students, when perhaps the deficiency arises more from preschool home life and failure in parental guidance. A company is more inclined to blame falling sales on unfair competition or fickle consumers than on its own poor products and service.

By reducing the ability to blame others, systems thinking requires people to face up to the undiscussable issues; the problems that are recognised but not addressed within their organization (Allen 2000b; Argyris 1993; Isaacs 1999; Jaworski 1996). Addressing these issues can be threatening to many people, resulting in defensive reactions and resistance to the implementation of systems thinking. Some individuals also see admitting their beliefs as a threatening process. Studies have shown that many people fear that they will be reprimanded if they admit not believing the dominant view, or feel they will look stupid if they admit to not knowing (Allen 2000b; Jaworski, Gozdz & Senge 1997). This leads to a range of defensive behaviours that block learning. For all these reasons systems thinking needs a culture that supports learning and change before it can be effective. This is why systems thinking and the field of organizational learning are so intertwined.

3.3 Organizational learning

Organizational learning approaches enable change to be undertaken in organizations by establishing a culture that supports learning and change. They focus on the provision of skills and tools that can help people to surface the assumptions behind their mental models, enabling them to discuss and refine them. This leads to the removal of the impediments to learning described above. Senge (1990 p.203) explains the importance of this. 'Until prevailing assumptions are brought into the open, there is no reason to expect mental models to change, and there is little purpose in systems thinking'. He also warns that 'The inertia of deeply entrenched mental models can overwhelm even the best systemic insights' (Senge 1990 p.177).

According to organizational learning theory, obtaining change in an organization *is* equivalent to learning, as it requires people to learn about the change, accept it, and

implement it (Argyris 1993; Schein 1995). As Kosko (1994 quoted in Sterling 1996 p.37) states 'You cannot learn without changing, or change without learning'.

Organizational learning theory proposes that there are two types of learning: that which does not require changes to our mental models, and that which does (Fisher, Rooke & Torbert 2000). The first kind, called single loop learning, is relatively simple. An individual absorbs some facts that agree with their existing mental models and they simply adjust their behaviour accordingly (De Geus 1997; Malhotra 1996). For example, a person operating a piece of machinery is told that an update from the manufacturer of the machine has said that the machine should have routine maintenance every four months instead of three. This probably does not pose a dilemma to the operator's beliefs; they simply accept the fact and alter their behaviour accordingly. This type of learning has also been called adaptive learning (Senge 1990) and assimilative learning (De Geus 1997).

In many cases, learning requires a change to our mental model. It challenges the individual's beliefs, resulting in the need to convince them that the change is necessary, that it is the right change to make, that it is not going to have adverse affects for them and that they are capable of performing the new process. Otherwise, the individual will discard the information and not take action. They will feel threatened and resist accepting it. This type of learning, called double loop learning, is shown in Figure 11. It requires us to alter our mental model, and is much more complicated than single loop learning (Agashae & Bratton 2001; Lane 1992; Malhotra 1996; Mezirow 1981; Walker 1995). Double loop learning has also been called generative learning (Schein 2001; Senge 1990), second-order change (Walker 1995) and accommodative learning (De Geus 1997).

Figure 11: Double loop learning (From: Sterman 1994 p.296)

Examples of situations in which double loop learning is required include those where changes from mechanical to automated production processes, or from typewriters to computers, are required. These changes have been, and continue to be, a difficult change for many people to accept and make. Those who are uncertain of the benefit from the changes, or of their ability to undertake the changes, resist them. Forced changes to work practices, like those resulting from government legislation such as equal opportunity and environmental protection legislation, are further examples of situations requiring double loop learning and a change in beliefs of many business people. If they do not change their beliefs to be in favour of the changes, the business personnel simply resist implementing them.

Dick and Dalmau (1990) claim that Ashby, in 1952, was the first person to use single and double loop learning. They state that humans learn to use single loop procedures very early in life, and that Kelman explained back in 1958 why this occurs. He explained people learn to do what their parents and other authority figures, such as teachers, want them to do, and / or reward them for. They learn not to question what the authority figures want. They just do it.

Double loop learning can occur at the team level. Where the individuals in a team have accepted the same mental model, it becomes a shared mental model. These shared mental models are often referred to as the group's dominant logic or culture (Hutchens 1999; Meadows 1997; Zahn 1999). Often these shared mental models are not stated or questioned by members of the group – everyone just accepts that is just the way things work (Meadows 1997; Robinson 1993). This failure to question shared mental models can be detrimental to the organization, as it reduces the likelihood of questioning, innovation and improvement to organizational practices (Lane 1992; Senge 2000).

Hutchens (1999) reports that the Swiss watchmakers discovered shared mental models the hard way. They failed to see the value of digital watches when the quartz technology was introduced. Their mental models said that watches were meant to tick, be beautifully crafted and mechanical. They believed that people valued these qualities. This flawed mental model led to them losing their dominance in the world watch market as consumers

took to simple, cheap, digital and / or battery operated watches produced in other countries. It was only when the Swiss watchmakers finally accepted that their mental model was flawed and altered it that they were able to regain market share through the production of Swatch watches.

Kim (1993b, 2001) explains that when teams do question their mental models and undertake double loop learning, this results in a new, shared mental model, and therefore in organizational learning. This process is shown in Figure 12. Schein (1992, 2001) adds that if this learning results in behaviour changes in order to be in alignment with the new mental model, it will result in organizational culture change. Such inquiry into mental models is rare in teams that do not have knowledge of and skills in organizational learning. In these teams, individuals tend to ignore anyone who presents a different view, believing that their own view is right, or that inquiring into the other's mental model will result in that person reacting defensively. Such behaviour prevents double loop learning from occurring. The tools of organizational learning help teams to develop the skills and ability to inquire into each other's mental models, thereby enabling organizational learning to occur.

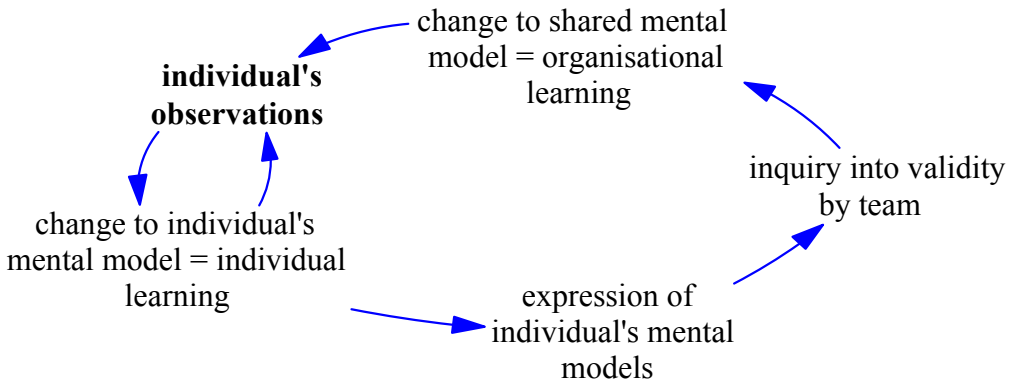


Figure 12: The link between individual and organizational learning (Developed by the present author).

De Geus (1997) explains the organizational learning process through an analogy with the bird world. He says that some birds are territorial. They defend their territory from their neighbours. If they learn something new about how to gather food or build a more stable nest, this knowledge is not passed on – only individual learning occurs. However, if the same learning occurred in birds that have a flocking tendency, then the knowledge would

be past throughout the flock reasonably quickly and all would learn: this is organizational learning.

This process of testing and refining shared mental models underpins the organizational learning approach to implementing change (Kim 2001). The approach involves a process whereby management and staff come together to discuss their mental models about the change – they discuss their fears and concerns. It includes an opportunity to form a shared understanding of how the business operates as a system and why the changes are needed. Staff members are involved in discussing the different options for implementing the change, selecting the methods to be used and implementing and reviewing those methods.

Stace and Dunphy (2001) claim that in some situations it may not be appropriate for staff to be involved in making all of the decisions, such as when a company has fallen significantly behind global best practice and needs to undergo transformational change: a major restructure. They point out, though, that while management may need to make this decision alone, it is beneficial to provide staff members with the opportunity to ask questions and to understand why the changes are needed, the implications of those changes and how they will be helped through the process. This helps them to accept the change. Stace and Dunphy (2001) warn that after any such major transformational change, a significant investment in developing trust and a supportive culture is required to enable the company to perform effectively in the future.

Senge (1999) reports that when the organizational learning process is used there is little need for coercive change. Many authors agree, explaining that when staff members are involved, resistance to change largely disappears (Ellinor & Gerard 1998; Kanter 1995; Kim 2001; Lorenz & Shapiro 2000; Schein 1995; Seven Dimensions Pty Ltd 1992d; Walker 1995). Staff members no longer have reason to be afraid. They know that while management may set the overall direction for change, they will be able to have a say in how it occurs, and ultimately will still have a position if they are performing acceptably (Kanter 1995). If some positions are to be removed, they will know the criteria on which this will be based, and what options they have to learn and develop (Stace & Dunphy 2001). Table 7 shows a range of emotional reactions that can occur when staff members face a change process at their workplace (Jones 1998; Spencer 1998).

Table 7: Feelings associated with change at work (Adapted from: Jones 1998 p.90)

Emotion	Feelings associated with the emotion	Possible reason for the feelings
Fear (generally relates to future expectations)	Uneasiness and apprehension, anxiety, worry, restlessness, feelings of panic and dread. Fear can lead to reduced self confidence, reduced self esteem, confusion and stress.	Uncertainty about the future, fear of redundancy, fear of not coping or fear of not being successful in a new position.
Anger (often relates to present situation)	Irritability, frustration, short temperedness, increased arguments at home and at work, restlessness, and rage. Anger can lead to depression, headaches, stomach upsets, sleeplessness and increased blood pressure.	Not being involved in decisions about change, reduced status, not knowing what is going on, lack of control over the situation or reduced career prospects.
Sadness (can relate to the past situation or to the present situation)	Vulnerability, hurt, sensitivity, tearfulness, preoccupation with loss and desolation. Sadness can lead to depression, feeling 'flat' and being unenthusiastic about life.	Loss of enjoyable aspect of one's job, not working with the same team, or not being recognized for the work one has done.
Joy (can relate to future expectations, present or past events)	Contentment, happiness, excitement, elation and euphoria. Unexpressed joy can lead to depression. (If the majority of staff members are negative about the change, the few people who do feel joy may feel that they cannot express it for fear of ridicule).	Being able to do something different, not having the stress of management, being able to review one's career, positive feedback from the boss or promotion opportunities.

Unaddressed emotions and the resultant resistance to change adversely affect organizational performance (Cairnes 1998; Frost 2001; Kotter 1995; Kotter & Cohen 2002). Cairnes (1998 p.52) explains that the emotions do not go away; they get hidden, thus becoming '... less controllable' and 'making business conversation, relationships, and life harder to handle'. Frost (2001) warns that like toxins in a body, these unaddressed emotions lead to disease in organizations.

Staff members who feel the above emotions can resist change through behaviours including:

> … leaving the company or organization, open disagreement, rebelliousness (cut down work levels, overtime, etc), indirect behaviour (failing to meet deadlines, being negative about all discussion of the

> future, being negative about individuals, disrupting meetings), apathy and lack of motivation. (Jones 1998 p.91)

The above resistance to change can mostly be avoided with the use of the organizational learning approach, because with this approach staff members understand why the changes are needed, and are involved in the design and implementation of those changes (Ellinor & Gerard 1998; Kanter 1995; Kim 2001; Lorenz & Shapiro 2000; Senge 1999; Seven Dimensions Pty Ltd 1992d).

Many organizations, however, are still managed traditionally, with strict managerial control, where change is expected to result from a management directive and staff members are not involved in designing the change process (Cairnes 1998). This has proven '… notoriously ineffective' (Isaacs 1999 p.337; Atkinson 1998; Carr 1996) and is often referred to as the mechanistic approach to management and change, because management acts as if change should be simple, like fixing the broken part of a machine (Clannon 1999; Dunphy 2001; McLeod 2001; Senge 1990; Senge & Carstedt 2001).

The mechanistic approach to management does not address people's emotions, and results in significant resistance to change and defensiveness from staff (Cairnes 1998; Johnson & Wilson 1998; Slobodnik & Wile 1999; Sugarman 2000). Ellinor and Gerard (1998 p.43) explain that the machine metaphor for organizations is based on the following assumptions:

- Organizations function as large machines with removable parts and in a hierarchic structure.
- Workers are mere cogs in a wheel, removable, replaceable and expendable.
- Leaders are captains at the helm of slow moving ships.

They state that underpinning these larger assumptions are a range of unspoken mental models that determine organizational behaviour (Ellinor & Gerard 1998 p.170)

- Decisions and action create results. Reflection and soak time do not.
- Attention to relationships and quality are secondary to quick decisions and action.
- Agreement = closure, and getting on with it is more important than shared understanding of what is agreed upon.

- Fast equals efficient equals good. Slow equals inefficient equals bad.
- Being right and being certain are strengths. Not knowing is a weakness.
- Diversity creates problems and is not efficient. Similarity and agreement lead to fast, predictable results.
- It is better to act as if those in power know best even when they don't.
- We all have specific roles and will be evaluated on that basis.
- Responsibility without power/control is undesirable.

Ackoff (1994) explains how the machine metaphor developed. He feels that during the industrial revolution the success of business relied mostly on machines. Staff members were uneducated, replaceable 'parts' that worked with the machines. Labour was plentiful. Management made the choices and the workers performed the same function over and over, just like parts in a machine. Companies worked towards profit, and management made the decisions alone.

He states that this began to change as staff became more educated and demanding, unions came in and governments regulated working conditions. Management were also forced to change their practices due to the increased mechanisation of production. The mechanisation meant that machine operators had to have greater skills, and managers had to invest in their training. Such increased expenditure meant that organizations needed to retain their staff members in order to get a return on their training investment. Businesses also became public entities in order to gain capital, which required owners to relinquish some control to a board of shareholders.

Ackoff (1994) claims that the Second World War led to further changes as many workers were sent off to fight and women, the elderly, and even children were bought in as replacements. These people worked more out of patriotism than for money, and hence did not respond well to the impersonal nature of the business culture. For the first time management had to treat their workers as human beings with their own purposes and goals. Ackoff (1994) states that after the war, servicemen came back to work and demanded to be treated as individuals; the military approach of ordering had become repugnant to them.

This trend grew further in the sixties and seventies, when people started to see work as a necessary evil. They did not focus on material goods, and would only work if they wanted to and if the company treated them well. Protest groups also started pressuring business to be responsible for its impacts on society and the environment. The above factors combined to influence management to adopt a more social view of business.

While Ackoff (1994) explains that the trends away from the mechanistic approach to change and management have been occurring for some time, many businesses are still operated in a highly management-controlled manner. This makes undertaking effective change very difficult (Berdish 2001; Jaworski, Gozdz & Senge 1997; Yankelovich 1999). Even if the proposed changes are technically and economically viable, the failure to deal with staff emotions and resistance can result in the failure of the change attempt (Johnson & Wilson 1998).

Jaworski, Gozdz and Senge (1997 p.3) explain that such approaches often result in:

> … grand strategies that are never implemented, sweeping re-organizations that produce more unintended problems than intended benefits, and superficial "roll-out" strategies where somehow, magically learnings in one or two pilot sites are supposed to be spread to 200 operating units.

Cairnes (1998 p.159) has found that the mechanistic approach to change leads to confusion where:

> … CEOs feel powerless to obtain change in their organizations, they can advocate it, try to force people, but ultimately the people can resist and often do. The staff feel powerless thinking that all the power is at the top with the CEO. They feel that they can't enact change and put up with a working life that is less than satisfactory or productive.

In explaining the need to move from a mechanistic approach to an organizational learning approach to management and change, Senge (1999 p.8) uses a gardening analogy to show that it is pointless for managers to order their staff to change. He explains that when gardening we do not stand over the garden and say "Grow! Grow or you'll be fired!" It does not work. Instead, the gardener looks at the conditions that stop the garden growing, the balancing factors – water, fertiliser, soil alkalinity, temperature – and tries to remove these limits, so that growth can continue. Senge (1999 p.8) calls for business managers to do this when implementing change in their workplaces. 'Sustaining change requires

understanding the reinforcing growth processes and what is needed to catalyse them, *and* addressing the limits that keep change from occurring'.

Argyris (1993) warns that while people can be coerced to change their behaviour through management directives or incentives, if their mental model has not been altered to believe in the importance of the new action, the change will not last. He states that people will revert back to their old behaviour, undermine the change, or leave. He emphasises that changes to mental models are necessary in order to obtain true, long lasting change. Stace and Dunphy (2001 p.264) agree, stating that 'Permanent change is deep change, to be effective change must go to the core of the organization, to positively affect the behaviours and attitudes of its people'.

Kotter (1995 p.67) suggests two important actions management can take to ensure that the changes achieved become a lasting part of the culture. He states that management should make '… a conscious attempt to show people how the new approaches, behaviours, and attitudes have helped improve performance', continually communicating their importance. Second, they should ensure that any staff members recruited or promoted have attitudes and behaviours that support the changes. Together these two actions will support further change and ensure that practices do not revert back to their original form.

Handy (1995 p.46) believes that there are significant advantages in being a learning organization. They are '... far more responsive, efficient, and cost effective'. However, becoming a learning organization requires significant changes to traditional management styles, as shown in Table 8 and Table 9.

Table 8: Machine versus Learning Metaphor for Organizations (Adapted from: Ellinor & Gerard 1998 p.45).

Machine Metaphor	Learning Metaphor
Focus on structure and tasks	Focus on relationship and process
Power and control	Shared leadership
Top down decisions	Shared meaning and consensus
Competition	Collaboration / community
Self-mastery	Collective mastery and leveraging diversity
Linear thinking	Systems thinking
One right answer	Many right answers / paradox
Fragmentation	Holistic

Table 9: Differences between traditional and learning organizations. (From: Sugarman 2000 p.11)

	Old model bureaucracy	New model learning organization
Strategy	Replicate, follow the formula, mass produce	Innovate to please the customers
Structure	Hierarchy, vertical, chain of command, big picture held at the top	Networks, horizontal, many project teams, maybe matrix, everyone has the big picture
Systems	Formalised, coordination by the rule book, standard operating procedures very important	Informal, coordination by mutual adjustment
Style	Conformity, please the boss, politics, everything in its place	Creativity, learning, participation, dialogue, politics (rivalry) over priorities and strategies
Staffing	Role clarity, dispassionate	Flexible job boundaries, passion about work
Skills	Narrowly specialised	Versatile, cross trained
Purpose	Create profits and rising share values for investors (business). Administer programs and policies authorised by the legislature (government).	Fulfil a shared vision of organization mission through creative work in a community of employees, partners, and stakeholders (both government and business).

These are fundamental changes to the operation of traditional hierarchical business organizations. From management holding all knowledge and power, to open communication, mutual trust, and staff involvement; from survival of the fittest, rewarding individual behaviour and achievement, to rewarding team based actions; from static, clearly defined positions, to flexible, ever changing positions (Schein 2001).

Jaworski, Gozdz and Senge (1997) warn that while management may recognise the need for change in organizational approaches, they are the ones with the most vested interest in maintaining the traditional management style. It is that style which they mastered to become the top layer: changing that is threatening. Many authors agree, with some pointing out that managers find it hard to let go of control, and fear being held accountable for the consequences of staff empowerment (Cairnes 1998; De Geus 1997; Dunphy 2000; Griffiths 2000; Handy 1995; Kotter 1998). This leads to defensive routines, and the tendency to recentralise and reassume power when they feel threatened.

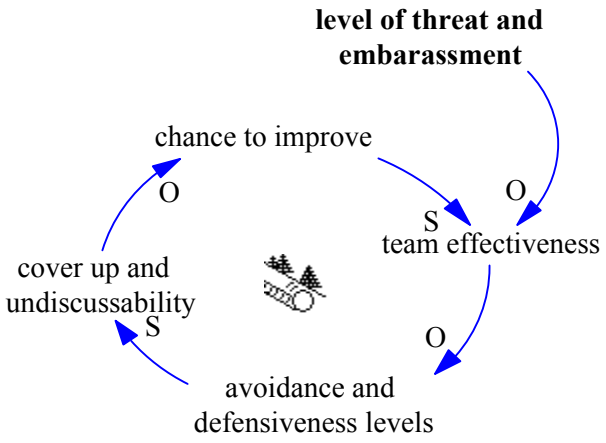
Similarly, staff may feel that they are being forced to change and adopt organizational learning principles in order to retain their positions or be promoted. They may not want to look outside their position or accept that it needs to change, the result being defensiveness and resistance. Schein (2001) goes so far as to compare the situation of staff to those of prisoners in a political camp, stating that the pressure and coercion to adopt the new way is just as strong.

Seven Dimensions Pty Ltd (1992c) point out that even if staff see the value of the changes, they may not be willing to implement them because management often expects them to do so on top of their normal jobs. In many organizations staff members are already performing more than their original roles due to recent trends of downsizing and are already adjusting to previous changes that have been made to cope with the changing market place (Hines & House 2000; Kotter 1995; Kotter & Cohen 2002; Pears 2000). The result is a contradiction to the rhetoric that staff will embrace the empowerment involved in organizational learning. They may not. The staff members may be change fatigued resulting in resistance and defensive routines.

Argyris (1993) explains that defensive routines are a form of rigid mental model from which teams suffer. They do not allow for discussion of issues that would lead to team members feeling threatened or embarrassed. They prevent the detection and correction of errors, limit inquiry and hinder problem solving and decision-making, ultimately leading to reduced organizational performance (Agashae & Bratton 2001; Argyris et al 1985, 1990, 1993; Cunningham, Sinclair & Burritt 1997; Johnson 2000; Ramsey & Wells 2000; Smith & Yanowitz 1999; Sterman 1994). The process is shown in Figure 13 and Figure 14.

Features that are embarrassing or threatening:

- Dissatisfaction with group performance
- Politics
- Attribution that causes of low performance are not discussible
- Recognition of norms against dealing with conflicts or views openly



Impact on team effectiveness:

- Arrive late, leave early
- Miss meetings
- Remain active while experiencing burnout, discuss only boring issues
- Effectively disband group

Actions that excuse and maintain cover up:

- Blame others internal or external
- Privately express dissatisfaction about group performance
- Privately hold doubts about group's ability to change
- Experience helplessness
- Distance oneself from one's own causal responsibilities

Figure 13: Self fuelling, uncorrected group processes (Adapted from: Argyris 1993 p.44)

Guiding Values	Key Strategies	Consequences
Win don't lose Avoid unpleasantness	Discourage critical scrutiny of own views by: • Non-disclosure • Discouraging expression of objections Test views and reactions privately rather than publicly Make unilateral decisions about how to manage: • Content • Processes • Emotional reactions	Problem solving effectiveness is decreased through: • Non-disclosure of critical and/or threatening information • Inadequate testing of assumptions and opinions Intellectual commitment is reduced since: • Objections not surfaced and resolved • Problem solving seen as controllers responsibility Emotional issues threaten problem solving effectiveness

Figure 14: Defensive routines in organizations (From: Robinson 1993 p.68 who states it is a substantially modified version of Model 1 from Argyris & Schon 1974)

Senge (1990 p.254) warns that 'The more effective defensive routines are, the more effectively they cover up underlying problems, the less effectively these problems are faced, and the worse the problems tend to become'. Removing these defensive routines

requires teams to be prepared to admit their existence and invest the necessary effort to remove them (Argyris 1991, 1993; Digenti 2001; Jaworski, Gozdz & Senge 1997; Nevis et al 1995; Senge 1990; Sterman 1994). This requires individuals and the team to: 1) decide that they *aspire* to remove the defensive routines, 2) be able to undertake *generative conversations* (where these issues can be discussed in non-threatening ways to generate a shared understanding and solutions) and 3) *understand the complexity* within their organization and why the defensive routines have arisen. These three capabilities underpin the organizational learning approach as pictured in Figure 15.

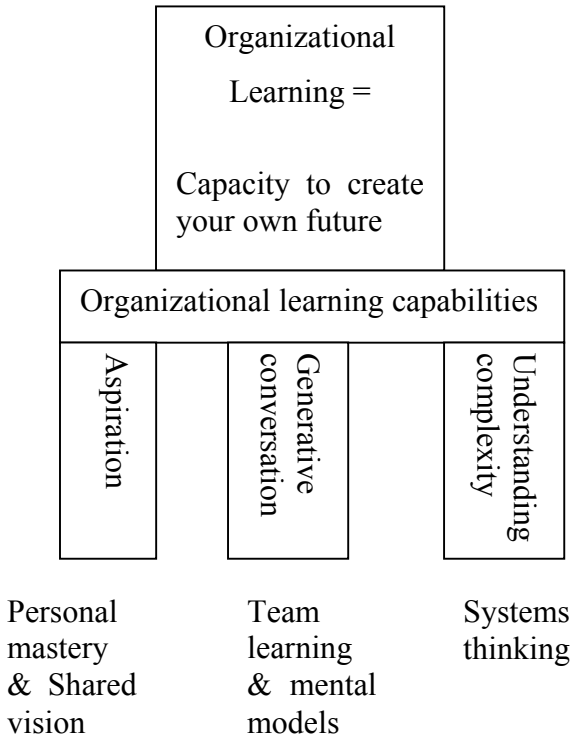


Figure 15: Three legged stool of organizational learning (Adapted from: Kim 2001 p.30).

The above diagram shows that underpinning the three organizational learning capabilities are the five disciplines of the learning organization, as developed by Senge (1990): personal mastery, shared vision, team learning, mental models and systems thinking.

Organizational Learning Capability 1: Aspiration

Aspiration refers to the individuals and the team developing a vision of how they want to work together, of the types of organizational practices they would like to see. They then

compare this to their current reality and commit to take action to move towards their *shared vision*. In this way each party is committed to making the vision come true. This normally results in commitment to move away from strict management control towards participative management, with a focus on learning and the removal of defensive routines. This requires each individual to practice *personal mastery* – to move towards his or her goals and manage their emotions in non-defensive ways (Cairnes 1998; Handy 1995; Jaworski, Gozdz & Senge 1997). Since the team has committed to the removal of defensive routines, it should make it safe for staff to point out when such routines are occurring. This enables action to be taken to remove them. To do so requires the ability to undertake generative conversations.

Organizational learning capability 2: Generative Conversations

Generative conversations require people to understand that they each have a different *mental model,* and that these are simplified, flawed representations of reality. It requires team members to realise that they can learn from each other, if they expose their mental models and the evidence they are based on, allowing others to inquire into them. Through this process of exposing and discussing individual mental models, a shared understanding of the business as a system can develop; the *team learns* together.

Organizational learning capability 3: Understanding complexity

Understanding the business as a system, as one entity, requires individuals to have *systems thinking* skills, which were explained earlier in this chapter.

Kim (2001 p.31) explains that the stool shown in Figure 15 is a useful analogy, as it shows that the five organizational learning disciplines or skills are interdependent. If one is missing the stool will fall over and organizational learning will not occur. If the disciplines are developed at different rates, the legs will be of different length, the stool will be wobbly, and probably collapse. Similarly if organizations develop the five disciplines in isolation of each other, they may obtain some short-term success, but it is not likely to last. Kim (2001) warns that unfortunately many organizations do not realise this; they fail to build capacity to undertake organizational learning effectively. They get disappointing results and then conclude that the concept must be flawed. Kim and Senge (1994 p.278) have found that this is a common occurrence in today's business environment, with serious

consequences for companies. They demonstrate this tendency through an analogy to calculus:

> It has taken me a long time to begin to get what this new worldview is all about. I'm beginning to feel like I felt in my freshman calculus class. After months of confusion, I began to get it. Within a year, I had begun to develop some competence. Within four years, the basic tools and way of thinking were an integrated part of my professional skills…The problem is, if calculus were invented today, our organizations could never learn it. We would send everyone off to the three-day crash course and then tell them to go off and apply it. After three months we'd check if it was working. Since little would have been achieved, we'd conclude that there really wasn't much there, and we'd move on to the next program.

For organizational learning to be implemented successfully, it requires more than the improvement of staff skills in the five disciplines. It also requires a learning-supportive culture where:

- Staff members feel safe to implement their new skills (Coghlan 2000; Gerard & Ellinor 2000; Isaacs 1999; Kofman & Senge 1995; Suarez 1993);
- Information is shared and problems discussed openly (Jaworski, Gozdz & Senge 1997; Nevis et al 1995);
- Diversity is appreciated and ideas from everyone are encouraged (Kofman & Senge 1995; Nevis et al 1995);
- It is acceptable to say 'I don't know' (Berdish 2001); and
- People are accepting of change (Cairnes 1998).

This requires management to fully support the implementation of organizational learning through exposing their own mental models for inquiry, and demonstrating the use of organizational learning skills (De Geus 1997; Isaacs 1999; Johnson 2000; Nevis et al 1995; Por & Molloy 2000). That is, managers need to 'walk the talk', showing that their mental models in-use and espoused about the importance of organizational learning are aligned (Cairnes 1998; Handy 1995; Kotter 1995, 1998; Kotter & Cohen 2002; Kouzes & Posner 1995; Senge 1990; Stace & Dunphy 2001; Suarez 1993).

Undertaking the above actions will align the team, enabling them to work together to achieve their shared vision. This process is illustrated in Figure 16. Wolfenden (1999) suggests that team members may not align completely due to their individual goals and

differences. He suggests that while heading in a much more aligned direction than the arrows on the left hand side of the diagram, the arrows on the right hand side should still be going in slightly different directions to recognise this fact.

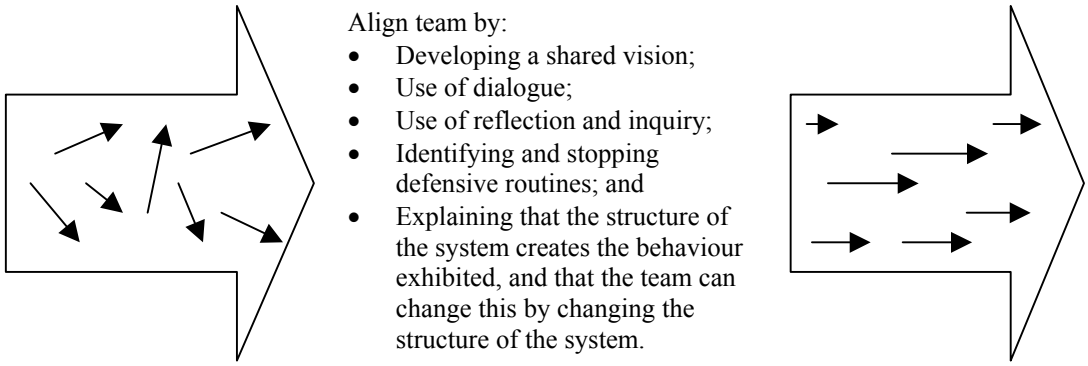


Figure 16: Unaligned and aligned team energies (Adapted from: Senge 1990 p.234).

For organizational learning to be successful it is also important that management regularly communicate the importance of the change, through many different channels (Kotter 1995). They should '… show the meaning of people's everyday work to that larger purpose' (Kotter 1999 p.32), and they should identify and remove constraints to the change, while establishing processes that support and encourage the change (Kotter 1995; Senge 1999). This will include establishing learning infrastructures (Handy 1995; Jaworski, Gozdz & Senge 1997; Johnson 2000; Kim 2001) where

- Staff members are provided with time to implement their skills and reflect on the business operations (Agashae & Bratton 2001; De Geus 1997; Isaacs 1999; Jaworski, Gozdz & Senge 1997; Kotter & Cohen 2002); and
- They are given problems to work through and research to undertake which will further build their organizational learning capacities (Berdish 2001; Nevis et al 1995; Senge 1990; Senge & Kim 2001).

If time is not allocated for these tasks, they are unlikely to be undertaken. For this reason Kotter and Cohen (2002) highlight that time needs to be created, either by redesigning practices to reduce the amount of time required for each role or by delegation of tasks, so that individuals have time to allocate to the changes.

Creating opportunities for people to work together on the changes recognises that learning is a social process and that through learning together, the sense of trust and safety to implement organizational learning is enhanced (Jaworski, Gozdz & Senge 1997; Por & Molloy 2000; Schein 1995). Kim (2001) highlights that like sports teams and orchestras, business teams need to practice regularly to become effective in the use of organizational learning principles.

Management also needs to accept that individuals will adopt and implement the changes at different rates (Soderbaum 2000; Kotter 1995). They should reward the early adopters and encourage these leaders who exist at all levels of the organization, to work with the resistors and the fence sitters to encourage them to adopt the changes (Coghlan 2000; Dunphy 2000; Fraser 2000; Kotter 1995, 1999; Stace & Dunphy 2001; The SIGMA Project 2001). This network of change-supportive people form a powerful guiding coalition that should be nurtured, as they are often able to have a greater influence in convincing people to change than management can. A person may be willing to discuss their concerns and fears with a peer they respect, but reluctant to discuss such issues with their manager or the CEO (Kotter 1999).

Management should also redesign reward systems to support organizational learning and teamwork rather than individual success (Kotter 1995, 1996; Kotter & Cohen 2002; Por & Molloy 2000). By doing this it becomes in each person's best interest to accept the changes (Dick & Dalmau 1990). They should aim for some visible short-term wins, as well as longer-term wins. The short-term wins boost the confidence of staff in their ability to make the changes, confirm that the changes are worthwhile undertaking, and encourage those who still resist or who doubt that the changes will be effective to become supportive (Kotter 1995, 1998).

Management needs to recognise that mistakes may be made along the way and to convince staff that this is okay, otherwise staff will not try any new activities (Handy 1995; Kotter 1995; Schein 1995; Seven Dimensions Pty Ltd 1992f). Senge (1990 p.300) calls for real forgiveness, which he defines as forgive and forget. He explains that:

> Sometimes, organizations will "forgive" in the sense of not firing someone if he makes a mistake, but the screw up will always be hanging

> over the offender's head. Real forgiveness includes "reconciliation," mending the relationships that may have been hurt by the mistake.

In this vein, management should view mistakes as learning opportunities (Fisher, Rooke & Torbert 2000; Handy 1995; Kofman & Senge 1995; Kouzes & Posner 1995 Nevis et al 1995) and problems as challenges (Robinson 1993). They should recognise that it is the structure of the system that leads to behaviour, therefore realising that blaming individuals is pointless and stifles learning. Staff and management should seek to understand what led to the problem and alter the structure accordingly. That is, they should be constantly refining their understanding of how the business operates as a system, recognising that their views can always be improved (Berdish 2001; Cairnes 1998; Johnson 2000; Kofman & Senge 1995; Nevis et al 1995; Senge 1990; Yankelovich 1999). Through these actions they can identify and remove the constraints to change, and support the change process (Kotter 1995; Senge 1999).

It takes considerable time to learn the necessary skills and create a learning-supportive culture (Fisher, Rooke & Torbert 2000; Yankelovich 1999). Jaworski, Gozdz and Senge (1997 p.15) warn that the:

> … iterative process of generative interviews, data analysis, coaching, surfacing undiscussables and learning disabilities, and initial group dialogues can take nine months or longer for a large corporation. Moreover, many of the issues that arise in this process can only be resolved and significant progress achieved over still longer periods of time.

Yankelovich (1999 p.122) lists the following criteria for determining the kinds of problems that require extended dialogue. He defines 'extended dialogue' as a commitment of at least six months duration with frequent meetings.

1. A deep and prolonged heritage of mistrust has kept the participants apart;
2. A serious conflict of interest of religious-type intensity divides the participants;
3. The participants must abandon their familiar and comfortable conceptual frameworks and paradigms for new ways of thinking and knowing; and
4. The purpose is to move the participants to deeper levels of intimacy or to higher levels of thought than any one individual may be capable of achieving.

For many organizations, introducing change to practices will require addressing these issues, and will therefore fall into the extended category that Yankelovich (1999) mentions. Management therefore needs to accept that this will take time, and that the implementation of organizational learning and changes will not be effective without the creation of a learning-supportive culture (Agashae & Bratton 2001; Hawken 1993; Lorenz & Shapiro 2000; Smith & Yanowitz 1999; Sugarman 2000; Teisseyre 1997).

3.4 Surfacing and refining mental models

The underlying issue in organizational learning is the surfacing and refinement of mental models. The above supportive learning atmosphere is needed to enable staff to feel safe to expose their mental models for discussion. There are many methods that can be used to surface and refine mental models. The methods reviewed and used throughout this thesis include

- Dialogue which underpins all of the other methods (Argyris 1993; Berdish 2001; Jaworski 1996; Kim 2001; Senge 1990, 2001; Smith & Yanowitz 1999);
- Exposing gaps between espoused mental models (what a person says they do) and mental models in-use (what the person actually does) (Argyris 1993; Senge 1990);
- Systems archetypes (Kim 2001; Senge 1990);
- Systems mapping / causal loop diagrams (Argyris 1993; Berdish 2001; Canas, Leake & Wilson 2000; Kim 2001); and
- System dynamics models and learning environments (Kim 2001; Senge 1990)

3.4.1 Dialogue

Gerard and Ellinor (2000 p.1) explain dialogue as '… a form of conversation intended to build shared understanding and learning, around how the members of a group think about a given issue or question'. Dialogue is often confused with other forms of communication such as debate and discussion, however it varies significantly from these, as shown in Table 10 and Table 11. Isaacs (1999) summarises these differences in diagrammatic form as shown in Figure 17.

Table 10: The conversation continuum (From: Ellinor & Gerard 1998 p.21)

Discussion / Debate	Dialogue
Breaking issues/problems into *parts*	Seeing the *whole* among the parts
Seeing *distinctions* between the parts	Seeing the *connections* between the parts
Justifying/defending assumptions	*Inquiring* into assumptions
Persuading, selling, telling	*Learning* through inquiry and disclosure
Gaining agreement on *one* meaning	Creating *shared* meaning among many

Table 11: Debate v Dialogue (From: Yankelovich 1999 p.39)

Debate	Dialogue
Assuming that there is a right answer and you have it	Assuming that many people have pieces of the answer and that together they can craft a solution
Combative – participants attempt to prove the other side wrong	Collaborative – participants work together toward common understanding
About winning	About exploring common ground
Listening to find flaws and make counterarguments	Listening to understand, find meaning and agreement
Defending assumptions as truth	Revealing assumptions for re-evaluation
Critiquing the other side's position	Re-examining all positions
Defending one's own views against those of others	Admitting that others' thinking can improve on one's own
Searching for flaws and weaknesses in other positions	Searching for strengths and value in others' positions
Seeking a conclusion or vote that ratifies your position	Discovering new options, not seeking closure

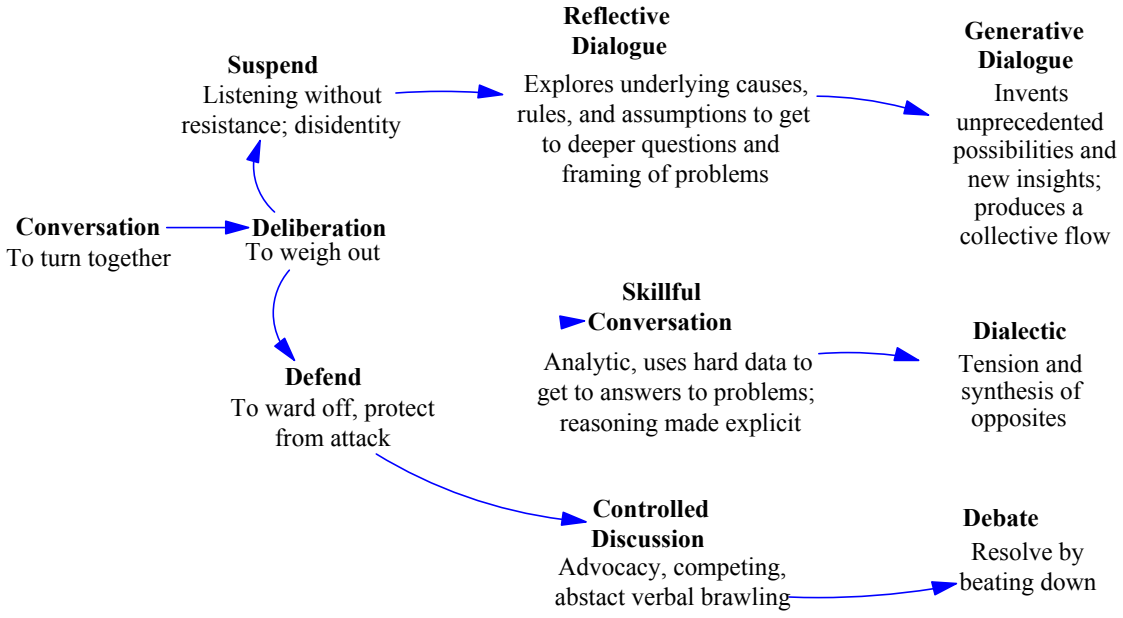


Figure 17: Types of conversation (Adapted from: Isaacs 1999 p.41)

Yankelovich (1999) explains that as well as using dialogue to inquire into and refine mental models it can also be used to overcome emotional misunderstandings. He points out that individuals often project their feelings from past events into current discussions; this is the principle of transference used in psychotherapy. For example, in a conversation between two managers, one of them (Frank) might not realise that the reason he is reacting angrily is because the way he is being spoken to by his work colleague reminds him of the way his father used to speak to him as a child. Dialogue could be used to help him inquire into why he is feeling that way and to help him overcome such reactions.

For instance, once Frank realises why he reacts angrily when spoken to in a certain way, he can choose to notice each time he is about to react, realise that it is related to his father rather than the current event, and therefore decide to let the anger go and not react. Or he may choose to use dialogue to expose his feelings with a statement such as "when you talk to me in that way, it reminds me of how my father used to scold me, and it annoys me. I am telling you this so that you understand that my reaction is not necessarily about you, and that I do want to continue working on the organizational problem with you". This would enable the problem solving to continue. If Frank did not feel comfortable raising his emotional reaction, or did not realise where it came from, it is likely that the other person involved would react defensively to Frank's anger, leading to an escalation of conflict and negative consequences for solving the organizational problem. The ability to manage such issues is called 'emotional intelligence' (Duxbury & Anderson 2000; Goleman 1995; Senge 1996). Dialogue is one tool that can be used to help people improve their emotional intelligence and their team interactions.

Senge (1990 p.200) provides the following guidelines for undertaking dialogue:

- Make your own reasoning explicit (i.e. say how you arrived at your view and the "data" upon which it is based)
- Encourage others to explore your view (i.e. "Do you see gaps in my reasoning?")
- Encourage others to provide different views (i.e. "Do you have either different data or different conclusions or both?)
- Actively inquire into others' views that differ from your own (i.e. "What are your views?" "How did you arrive at your view?" "Are you taking into account data that are different from what I have considered?") …

- If you are making assumptions about others' views, state your assumptions clearly and acknowledge that they are assumptions.

While the concept of dialogue is deceptively simple, it does require teams to have the following qualities for it to be effective:

- Openness, where individuals state their assumptions thereby enabling others to inquire into and examine them. This inquiry and examination is done in a non-judgemental way (Ellinor & Gerard 1998; Isaacs 1999; Robinson 1993; Senge 1990, Walker 1995; Wheatley 2000; Yankelovich 1999). People simply ask for further information to clarify the issues (Ellinor & Gerard 1998).

- Authenticity, commitment and trust, creating a supportive climate or 'container' in which to hold the dialogue (Dick & Dalmau 1990; Ellinor & Gerard 1998; Isaacs 1999; Papadakis 1996), with suspension of power so that all people feel equal and safe to contribute (Robinson 1993; Walker 1995; Yankelovich 1999).

- Listening deeply to self and others to enable the development of collective meaning (Ellinor & Gerard 1998; Isaacs 1999; Wheatley 2000; Yankelovich 1999). This requires a slower pace, with silence between speakers, so that people can reflect. The team should understand that it is not necessary to make a decision; the purpose is to explore and learn (Ellinor & Gerard 1998).

3.4.2 Expose gaps between mental models in-use and espoused

This technique simply provides evidence of a gap between a person's mental model espoused (what they say they do) and mental model in-use (what they actually do). By helping the individual to see the contradiction, it motivates them to take action to align their mental models (Balasubramanian 1997; Dick and Dalmau 1990; Isaacs 1999; Senge 1990). Argyris (1993) recommends tape recording conversations and meetings to reveal these contradictions. The transcripts of these can be used as irrefutable evidence to present to the individual. For instance, the manager discussed earlier, who believes that he practices participatory decision making, could be presented with instances in which he has made decisions unilaterally. Dialogue principles are used in presenting the evidence in order to minimise evoking defensiveness.

3.4.3 Systems archetypes

The systems archetypes are a collection of recurring structures that are common to a range of circumstances: work, home and society. They are used to help individuals to see the importance of looking beyond the event level, to see that structure really does cause behaviour (Senge 1990). This helps them to adjust their mental models about causal relations and to realise that there is no point blaming one person or group for a particular problem (Kim 2001). It helps people to see the leverage points for addressing situations, and encourages them to look for system structure in all situations that they encounter (Senge 1990). The use of systems archetypes to alter mental models is recommended by several authors (Isaacs 1999; Kim 2001; Senge 1990).

There are many systems archetypes, though only two will be demonstrated here: the 'tragedy of the commons' and 'limits to success'. For further information on these and other archetypes see Kim (1992, 1994), Kim and Anderson (1998) and Senge (1990).

3.4.3.1 Limits to success

This archetype, also referred to as 'limits to growth', contains only two loops: a reinforcing loop that creates growth and a balancing loop that slows the growth down, as shown in Figure 18.

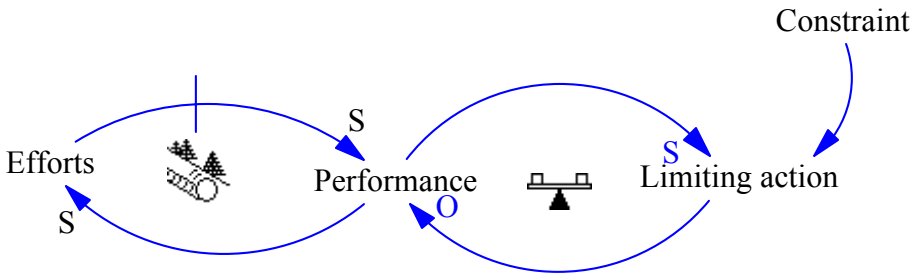


Figure 18: Structure of the limits to success archetype (From: Kim & Anderson 1998 p.43)

It is a very common archetype in business and society. Examples include:

- The growth of a small business, whose success and expansion is eventually slowed by the lack of management and administration skills of the entrepreneurs who established the company (Kim & Anderson 1998).

- The growth in the number of suggestions for improvement to practices when staff are empowered, which eventually slow down as staff become frustrated at the delay in management implementing their suggestions, or they hit the wall of that which management is prepared to let them influence (Kim & Anderson 1998).

- The marketing division of a manufacturing company runs a sales campaign that is successful in increasing orders. Pleased with the result they continue the push, but eventually find that no matter how hard they push sales decline. The manufacturing capacity has been exceeded, resulting in increased delivery delays, which affect the company's reputation and the customers' patience, leading to lowered sales (Kim & Anderson 1998).

- Individuals work hard to earn money and grow their wealth, but find that they are then too busy and stressed to enjoy the money. This leads them to decide to slow down their work and therefore lower their earnings (Kim 1992).

- Individuals decide to diet and eat less, resulting in weight loss. Spurred on by the success they continue to eat less, but find that the rate at which they lose weight is slowed or even stopped, as their body's metabolic rate adjusts to the lowered food intake (Kim 1992).

When faced with the slow down in growth, most people work harder trying to gain the same results that they previously did. However, no matter how hard they try, the growth does not improve, as it has hit the systems limit (Kim 1992, 1994; Kim & Anderson 1998; Senge 1990). The leverage point lies in recognising potential limits before they take hold, and taking action to remove them (Kim 1992). This involves addressing the balancing loop, not the reinforcing loop (Senge 1990).

Failure to identify and address the limit before it takes hold can have deleterious consequences, such as in the case of the small company that needed more professional management. By the time the entrepreneurs accepted the fact that they could no longer manage the growing business effectively, growth had started to decline. Delays in finding, hiring, and bringing those who were eventually hired up to speed meant further declines in sales, resulting in a cut back to all departments including research and development expenditure. This led to losing their reputation for innovative products and their niche market as competitors caught up. This ultimately led to the company's demise (Kim & Anderson 1998).

The lesson to learn from the limits to success archetype is that excessive growth is not always beneficial to the organization, and that companies should plan for growth. They should look for limits before they take hold, that way action can be taken to prevent them adversely affecting the company. Senge (1990 p.102) explains that

> There is another lesson from the limits to growth structure as well. There will always be more limiting processes. When one source of limitation is removed or made weaker, growth returns until a new source of limitation is encountered.

This archetype can be used to help people accept that mental models such as 'If it ain't broke don't fix it' or 'I've been doing it this way for 20 years and I am not about to change' are deleterious to organizational performance and need to be altered (Kim 1994).

3.4.3.2 Tragedy of the commons

The tragedy of the commons is a systems archetype related to limits to growth, but much more complicated. It consists of six causal loops, as shown in Figure 19 (Kim & Anderson 1998). It occurs where individuals make use of a common resource and are either not aware of, or not concerned with, how much of the commons is being used by themselves and others over time. While there is still plenty of the commons this does not cause any problems. However, as the resource limit of the commons is reached, each individual will start to receive diminishing returns for their effort, and ultimately their continued use of the commons may lead to its collapse (Kim & Anderson 1998; Senge 1990).

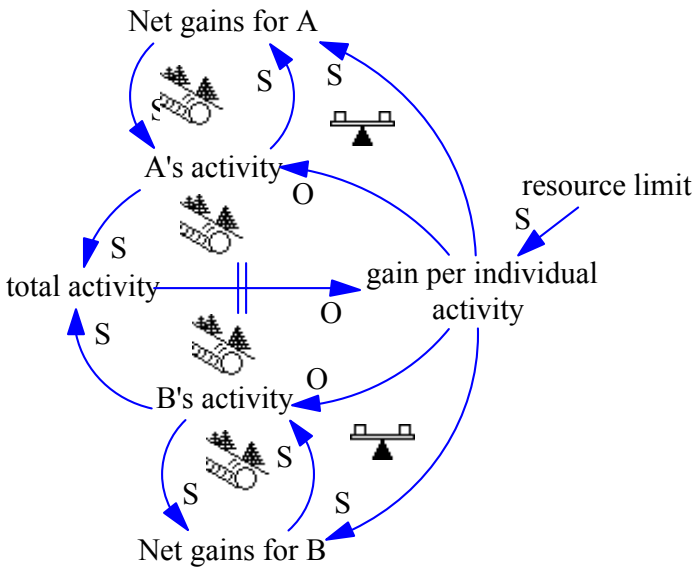


Figure 19: Tragedy of the commons structure (Adapted from Kim & Anderson 1998 p.111)

This archetype is very common in business situations in which many individuals or departments have access to common resources. Examples of such common resources include '… the word processing pool, the IT support group, machine capacity, power supply, total market or funds available for investment' (Kim & Anderson 1998 p.112), '… financial capital, productive capital, technology, community reputation, good will of customers, good will and support of suppliers, and the morale and competence of employees to name a few' (Senge 1990 p.296).

It is also very common in environmental situations where the commons is the atmosphere, ecosystems, fish stocks, rainforests, land, water, minerals, and animal life (Kim & Anderson 1998; Senge 1990). It even occurs in social situations, such as when too many people decide to go to the pool on a hot day, resulting in overcrowding and reduced enjoyment for all. Or when many people attempt to use the freeway to commute to work, resulting in traffic jams and slower speeds (Kim 1992).

Since the individuals may not perceive the existence of the commons, or understand the consequences of their and others' actions, it is common for individuals to work harder and to use more of the resource when they start to notice the diminishing returns for their efforts. For example, when the fishermen are finding fewer fish in their nets, they fish even

harder (Kim & Anderson 1998). This further use accelerates the decline of the common resource and increases the likelihood of collapse.

An individual who does understand the significance of their actions may decide to take less of the resource, however this will be ineffective, since another person will just take the part of the commons that the first individual has decided not to take (Kim & Anderson 1998; Senge 1990). Leverage lies at a higher level. It lies in helping everyone to identify the common resource and to agree to its management, so that it is not over depleted (Kim 1992; Kim & Anderson 1998; Senge 1990). Senge (1990 p.297) explains that in managing a tragedy of the commons situation there are two choices:

> The first is to set up a manager of the "commons" – someone or some group who can influence the actions of the local units that put the "commons" at risk…the second approach…is to establish signals…that alert local actors that a "commons" is in danger. This second approach puts the onus on local managers to practice self-restraint.

Kim and Anderson (1998) explain that calculating the future losses that each face if the commons collapses can help individuals to realise the seriousness of the situation, and foster their commitment to action. Kim (1992 p.27) adds that 'evaluating the current reward system may highlight ways in which incentives can be designed so that coordination among the various parties will be both in their individual interest, as well as the collective interest of all involved'.

The tragedy of the commons archetype can be used to help people realise the need to alter their mental models of 'I can use as much as I want', 'there's plenty to go around', or 'actions in my department are my business and no-one else should be able to tell me what to do', to see that they are part of a larger system, that there is a limit to the common resource, and that it needs to be managed for the best interest of all involved. It helps people to see the need for a systems view.

3.4.4 Systems mapping

Systems mapping refers to the development of qualitative diagrams showing how all the factors that affect a particular situation interrelate; it is a map of all the causal loops within the system. Several system maps are presented throughout this thesis; see Figure 9 and

Figure 19 for examples. The systems mapping process is often called qualitative system dynamics modelling, and can be done with individuals and groups (Wolfenden 1999; Wolstenholme 1999). When a group works together to develop a systems map, the process helps them to surface the many different mental models that they each hold about how the system operates. When members disagree about a point, it provides them with the opportunity to expose their mental models and explore the reasoning behind their beliefs. This ultimately leads to a new, improved, shared mental model and understanding of the system (that is, organizational learning) (Coyle 2001; Homer & Oliva 2001; Kim 2001; Vennix 1996; Wolstenholme 1999).

3.4.5 System dynamics models and learning environments

System dynamics models also involve developing a map of the system. However, system dynamics models are quantitative. That is, they are computer based, mathematical models that can simulate what will occur within the system over a period of time. In this way teams can trial their proposed solutions to see if they will be effective (Thurman 1993). If they are not, they can explore the system structure to understand why the solutions did not work and adjust either their mental model, or the structure of the computer model, accordingly (Forrester 1994; Smith 1999). For examples of system dynamics models relevant to business see Sterman (2000). For models relating to environmental issues see Ford (1999) or Meadows, Meadows and Randers (1992).

These models are often developed into computer games that management teams can play together or individually to practice a range of skills such as decision making, problem solving, systems thinking and organizational learning (Isaacs 1999; Senge 1990; Thurman 1993). De Geus (1997) states that this enables learning through play and is very effective. He states that companies already learn through playing, for example when they build models of new plants and products to test and try before undertaking the decision to make the larger changes. Learning through play also occurs when they use spreadsheets and computer programs to test the consequences of different options before making a decision.

These computer games have been given many names including: virtual worlds (Senge 1990); micro worlds (Gill A 1999; Morecroft & Sterman 1994; Senge 1990; Sustainable

Solutions Inc 1999); management flight simulators (Grossler 1997; Maier & Strohhecker 1996; Milling 1996); learning laboratories (Senge 1990); and learning environments (Kim 2001; Senge 1990). Maier and Grossler (1998) have called for clarification of this terminology. The term 'learning environments' will be used to refer to these games throughout the rest of this thesis.

Regardless of what the computer games are called, they have many benefits, as explained by Sterman (1994 p.317):

> They provide low cost laboratories for learning. They allow time and space to be compressed or dilated. Actions can be repeated under the same or different conditions. One can stop the action to reflect. Decisions that are dangerous, infeasible or unethical in the real system can be taken in the simulation. Thus controlled experimentation becomes possible, and the time delays in the learning loop through the real world are dramatically reduced. In the real world the irreversibility of many actions and the need to maintain high performance often over ride the goal of learning by preventing experiments with untried possibilities (if it ain't broke, don't fix it). In the simulation one can try strategies that one suspects will lead to poor performance or even (simulated) catastrophe.

These learning environments are believed to be more effective than case studies, which are traditionally used for management education, as they enable more than hypothesizing the consequences of different actions; they enable simulation to show the results. This allows people with different view points to explore what would occur under each mental model, thereby diffusing any argument over whose view is right (Graham et al 1992; Smith 1999).

However, in opposition to the benefits of developing system dynamics models and learning environments is the fact that their development requires specialised modelling skills, which require significant time and training to develop (Kim & Senge 1994; Meadows 1980). The effectiveness of learning environments, and the best methods to use for their design and layout, are still being debated (see Andersen et al 1990; Davidsen & Spector 1997; Grossler 1999; Isaacs & Senge 1992; Milling & Maier 1997; Morecroft 1988; Vennix 1990). Also being debated is the issue of how to accurately model 'soft variables' such as the impact of self esteem on behaviour, or the impact of rewards on the flexibility of staff (see Coyle 2001; Homer & Oliva 2001).

Due to the specialised skills required for developing system dynamics models and learning environments, it is common for management teams to hire a system dynamics consultant to develop a model relating to a particular problem that they are facing, or to use a pre-prepared learning environment. Pre-prepared learning environments explore issues common to many organizations. For instance, *The People Express Management Flight Simulator* requires individuals to explore how to manage a growing business effectively (see Bakken et al 1992; Graham et al 1992), while *The Claims Learning Laboratory* requires players to explore the links between managing cost and quality in a service business (see Senge 1990).

If a company does hire a consultant to develop a system dynamics model, it is important that the management team are either involved in the process of developing the model, or have the model explained to them in a way that enables them to understand it, so that they can adjust their mental models accordingly (Vennix 1996). Otherwise, it is likely that the findings of the model will be rejected. Similarly, if they are using a pre-prepared learning environment and do not realise why the results they are receiving are occurring, the results will be rejected. Campbell (1999) attributes this rejection to the fact that the recommendations from system dynamics models are often counterintuitive and against traditional management practice. This highlights the need to work with mental models when undertaking system dynamics modelling. When system dynamics models and learning environments are used in a way that enables the audience to understand the model and its implications, they can be powerful tools for assisting teams to surface, discuss and refine their mental models (Isaacs 1999; Senge 1990).

Some of the many different techniques that can be used to identify and refine mental models have been demonstrated within this section. Which technique or combination of techniques to use is largely a matter of personal preference, and can be altered to suit the issue and stakeholders concerned.

3.5 The implications of systems thinking and organizational learning for business sustainability

The material reviewed in this chapter suggests a number of key issues that need to be addressed to support learning and change for sustainability within business organizations.

3.5.1 Issuing a directive for change is largely ineffective.

It has been shown within this chapter that issuing a directive for change is largely ineffective. This kind of mechanistic approach is often resisted by many of the parties involved, who are uncertain of the need for the changes, the affect such changes will have on their positions, and their ability to successfully undertake the proposed new way of operating. This suggests that simply issuing a management directive to implement sustainability will fail.

3.5.2 Addressing sustainability without management and board member support is unlikely to be effective. Single sustainability officer approaches rarely work.

It was also explained within this chapter that to prevent or overcome resistance to change, managers must use participative approaches that help all parties develop a positive attitude towards any proposed changes. The individuals need to be provided with the opportunity to ask questions so that they can understand why change is required. They need to be involved in analysing the different options, and to have a say in deciding the specific changes to occur. The managers need to establish a learning-supportive culture. They need to reassure staff members that they will be provided with the necessary support and training to build their skills and make the necessary changes to their practices. This suggests that leaving sustainability up to a single environment officer to implement will not work, unless they have full management support and commitment to the process. Pears (2000 p.170) warns that a single officer approach '… virtually guarantees failure'. Dunphy (2000 p.268) highlights that it is important to also have the support of the board of directors and financial analysts as '… they write the core rules and rewards which influence the decisions of CEOs and senior executives'.

3.5.3 Avoiding defensiveness and resistance to change requires staff involvement and a supportive learning culture.

Gaining staff involvement to implement change requires a learning-supportive culture in which staff members are given time to reflect, to try new ways, and to learn. They need to feel safe to admit that something does not work, and to alter the approach until it does work. Otherwise many staff members will be defensive and not take action. A range of systems thinking tools can be used to assist management to establish a learning-supportive culture and to help staff members develop the necessary skills, to help them learn about and implement the changes. Any company wanting to address sustainability will therefore need to look at these issues and create a learning-supportive culture before they attempt to undertake the change process.

3.5.4 Every person will have a different mental model about what needs to change. Develop a shared understanding and vision.

It was explained that individuals form different mental models on the same issue, as a result of their different backgrounds. This includes formation of mental models on how their organization operates, the problems it has, and what needs to change within it. If individuals do not understand that each person forms a different mental model regarding a particular issue, it can lead to conflict. They may spend their time arguing their point rather than inquiring into each other's reasoning.

This suggests that before staff can discuss sustainability or other proposed changes effectively, they need to have certain systems thinking and organizational learning skills. They need to be aware of the existence of mental models, and recognise the value of learning from the many different views held. They need to be able to undertake dialogue to discuss issues in non-defensive ways, and develop a shared understanding of the issue of focus.

Business personnel wanting to address sustainability within their company should recognise this and undertake dialogue processes with their staff to develop a shared understanding and vision on sustainability for their company. If they do not, the many

different opinions may lead to confusion, fear, and resistance to implementation of the changes.

The process of developing a shared vision on sustainability will involve deciding which end of the sustainability methods continuum, presented earlier as Figure 2, is to be implemented. That is, whether to implement the transformative end of the continuum that involves a total rethink of purpose, products, and processes to reduce their impact over their entire lifecycle(s), or the simple end of the continuum that focuses on environmental management; mostly waste minimisation and improved efficiency of current operations. Individuals within each company will need to weigh up where along this scale they want to act, knowing that over time, tighter legislative requirements and public pressure will force them towards the transformative end, and that only the transformative methods will be effective in stopping environmental degradation.

Many authors point out that sustainability can involve major contradictions to dominant mental models about business practices, and can therefore lead to significant resistance and defensiveness if handled poorly (Ehrenfeld 2000; Schley & Laur 1998; Smith & Yanowitz 1999). Examples of where the mental models required for sustainability conflict with the dominant mental model for business practices are listed in Table 12.

Many authors argue that changes are also required to societal mental models, as shown in Table 13 (Fien 1993; Robottom & Hart 1993; Walker 1995). Such changes in view are required so that the general public, through their purchasing decisions and lobbying, encourage business personnel to adopt more sustainable practices. Similarly, the public can place pressure on governments, through lobbying and voting for those political parties that will implement legislative, market and structural reform in support of sustainability, as described in Chapter Two.

Table 12: Mental models for business sustainability (Adapted from Schley & Laur 1998 p.12).

Unsustainable mental model	Sustainable mental model
The economic system is the entire system. All growth is good. Business schools and business personnel often focus just on the financial aspects of business. They do not consider the costs involved in the pollution and waste that they generate as these items do not appear on their balance sheets.	*The Earth is the source of all profits, affecting the success of all companies* The raw materials for business are all produced from the Earth, e.g. lumber and petroleum. If these are not used wisely and are depleted then all companies that rely on these materials may no longer be able to operate.
Industrial processes are linear People are used to thinking linearly where action A leads to outcome B. They do not realise that there will be other consequences and are often surprised when these appear, e.g. drums of chemicals buried "securely" under the Earth 20 years ago leak into and contaminate the local water supply, or the product that made us millions of dollars in profits costs us hundreds of millions in environmental cleanup a few years later.	*Product development is a cyclical process* By designing our product development processes in a cyclical fashion, so that by-products are recovered and used in the production process, less overall waste is generated and the costs of doing business are lowered. Products should be designed for multiple lifetimes, where they are recovered at the end of their first useful life, disassembled and remanufactured.
There are infinite resources for the production of goods, so wastes can be thrown away. Smokestacks are a sign of progress. In the early days of the industrial era the perception prevailed that physical resources were unlimited. People did not therefore think about the need to use resources efficiently by minimising waste and reusing materials.	*The supply of raw materials is limited. There is no away. Everything is interdependent.* It is now being recognised that there are limits in the supply of materials and that they need to be used more efficiently. It is also recognised that there is no 'away' to throw waste to and that past disposal practices have led to significant environmental and health problems.

Table 13: The contrasting values and beliefs of the dominant social paradigm and the new environmental paradigm (Adapted from: Fien 1993 p.25).

Dominant social paradigm	New environmental paradigm
1. Low valuation on nature • Use of nature to produce goods • Human domination of nature • Economic growth over environmental protection	1. High value on nature • Nature for its own sake; worshipful love of nature • Holistic relationship between humans and nature • Environmental protection over economic growth
2. Restricted compassion for those near and dear • Exploitation of other species for human needs • Lack of concern for other people • Concern for this generation only	2. Generalised compassion toward • Other species • Other peoples • Other generations
3. Risk acceptable to maximise wealth • Science and technology a great boon to humans • Swift development of nuclear power • Emphasis on hard technology • De-emphasis on regulation, use of the market, individual responsibility for risk	3. Careful planning to avoid risk • Science and technology not always good • Halt to further development of nuclear power • Development and use of soft technology • Government regulation to protect nature and humans
4. No limits to growth • No resource shortages • No problem with population or production and consumption	4. Limits to growth • Resource shortages / increased needs of an exploding population • Conservation
5. Present society satisfactory • No serious damage to nature by humans • Hierarchy and efficiency • Emphasis on market • Competition • Complex and fast lifestyles • Emphasis on jobs for economic needs	5. Completely new society needed • Serious damage by humans to nature and themselves • Openness and participation • Emphasis on public goods • Cooperation • Simpler lifestyles • Emphasis on worker satisfaction
6. Current politics satisfactory • Determination by experts • Emphasis on market control • Opposition to direct action; use of normal channels • Left-right party axis; argument over ownership of means of production	6. New politics needed • Consultation and participation • Emphasis on foresight and planning • Willingness to use direct action • New party structure along a new axis

As reported earlier, Ray Anderson, the Chairman of Interface, has transformed his business from selling carpet to leasing the services of carpet – look, feel, and comfort. This resulted in a 97 per cent total reduction in materials used. He agrees with the need for larger societal changes in mental models. He explains that one of the biggest challenges faced when making the changes to his company has been changing the mental models of consumers who are used to owning carpet, as well '… as those of purchasing departments in big companies whose incentives are based purely on cost of purchase, rather than on lifetime costs and aesthetic benefits' (Senge & Carstedt 2001 p.34). The complexity of the situation and the changes to mental models required make it difficult for Interface to achieve the brilliant sustainability results that they have shown are possible.

Dealing with mental models is therefore an important part of the process of implementing sustainability within business organizations. Managers should recognise this and foster development in their staff of skills that can help to address these issues.

3.5.5 Introducing change to operations requires seeing the business as a system

Introducing changes in one part of a complex system such as a business organization can have unintended effects in other parts of the system. Some of these effects will have a delayed appearance. For this reason, when considering implementing any changes it is important that business personnel understand their business as a system, and assess the impact of the intended change on the whole business. That way they can see the interconnection and avoid the creation of many unintended consequences.

This suggests that it would be unwise to encourage staff in each department to implement sustainability initiatives in isolation, as the actions one area takes may adversely affect operations in other departments. A departmental approach is also likely to fail to identify opportunities that cross departments and that are system wide – for instance the excess heat and steam produced in one manufacturing area could be piped to another to save on electricity bills.

To undertake sustainability effectively requires staff to become system thinkers. It requires them to move from thinking about the business as a linear process – where raw materials come in, manufacturing occurs, and products go out – to seeing their operations as a system where they 'close the loops' to see what happens at each step; to see where wastes and pollution occurs, and opportunities for improvement exist. Management needs to recognise this and encourage staff to develop this holistic view of their business operations.

3.5.6 Behaviour change is a limits to growth archetype – obtaining the change requires altering the system to remove the limits

The act of becoming a sustainable business can therefore be seen as a limits to growth situation, as shown in Figure 20. This suggests that in order for the initiative to be successful, steps should be taken to identify any constraints or limits and remove them. By doing this and applying the organizational learning and systems thinking skills outlined in this chapter, the changes involved in becoming sustainable can be made much easier to undertake.

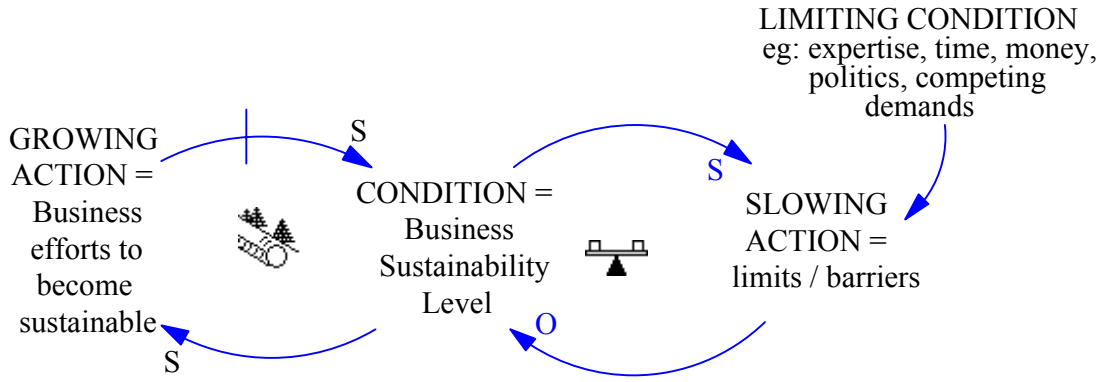


Figure 20: Limits to growth loops

3.5.7 Definition of a sustainable business according to systems theory and organizational learning theory

In summary, according to the theory of systems thinking and organizational learning, a sustainable business would be one:

- Where the people within the organization have been trained in organizational learning skills, so that they accept the existence of mental models and their effect on behaviour, and know how to surface and refine them, facilitating the removal of defensive routines and the acceptance of change;

- Where the people have been trained in systems thinking so that they can accept that structure leads to behaviour and that blaming individuals is pointless. Where they recognise that they can alter the structure to obtain the results that they want;

- Where management has created a learning-supportive culture, where staff feel safe to discuss issues, to try new ways, to make mistakes and learn from them. Where staff have been given time to reflect, to practice their new skills, and to share their learnings throughout the organization, and where reward systems and policies have been reviewed to encourage team learning;

- Where the people within the organization have used their organizational learning skills to explore their mental models regarding change and sustainability, including their fears and concerns, to develop a shared vision of what sustainability means for their organization;

- Where the people have realised that becoming sustainable is an ongoing learning process, requiring thinking of the business as a system, and the breaking down of constraints and politics between departments, so that system wide improvements can be implemented;

- Where the people are constantly refining their understanding of their business as a system, using this knowledge to consider different implementation options for

sustainability, and selecting only high leverage strategies, avoiding the tendency to choose quick symptomatic fixes or argue over low-leverage strategies;

- Where management has assisted each staff member to identify their own goals and desires for their future development, and aligned their roles where possible to achieve this. This leads to intrinsic motivation and fulfilment of the individual, and greater commitment to their work;

- Where the parties have used all of the above to rethink the purpose of their business and have implemented changes that improve its triple bottom line:

    - Changes that have resulted in improved energy efficiency and dematerialisation of their products, which are now designed for many lifecycles; substitution of harmful chemicals and processes with more benign processes; and the elimination of waste as described in Chapter Two.

    - Changes that improve the enjoyment and functionality of their products, resulting in improved quality of life for those that use them.

    - Changes that make their organization a healthy, enjoyable place to work, where staff are developed to their full potential and rewarded appropriately.

    - Changes to their investment patterns to provide funds for social and environmental causes, enabling rehabilitation of degraded ecosystems, research into cleaner practices, and a higher quality of life within society, as well as providing returns to shareholders.

3.6 Conclusion

Within this chapter it has been shown that the use of theory and skills from systems thinking and organizational learning significantly increases the likelihood of successfully implementing change within business organizations. In Chapter Two it was shown that sustainability requires significant changes to existing business practices. This suggests that the use of systems thinking and organizational learning practices will make it considerably easier for business personnel to change their practices and make their businesses more sustainable. How systems thinking and organizational learning theory can be used to do this was explained.

Environmental education theory will be explored within the next chapter. It will be shown that like business personnel with their two main approaches to change – the mechanistic approach and the systems or learning approach – educators also have two main approaches to obtaining behaviour change: the positivist and the critical, which parallel these issues.

Chapter 4. The theoretical foundations

Sustainability education methods and their effectiveness in obtaining behaviour change.

> *'Education has a pivotal role to play in both building a supportive social context for sustainability and in empowering citizens to influence policy makers to hasten the transition towards sustainability. Indeed, without such education, even the most enlightened legislation, cleanest technology and most sophisticated research will not achieve the long-term goal of a sustainable future'.* (Fien 2001 p.13)

4.1 Introduction

It was shown in Chapter Three that becoming a more sustainable organization could be seen as a 'limits to growth' situation. Many limits or constraints that hinder business personnel taking action were outlined in Chapter Two. In Chapter Three it was shown that implementing change requires a participative management style, a supportive learning culture, and staff skilled in systems thinking and organizational learning. This suggests that government educators should not simply tell business personnel to change, but work with them to identify the constraints to change and develop ways to remove them, thus making it easier for business personnel to take action. This would include helping business personnel to build their capacities to implement change within their organizations. It will be shown in this chapter that the most commonly used approach to education programs, the positivist approach, has not focussed on achieving these outcomes.

The positivist approach to change is like the mechanistic approach to obtaining behaviour change in business practices. The government educators tell business personnel to change and attempt to motivate and manipulate them to do so. As was shown in Chapter Three, such an approach to obtaining change can create defensiveness and resistance. It is also largely ineffective if there are constraints that inhibit the targeted stakeholders from taking action. Some of the psychologists and educators using the positivist approach to education have recognised this, and are altering their approach to involve a representative sample of targeted stakeholders in identifying their constraints to change and developing ways to remove them. These programs are then delivered across wide geographic areas.

While this is an improvement, the majority of these positivist educators are only focussing on the removal of the constraints. They are not focussing on helping the targeted stakeholders to learn about the issues, building their capacity to take action, or assisting them with implementation of sustainability solutions. The positivist educator still remains in control of the process and many educators believe that this reduces its effectiveness. The educators with an alternative viewpoint believe that the targeted stakeholders, the participants, should be the ones with control, so that education programs become participant activated, problem solving processes.

With these problem solving education programs, the government educator is not the expert, but a facilitator who enables the stakeholders to interact, to solve their problems, and learn about the issues together. They also build the capacity of the stakeholders to make the changes in their organizations or homes and coach them with their efforts. The problem solving approaches to sustainability education, namely critical and problem based methodology approaches, parallel the systems or learning approach to obtaining change in business practices.

All of these approaches to education programs will be explored in detail within this chapter. The limitations of the positivist approach will be shown, and the advantages of the problem solving approaches over the positivist approach will be explained.

4.2 Sustainability definitions and environmental education approaches

There are three main approaches to environmental education that are discussed within the literature. These are positivist, interpretivist and critical environmental education approaches. These approaches to education have originated out of the research paradigms of the same names. The characteristics and differences of these three research approaches are shown in Table 14. Which education approach an educator chooses will partly depend on which research paradigm they believe is the most important or relevant to the issue that they are addressing.

Another factor affecting which approach educators use is their beliefs about what a sustainable society would look like, and how it can be achieved (Robottom & Hart 1993). Some of these beliefs are described in Table 15.

Table 14: Research Approaches (Adapted from: Gunning 1994 p.1)

	Positivist	**Interpretive**	**Critical**
What is the approach modelled on?	Classical physical sciences investigation	Historical, literary, and existential studies in which the subjective understandings of subjects are significant	Marxist, interpretive and psychoanalytic studies which focus on the insights and judgements of the subjects
What does it assume about reality?	Reality is unitary and it can only be understood by empiric-analytic inquiry; that is the scientific method	There are multiple realities which require multiple methods for understanding them	There are multiple realities which are problematic through distorted communication
What is the foundation data?	Disciplined sensory-perceptual observation; that is rules for observation	Meanings are the basis of data: meanings precede logic and fact	Meanings are found in language and social behaviour and they precede logic and fact
How is observation done?	Through clear and unambiguous rules which are not modified by the setting and are totally independent of it	Through the social, linguistic and cognitive skills of the researcher; that is, dialogue	Interpretive methods plus critical self-reflection concerning the grounds of observation
What is generated by inquiry?	Evidence and generalisable laws which are not affected by contexts and have nothing to do with the way in which they were discovered in the first place. Objectivity depends upon the removal of error and bias which is related specifically to the logic of observation and measurement	Knowledge which is dependent on the process of discovery. The integrity of the findings depends upon the quality of the social, linguistic and cognitive skills of the researcher in the production of data analyses and conclusions	Knowledge which falls within the interpretive framework, but which also serves the purpose of assisting personal liberation and understanding and emancipation from forces constraining the rational independence of individuals

Table 14 continued: Research Approaches (Adapted from: Gunning 1994 p.1)

	Positivist	Interpretive	Critical
What interests are inherent in the inquiry?	Prediction and control, technically exploitable knowledge. Explanation	Understanding at the level of ordinary language and action. Discovering the meanings and beliefs underlying the actions of others	Interpretive interests plus revealing the interests which underlie other forms of inquiry and action. Radically improving human existence. Practical and public involvement in knowledge formation and use
What values are inherent in inquiry?	Science and scientific knowledge are inherently value-neutral	Science and scientific knowledge have both to be interpreted in terms of values they represent	Science and knowledge are never value-neutral; they always represent certain interests

Table 15: A pattern of environmental ideologies (Developed from: Fien 1993 p.27; Greenall Gough 1997 p.136 & Palmer 1998 p.89)

<table>
<tr><td colspan="2">Technocentrism
Belief in the retention of the status quo and the existing structure of political power, but with a growing responsiveness and accountability in political, regulatory, planning and economic institutions.</td><td colspan="2">Ecocentrism
Demand for redistribution of power towards a decentralised, federated economy with more emphasis on informal economic and social transactions and the pursuit of participatory justice.</td></tr>
<tr><td>Cornucopian / Intervention</td><td>Accomodationist
Managerialist
‘Light green’</td><td>Communalist
Ecosocialist
‘Red-green’</td><td>Gaianist
Utopian
‘Dark green’</td></tr>
<tr><td>1. Optimism about the human ability to improve the lot of the world’s people and find a way out of any political, scientific or technological difficulties.

2. Acceptance that all economic growth is good; pro-growth goals define the rationality of policy formulation and development discussions.</td><td>1. Reformist belief that economic growth and resource exploitation can continue assuming that:
(a) Suitable economic adjustments via taxes and fees;

(b) Legal rights to minimal level of environmental quality are legislated; and</td><td colspan="2">1. Lack of faith in modern large-scale technology and its associated reliance on elitist enterprise, central state authority and anti-democratic institutions.

2. Rejection of materialism for its own sake. Belief that economic growth should be geared to providing for the basic needs of all, especially those below subsistence levels.

3. Belief in the intrinsic importance of nature for defining and sustaining humanity.

4. Emphasis on ‘small is beautiful’ in community identity, work and leisure.</td></tr>
</table>

Table 15: continued: A pattern of environmental ideologies (Developed from: Fien 1993 p.27; Greenall Gough 1997 p.136 & Palmer 1998 p.89)

Cornucopian / Intervention	Accomodationist Managerialist 'Light green'	Communalist Ecosocialist 'Red-green'	Gaianist Utopian 'Dark green'
3. Belief that any problems can be overcome, given will, ingenuity and sufficient resources arising out of economic growth and technological change.	(c) Compensation arrangements are made for those who experience adverse environmental and / or social effects.	5. Faith in the rights of nature and the essential need for co-evolution of human and natural systems.	5. Faith in the cooperative capabilities of societies to establish self-reliant communities based on sustainable resource use and appropriate technologies.
4. Faith in science and technology to provide the foundation for advice on economic growth, public health and environmental problem solving. 5. Suspicion of attempts to widen participation in social and environmental appraisal and policy review.	2. Acceptance of development appraisal techniques and decision making arrangements to allow for wide discussion or genuine search for consensus among representative groups of interested parties. 3. Provision of effective environmental management agencies at national and local levels.	6. Belief that ecological (and other natural) laws should dictate human morality. 7. Biorights – the right of endangered species or unique landscapes to remain unmolested.	6. Integration of concepts of work and leisure through a process of personal and community development. 7. Importance of participation in community affairs, and of guarantees of the rights of minority interests. Participation seen as both a continuing educational and a political function.
Authors: Hore-lacy	Authors: Stapp Roth Hungerford IUCN (1980) UNESCO-UNEP (1975, 1977, 1988) WCED (1987) DHAE (1984) DPMC (1990)	Authors: Fensham Fien Greig, Pike & Selby Huckle Jickling Greenall Gough Robottom UNESCO (1980)	Authors: Gough Van Matre Treaty (1992)
10-35% of various opinion surveys	55-70% of various opinion surveys	5-10% of various opinion surveys	0.1-3% of various opinion surveys

According to the data in Table 15 the technocratic-accomodationist approach is the most commonly held view of what needs to occur to obtain sustainability. It represents the approach that many governments have taken. It has been criticised for being human-centred, mechanistic, and promoting the status quo – with continued industrial development – while ignoring the role of power in shaping sustainability actions (Gough 1990; Greenall Gough 1997). Being the most commonly held view, it is not surprising to find that its principles or ideologies are those that are most commonly represented in education programs. This occurs through positivist approaches to environmental education. Underpinning the positivist approach to environmental education are three main beliefs about what is required to obtain behaviour change. These are shown in Figure 21. Not all positivist educators believe all paths (Day & Smith 1996).

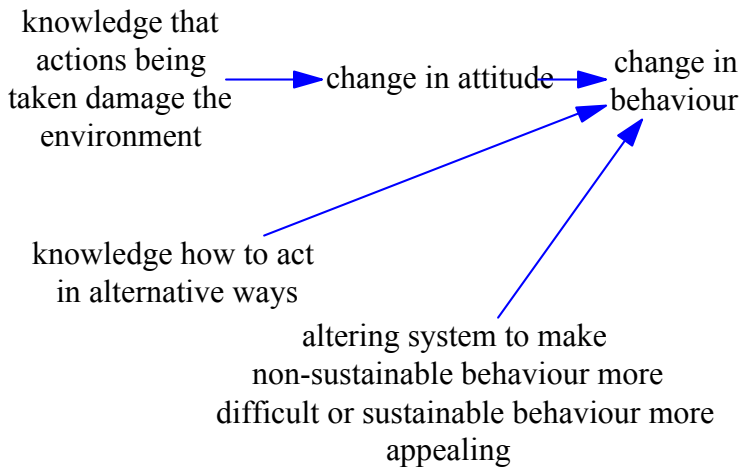


Figure 21: The positivist educator's assumptions about obtaining behaviour change (Adapted from: Greenall Gough 1993 p.38)

The first path involves the belief that once an individual receives information (also referred to as knowledge, awareness, or understanding) about the consequences of their actions and the benefits of alternative action, they will alter their attitudes and consequently alter their behaviour (Greenall Gough 1993; Lucas 1979; Martin 1996; Kaplan 1991; UNESCO-UNEP 1987). This is the main concept underpinning the psychological field of humanism (Geller 1995, 2003). Humanist practitioners focus on attitudes, trying to convince people of the need to change their ways '… by reasoning with people or appealing to guilt or "social conscience"' (Geller 2003 p.3).

Techniques used by advocates of humanism include provision of persuasive information and pleading through media campaigns, personal visits and discussions. This can be effective if people do indeed change their beliefs to be in support of the environment, feel able to, and do take action to change. However, changing may require breaking old habits and overcoming many constraints that may result in failure to change, despite a positive attitude and the best of intentions (Linke 1980). Therefore achieving attitude change alone is likely to have limited impact, unless these other constraints to change are also removed (Smith 2002). This has been demonstrated by the limited impact that mass media, direct persuasion approaches have had on stopping people from undertaking activities such as smoking, speeding, and wasting water (Geller 2002; Layrargues 2000; Simmons & Widmar 1990). Many authors argue that such a progression from information to attitudes to behaviour does not necessarily occur (Day 2000; Hernandez & Monroe 2000; Linke 1980).

The second path recognises that action can result from knowledge, without first altering attitudes towards the environment (Lucas 1979). For instance, a person receiving information on how they could alternatively undertake their action may be prepared to change their behaviour, if the alternative behaviour still enables them to achieve their goal without significant difficulty, or with less difficulty than their original actions. They do not necessarily have to care about the environment in order to change their behaviour.

The third path does not focus on attitude change to support sustainability either. It focuses on making it harder to perform the undesirable behaviour. This is the concept behind the psychological field of behaviourism. This occurs when the government or other controlling or respected authority alters the system surrounding individuals to make a specific behaviour less beneficial to the individual, thus motivating or manipulating them to change (Geller 2002; Palmer 1998). The mechanisms that the government can use to achieve this with business personnel include legislation, regulation, taxes, penalties, incentives, peer pressure and lobbying.

Together these three paths or beliefs about obtaining behaviour change summarise the positivist approach to environmental education. Positivist educators target individual

behaviour change, and believe that the targeted stakeholders should be made to behave the way that the educators or the government deem correct (Greenall Gough 1997; Robottom 1990; Robottom & Hart 1993). They design their programs top-down without the involvement of the targeted stakeholders, tending to focus on raising awareness of the problems, promotion of the 'correct' behaviour, and alteration of the system to make it harder for individuals to perform in non-correct ways (Sterling 1996b). Education is seen as a persuasion tool, used to explain new legislation or policies and why people must change (Greenall Gough 1997; Hernandez & Monroe 2000; Hough & Day 2000).

The second type of educator, interpretivists, believes that individuals do not need to be manipulated into behaving in the 'correct' way. They believe that behaviour change is more likely to result if an audience member is helped to appreciate nature and the consequences of polluting activity. They involve stakeholders in 'field work, sensory awareness activities and social research' to develop this appreciation (Walker 1995 p.90). Creating an 'experience' for people to have. Interpretivist educators believe that once this occurs, people will care about the environment and thus voluntarily change their behaviour to protect it (Fien 1993; Greenall Gough 1997; Kaplan 2000; Martin 1996; Van Matre 1990). This process is shown in Figure 22.

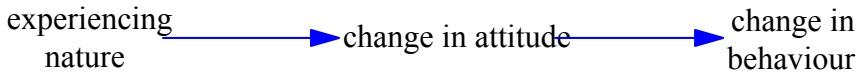


Figure 22: Interpretivist educator assumptions of behaviour change (Adapted from: Greenall Gough 1993 p.38)

Interpretivist educators believe that it is important that individuals be allowed to construct their own interpretation of their experience and decide on what action to take. This creates intrinsic motivation or ownership of the issue, unlike the positivist approach, which dictates what people should do. Interpretivist educators undertake dialogue with participants to foster their reflection on their experience, to discuss the implications of existing behaviour and to determine the actions the individuals wish to take as a result (Cantrell 1990; Fien 1993; Gerber 1996; Palmer 1998).

Research has shown that the interpretivist approach is particularly powerful in getting people to care about the environment, and that once these feelings are generated they last a lifetime. Palmer (1998 p.132) presents the results of research that sought to find out why people who support environmental initiatives care about the environment. A survey was sent to members of the National Association for Environmental Education in the UK. It asked them to identify environmentally friendly activities that they undertake (to prove that they actively cared) and to provide an explanation of what influenced them to care about the environment. The qualitative responses were then analysed to identify the influences. It was found that they could be grouped into the categories shown in Table 16.

Table 16: Significant life experiences: categories of response (From: Palmer 1998 p.132)

Category of influence	No. (n = 232)	%
Outdoors	211	91
Education courses	136	59
Parents / close relatives	88	38
Organizations	83	36
Television / media	53	23
Friends / other individuals	49	21
Travel abroad	44	19
Disasters / negative issues	41	18
Books	35	15
Becoming a parent	20	9
Keeping pets / animals	14	6
Religion / god	13	6
Others	35	15

Palmer (1998 p.241) reports that the study has been repeated in a number of countries including '… Australia, Canada, the USA, Greece, Slovenia, Sri Lanka, Uganda, South Africa, Spain and Hong Kong'. She reports that the results of these studies confirmed the findings of the UK study, in particular the high importance of experiences in nature and the spiritual or peaceful feelings that nature can instil. Interpretivist approaches often involve having the targeted stakeholders attend a particular site to have the experience. This may involve being out in nature, or it may involve attending a museum or other educational facility. This works well if the targeted stakeholders are voluntarily attending the course to learn i.e. school children undertaking excursions. It is more difficult if the targeted stakeholders do not want to learn i.e. business people who may not want to participate in

an excursion or an experience created for them at their premises. For this reason interpretive approaches are less commonly used with adult education.

The third category of educators, critical educators, believes that an education program should be designed together with the targeted stakeholders to address problems that are important to them (Sterling 1996b). This is believed to motivate the individuals to participate and learn (Grieser 2000). Critical educators believe that behaviour change occurs through learning, as a part of an ongoing process of obtaining new information, action, and reflection, undertaken by the participants on their own and in groups. Each change in knowledge affects their attitudes, which affects the knowledge they seek, and their future actions. It becomes a cyclic process as shown in Figure 23 (Greenall Gough 1993).

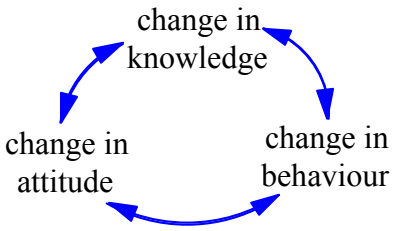


Figure 23: Critical educators assumptions of behaviour change (Adapted from: Greenall Gough 1993 p.38).

Educators operating with this mindset use bottom-up approaches, where the targeted stakeholders are involved in the design and development of programs. Together they decide on the focus, seek a wide understanding of issues affecting the situation, develop solutions to their chosen problem(s), and action their agreed changes to behaviour (Sterling 1996b; Tilbury 1997). Education of this type has similarities to multi-stakeholder processes, participatory decision making, collaborative decision making, environmental dispute resolution, consensus building, and action research / action learning techniques. All of these focus on participatory problem solving (Allen 2000b; Davis et al 1996; Enderby & Phelan 1994; Fisher, Rooke & Torbert 2000; Forester 1996; Gibbons 1999; Hemmati et al 2001; McGill & Beaty 1992; Mumford 1997; PCI 1999; Robinson 1993; Smith & Dodds 1997).

Like interpretivist educators, those operating from the critical paradigm believe that ownership of the changes and intrinsic motivation are of extreme importance (Grieser 2000). A significant difference between the critical approach to sustainability education and that of the first two categories is that these educators do not just focus on changes to the individual participants behaviour. They also focus on group work and on larger changes, such as changes to societal structures and power distribution, in order to move towards a more sustainable state (Greenall Gough 1997; Palmer 1998). They recognise that these larger issues or constraints inhibit individuals taking action and need to be removed. The above represent three very different approaches to environmental education, as shown in Table 17.

Table 17: Three images of environmental education (Developed from: Greenall Gough 1997 p.90; Huckle 1996b p.108; Robottom & Hart 1993 p.26)

	Positivist – education for environmental management and control	**Interpretivist – education for environmental awareness and interpretation**	**Critical – education for sustainability**
Purposes View of environmental education	Knowledge '*about* the environment'	Activities '*in* the environment'	Action '*for* the environment'
Educational purpose	Vocational / Neoclassical	Liberal / Progressive	Socially critical
Learning theory	Sometimes behaviourist, deficit models of the learner	Constructivist, Interactionist, models of the learner as building cognitive structures through interaction	Reconstructivist, model of the learner as reconstructing his/her own knowledge, a social reality that is socially constructed and subject to reconstruction through historical and political processes
Roles Role of goals of environmental education	Externally imposed taken for granted	Externally derived but often negotiated	Critiqued (seen as icons of ideology)
Teachers' role	Authority-in-knowledge	Organiser of experiences in the environment	Collaborative participant / inquirer

Table 17 continued: Three images of environmental education (Developed from: Greenall Gough 1997 p.90; Huckle 1996b p.108; Robottom & Hart 1993 p.26)

	Positivist – education for environmental management and control	**Interpretivist – education for environmental awareness and interpretation**	**Critical – education for sustainability**
Students' role	Passive recipients of disciplinary knowledge	Active learners through environmental experiences	Active generators of new knowledge
Curriculum supporters	Disseminators of prepared solutions to environmental problems	External interpreters of the learners' environments	Participants in new problem solving networks
Role of texts	Pre-existing source of authoritative knowledge about the environment	Pre-existing source of guidance about environmental experiences	Emergent reports of outcomes of critical environmental inquiries
Knowledge & Power			
View of knowledge	Preordinate / commodity Systematic Personal Objective Derived from experts	Intuitive Semi-structured Personal Subjective Derived from experience	Generative / emergent Opportunistic Collaborative Dialectical Derived from inquiry
Organising principles (source of authority)	Disciplines	Personal experiences	Environmental issues
Power relationships	Reinforces power relationships	Ambivalent about power relationships	Challenges power relationships
View of research			
Research is	An applied science Objectivist Instrumental Quantitative Acontextual / individualist Deterministic	Interpretive Subjectivist Constructivist Qualitative Contextual / individualist Illuminative	Critical social science Dialectical Reconstructivist Qualitative Contextual / collaborative Emancipatory
Research design	Preordinate / fixed	Preordinate / responsive	Negotiated / emergent
Researchers are	External experts	External experts	Internal participants

Table 17 continued: Three images of environmental education (Developed from: Greenall Gough 1997 p.90; Huckle 1996b p.108; Robottom & Hart 1993 p.26)

	Positivist – education for environmental management and control	**Interpretivist – education for environmental awareness and interpretation**	**Critical – education for sustainability**
Examples of educators who write in this category	Hungerford, Peyton & Wilke (1983) Boyden (1970) Hore-Lacy (1980)	Disinger (1987) Hungerford et al (1980) IUCN (1970) Linke (1986) Lucas (1991) Roth (1970) Stapp (1970) Van Matre (1990)	Elliott (1991) Di Chiro (1987ab) Fensham (1978) Fien (1991, 1993) Gough (1989) Greenall (1987) Greenall Gough (1992) Huckle (1991) Robottom (1993)

Many authors argue that only the critical approach to environmental education is 'true' education for sustainability, since it is the only one that results in action to improve the environment. Fien (1993 p.16) explains:

> Reflection on the relative strengths and weaknesses of these three approaches to environmental education has led many environmental educators in Australia (e.g. Lucas 1979; Robottom 1984; Maher 1986; Fien 1988a, 1991; Greenall Gough 1990) and overseas (e.g. Huckle 1983a, 1990a; Sterling 1990a) to argue that it is only when the overt intention of a program is education *for* the environment [the critical approach] that effective environmental education is actually taking place. Education *about* [the positivist approach] and *through* [the interpretivist approach] the environment are valuable only in so far as they are used to provide skills and knowledge to support the transformative intentions of education *for* the environment [the critical approach].

Others such as Palmer (1998), Scriabine (1996) and Connell (1997) are not so adamant that the critical approach is the most important. They argue that all three approaches have significant benefit and can be used in combination. They believe that they are complementary. Webster (1996) summarises the differences by referring to '… weak versus strong education for sustainability'. To him the positivist approach is weak education for sustainability, as it simply involves continuous improvement approaches to current societal practices. Strong education for sustainability, the critical approach, is about participation, critical analysis of current practices and structures, reformation, and change to the status quo.

Walker (1995) adds a different perspective to the argument. She argues not for any one of the three environmental education approaches but for a fourth option – problem based methodology (PBM). In problem based methodology the educator works with the targeted stakeholder to help them solve a problem of their choosing. They use critical dialogue to understand the problem; the constraints to change that exist and then discuss solution options. These solution options may be ways to solve the problem within the current constraint structure or they may require changing the constraint structure. If they do require such changes the educator helps the targeted stakeholder to build the necessary skills. Many different tools may be used to solve the problem as appropriate. This may include using aspects of the three approaches to environmental education outlined above, or it may not.

The positivist, critical and problem based methodology approaches to environmental education will be explored in greater detail in the next two sections.

4.3 Positivist approaches to environmental education

There are many different methods used by educators working from the positivist paradigm. Table 18 contains the most common methods, divided into three categories: information based, positive motivation based, and coercive manipulation based techniques. De Young (1993) explains that there are dominant mental models that underlie each of the categories of behaviour control techniques.

Underpinning the information based approaches are the assumptions that

- Information will lead to awareness and that will lead to behaviour change; a supportive attitude towards environmental initiatives needs to be created. Educators with this belief focus upon brochures, information and case studies to explain why people should take action.

- People want to take action, but do not know what to do; they already have a supportive attitude towards environmental initiatives, but need to be supplied with information on what to do. Educators with this belief focus upon techniques that

explain what action to take and how to take it, for example prompts, modelling, and training.

Underpinning the positive motivational based techniques is the assumption that

- Educators should not constrain individual choice, but simply encourage or entice people to change their behaviour, that is, convince them that it is beneficial to take the action. Educators with this belief focus upon monetary incentives, social reinforcement, use of role models and techniques that lead to social pressure.

Underpinning the coercive manipulation based techniques is the assumption that

- Educators have the right to 'constrain one's choice either physically or perceptually', that is, to force people to take action (De Young 1993 p.489). Educators with this belief focus upon penalties, taxes, regulations, fear tactics and engineering and design strategies.

While Table 18 shows the behaviour change techniques divided into three categories, some authors prefer a two group categorisation (Dwyer et al 1993; Geller 1995; Smeyers & Verhesschen 2001). The first group is called activators or antecedents. It includes awareness raising materials, demonstrations, commitment procedures and engineering / design strategies. All of which are believed to direct behaviour. The second group is called consequence conditions. It includes penalties and incentives, which are believed to motivate behaviour (Dwyer et al 1993; Geller 1995; Smeyers & Verhesschen 2001). Each of the different educational techniques has been shown to have varying levels of effectiveness.

Table 18: Typology of selected behaviour change techniques (Developed from: De Young 1993 p.492; Dwyer et al 1993 p.279; Geller 1995 p.181)

	Behaviour Change Techniques		
Source of change	Information based	Positive motivation based	Coercive manipulation based
Environment / Others (Tangible)	• **Written material** declarative knowledge: you should change; procedural knowledge: how to change • **Awareness and education sessions** training, seminars, information nights • **Feedback** progress report or equipment showing resource use levels over time • **Modelling** case study reports, demonstrations, videotape • **Prompts** signs, stickers, buttons, TV adverts, verbal reminders	• **Material incentives** rewards, discounts • **Social support** recognition, social approval, purchasing preference • **Goal setting** agreed targets • **Commitment procedures** pledges to take action • **Use of respected or influential person** movie and sports stars, industry bosses encouraging action	• **Material disincentives** fines, taxes, penalties • **Social pressure** lobbying, boycotts, peer pressure • **Legal mandates** laws, standards, regulations • **Engineering and design strategies** changes that make environmentally responsible behaviour more salient & convenient • **Fear tactics** arguing business will not survive without changing
Internal (Intangible)	• **Direct experience** learning from surroundings and events • **Personal insight** learning from reflection and analysis of thoughts • **Self-monitored feedback** consciously observing the consequences of any actions taken and modifying behaviour accordingly	• **Commitment** belief in and want to act • **Intrinsic satisfactions** pleasure from taking action • **Sense of competence** pleasure from feeling capable • **Sense of confidence** pleasure from having positive self esteem	• **Sense of duty** feeling that you must take action even if you don't want to change your ways • **Feeling of remorse** feeling guilty or sorry for damage to environment and human health

4.3.1 Information based techniques

One of the simplest information based techniques occurs when an educator produces awareness raising materials such as brochures, stickers and information kits that they believe will influence the targeted stakeholders to change their ways. These are distributed to the stakeholders and are expected to induce behaviour change. Such a technique can be effective in obtaining behaviour change on simple issues, if there is a low response cost to changing. That is, where the behaviour is reasonably convenient, for example turning off lights when leaving a room, and the instructions are specific and provided close in time and location to the behaviour event (De Young 1993; Dwyer et al 1993; Geller 1995, 2002). These changes, however, have been found to be non-durable, with behaviour reverting back to the original once the information brochure has been filed or the prompt (the sticker or sign) has lost its novelty or been removed (De Young 1993; Hernandez & Monroe 2000). When there is a high response cost – where the behaviour is relatively inconvenient – information alone is unlikely to motivate people to take action (Dwyer et al 1993; Geller 2002).

Many other factors impact on the effectiveness of written awareness raising education materials, including whether or not they address the mental models of the audience, how they are distributed, the language used, the learning styles covered, and how much material exists, as will be explained (Day 2000; Dick & Dalmau 1990; McKenzie-Mohr & Smith 1999; Monroe & Kaplan 1990; Passey 2001; Smith 1999, 2000).

McKenzie-Mohr and Smith (1999 p.45) believe that to be noticed information needs to be presented vividly:

> Vivid information increases the likelihood that a message will be attended to initially, a process called encoding, as well as recalled later. That is, information that is vivid is likely to stand out against all the other information that is competing for our attention. Further, because it is vivid, we are more likely to remember the information at a later time. This last point is critical, since if the information is only remembered fleetingly, it is not likely to have any long-lasting impact upon our attitudes or behaviour.

An example of how to use vivid information is provided in McKenzie-Mohr and Smith (1999 p.45). They quote the research of Gonzales, Aronson and Costanzo (1988) who

worked with an energy company in Canada to train its home assessors to use vivid information. In Canada, utility companies are required to provide audits to homeowners to inform them of opportunities to improve their energy efficiency. 'Normally, assessors provide feedback to the householder regarding energy efficiency by noting the absence of insulation in a basement or attic, cracks around windows or doors'. In this study the assessors presented the same information vividly, by saying something like

> You know, if you were to add up all the cracks around and under these doors here, you'd have the equivalent of a hole the size of a football in your living room wall. Think for a moment about all the heat that would escape from a hole that size. That's why I recommend you install weather-stripping…And your attic totally lacks insulation. We professionals call that a naked attic. It's as if your home is facing winter not just without an overcoat, but without any clothing at all. (McKenzie-Mohr & Smith 1999 p.45)

Other examples include referring to the amount of waste generated as '… able to fill a local landmark', or if spread along the road, '… enough to reach from one town to another' (McKenzie-Mohr & Smith 1999).

Passey (2001 p.30) highlights that:

> The style in which information is presented is also very important. According to an Environment Australia survey, serious methods should be used rather than 'gimmicky' or ' jokey' styles, and real life situations rather than cartoon characters were preferred (EA, 1999). According to the CAR [Community Awareness Research] report, images of 'cute' or endangered animals generate more of a response than 'big picture' environmental effects or the likely impacts on human health. It also stressed that sensationalising the problem in order to shock and get an exaggerated response runs the risk of losing credibility, and information should be framed as advice rather than in didactic tones (CAR, 1999).

Day (2000 p.80) explains that expert developed awareness raising materials are often ineffective, as the educator and the audience members use different language to describe the same issue. For this reason he argues that educators cannot design effective messages without first learning the language of the audience. He provides an example from Egypt where

> … officials of the Ministry of Public Works and Water Resource told GreenCOM [a sustainability education company] that they know what messages would get farmers to conserve water. But in a pretest of only 40

> people, 39 did not even understand the ministry's message—let alone find it persuasive.

Day (2000 p.82) also points out that awareness raising materials will be largely ineffective if the audience is not interested in the issue that is being discussed. He suggests that before providing detailed information, educators need to capture people's attention. He suggests that this can be done through traditional marketing techniques that appeal to individuals 'need states', for example the importance of 'status, sexual attractiveness or of being a good parent'. Day (2000) suggests that using advertising to make people feel that taking action on sustainability would result in these 'needs' being fulfilled captures their attention, and makes them more likely to change their behaviour. He acknowledges that people quickly realise that the change does not actually result in the fulfilment of the 'need' as advertised, and it is at this point that individuals will change their behaviour back to the original, unless they are given some other reason to continue with the new behaviour. It is at this time when Day (2000) suggests that more factual information should be given. He states that there is no point giving it in the first instance because people are not interested in reading it. However, once their interest is captured, they may read and absorb the information.

Many authors warn that if there is too much information to absorb people may become overloaded and simply ignore it (Kaplan 2000; Monroe & Kaplan 1990; Passey 2001). Dunphy (2000) suggests that rather than talking to business personnel or providing them with information on all aspects of sustainability, educators or consultants working with them should determine which of the four below categories the company belongs to and then tailor their approach accordingly. The four categories are:

- The unsustainable corporation – low ecological and low human / social sustainability. Educators should provide information on all aspects of sustainability.
- The ecologically concerned corporation – high ecological sustainability, but low human / social sustainability. Educators should provide information that shows the business personnel the benefits of participative management and investment in staff and community development initiatives.
- The people concerned corporation – high human / social sustainability, but low ecological sustainability. The educator should provide information on the benefits of environmental management.

- The sustainable corporation – high human / social and ecological sustainability. The educator should provide suggestions of further initiatives that the company may like to take.

Dick and Dalmau (1990 p.47) report that:

> … on occasions we have been surprised, and not a little dismayed, at how thoroughly people filter out broadcast or printed information. Ultimately, it is face-to-face communication, which matters most.

When conducting face-to-face communication educators can increase the likelihood of their message being heard, if they listen to the language used by the targeted stakeholders and determine their preferred learning style. This enables the educator to alter the way they present their material to use the language preferred by that learning style. This makes it easier for the targeted stakeholder to understand (Advanced Neuro Dynamics Inc 1987; ANTA 1999; Cristofani, Powell & Melville 2000; Smith 2002). Similarly, when designing written materials and training courses, educators should ensure that material that covers each of the different learning styles is included (Advanced Neuro Dynamics Inc 1987; ANTA 1999; Cristofani, Powell & Melville 2000; Smith 2002). Table 19 shows the different learning styles and how these affect learning.

Similarly, it is suggested in the organizational learning literature that the information presented will be more effective if it addresses the mental model of the individual who is being targeted. An example of this applied to business personnel and sustainability is shown in Figure 24. If the educational approach fails to address the mental models held by the targeted individual, they are unlikely to be willing to spend time addressing the issue, regardless of the incentives and disincentives that the educator presents (De Young 2000; Fagan 1996; Kaplan 1991; Schein 2001; Smith 1999, 2000, 2000b, 2002, 2002b).

Table 19: Learning styles and their characteristics (Adapted from: Advanced Neuro Dynamics Inc 1987 and ANTA 1999)

	VISUAL	AUDITORY	KINESTHETIC	AUDITORY DIGITAL
Common Characteristics	They memorize by seeing pictures, and are less distracted by noise. They often have trouble remembering verbal instructions because their minds tend to wander. They are interested by how the program looks	They typically are easily distracted by noise. They can repeat things back to you easily, learn by listening, like music and like to talk on the phone. Tone of voice and the words used are important.	They often talk slowly. They respond to physical rewards and touching. They memorize by doing or walking through something. They will be interested in a program that 'feels right' and go on their 'gut feelings'.	This person spends a fair amount of time talking to them selves. They memorize by steps, procedures, and sequences. They will want to know if your program makes sense. They can also exhibit parts of the other styles.
Commonly used words	See	Hear	Feel	Sense
	Look	Listen	Touch	Experience
	Appear	Sound	Grasp	Understand
	View	Tune in/out	Get hold of	Think
	Show	Make music	Slip through	Learn
	Crystallize	Harmonize	Catch on	Process
	Reveal	Reply	Tap into	Decide
	Envision	Ring a bell	Make contact	Motivate
	Illuminate	Silence	Balance	Consider
	Twinkle	Heard	Turn around	Change
	Clear	Resonate	Vibration	Perceive
	Foggy	Deaf	Move	Thought
	Focused	Rehearse	Concrete	Distinct
	Hazy	Talk	Scrape	Conceive
	Crystal Clear	Snap	Handle	Know
	Flash	Overtones	Solid	Question
	Imagine	Attune	Suffer	Comprehend
	Picture	Outspoken	Budge	Meaning
	Sparkling	Tell	Impression	Recall
	Snap Shot	Announce	Touch base	Communicate
	Vivid	Click	Rub	Remember
Speech Pattern	Quickly grouped words	Lots of interruptions, and 'uh', 'um', 'ah'	Deliberate phrasing	Long complicated sentences

Table 19 continued: Learning styles and their characteristics (Adapted from: Advanced Neuro Dynamics Inc 1987 and ANTA 1999)

	VISUAL	AUDITORY	KINESTHETIC	AUDITORY DIGITAL
Processing Patterns	Quickly with minimum of detail	Will let you know unconsciously when they understand by changing the subject	Extensive detail	Will not give indication of understanding unless you ask
Often Asks	When?	Where?	Why?	What if?
Preferred learning methods	• Poster charts and graphs • Visual displays • Booklets, brochures, and handouts • Variety of colour and shape	• Question and answer • Lectures and stories • Audio tapes • Discussion pairs or groups • Variety in tone, rate, pitch and volume • Using music or slogans	• Team activities • Hands-on experiences • Role plays • Note taking • Emotional discussions	• Combination

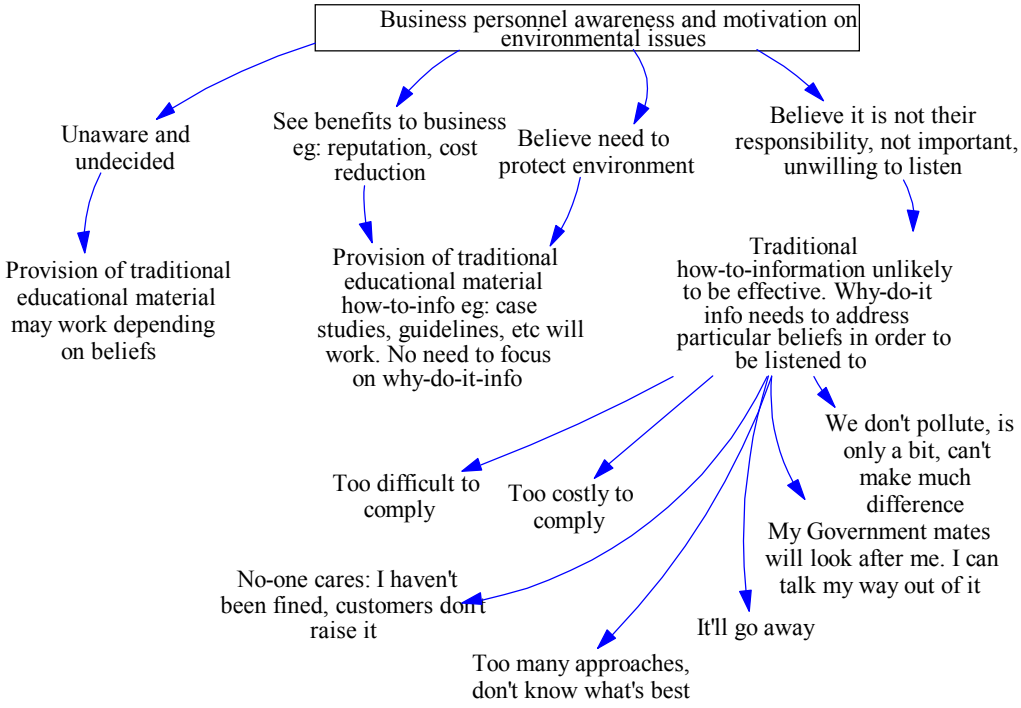


Figure 24: How mental models of business personnel will impact on effectiveness of education materials (Developed by present author).

Others argue that the content in awareness raising materials should point out the consequences of inaction, as it is believed that people will change their behaviour to avoid negative consequences and to gain positive consequences (De Young 2000; Geller 1995; Kaplan 1991; Scriabine 1996; Smith & Day 1996). This belief underpins one theory on why people behave in ways destructive to the environment. It is believed that people behave destructively because that behaviour results in immediate positive consequences, such as comfort and convenience, and because there is a significant time delay between the behaviour and the appearance of the negative environmental consequences. People simply do not equate the two (Cunningham, Sinclair & Burritt 1997; Geller 2002; Hernandez & Monroe 2000; Kassirer 1999; Layrargues 2000; Lothian 2002; McAllister et al 1999). Support for this theory is given by the fact that people have tended to conserve water and gasoline only when shortages and crises occur, resulting in higher costs and inconvenience. That is when they encounter immediate negative consequences (Geller 2002).

These authors therefore recommend that consequences or self-interest should be pointed out in education programs; that educators should look for ways to make the message seem personally relevant to the audience member (Cunningham, Sinclair & Burritt 1997; Day & Smith 1996; Geller 2002; Kassirer 1999; Layrargues 2000; McAllister et al 1999; Tilbury 2002). Kassirer (1999) calls for illustrating educational points in ways that help the person to physically experience the issue – through touch, smell, sight, or hearing. McAllister et al (1999) emphasise linking educational messages to past experiences to highlight their relevance. For instance, if a business manager was a fisherman, the conversation should focus on the damage to waterways and how this has affected the numbers of fish available. If they are a family person, the effect that environmental damage is having on our native animals and plants can be highlighted, with expression of sadness at the fact that their children will not be able to experience collecting tadpoles, chasing butterflies, or other memorable childhood activities.

Two surveys of community knowledge and attitudes about environmental issues have found that the major reason people are concerned about the environment is that they have '… concern about future generations' (NSW EPA 1997, 2000). This suggests that targeting stakeholders with messages containing a focus on the impacts for future generations may be more effective than other focuses, about which the community does not care as much.

Versteegen and Scharmer (2001 p.41) agree with the importance of making awareness raising and training sessions personally relevant to the participants. They identify two principles for structuring workshops:

> 1) begin with "current" and "emerging" realities and then move to images, inspirations and intuitions of the future; and 2) have an unfettered focus on the participants' real work challenges and make the teaching of tools contingent on the current issues and challenges.

This suggests that educators implementing training programs should not simply present the environmental information and processes that *they* believe should be implemented to reduce environmental impact. They should design their training programs to address the current reality of the participants and *their* needs in order to take action.

Monroe, Day and Grieser (2000 p.5) believe that awareness raising approaches can be effective, but state that they need to be designed according to the following four step model:

1. First, set a clear goal. What exactly do we want people to do? Which behavior do we want to focus on and why? Environmental practices often involve a myriad of behaviors. Which of these should be the focus of our efforts?
2. Then select the audience that can have the most impact and focus on it.
3. Learn that audience's "media diet." What media does the target audience get its information from—radio, TV, newspaper, community bulletin boards, their doctor, boss, or children?
4. Only then can we focus on message. A message written for a community bulletin board is quite different—and could be more effective in changing behavior— than one written for TV.

Once messages are created, Monroe (2000) suggests that they should be tested with a sample of the audience to see if they are effective. Table 20 shows an example testing process.

Table 20: Pre-testing questions (Adapted from: Monroe 2000 p.58)

For an educational product, ask teachers or administrators… • Is this activity/poster/filmstrip/booklet something you could use in your class? • For what grade level is it most appropriate? • For what subject is it most appropriate? • Are the illustrations appropriate? Gender-free? Ethnically appropriate? • Is the vocabulary appropriate? • Will the activity help you meet your curriculum objectives? • Would you use this? Why or why not? • Would you need training to feel comfortable using this?	Rather than asking teachers questions about their students' reactions, ask teachers to conduct the activity and record students' questions, comments, or activities. In addition, students could fill out a response sheet. • Did you alter the activity from what was written? If so, how? • Did boys and girls respond differently? If so, how? • Please give some examples of the questions that students asked. • Please give some examples of student reactions to the activity. Were they engaged? Did they stay on task? Were they confused? • Did you achieve your objectives? Did your students gain knowledge or skill?
For a communications product, ask the intended audience... • What do you think the main message of this poster/ad/radio spot is? • To whom is this message directed? • Could it be you? Why or why not? • Does the main character remind you of someone you know? Why or why not (which may be prompted with specific questions about hairstyle, clothing, gender)? • What would prevent you from doing the suggested behavior?	For any product, ask experts... • Is the information conveyed here accurate? • Is the message conveyed appropriate? • If people adopted this behavior, could it make a difference in the problem?

Research has shown that information in the form of examples of model or ideal behaviour can be very effective in the creation of norms and shared mental models. This can be achieved through video, demonstrations and case studies (McKenzie-Mohr & Smith 1999; Smyth 2002). McKenzie-Mohr and Smith (1999 p.38) report on an experiment conducted by Aronson and O'Leary (1982-83) that tested the power of norms to affect people's behaviour with water conservation. In a university athletic centre they placed signs next to the showers, encouraging people to turn off the shower while they lathered up. 'The sign read: Conserve water: 1. Wet down. 2. Water off. 3. Soap. 4. Rinse'.

Only six per cent of people complied, despite a survey showing that '… 93% were aware of the sign and its message'. When researchers posed as students and demonstrated the behaviour, they found that compliance of others increased to 49 per cent when one person modelled the behaviour and to 67 per cent when two people modelled the behaviour. A norm was set with which people felt compelled to comply.

Another example that they report is an experiment conducted by Cialdini, Reno and Kallgren (1990) involving littering activities. Researchers placed flyers under the windscreen wipers of all cars in a library car parking lot. They conducted two experiments. The first involved having a researcher either just walking past patrons as they approached their cars, or picking up a piece of litter and putting it in the bin as they walked past. They found that in the control situation, over a third of people littered the flyer. However, in the test situation where the researcher demonstrated picking up litter and putting it in the bin, virtually no one littered the flyer. The second experiment involved manipulating the amount of litter in the car park:

> … when the parking lot was littered with flyers, the library patrons littered as well. However, when only one flyer was littered in the parking lot, patrons littered significantly less. (McKenzie-Mohr & Smith 1999 p.39)

McKenzie-Mohr and Smith (1999 p.39) report that the '… conformity that occurs due to individuals observing the behaviour of others in order to determine how they should behave can have long-lasting effects'. However, it would seem likely that this would only occur if they have altered their mental model to accept the new behaviour as the right behaviour. If they have not, and other people around them stop demonstrating the model behaviour, it is likely that they would forget the new behaviour and return to their original practice, as the control situations suggest.

Providing individuals with information on their current environmental performance and their performance over time has also been found to be influential on behaviour. Many authors recommend the use of such feedback techniques (Goleman 1995; Hernandez & Monroe 2000; Kassirer 1999; McKenzie-Mohr & Smith 1999; Meadows 1997, 2000). The feedback may be given verbally, in writing, or via equipment that provides instantaneous readouts of the person's resource usage. Such devices are being developed to

instantaneously report on electricity, water, and gas usage, even miles per gallon used when driving vehicles (Geller 2002; Meadows 1997).

McKenzie-Mohr and Smith (1999 p.55) recount a study by Larson, Houlihan and Goernert (1995) which demonstrated that simply 'Posting signs above aluminium can recycling containers that provided feedback about the number of cans that had been recycle [sic] during the previous weeks increased capture rates by 65%'. Similarly, they quote research by Seligman and Darley (1977) that showed providing households with regular feedback on their energy consumption, reduced their consumption '… by 11% relative to physically identical households who did not receive feedback' (McKenzie-Mohr & Smith 1999 p.55). Meadows (1997) details similar research where the feedback was instantaneous with the energy meters placed in a prominent position of the house. In this situation, the energy consumption was 30 per cent lower than in houses where the meters were outdoors.

Feedback devices have significant potential to improve the practices of individuals at home and at work, *if* they can be installed widely through out society, and if people *care enough* to read them and act on the feedback (Geller 1995, 2002). People may respond to feedback for many reasons, including that they believe in protecting the environment and enhancing society, or out of self-interest to save themselves money. Meadows (2000) believes that feedback leads to voluntary change and removes the need for coercion and penalties, because it removes the delay between the environmentally destructive behaviour and the appearance of the negative consequences. People can see that they are wasting their money, or, if they care about the environment, that their actions do not comply with their values; they can see that their mental models espoused and in-use conflict. Dwyer et al (1993) warn that it is important that the feedback be held in place until it becomes a norm for people to act in the more sustainable way. If it is stopped before this, some people may revert back to their old behaviours.

Many authors suggest that providing positive feedback on what a company is already doing can make it more likely that they will be prepared to undertake further action (Geller 2002; Kassirer 1999; McKenzie-Mohr & Smith 1999; Scriabine 1996). These authors suggest that the positive feedback helps the business person to see himself or herself as someone who cares about the environment, making the request seem less foreign. It creates

a positive atmosphere of interaction between the educator and the business person. This can be achieved quite simply, such as by stating "I see you're already recycling your paper, cardboard and metals. Have you considered looking at other less obvious wastes such as energy and water? Reducing these wastes can save you significant amounts of money through simple measures such as turning off lights before you leave a room, checking compressors for leaks…"

The information techniques outlined above are important to help people understand what sustainability is, and how to take action to move towards it. However, information alone may not result in individuals changing their behaviour, if there are perceived or real constraints to change which act as inhibitors. In this situation, positivist educators believe that mixtures of the motivational and coercive educational techniques are required to overcome the constraints and convince the individual to change.

4.3.2 Positive motivation based techniques

Positive motivation based techniques include material incentives, social support, use of a respected person or role model, goal setting and commitment techniques.

Material incentives such as rewards need to be used carefully. Research shows that large rewards can actually hinder the creation of positive attitudes towards sustainability (De Young 1993; Geller 2002; McKenzie-Mohr & Smith 1999; Santopietro 1995). Large rewards encourage people to act, but they do so to get the reward. The result is that if the reward is removed their behaviour often reverts back to the prior action (Bradbury 2000; De Young 2000; Dwyer et al 1993; Geller 2002, 2003; Meadows 1997; Robinson 1993). Worse, business personnel could begin to expect monetary rewards and refuse to take action without them (De Young 1993; Santopietro 1995). This has a negative impact on the success of other behaviour change techniques, and can be an extremely expensive approach for governments to take (Santopietro 1995).

Small rewards such as monetary rebates, verbal commendations, merchandise discount coupons and raffle tickets can be effective at motivating behaviour change (Dwyer et al 1993; Geller 2002). It is believed that unlike with larger rewards, behaviour change occurs

because individuals already feel that they should act, and the small reward motivates them to act on their belief. That is, it helps to build on their intrinsic motivation, and people feel better about themselves for having taken action (De Young 1993). It supports the growth of a positive attitude towards sustainability. One way of doing this is reported by Newton (2001 p.298):

> The "Thank-You Project" is one of the activities carried out through the volunteer program. For this project, volunteers visited classrooms and gave presentations on conservation and natural resources and described what conservation-minded farmers are doing to help protect natural resources. Afterward, students in the class wrote thank-you notes to farmers who were actively employing conservation practices. Ninety thousand notes were generated and distributed, and many farmers wrote back, expressing their appreciation of the students' interest in their conservation efforts. [While effective in reinforcing the farmers' motivation, this approach would appear to have consumed several trees worth of paper!]

In the situation where a person has little or no intrinsic motivation to help the environment, small rewards alone may not be enough to motivate the person to act (De Young 1993). However, positivist educators believe that if combined with other techniques such as awareness raising, modelling behaviour and peer pressure, behaviour change may be initiated. Rewards and other incentive techniques need to be held in place long enough for '… natural consequences such as social approval, media recognition, or visible environmental improvement to gain control' and cement the new behaviour as a shared mental model or societal norm (Geller 2003 p.8, 1995, 2002). If they are not kept in place people may revert back to their original behaviours. Geller (2002, 2003) therefore, recommends keeping strategies such as rewards and feedback methods in place indefinitely. He explains that many are cheap and produce better outcomes for the money spent than do penalty approaches, which require significant investments in both promotion and enforcement.

Reinforcement techniques such as the use of a role model can be effective in motivating behaviour change if the message is presented by someone who the audience member respects (Day 2000; Dwyer et al 1993; Geller 1995; Graborsky & Grant 2000; Hemmati et al 2001; McKenzie-Mohr & Smith 1999; NEETF & ICEM 2000b). It is therefore common practice for television, music and sporting personalities to be used in education programs to promote environmental causes. Examples of performers who have accepted this role

include Pierce Brosnan (actor), Olivia Newton John (musician and actor), Sting (musician), Pat Cash (tennis player) and Kate Slatter (Australian olympic gold medal winner in rowing). Many respected business leaders have also promoted sustainability; these include Chad Holliday (Chairman and CEO of DuPont), Archie Dunham (Chairman and CEO of Conoco) and Phil Watts (Managing Director of The Shell Petroleum Company). They promote sustainability through articles in management magazines, presentations at conferences and publication of books with the World Business Council for Sustainable Development (See www.wbcsd.com for more information).

The benefits obtained from using role models to promote causes also occur when popular television programs incorporate educational themes into their stories. Day (2000 p.79) reports that:

> In the United States, we have seen television episodes plant seeds of change in a nation's minds when Maude (a popular character on a prime time show in the 1970s by that name) chose to have an abortion or when Fonzie, a street-smart teenager, got a library card. The American public began to debate the merits of legal abortions and nearly one half million youths rushed to public libraries to get their cards.

Simmons and Widmar (1990 p.5) report that children can be effectively utilised as the respected person. They cite a survey that asked people where they obtain their environmental information. They found that '… nearly one-fourth of those residents with school aged children felt that educational materials brought home by their children were helpful'. Simmons and Widmar (1990) therefore recommend that education programs should provide materials to children, even when they are not the target audience, as this will result in the information reaching their parents.

McKenzie-Mohr and Smith (1999) report on the findings of two research projects that have demonstrated the impact of using a respected person to promote a cause. They state that in the first study by Burn (1991) only 12 per cent of people changed their behaviour when provided with information alone. The addition of a respected person promoting the cause increased this to 28 per cent, but more importantly it was shown that people who took action as a result of a respected person's request continued to take action for longer than those who were not requested to act. The second study by Craig and McCann (1978) sent the same brochure in envelopes from two different agencies: the state regulatory agency

and the local utility. They found that the group of people who received the brochure from the regulatory agency implemented more of the recommendations. This matched their preliminary research, which had shown that the regulatory agency was more respected. Passey (2001 p.27) reports that in Australia research has shown that:

> … the government is not considered a trustworthy source of information, and the general community was more likely to trust information from scientists or environmental advocates (ABS, 1998).

This suggests that government educators should work with these more trusted parties to conduct their programs. In relation to business this may mean working with respected bodies such as industry associations to encourage them to promote sustainability to their members (ANZECC 1998; Environment Australia 2001; NEETF & ICEM 2000b; UNCED 1992). Such an approach was recommended in UNCED (1992) *Agenda 21* and is being acted upon by Environment Australia, whose staff members have negotiated eco-efficiency agreements with 24 industry bodies. These require the industry bodies to promote eco-efficiency to their members, to survey their members on their activities, and to publish an annual public environmental report of the results. Some industry bodies are even developing model environmental management systems that can be adopted by their members, providing case studies, and providing assistance with audits (Environment Australia 2002e). In exchange for their efforts the staff of Environment Australia provide '… advice, support, promotion and in some cases funding' (Environment Australia, 2001b p.10). Three of the industry bodies involved '… have now published their first Public Environmental Reports under their agreements' (Environment Australia 2002e).

Governments have found that working with the industry bodies to establish voluntary agreements and codes of practice has the benefit of creating ownership and commitment to their implementation. It enables peer pressure or social support to be created for the association's members to take action, with the association theoretically being able to revoke membership for non-compliance (ANZECC 1998). It has however been recognised that many small and medium sized enterprises '… simply do not have the capacity to fulfil the requirements of voluntary agreements' (ANZECC 1998 p.27). Similarly, such an approach will only be effective *if* the business person is a member of the industry association *and* values its recommendations highly enough to implement them. If they do not, they are unlikely to be motivated to act.

De Young (1993) suggests that the pressure exerted from such groups, often referred to as social support groups or peer pressure groups, should focus on the positive opportunities of sustainability and recognition of the steps that business personnel are already taking. Kaplan and De Young (In Press p.1) agree, stating that '… much pro-social behavior may well be traceable to the way in which cultures use respect as a reward for such behavior'.

Expanding on the concept of social support is the establishment of peer mentoring and learning communities, also referred to as Communities of Practice (CoP). These are groups in which business people can voluntarily become involved to discuss the issues and learn from each other, with or without a facilitator. This enables them to not only receive the information from government officers, but to learn about its viability from people in the same situation who are grappling with the same issue.

Monroe and Chambers (2000) point out that this acknowledges adult learning principles, recognising that those involved will have expert knowledge and valuable experiences to contribute. It also recognises the social nature of learning, which many authors argue is important (Allen 2000; Allen 2002 et al; Innes 1995; Jaworski 1996; Molloy 2001; Senge & Scharmer 2000). These authors explain that learning is more effectively done in groups, as a social process, rather than individually. This is because an individual may decide to simply ignore or avoid the issue, and because people determine meaning and acceptability through conversation and others' opinions.

McKenzie-Mohr and Smith (1999) and Simmons and Widmar (1990) report that research shows that people pay more attention to what others, such as friends and co-workers say, than they do the media. The media simply influences what is discussed. The authors recommend that education programs that focus largely on media campaigns should also involve opportunities for peer interaction and learning. Palmer (1998 p.134) agrees on the benefits of peer interaction and learning, but disputes the above authors' claims about the impact of the media. She cites a study that looked at what influenced people to care about the environment. The study revealed that

> The five most important influences overall are, in rank order: television documentaries, media images, personal experience with animals and nature, nature and wildlife films, and intellectual argument (linked to

> media coverage). Higher education courses came sixth in the ranking, and school level courses ninth, out of 14 categories of influence.

Many authors recommend creating peer learning opportunities as a part of education programs (Geller 2002; Innes 1995; Kassirer 1999; McKenzie-Mohr & Smith 1999; Molloy 2001; Senge & Carstedt 2001). It should be noted however that traditional positivist educators would see such interactive sessions as useful only so far in that they provide another opportunity for them, the experts, to tell the targeted stakeholders what to do, and to foster peer pressure for implementation of the changes. Educators focussing on problem solving would, however, see the opportunity for the participants to clarify their understanding of the issues, to learn about viable sustainability techniques from each other and to build confidence in their ability to take action.

A very simple example of how to set up peer learning opportunities is provided by Newton (2001 p.299). He reports that in the government environmental education program that he operates for farmers they hold:

> "kitchen table talks," for example, conservation agents ask someone who is working with NRCS [Natural Resources Conservation Service] to invite several neighbors over for coffee one afternoon to talk about conservation and some of the things they could be doing better.

A more formally organised example is that of 'environmental mentoring', which is becoming a common technique used by large companies to bring their suppliers up to a certain standard. It is also used by government educators who have recognised the value that involving business personnel has on helping other business personnel to take action (Green Business Network 2001; NEETF & ICEM 2000a, 2000b; Vivian 2002). Where these programs are organised by government bodies, their officers recruit business mentors from their local areas. In exchange for the time and effort of their staff, these companies gain recognition as leaders in the field, in some cases are compensated for their time, and if working with companies within their supply chain, they can benefit from the improved products that result. Alternatively, companies who manufacture environmentally friendly products may wish to become involved in mentoring programs to increase the sales of their products.

Environmental mentoring programs are being implemented in the United States in Texas, Santa Clara, Massachusetts and Pittsburgh. Companies such as General Motors and The John Roberts Company are also implementing these kinds of programs (NEETF & ICEM 2000a, 2000b). These mentoring programs have also commenced in Australia, as documented in Vivian (2002 p.1). She reports on an education program utilising peer mentoring implemented by the Charles Sturt Council in South Australia, as a part of their commitment to the Cities for Climate Protection Program. The education program involved forming partnerships with two large industries – Pierlite Pty Ltd and Clipsal/Gerard Industries – to mentor small and medium sized industries to improve their energy efficiency. Staff of participating companies attended workshops, had their premises audited and were provided with recommendations and advice on improvement options. The program was hailed a success, with staff at 30 businesses becoming involved and reducing their energy use. The program has resulted in annual energy bill savings to the businesses of over AUS$311,222 per year and has required an investment of only AUS$157,110. All companies face a payback period of less than two years. The program has resulted in an 11.4 per cent reduction in carbon dioxide emissions, or 2,711 tonnes per year. The program will be expanded throughout the Charles Sturt Council and promoted to other local governments through the Cities for Climate Protection Program.

Goal setting and commitment techniques have also shown promise in motivating people to act on sustainability issues (De Young 1993; Geller 1995, 2002; McKenzie-Mohr & Smith 1999). It seems that if a person voluntarily commits to take certain action, they then feel compelled to do so; to be genuine, to align their mental models in-use and espoused (Geller 2002; Hernandez & Monroe 2000; McKenzie-Mohr & Smith 1999). It is believed that this occurs because people want to be seen as consistent. McKenzie-Mohr and Smith (199 p.22) state that

> … consistency is an important character trait. Those who behave inconsistently are often perceived as untrustworthy and unreliable. In contrast, individuals whose deeds match their words are viewed as being honest and having integrity.

The psychology literature suggests that the act of making the commitment can change people's perceptions so that they see themselves as someone who cares about the issue. It alters their mental model and this makes it easier to gain their commitment to further

action over time. However, in order for commitment techniques to be effective, people must voluntarily commit (McKenzie-Mohr & Smith 1999). This suggests that while social support and a role person requesting action can influence them to say yes, they must already have at least a small amount of intrinsic motivation to agree to, and actually take the action.

Some research has shown that behaviour change from commitment is more durable than behaviour change from incentive or reward techniques (De Young 1993; Geller 1995, 2002). This would make sense if the incentive or reward techniques resulted in people taking action in order to receive the reward, and not because of any environmental concern. In such a situation the desired behaviour may be stopped if the reward is no longer valued or is removed. McKenzie-Mohr and Smith (1999 p.23) provide an example of the effectiveness of commitment. They report on research by Moriarty (1975) conducted on a New York City beach:

> In this study, a researcher posing as a sunbather put a blanket down some five feet from a randomly selected sunbather. He then proceeded to relax on the blanket for a few minutes while listening to his radio. When he got up he said to the person beside him, "Excuse me, I'm here alone and have no matches … do you have a light?" He then went for a walk on the beach, leaving the blanket and radio behind. Shortly afterward, another researcher, posing as a thief, stole the radio and fled down the beach. Under these circumstances, the thief was pursued 4 times out of 20 stagings. However, the results were dramatically different when the researcher made a modest request prior to taking the walk. When he asked the person beside him to "watch his things" in 19 out of the 20 stagings the individual leapt up to pursue the thief. When they caught him some restrained him, others grabbed the radio back, while others demanded an explanation. Almost all acted consistently with what they had said they would do.

Their research has also shown that 'A substantial amount of time can pass between the first and second request, and that the second request can be made by a different individual'. They claim that this proves that a lasting change in perception within the person has occurred. The person now thinks of himself or herself as someone who cares about the environment (McKenzie-Mohr & Smith 1999 p.23).

McKenzie-Mohr and Smith (1999) state that volunteers or community groups can be used to gain commitments, and that these can be made even more effective by asking people to

commit in writing to undertake the behaviour requested. They cite an example provided by Burn and Oskamp (1986) in which there was a 31 per cent difference between a control group approached by boy scouts asked to commit to recycling, and those asked to commit and sign a statement expressing their commitment. Asking for a written commitment is a task that industry associations and respected persons could also undertake. McKenzie-Mohr and Smith (1999) recommend asking for commitment to undertake a small task in every education program. The task should be something that it would seem unreasonable to refuse. The educator can then say that they will check back with the person after an appropriate time period, to see how they have gone and to talk about the next steps. Where possible they recommend making the commitment public, so that the person has increased pressure to perform and obtains recognition for their effort.

4.3.3 Coercive manipulation based techniques

Environmental psychologists discourage the use of coercive manipulation techniques, such as laws and penalties, which attempt to force people to take action (De Young 1993, 2000; Dwyer et al 1993; Geller 1995). Such techniques can lead to bad feelings, resistance, even deliberate non-compliance – a phenomenon known as 'psychological resistance' (Geller 1989 p.23; Kaplan 2000) or 'psychological reactance' (De Young 2000). Geller (1989 p.23) provides an example, 'The road sign that announces a $50 fine for littering may actually prompt some motorists to toss litter on the highway when police officers are obviously not available to enforce such a litter control ordinance'. Such approaches cost considerable amounts of money to promote and enforce. If enforcement is ineffective or people can afford the fines, then there is little to motivate them to act if they do not care about the environment (De Young 1993; Potter 1996). Worse, De Young (2000 p.512) reports that such coercive approaches that restrict choice '… result in its user having significantly lower self-perceptions'. They develop a sense of helplessness due to having their behaviour determined by outside forces. Despite their ineffectiveness many government programs still utilise these methods. Geller (1995 p.192) explains why. He feels it is

> … partly because (a) laws, policies and ordinances are relatively quick and easy to implement; (b) this approach represents the traditional governmental approach to managing behaviour; and (c) the monetary fines from noncompliance provide funds (i.e., reinforcing consequences) for the mandating government, organization or community.

Authors such as Geller (1995) prefer the use of the information based and positive motivation based techniques rather than laws and fines. Similarly they do not recommend the use of other coercive approaches, such as the use of fear tactics and promotion of the negative consequences of inaction (De Young 1993; Hudson 2001; McKenzie-Mohr & Smith 1999). These coercive approaches appear to be counter-productive as well. Like laws and penalties, they can result in a negative attitude, leading people to feel a sense of hopelessness, to habituate to the message and to shut off from it (De Young 1993; Harrison 1990; Hudson 2001; Linke 1980; McKenzie-Mohr & Smith 1999; Passey 2001). Harrison (1990 p.230) warns:

> People are starting to become fed up with all the talk about the environment, perhaps as many as one person in four. Day after day they receive the depressing messages and the achievements seem to pale into insignificance… to make them feel that somehow their individual efforts are not particularly worthy. For those of you who care, to have one person in four saying they are fed up with all the talk is very dangerous indeed … the majority of people thought they had received the messages loud and clear about the problems the environment – whatever it might mean – is facing but they were not given the solutions to do anything about those problems.

Therefore, many authors warn that if an educator does point out the negative consequences of environmentally destructive behaviour, it is important to ensure that they also create a sense of hope by including solutions to the problem. That way the person is left feeling that they can take action and they can make a difference (Hudson 2001; McKenzie-Mohr & Smith 1999; Martin 1996; Sundaram 2002).

McKenzie-Mohr and Smith (1999) report that one way in which identifying the negative consequences can be effective is emphasizing losses that occur from inaction. This has been shown to be more effective than emphasizing potential savings. It makes it clear that *inaction is a choice* that costs the company money. While effective in achieving that realisation, many authors report that it does not necessarily result in behaviour change. These authors state that many business personnel are reluctant to implement sustainability technology, despite significant savings that could be gained (Bradbury 2000; Dwyer et al 1993; Molloy 2001).

Engineering and design strategies can also be used to obtain behaviour change. This can result from

1. Making environmentally destructive behaviour more difficult, for example extension of the delay on elevators closing resulting in more people using the stairs;
2. Making environmentally friendly behaviour more salient and convenient, for example installation of recycling bins or high occupancy commuter lanes that make it easier to undertake, or provide benefits to people who undertake, the preferred environmentally friendly behaviour; and
3. Making buildings and equipment more resource efficient, rather than relying on human behaviour. For example the use of timer switches on lights, water efficient showerheads, or insulation and tinting on windows to decrease air conditioning and heating needs.

White (2001) reports that some utility companies are using these engineering and design strategies to help consumers reduce demand for their products. It is in the utility company's interest to do so when the demand for their product outstrips supply, and / or the cost of supplying the resource is restrictive. White (2001 p.3) explains that the Kalgoorlie-Boulder area of Western Australia is one example of where such a situation exists. Water is transported by pipeline over 500 kilometres to service the remote mining towns of that region. As a result 'The operating and capital costs associated with supplying this demand are amongst the highest in Western Australia'. Population in the towns is increasing, resulting in even greater demand. The utility company has not been able to meet the demand, necessitating water use restrictions during summer.

This led the water corporation to conduct a water efficiency education program. The program consisted largely of engineering and design strategies to reduce demand. It included

- Retrofitting 6/3 litre dual flush toilets – free of charge;
- AAA-rated (9 litres per minute or less) water efficient shower heads – installed free of charge;
- Fitting of flow restrictors/aerators to tap spouts in internal sinks and basins – free of charge;
- Leaking taps repaired – free of charge;
- Air-conditioner bleed valves fitted – free of charge;

- Garden reticulation systems checked and adjusted plus minor repairs – free of charge;
- Tap timers discounted from $AUS20 to $AUS8;
- The supply of free WaterWise (drought tolerant species) plants up to the value of $AUS80; garden mulch up to the value of $AUS200 in exchange for lawn reduction and new garden establishment in the WaterWise theme;
- WaterWise garden assessment and information brochures – free of charge;
- Free water audits for the premises of 150 commercial and institutional customers with annual demand greater than about 1,000kL/a; [and]
- Two WaterWise demonstration gardens which incorporate information on low maintenance and low cost landscaping. (White 2001 p.3-4)

White (2001 p.4) reports that:

> The financial analysis of the program suggests that the financial benefits in reduced operating and capital costs will more than make up for the costs. There will also be a major financial benefit to customers in reduced water bills and also energy bills due to reduced hot water usage. Based on the original budget, the projected savings to the Water Corporation are $AUS3.5m, and $AUS2.8m to the customer over a 2.5 year period (Botica and White, 1996).

While these engineering and design strategies can be effective, they are not foolproof. Dwyer et al (1993) report that Geller, Erickson and Buttram (1983) found that simply installing environmentally friendly technology in homes does not guarantee improvement. They found that this led to a compensation effect, where people showered longer because they had more efficient showerheads. This suggests that in order for engineering and design strategies to be effective, people's mental models also need to be changed. They need to be altered so that they see changing their behaviour as important, worthwhile and achievable. Combining a range of the information based techniques with the use of engineering and design strategies can help to achieve this.

Indeed, many of the behaviour change techniques presented above can be combined to enhance the likelihood of obtaining behaviour change. McKenzie-Mohr and Smith (1999) refer to the research of Burn (1991) who provides a simple example of how this can be done in written messages, as shown in Table 21.

Table 21: Combination of behaviour change techniques (Adapted from: McKenzie-Mohr & Smith 1999 p.54).

Message Text	Technique Demonstrated
As a US Citizen you probably show your support for our country by voting and paying taxes. Beyond this you may feel that there is nothing more that you can do. However, there are things that you can do. One of these is participation in Claremont's recycling program.	Emphasise norms of 'pride of place' and 'doing what you can'
Californians alone produce some 40 million tons of refuse a year – enough to fill a two-lane highway, ten feet deep from Oregon to the Mexico border.	Vivid information
Currently the average person in the US produces about 1,300 lbs. of solid municipal waste a year. Most of this trash goes into landfills, and it is estimated that if present trends continue, nearly all of L.A. County will be without refuse disposal capacity by 1991.	Moderate threat
Recycling uses wastes instead of filling up landfills. Recycling extends resource supplies. Recycling is easy… simply put newspapers, aluminium, and glass into separate bags and place at the curb on your regular trash collection day. Recycling makes a difference and recycling is happening.	Creation of positive attitude – showing that the issue is important, worthwhile addressing and achievable. Clear instructions
Over 80 per cent of Claremonters favor the city's recycling program and other cities are calling to ask how Claremont does it. Help us do it, please recycle.	Appeal to norms and request for commitment

Geller (2002) provides a way to assess which of the behaviour change techniques listed in Table 18, will be most appropriate for different individuals. He divides people into four different categories, each of which requires different educational approaches. The first three categories are information based, motivational based, and support based. The fourth category is one in which people monitor their own actions and do not need outside assistance. The aim of all programs is to move people to this fourth state.

1. The person does not know about the issue – they are unconscious of their incompetence. The primary need is for an *instructional intervention,* for example education sessions, training exercises and directive feedback. The person will need all three types of instruction over time; information in order to understand, motivation in order to start, and support in order to continue.

2. The person knows about the issue and performs desired behaviour occasionally – they are conscious of their competence. The primary need is for a *supportive intervention,* for example the creation of positive consequences through feedback and recognition. The person does not need information or motivation, as they already perform the behaviour some of the time; they just need support to do it all of the time.

3. The person knows about the issue, but does not act – they consciously choose to be incompetent. The primary need is for a *motivational intervention.* The information that has been presented has not produced the desired result and the person needs to either be provided with more effective information, such as that tailored to their mental models as was shown in Figure 24, or be exposed to initiatives that motivate them to start taking action. Once started they will need support to continue. Motivation may be created through the use of incentives and / or peer pressure.

4. The person knows about the issue and performs the desired behaviour all of the time – they are competent without needing to be reminded of the issue. The behaviour has become a norm for them. Geller (2002) refers to these people as unconsciously competent. They undertake *self management* of their behaviour and initiate changes to it. The person does not need outside assistance, but educators may like to point out further actions that these individuals could take.

Hernandez and Monroe (2000) report a similar categorisation developed by Prochaska and DiClemente (1983). They suggest five stages of behaviour performance as shown in Table 22.

Table 22: Environmental behaviour categories (From: Hernandez & Monroe 2000 p.12)

Stage	Description
Pre-contemplation	Not considering or not knowing about an environmentally friendly behavior, or actually engaging in an environmentally unfriendly behavior such as dynamite fishing.
Contemplation	Beginning to think about adopting or changing to an environmentally friendly behavior.
Action	Trying out an environmentally friendly behavior.
Maintenance	Making the adopted environmentally friendly behavior a customary practice.
Advocacy	Multiplying the behavior by encouraging others to do the same.

Like Geller (2002), Hernandez and Monroe (2000 p.12-13) recommend different educational approaches for people within the different categories:

> Individuals at any stage may be motivated to move to the next stage by a message unique to that stage. Thus, a message to ensure maintenance behavior will be different from a message designed to promote contemplation. Rather than appealing to the experimental nature of trying something new, maintenance messages should strengthen existing positive consequences, by eliminating or changing negative consequences, or by reminding individuals of important information that reinforces their behavior (Graeff, Elder, and Booth, 1993). Not only do individuals move along a continuum of awareness and willingness to perform a behavior, but so do populations (Muth and Hendee, 1980). As more people shift from contemplation to action, for example, it becomes easier for others to move because the social norm changes toward accepting the behavior.

The positivist techniques discussed have constituted the most common approach used by Australian government educators (Environment Australia 1999). They range in complexity from simple awareness raising programs applied to the whole community, where educators have developed the information without the involvement of the targeted stakeholders, to the more formal approaches where different programs and messages are crafted for different people, to maximise the likelihood of obtaining behaviour change.

Similarly, how the techniques are evaluated also varies in complexity. Simple evaluation methods include formative or process measures and summative measures. Formative measures are conducted throughout the operation of the education program to measure progress (AED 2002; Hernandez 2000b; Newland 2000; NSW EPA & DLWC 1997; NSW Government 1996). Examples of formative measures include the number of business personnel spoken to, the number of seminars held or the number of brochures distributed.

Summative measures are undertaken at the end of the education program to determine its outcomes. Surveys are the most common method used. Audience members are typically asked if their awareness has increased, if they have changed their behaviour, and whether or not they have found the education program helpful (AED 2002; Dwyer et al 1993; Geller 1989; McKenzie-Mohr & Smith 1999). The audience member's answers to the survey questions are not usually verified, and studies have found that statements made about changes undertaken are not always accurate (Dwyer et al 1993; Newland 2000).

More formal evaluation processes occur in the form of scientific designs (De Young 1993; Dwyer et al 1993; Geller 1989; Grieser & Rawlins 2000; Hernandez 2000b). However, there are difficulties involved in applying such processes to evaluation of environmental education programs. Hernandez (2000b) states that three common research designs are used:

1. Pre-test / post-test – where behaviour of the audience is measured before and after an education program. Errors with this approach include the difficulty in proving that any change that resulted occurred because of the education program and not because of an outside influence;

2. Pre-test / post-test with experimental and control groups – this also involves measuring behaviour before and after an education program, but in this case a control group is added and their behaviour also measured. This helps to overcome the proof of external factors, as theoretically both groups would be affected by the same events. Therefore changes that occur in both groups are shown not to be a result of the education program. Conversely, changes that occur only within the group exposed to the education are assumed to be a result of the education program; and

3. Post-test only control group design – where behaviour is measured in a group exposed to the education program and a control group that was not exposed. No inquiry is made to determine what people's beliefs or behaviours were before the study. Errors are therefore believed to occur with this design, since the educators may misjudge what actually constitutes a change.

Hernandez (2000b) reports that in addition to the above, there are many other factors that can lead to errors in results. These include maturation of study participants (they have aged or learnt), loss of study participants (they leave or die), and repeated testing (if you give the same test before and after, the results are likely to be better the second time around). Errors can also be introduced through modifications to evaluation instruments, and through increased experience of evaluators; slight word changes may affect answers and changes in evaluators may lead to interpreting the same behaviour differently after the experiment. Implicit in these positivist evaluation techniques is the assumption that all people being targeted will respond in the same way. The methods used do not acknowledge that individuals will have different mental models, constraints to change and needs, all of which must be addressed, before they will be prepared to, and capable of, changing their behaviour. Despite all of the above, many positivist educators believe that such scientific evaluations should occur (De Young 1993; Dwyer et al 1993; Geller 1989; Grieser & Rawlins 2000; Hernandez 2000b).

Many positivist educators even argue that programs should be designed and tested prior to their implementation, to make sure that they are effective (De Young 1993, 2000; Dwyer et al 1993; Geller 1989). These authors suggest the trial of different techniques with different groups to see which ones work best. In this way, a cost effectiveness analysis can be conducted. The techniques found to be the most effective (those that result in the highest percentage of targeted stakeholders changing) and most durable (those that result in behaviour change that lasts the longest, as determined through repeated follow ups after the trial has been completed to see how long people continue to exhibit the new behaviour) are those that should be used in a large scale education program. Such a process may require several trials to refine the approach to be used. Many authors argue that this effort is worthwhile; as once it has been completed the program can be applied across a large audience or geographical area with confidence (De Young 1993, 2000; Dwyer et al 1993; Geller 1989).

The positivist authors argue that this more scientific part of the positivist approach to sustainability education, known as applied behaviour analysis, holds great potential for obtaining behaviour change in society. Geller (1989 p.19) reports that ‘Although it is widely recognised that most of our environmental problems have been caused by human

behaviour, the real-world application of behavior change strategies in the domain of environmental protection has been minimal'. He continues, 'Not only have behaviour analysts failed to get their technology accepted and implemented by environmental policymakers…but in addition, their behavior change perspective had been viewed narrowly and inaccurately by other environmental professionals'.

Several reasons are given for this failure of applied behaviour analysis approaches to be adopted into mainstream environmental education programs. These include the following:

1. Programs are designed by many different organizations, with little sharing of results or learning from each other's findings (Geller 2003; Hemmati et al 2001). Results of programs conducted by academics tend to be published within academic journals. The information therefore does not reach those who design and implement programs on the ground (Geller 2003).

2. Problems in trial designs where multiple methods have been used, preventing analysis of the effect of each strategy (Dwyer et al 1993; Geller 2003). The result is many studies showing change, but not being able to determine which method had the effect.

3. A focus on showing behaviour change that resulted from different methods, without conducting extended follow up studies to ascertain whether or not behaviour change lasts (Dwyer et al 1993; Geller 2003).

4. The application of the approach to relatively minor issues like recycling and littering, despite it being recognised that sustainability involves much more complex issues (Geller 2003). Most studies have been conducted in the residential / consumer sector with little work undertaken in government, commercial or industrial institutions where the most significant potential for improvement exists (Geller 1995).

The positivist approach to education has been criticised by many authors for many reasons (Di Chiro 1990; Greenall Gough 1993; Robottom 1990; Robottom & Hart 1993). These include the following:

- The positivist approach is expert derived and controlled, failing to involve the targeted stakeholders in the programs design and implementation. This can result in defensiveness and resistance to change (Allen et al 2002; Greenall Gough 1997; Holling 2000; Hudson 2001; NSW Council on Environmental Education 2001). The positivist educators cannot address the individual stakeholder's mental models and skill deficits, or remove the constraints to change that they face, since these needs are not identified (Smith 2002). Dunphy and Griffiths (1998) state that without understanding and assistance to remove the constraints and implement change, it is not surprising that some business personnel have found it easier to lobby against sustainability, rather than to embrace it.

- The positivist approach tells people what to do and fails to help people to truly understand the issue, to see its relevance, and develop their own critical thinking and sustainability capabilities. As a result it often fails to convince the targeted stakeholders to take action (Greenall Gough 1997; Palmer 1998; Robottom 1990).

- The positivist approach promotes continuous improvement approaches to sustainability. It does not question the status quo or explore the role of power or vested interests. Nor does it explore the wider systems connections – the range of other factors that may affect behaviour and need to be altered in order for business personnel to take action on sustainability – such as market structures, laws and subsidies (Fien 1993; Gough 1990; Greenall Gough 1993, 1997; Robottom & Hart 1993).

Recognising some of these criticisms as valid, several of the positivist educators are now altering their approach to include consulting with a sample of the targeted stakeholders to identify how they currently behave, and what leads them to behave that way. This enables the educators to identify the constraints to change that the individuals face (Foster-Turley 1996; Hernandez & Monroe 2000; Monroe, Day & Grieser 2000; Scriabine 1996; Smith & Day 1996). The educators can then develop their programs to overcome these constraints, often using the same educational techniques already discussed (Bossi 2000). While still maintaining a focus on the need for individuals to change, these educators recognise that the wider societal structures can limit their ability to do so. They therefore attempt to

remove these limits or provide incentives that will overcome their effect. This type of positivist approach is referred to as 'community-based social marketing'.

4.3.4 Community-based social marketing

Smith and Day (1996) provide a typical example of how community-based social marketing programs are developed and implemented. Their five-step 'participatory program development process' is reproduced in Table 23.

Table 23: The participatory program development process (From: Smith & Day 1996 p.3-4)

Step 1	Assess the problem: conduct formative research in the target population on environmental behaviors, knowledge, attitudes, and differences between those that exhibit the desired behavior and those that do not. This involves listening to the people and selecting the specific behaviors that will make a difference (Booth, 1996).
Step 2	Plan a strategic intervention program that addresses the needs of the target audience: messages, products, services, support and/or benefits that were identified as reasons individuals were conducting the "right" environmental behavior.
Step 3	Test the messages, tactics, products or materials selected as part of the environmental education or communication campaign.
Step 4	Implement the intervention through environmentally appropriate channels.
Step 5	Transform the assessment based on actual observation and feedback from the target population.

Most authors recommend a three-step process to identify the constraints to change that an audience faces (Geller 1989; Kassirer 1999; McKenzie-Mohr & Smith 1999). They recommend

1) Conducting a literature review to identify constraints already known;
2) Holding focus groups to clarify issues and delve deeper; and
3) An interview of a random sample of the audience to confirm the findings.

This three-step process recognises that much information already exists, and attempts to overcome the impracticality of involving all stakeholders in the information gathering process. It recognises that many individuals will hold the same view, and argues that it is

obtaining all the various views, rather than involving all people, that is important (Hemmati et al 2001; Kassirer 1999; McKenzie-Mohr & Smith; Yankelovich 1999). Yankelovich (1999) refers to this as proxy dialogue, stating that people will relate to a program and its findings if they can see that their view was represented and addressed.

Once the literature review has been completed, the findings are analysed to identify issues of particular interest, or those that require further clarification. Questions relating to these are developed and discussed with focus groups – small groups of audience members bought together to discuss a particular issue. The purpose of this is to find out what the 'typical' audience member thinks and feels, in addition to clarifying and expanding on the constraints identified in the literature review. For this reason McKenzie-Mohr and Smith (1999) argue that it is important to randomly select those to attend, not to use volunteers. They explain that if a person volunteers, it is likely that they have a special interest in the issue and are therefore not truly representative of the audience. They recommend paying individuals to participate, and highlight that the participants should not be sent any information to read prior to the focus group, as this would also alter their representativeness.

Grieser and Rawlins (2000) and AED (2002) suggest that different techniques for obtaining behaviour change may be needed for different segments of the intended audience. They suggest that data should be collected on what each of the sexes, different age groups, and socio-cultural status groups that make up the target group think, and their reasons for behaving the way they do.

Many authors suggest that focus groups should be made up not only of the targeted stakeholders, but also of a wide range of representatives or other stakeholders who relate to the situation under investigation. For example government officials, representatives of community groups and those of environmental groups might be deemed appropriate to the program (Clark, Perez-Trejo & Allen 1995; Davis et al 1996; Gunderson, Holling & Light 1995). Bossi (2000 p.42) warns that 'Too frequently—usually because of time constraints—assessments focus [only] on senior officials, high-level organizational representatives, or other prominent leaders, and influential citizens'. He warns that this does not result in a representative view of the issue, and limits the ability to plan an

effective program. Davis et al (1996 p.2) suggest that educators can identify the best stakeholders to involve in focus groups by making '… lists of those who will be positively or negatively impacted by a change in the status quo, those who will have to change the way they operate, and those whose resources or expertise can make the project successful'.

Focus groups that involve representatives of those involved in the issue are seen as an important step in obtaining detailed insight and understanding of a problem and why it occurs. Another benefit of focus groups held with the targeted stakeholders is the identification of the language they use to discuss the issue – their jargon. This enables resultant educational material to be developed using the language of the stakeholders. Many authors emphasise the importance of this (Adler 2001; Allen et al 1998; Smith 2002; Yankelovich 1999).

Newton (2001 p.198) reports that the government organization to which he belongs commissioned a study to identify whether or not the public understood thirteen terms commonly used in their education programs. The results showed that in many cases people did not understand:

> Most said that they understood the terms conservation, natural resources and water quality. One-third said that they did not understand technical assistance, wetlands, and stewardship; and one-half or more said that they did not understand biodiversity, locally led conservation, best management practices, sustainable agriculture, watershed, nutrient management, and nonpoint source pollution.

This study shows the importance of the stage of identifying the way the targeted stakeholders speak about the issue, enabling the educational materials to be designed in that language. There are, however, limitations to the effectiveness of focus groups. These include the fact that only a small percentage of targeted stakeholders participate and the impact that group dynamics may have on the answers given (Hemmati et al 2001; McKenzie-Mohr & Smith 1999). For this reason it is important that the focus group process be designed according to the organizational learning principles presented in Chapter Three. It is essential that a learning-supportive culture be fostered and that a skilled facilitator guides the participants in the use of systems thinking and dialogue skills enabling discussion of the issue in non-threatening ways (Allen 2000b).

To ensure that the limitations of focus groups do not result in skewed answers, many authors recommend a third step in identifying the constraints that the targeted stakeholders face. This third step is to conduct individual interviews or surveys to confirm the findings from the literature review and the focus groups (Geller 1989; Kassirer 1999; McKenzie-Mohr & Smith 1999). This also enables the collection of more intimate detail that an individual may not have been prepared to share in front of a group. To gain such data the interviewer will need to create an atmosphere of trust, in which the interviewee feels safe to answer truthfully and completely (Robinson 1993; Senge & Scharmer 2000; Smith 2002; Walker 1995). Keeping responses anonymous helps in this regard.

McKenzie-Mohr and Smith (1999) recommend the use of phone surveys to confirm the findings of the information gathering processes. They state that this is preferable to mail surveys, which have low return rates, or person-to-person interviews, which are very expensive and time consuming. Additional benefits include the fact that phone surveys make random sampling easy and can reach populations who may not be accessible by foot. They claim that fewer staff members are needed and those that are hired do not need to be located near the targeted stakeholders. They believe that phone surveys also enable easier quality control.

If funds are available, face-to-face interviews can be beneficial as they enable observation of reactions and workplace behaviour, which can highlight conflicts between mental models in-use and espoused. This is important as it identifies the 'real' reasons that people behave the way they do (Bossi 2000; Geller 1989; Robinson 1993; Walker 1995). Such conflicts between mental models are less likely to be identified over the phone, which may mean that important issues do not get recognised and addressed within the education program. Face-to-face interviews also provide the opportunity to assess how people react to the system around them. Some people may find ways to overcome constraints to which others succumb. Observing such people can identify various solutions that can be promoted to others (AED 2002; Day 2000; Robinson 1993; Walker 1995).

The above steps – literature review, focus groups, and interviews – will provide a greater understanding of the targeted stakeholders' behaviour and their constraints to change. This enables the education program to be designed to meet the needs of the targeted

stakeholders, making it easier for them to take action. McKenzie-Mohr and Smith (1999 p.19) have found that many people skip over constraint or barrier identification, thus dooming their education programs to failure. They state that there are four main reasons that people skip over this stage. They include:

- Belief that the barriers to the activity are already known;
- Time pressures;
- Financial constraints; and
- Managerial staff who do not support conducting preliminary research.

This highlights the need to address the mental models of not only the targeted stakeholders, but also the educators and the government personnel involved in program design. This will include mental models about what will lead to behaviour change and how programs should be designed. These beliefs will affect the methods and educational designs that the educators choose. For instance, an educator who believes that business personnel do not care about the environment and will only respond to fines is likely to tailor their brochures and materials to highlight the penalties that business face. This will be very different to the approach taken by an educator who believes that business personnel do care, but find change too difficult. Such an educator's approach would involve material on change management and problem solving, as well as assistance to help business personnel implement the changes (Smith 2001b, 2002).

Similarly, educators will hold different beliefs about how programs should be designed – whether by educators alone, or by involving the targeted stakeholders. McKenzie-Mohr and Smith (1999 p.81) warn that people become very attached to their hunches or theories, and introducing this alternative approach to program design is often resisted. Some individuals see it as an '… implicit admission that past initiatives were not designed as effectively as they might have been'. They state that those introducing the approach need '… to be prepared to deal with concerns your colleagues will have over the length of time that it will take to design and implement' the approach. They state that the process of identifying barriers can typically add two to four weeks to the development of an education program. However,

> The length of time required to identify barriers pales when compared to the time and effort involved in having to design and deliver a new program if the first is unsuccessful. Similarly, while identifying barriers adds to the expense of delivering a program, there is a high return on

> investment given the much greater likelihood of delivering a successful program. (McKenzie-Mohr & Smith 1999 p.19)

Once the barriers have been identified, approaches can then be developed to remove them. The approach will vary according to the barrier. Kassirer (1999b p.1) provides an example of this. He reports on an education program run in Toronto, Canada, whose government in 1990 '… made an official commitment to reduce the city's net CO_2 emissions by 20 per cent relative to 1988 levels by the year 2005'. The main goals of the program were to retrofit all Toronto buildings and '… to find cost-effective and creative solutions to enhance comfort, increase energy efficiency, and reduce operating costs in buildings'. The program was developed in partnership with many stakeholders including government, utilities, private environmental consultants, and materials companies. The main constraints and how these were addressed are shown in Table 24.

Table 24: Retrofitting Canadian Buildings (Adapted from: Kassirer 1999)

Constraint	Way overcome
Cost of undertaking physical changes to the buildings.	They provided interest free loans and guaranteed that savings would occur.
Concerns about whether it would be worthwhile.	Piloted the project through retrofitting government buildings, proving that it would be effective, before approaching the private sector. They also promoted the benefits obtained.
Concerns that it would be too difficult a process to undertake.	They simplified the process, including altering the way that all of the relevant government departments managed the issue. They removed the red tape, supported companies through it, made it as easy as possible, and demonstrated through the government retrofits that it could be done.

Kassirer (1999 p.3) reports that the Toronto pilot project achieved

> Over 100,000 tonnes per year in greenhouse gas reductions; 150 buildings retrofitted; almost 25% per year return on the City's investment. The returns were re-invested in the BBP [Better Buildings Partnership] loan fund to continue the rapid expansion of the program; 3,000 person years in jobs [created to do the retrofits]; over $11 million per year in building operating cost reductions; over $100 million in economic impact (investment levered by the program); all of the results greatly surpassed the goals of the program.

The Toronto program is now being expanded into the private sector and other municipalities. Kassirer (1999) reports that the program demonstrated the need for government personnel to recognise the constraints to change, and be prepared to alter their ways, to make it easier for business personnel to take action.

Once the approach to be used has been identified, evaluation methods should be developed. According to many of the authors who recommend this approach, it is necessary to use a reversal paradigm to gain true insight into whether or not the program has been effective. This involves the observation of individuals before and after the completion of the program to see whether or not their behaviour has changed (De Young 2000; Dwyer et al 1993; Geller 1989; Kassirer 1999). Ideally this should occur with control groups and multiple observations over time, to check the degree of behaviour change and whether or not it lasts (Kassirer 1999).

Geller (1989) calls for educators to also measure whether or not the education program has resulted in the individual changing other behaviours that were not specifically targeted. This is known as response generalisation. Whether or not the individual has influenced others to change their behaviour can also be measured. This is known as interpersonal generalisation. Geller (1989) states that educators should be constantly refining their knowledge of which methods can have these generalised effects. They should then promote the use of those methods. De Young (2000) agrees.

Once the details of the approach have been agreed upon, a complete set of materials and practices to be used should be produced. McKenzie-Mohr and Smith (1999) state that these can be presented to focus groups of the targeted stakeholders to assess whether or not they believe it would convince them to take action and help them achieve the desired outcome. The educational materials should be scrutinised and refinements made according to the suggestions from the focus group. Once the groups are satisfied with the approach, it should be piloted in a small area, preferably with a control group not previously exposed to the approach (De Young 1993; Geller 1989; Kassirer 1999; McKenzie-Mohr & Smith 1999). This is to prove that the education program would actually work ‘on the ground’. Again the approach should be refined and retested until it does work.

Smith and Day (1996) provide an example of a recycling program implemented in the City of Quito, Ecuador, that failed. The educators did not undertake the participative design and trial process. They designed the program and implemented it without consulting the targeted stakeholders. The educators were surprised when the participation rate for the recycling program declined dramatically only a month or two after its introduction. Investigations later revealed that the recycling program violated various cultural norms, resulting in only one gender being able to comfortably use the program. Smith and Day (1996) point out that this would have been discovered prior to program implementation if the educators had used their participatory design model.

McKenzie-Mohr and Smith (1999 p.5) report on a similar situation from the findings of Hirst (1984). He documents a very expensive and ineffective education program implemented by major gas and electricity suppliers in the United States. The staff of these agencies assumed – incorrectly – that they knew the constraints to change affecting their targeted stakeholders, and developed ways to overcome them, as shown in Table 25.

Table 25: Assumed constraints and solutions in energy reduction education program (Adapted from: McKenzie-Mohr & Smith 1999 p.5)

Assumed constraint	How overcome
Knowledge and time involved in identifying changes required.	Free household audit at time that suits the individuals.
Cost of implementing the changes.	Provide access to interest free or low cost loans.
Knowing which tradesmen or companies can undertake the changes properly.	Provide list of contractors.

They designed and delivered their education program without testing, only to find that despite spending millions of dollars advertising the program '… only 5.6% of eligible households requested an evaluation of their home and out of those only 50% took steps to improve their energy efficiency'. This resulted in only two to three per cent improvements in energy efficiency per household, despite it being '… possible to reduce residential energy use by more than 50%'. It is because of these kinds of results that the authors promoting community-based social marketing are adamant that programs need to be piloted to ensure that they work, before mass implementation.

Once the pilot has been completed and the approach proven to be effective, it can be implemented across the desired community. Progress should be reviewed regularly and learnings disseminated to all stakeholders, so that future programs can build upon the insights obtained (Geller 1989; Hemmati et al 2001). The authors recommending these approaches call for further funding and research into the effectiveness of the different methods. They call for the establishment of a diverse learning community made up of representatives of all stakeholders involved in education programs. This learning community could work together to continually refine and improve these educational (behaviour change) approaches, ensuring that the findings do get implemented 'on the ground' (Dwyer et al 1993; Geller 1989; Hemmati et al 2001; McKenzie-Mohr & Smith 1999; van den Bergh, Ferrer-i-Carbonell & Munda 2000).

Community-based social marketing does appear to be much more effective than the simplistic awareness raising approaches that are designed by educators without consultation with the targeted stakeholders and implemented without trial. However, it does not address all of the criticisms of the positivist approach identified earlier, and critical educators still believe that the approach contains many serious flaws.

4.4 Critical approaches to environmental education

Critical educators believe that the positivist approach is flawed because programs are still expert-derived and controlled. Even with community-based social marketing the programs are still developed by the educator, with only minimal involvement of the targeted stakeholders to identify constraints and then test the program developed. Critical educators believe that true participation, where the participants are involved throughout, and 'shape' the entire program, is required in order to obtain long lasting behaviour change (AED 2002; Allen et al 1998; Fien, Scott & Tilbury 2002; Kaplan 2000; Pretty 1995; Robottom & Hart 1993; Scriabine & Day 2000; Smyth 2002; Sterling 1996).

Critical educators believe that the educator should undertake a very different role to that of the positivist educator. They believe that educators should act as facilitators (Grieser 2000; Meppem 2000; Sterling 1996), researchers (Hart 1990), strategic planners (Senge 1990) and change agents (Huckle & Sterling 1996) helping the targeted stakeholders to solve the

problems that are important to them. That is, the program should start with, and deal with, what the participants currently feel, believe and need. They should not focus on what the government educator thinks or wants (Burkey 1993; Canas et al 1995; De Young 1993; Fagan 1996; Grieser 2000; Huckle & Sterling 1996; Jimnez Silva 1990; Kaplan 2000; Meppem 2000; Monroe & Chambers 2000; Monroe & Kaplan 1990; Senge 1990; Senge & Scharmer 2000; Versteegen & Scharmer 2001).

This is also the key concept underpinning assimilative theory, in which it is believed that in order to process new information and knowledge, the information or knowledge must relate to what people already know, otherwise it will not be absorbed (Canas et al 1995; Geller 1989; Monroe & Chambers 2000). The above requires an entirely different approach to education programs from what has been described so far. They cannot be pre-planned and then delivered. They become ongoing problem solving processes, where targeted stakeholders voluntarily participate and work together, along with the educator and other targeted stakeholders, to achieve their goals. The issues covered and the methods used will vary throughout the life of the program as desired by the group of targeted stakeholders who are working together. Such a group is often called a learning community. Senge and Scharmer (2000 p.7) explain that

> A learning community is a diverse group of people working together to nurture and sustain a knowledge creating system, based on valuing equally three interacting domains of activity:
>
> - Research: a disciplined approach to discovery and understanding, with a commitment to share what's learned;
> - Capacity building: enhancing people's awareness and capabilities, individually and collectively, to produce results they truly care about; and
> - Practice: people working together to achieve practical outcomes.

Not all of the targeted stakeholders may wish to participate in the learning community at the commencement of the program. Allen (2000b p.9) explains that educators need to accept this, and recognise that 'more will be learnt by a few genuinely committed co-researchers dedicated to exploring change within a smaller case study approach, than may be gained by engaging with a number of less willing participants in a bigger inquiry'.

As the program develops and people can see the benefits that result, others will join in. The educator has to accept this and let go of the concept that they 'control' the education

program. They need to be prepared to let the participants in the learning community develop at their own pace (Fagan 1996; Grieser 2000). Grieser (2000) claims that the educator also needs to accept the solutions or actions that the targeted stakeholders want to take, even if they do not necessarily believe that they are the most effective actions to be taken. For example, many business people may prefer to start looking at the simpler pollution reduction issues within their organization rather than at the more complicated transformative sustainability approaches. The educator and the targeted stakeholders can discuss the various arguments for different actions, but ultimately the educator needs to accept the stakeholders' choices, and support them in performing the actions they wish to take. This will result in the stakeholders having ownership of the decisions made and commitment to implement them. Educators need to support the participants in undertaking these processes. Failure to do so, or occasional lapses back into expert mode will result in damage to the relationship between the educator and the participants. It may even lead to resistance to participation in the program (Huckle & Sterling 1996).

Educators also need to practice committed impartiality. They cannot push the project in the direction that they believe is right. Educators need to be prepared to expose their mental models to the group, show that they are prepared to change them, and that they recognise that their mental models are not necessarily the correct ones. The group together needs to determine the way forward through dialogue and discussion (Fagan 1996; Fien 1993; Palmer 1998; Tilbury 2002). It is likely that such a change in role will be challenging for many educators who are used to implementing the positivist approach. Fagan (1996 p.140) explains the educator as facilitator role:

> The learning and action programme belongs to the local people. The facilitator rides alongside and within the group for a very short time with a clearly defined and limited role. He or she has a crucial part to play in helping the group think through strategy, preferred outcomes, processes and the results of action. At no time does the facilitator engage in action. The action belongs to the people alone. Sensible practical support is necessary to prove the facilitator's worth to the group. It is an active not a passive role, and one that must continually prove to be helpful. This does not mean negotiating important issues for the group or carrying placards at demonstrations. It does mean gathering, supplying, and accessing information, printing and publishing material, attending conferences and offering day-to-day counselling.

The effectiveness of these participative approaches to problem solving is widely recognised. It is believed to result from all parties having a greater understanding of the situation, the formation of trust, more productive working relationships between the parties and the development of ownership and commitment within the participants who will implement the agreed solutions (Adler 2001; AED 2002; Allen et al 1998; Clover 2002; Davis et al 1996; Hemmati et al 2001; Innes 1995; Kassirer 1999; PCI 1999; Productivity Commission 1999; Tilbury 2001; Vennix 1990).

Many authors report that the individuals involved in participative problem solving approaches alter their mental models as they hear from each other, the educator, and guest speakers, discuss their views, and learn about the many factors affecting the situation. The result is a greater understanding of the system surrounding the issue. This enables them to see a broader range of possible solutions than first imagined (Davis et al 1996; Forester 1996; Grieser 2000; Hemmati et al 2001).

Critical educators believe that another flaw in the positivist approach is that it continues to focus on changes that the individual can make. It does not focus on the changes to societal structures that could make it easier for all parties to take action, enabling more significant moves towards sustainability (Greenall Gough 1993; Kaplan 2000; Martin 1996). The wider constraints to change are looked at in community-based social marketing, but they are done so simplistically, with the aim being to minimise their effect on individual action, or to identify where incentives and other methods are required to overcome them. They are looked at so that the expert educator can design the program accordingly. Where solutions that would benefit all parties are possible, but would require significant changes to the status quo, these are often ignored, seen as unachievable or irrelevant. Examples of such changes include the changes to taxation and market systems that were discussed in Chapter Two. Instead, individuals are asked to act altruistically for the good of society and implement less effective, but what positivists see as more achievable solutions (Kaplan 2000; van den Bergh, Ferrer-i-Carbonell & Munda 2000).

It was shown in Chapter Two that many authors believe that there are sustainability solutions that actually enhance quality of life, not lessen it (Hawken, Lovins & Lovins

1999; Kaplan 2000). Critical educators believe that the status quo should be changed to enable these more effective solutions to be realised, as Kaplan (2000 p.500-501) explains.

> The observed environmental irresponsibility of many people cannot be interpreted as a simple example of disinterest or inappropriate attitude or sloth. Often there is a lack of appropriate infrastructure, or of multiply desirable choices [those that benefit the environment and other factors such as profitability or quality of life], or of cultural support. People have many reasons to resist making sacrifices for the common good, among them the concern that others will cheat, and that they will look like fools. When one adds to this the sense of inadequacy and helplessness as an individual tries to compensate for the inappropriate behavior of huge corporations and governments, it is hardly surprising that the behavior of ordinary people often falls short of exemplary (Bardwell & Kaplan, 1992)… Environmental campaigns must avoid 'blaming the victim' strategies. Individual behavior change strategies are inappropriate if macro conditions exist which can be blamed for contributing to the problem or constraining the effectiveness of individual efforts (e.g., companies that do not provide ecologically friendly products, government inactivity)".

At the very least these possibilities of change to the status quo should be discussed.

> There is nothing wrong with admitting that we can't do everything that is needed straight away for monetary reasons or because other priorities such as unemployment and health are seen as more important [than the environment]. What is needed is genuine, honest discussion on the issues to clarify the different stakeholders positions, beliefs, needs, and to work together to develop agreed steps forward. Without such honesty and dealing with the 'real reasons' for lack of progress the same problems will reoccur. (Walker, K. 2002, pers. comm., 28 May)

Another point that critical educators make is that the positivist educators do not aim to help the targeted stakeholders to understand the interconnectedness of all the issues, and all the possibilities. Critical educators believe that this understanding is important (Fagan 1996; Fien 1993; Greenall Gough 1993; Linke 1980; Martin 1996; Palmer 1998; Robottom & Hart 1993; Scriabine 1996; Sterling 1996). Instead, positivist educators focus on continuous improvement approaches to achieve sustainability. Martin (1996 p.45) explains why this is ineffective:

> More fundamentally, environmental or developmental concerns occur within and are a product of a particular social context. Accidents of history, social attitudes and values, economic, industrial and commercial development all enmesh to create the conditions from which the problems are an outcome. In the main, environmental problems are symptoms of entrenched social systems. Therefore, understanding requires critical

> social, economic and values investigation rather than environmental investigation. Unless the educational experience enables people to explore and analyse the fullness of the human-environment relationship, it is not possible to understand either the cause of the outcomes of human environmental management or any resolution to perceived problems.

To help build this understanding the educator would ensure that the participants have the opportunity to understand the many different points of view or arguments relating to the issue under discussion, for example the scientific, business, community and environmentalist points of view. This information would be provided through a range of mechanisms such as written information, case studies, videos or guest speakers / discussion participants. The group would then use the insights gained from this in their deliberations.

The positivist approach also fails to involve the targeted stakeholders working together to solve their problems. The social aspect of learning is ignored. The expertise of the individuals and their ability to learn from each other is overlooked; many positivists still think that the educator is expert, that there is one real truth, and that the targeted stakeholders should do what the experts say is correct (Greenall Gough 1997; Grieser 2000; Kaplan 2000; Monroe & Kaplan 1990; Robottom & Hart 1993).

Furthermore, the positivist approach does not recognise the need to help individuals develop a positive attitude towards sustainability, or build their skills and capacity to take action (Fagan 1996; Hernandez & Monroe 2000; Kaplan 2000; Smith & Day 1996). Critical educators believe that this is of the utmost importance (Grieser 2000; Kaplan 2000; Sterling 1996). As was shown in the previous section, many of the positivist methods for obtaining behaviour change depend on changing the individual's mental models in order for their effectiveness to last. Without this, the removal of the behaviour change technique results in reversal of behaviour. Senge (1990) explains this by saying that action based on a feeling of *should* dies off, while action based on a feeling of *want* lasts. Manipulation will only result in behaviour change if the negative consequences for inaction, such as penalties, are high enough and are enforced. If they are not, such techniques are largely ineffective (De Young 1993; Potter 1996), and as reported in Section 4.3 they can lead to resistance to environmental issues and deterioration in the relationship between the targeted stakeholders and the government.

Robinson (1998 p.4) describes what is required to create a positive attitude. He states that there are seven doors that need to be opened in order for the positive attitude to be produced. He states that the role of the educator is to open these doors, not to be the 'font of ultimate truth'. The steps are shown in Figure 25.

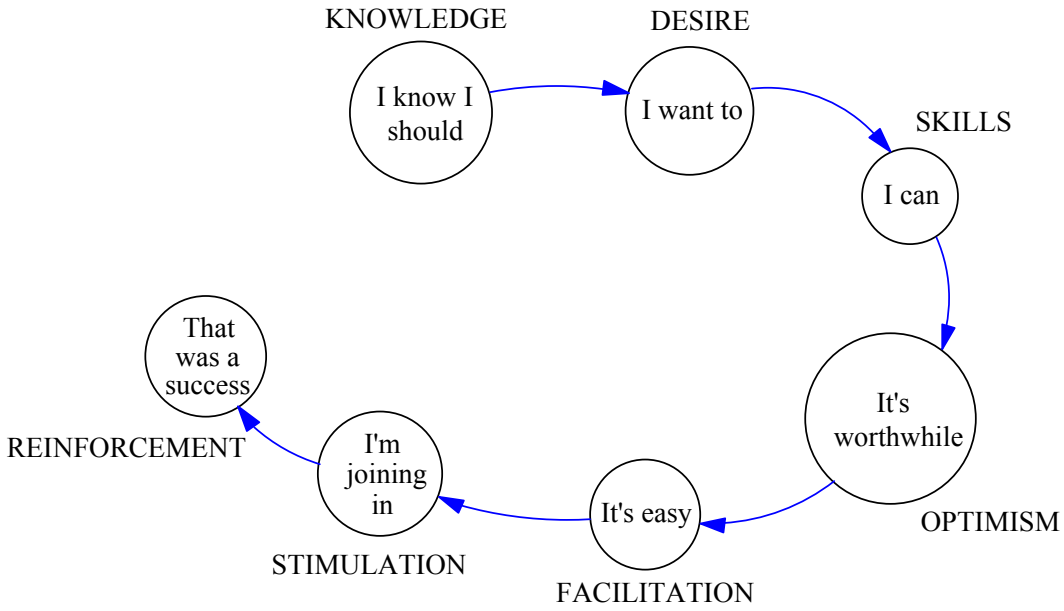


Figure 25: Seven steps to social change (From: Robinson 1998 p.4)

Step 1: Knowledge – people must know there is a problem, recognise that it is important and that there is a solution. They should understand the costs of inaction and the benefits of action. That is, they should be helped to understand the system around the issue, and alter their mental models to be in support of it.

Step 2: Desire – people need to be helped to see that the alternative future is achievable and desirable. That is, helped to obtain a vision of what they can achieve.

Step 3: Skills – people need to be able to understand the steps involved in reaching the goal, to see that it is relatively simple and easy. Educators need to help the targeted stakeholders to see that sustainability is important, achievable and worthwhile. Robinson (1993 p.52) explains why this is important:

> Psychologically, the chances of success are increased when massive social problems are recast into smaller ones, because problem solvers are more

> likely to judge the challenge as within their capacities, and as less risky. As Weick puts it, aiming for small wins produces a more functional level of arousal for those involved. "A small win reduces importance (this is no big deal), reduces demands (that's all that needs to be done) and raises perceived skill levels (I can do at least that)". When reappraisals of problems take this form, arousal becomes less of a deterrent to solving them (Weick 1984, p46).

Step 4: Optimism or confidence – people need to believe that they can achieve the goal, that there will be enough support and assistance through the government education program to help them do this, and that they will be able to do so with minimal disruption to their lives, or in the case of business personnel, their production levels.

Step 5: Facilitation – assistance should be provided easily and conveniently to the person, to make it as easy as possible for them to take the necessary action. 'They may need accessible services, infrastructure and support networks that overcome practical obstacles to carrying out the action' (Robinson 1998 p.6).

Step 6: Stimulation – people need stimulation to act. 'The stimulation could be an imminent threat (like a cost increase), a special offer or competition (based on self-interest), or, better still some communally shared event which galvanises action (e.g. a telethon, a public meeting, a festival)' (Robinson 1998 p.7).

Step 7: Feedback and reinforcement – people need consistent encouragement over time, as well as feedback on their success and that of others. They need to be provided with information and assistance to take the next steps.

Geller (1995, 2003) refers to similar issues, stating that in order for people to have a positive attitude – in order for them to actively care about environmental issues – they need to have certain person states (psychological conditions). These include the need to feel that they can take action and that their actions will make a difference. These person states are shown in Figure 26. Geller (1995) lists ways that these states can be created in workplaces; these are reproduced in Table 26.

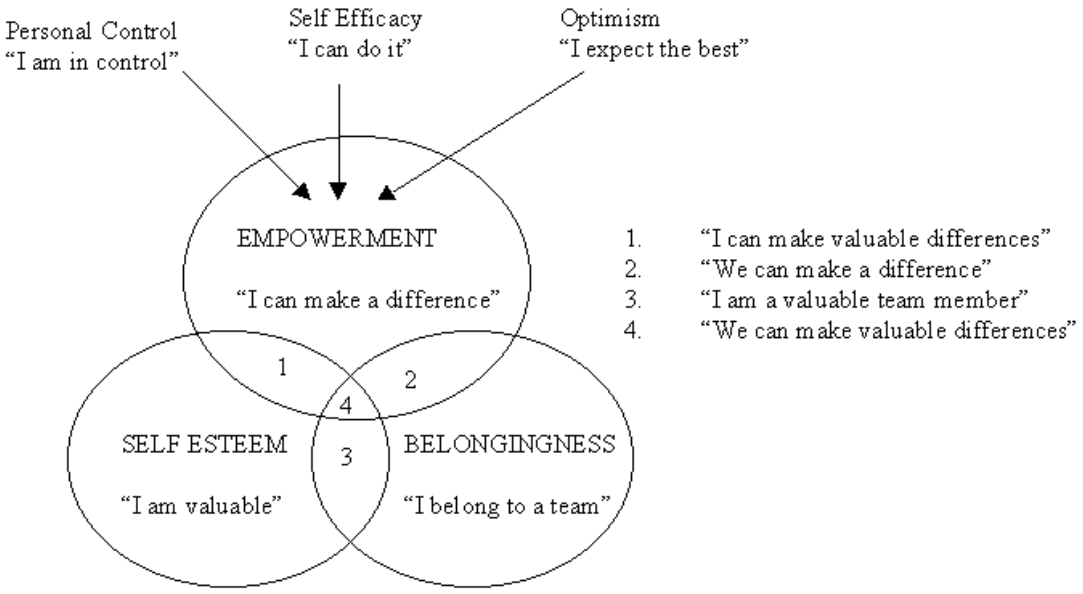


Figure 26: Person states hypothesised to increase propensity to actively care – to create a positive attitude towards undertaking change (Geller 1995 p.186).

In a later study Geller (2002 p.5) identifies organizational conditions required for long-term impact of behaviour change interventions. These include:

- Each level of an organization (from management to line workers) need education and training to understand the rationale behind an intervention, and to realize their specific roles in making the process work (cf. DePasquale & Geller, 1999).
- Indigenous [the company's own] staff need to implement the intervention procedures and thus have substantial input into intervention design (Geller, 2001b; McSween, 1995).
- A formal accountability system is required, which is best handled by an employee manned steering committee that monitors intervention results and develops action plans for enhancing intervention impact (Geller, 1998b; McSween & Mathews, 2001).
- A formal procedure for collecting, reviewing, and using behavioral results is needed to support the accountability system and enable continuous improvement (Krause, 1995; Krause, Hidley, & Hodson, 1996).
- Group and individual rewards are needed to support ongoing participation in the process, as well as to recognize exemplary achievements (Geller, 1996, 1997).

Table 26: Actions recommended in business organizations to support the creation of a positive attitude towards change (Adapted from Geller 1995).

Ways to increase empowerment	Ways to increase self esteem	Ways to increase sense of belonging
(a) Dividing overwhelming tasks into distinct smaller ones, more easily managed (with continuous monitoring of behaviours and outcomes); (b) Setting short-term goals and tracking achievements; (c) Offering frequent rewarding and correcting feedback for process activities (e.g. environmentally responsible vs. irresponsible behaviours), rather than only for outcomes (e.g. amount of energy savings or environmental pollution); (d) Providing opportunities to set personal goals, teach peers, and chart progress; (e) Teaching employees basic behaviour-change intervention strategies (e.g. response feedback and recognition procedures), and providing them time and resources to implement and evaluate intervention programs; (f) Showing employees how to graph daily records of baseline, intervention and follow-up data; (g) Posting response feedback graphs of group performance.	(a) Providing opportunities for personal learning and peer mentoring; (b) Increasing recognition for desirable behaviours and personal accomplish ment; (c) Soliciting and following up a person's suggestions.	(a) Decreasing the frequency of top-down directives and "quick-fix" programs; (b) Increasing team-building discussions, group goal setting and feedback; (c) Group celebrations for both process and outcome achievements; (d) The use of self-managed (or self-directed) work teams.

In essence, Geller (1995 p.187) is calling for a learning organization with a learning-supportive culture, as described in Chapter Three. He is stating that unless this exists, it will be difficult for staff members to care and to take actions on sustainability. He highlights that sustainability often requires people to '… be inconvenienced or to go beyond their normal routine or "call of duty", and that this only occurs when people are empowered to act'. He states that 'There is empirical support for this intuitive hypothesis (e.g., Bandura, 1986; Barling & Beattie, 1983; Ozer & Bandura, 1990)'.

De Young (1993) agrees, referring to people needing to be intrinsically motivated, to feel needed, and to think their contribution worthy, in order for them to act. In later work De Young (2000) reports that self-efficacy or competence has been found to be the most important internal driver of behaviour. He reports that participants in studies have stated

that they enjoy the challenge of solving problems and feeling competent, or building competence to address issues. Kaplan (2000 p.498) goes so far as to say 'Helplessness would be one of the most important motivational issues to consider in the context of behavior change…any psychological approach to ERB [Environmentally Responsible Behavior] that does not directly address the helplessness issue may have limited practical value'. People will simply avoid taking action in situations where they do not feel competent (De Young 2000; Fagan 1996; Kaplan 1991; Schein 2001).

> … in such a circumstance people will avoid attempting a new behavior regardless of genuine concern, positive attitude, strong social norm, or external inducement. Yet, it is a mistake to describe such people as unmotivated. They are strongly motivated by a desire to be competent. Unfortunately, in such a circumstance, the most reasonable action for people to take might be to avoid trying anything. By ignoring the role competence plays in behavior change, we may inadvertently create situations that cause not adoption of a new behavior but withdrawal and feelings of helplessness. On a more positive note, the human urge towards competence may readily explain the conditions under which people will consider adopting ERB. It may be no more complicated than providing a context where procedural information is readily available and behavior can tentatively be tried in a supportive environment. Such a situation would allow people to fulfil an innate desire to utilize and enhance their competence. (De Young 2000 p.516)

Obtaining this competence requires not only knowledge, but also the development of the capacity of the individuals to take action. This occurs with the development of various 'action skills' (Agyeman, Morris & Bishop 1996; Fien 1993; Lucas 1979; Palmer 1998; Sterling 1996). Fien (1993 p.71) reports that there is wide recognition of the need for action skills to be developed through environmental education in '… the Australian literature (e.g. Silbly 1978; Maher 1985b, 1988; Malcolm 1988; Greenall Gough 1990) and in the international literature (e.g. Martin 1975; O'Riordan 1981, 1987; Weibel 1983)'. This would include skills such as problem solving, dialogue, systems thinking and change management, as described in Chapter Three.

Developing these skills and a sense of competence requires the educator to work closely with the stakeholders and give them the opportunity to interact and learn from each other. This will be made easier if small, localised programs are operated, enabling people from their neighbourhood to come together and take action. Not large scale, mass implemented programs with little stakeholder involvement or interaction, as occurs with the positivist

approach. Critical educators add that education programs need to be undertaken at the local level to enable them to overcome constraints that are specific to their locale (AED 2002; Clover 2002; Fien & Tilbury 2002; Kaplan 2000). Newton (2001 p.297) states that localness also affects the acceptability of awareness raising materials. He manages a national environmental education program designed to improve farming practices in the United States. He has found that the effectiveness of documents and videotapes:

> … is often limited by geographic credibility. The primary audience of the NRCS [Natural Resources Conservation Service] – farmers, ranchers, and rural landowner – tends to be sceptical of information that does not appear to be specific to their part of the country. Documents and videotapes are most effective when they are clearly tailored to the local landscape. NRCS has stopped producing national brochures, for example, because field staff members do not use them if they are not tailored to the local audience.

Martin (1996 p.50) summarises the difference between the positivist and critical approach to education through an example of an environmental problem in Spain:

> The Extremadura region of southern Spain is an area of low population and extensive Dehas woodland. This is the product of soil, climate and human interaction. The shallow soils suffer summer drought and a short cold period in winter. Cork and holm oaks are both drought and frost resistant and predominate in a human-introduced shrub growth and flower-rich herbaceous layer. The economy of the Dehasa includes cork and firewood production and pork production from acorn-eating free-range pigs. The environment also supports important populations of rare and endangered species, including European lynx, imperial eagle, black stork, black vulture, and a huge wintering population of European cranes. The cranes arrive from their breeding areas of northern and eastern Europe in October to feed on the acorns from the cork oaks.
>
> This area is in the process of change stimulated by a variety of forces, including EU [Economic Union] farming subsidies and the inevitable rural drift as urban lifestyles are promoted and jobs, in particular those that enable people to achieve these dreams of urban excitement and fulfilment, are not available locally. The traditional response [the positivist approach] from many environmental NGOs would be descriptive, explaining the ecological interactions that create this fascinating and exciting biological mix. It would also promote its importance and exhort what a loss to the world it would be if it disappeared.
>
> An alternative approach [the critical approach] would start by investigating, with the local people, the unique socio-cultural and economic interactions that have created this landscape. Based on the above analysis it would explore alternative, but realistic, economic models for the region; models that utilize, but do not degrade, the social, cultural

> and environmental currency. It would work with the people of the area to explore these alternatives, provide them with the skills to participate in decisions about the region and to participate in and benefit from their implementation.

Similarly, Scriabine (1996 p.29) provides an example that shows why awareness raising does not always work to solve problems, and how participative approaches are more effective. She reports on a program conducted in Egypt. In that country farmers rely on a series of irrigation canals called mesquas for watering their crops. The canals, however, are often overgrown with weeds and used as a rubbish dump, impeding water flow and quality. The government wanted the farmers to clean and maintain the canals. They were considering launching an awareness raising campaign about the importance of the canals and the actions that farmers should take. Participative processes were undertaken instead, to identify the 'real' reason for the problem. Through 'focus groups, in-depth interviews and direct observation' it was revealed that:

> The farmers already recognized the importance of clean mesquas. However, they viewed mesqua maintenance as the government's responsibility. Furthermore, interviews with women pointed out that some people threw garbage in the canals because no adequate garbage disposal sites existed.

These insights enabled the parties to negotiate effective solutions to the problem. They developed an agreement about maintenance and cleaning – the farmers provided the labour, while the government paid for the removal of the waste and creation of more appropriate garbage disposal sites. Clearly, the original awareness raising process proposed would not have achieved this outcome and, as Scriabine (1996) points out, would very likely have frustrated both parties.

Kaplan (2000 p.503) explains that there are many benefits from such a participatory problem solving approach:

> People often find genuine participation (as opposed to the pro forma variety) satisfying and empowering (S. Kaplan & R. Kaplan, 1989; Wandersman, 1979). Further, the proposed approach allows people to discover that they are not alone, that there are indeed other concerned people. They also benefit from doing something that could make a difference. And finally, to the extent that the proposed process generates multiply desirable choices [those that benefit the environment and other factors such as profitability or quality of life], the individual may feel both that it is possible to behave responsibly without worrying about the

> implications of making a sacrifice in the process and that under these conditions others are more likely to join as well. The realization that other groups in other places are also generating multiply desirable choices may also reduce feelings of helplessness, as fear that nothing can be done is replaced by discovery that a great deal is, in fact, being done.

Sterling (1996b p.199) reports that

> An increasing number of countries have begun the process of strategy development for environmental education and public participation. It is probably true to say that a number of countries that have taken a lead, such as Finland, Norway, The Netherlands, Nepal and the Czech Republic, dissimilar in many respects, [they] have in common a pressing concern for environmental quality and this is often quoted as a key part of the rationale in strategy documents.

While many parties are undertaking these processes, there are no common guidelines for the development of critical environmental education programs. Sterling (1996b p.204) suggests that this is partly because the debate over what a critical approach involves is still young, but also because programs need to be negotiated with the people that are to participate within them in order for the program to meet their needs. He states that there cannot therefore be any prescriptive guidelines. He highlights however that

> Whereas there is no off-the-peg formula because each situation is different, there appear from experience to be a number of factors that determine the success of strategy. For example:
> - Strategies must build on previous and existing initiatives;
> - Strategies should be tailored to local conditions, needs and priorities;
> - Objectives should be realizable;
> - Governments and authorities should play a key support and facilitation role;
> - Participation, alliance, and capacity building are essential elements;
> - Conflict resolution is a central element;
> - Efforts must be made to attain coherence between strategies at different levels; and
> - Communication between participants is vital (CESP, 1994; Carew-Reid et al, 1994)

Grieser (2000 p.18) explains that:

> Generally participation begins with courtesy calls to local leaders and discussions leading to a consensus that there are problems of concern to the community, and that examining their causes could be beneficial to all. The next step depends on the degree to which one is committed to

> participation. Pioneers of the participatory approach insist that the development professional step into the shoes of the villager or whoever is experiencing the problem. If this means that a day a week is spent fetching wood, carrying water, building a local house, repairing a local road—then that is precisely what the development professional must do. This exercise shows the villager that the "expert" is imperfect, and that the villager, too, has expertise that he can teach to the technical specialist. This helps the two meet as equals. Living the village life also shows the technical specialist just how difficult that life is, and that suggestions for improvement need to be tempered with humility. GreenCOM [a sustainability education company] has used exercises in workshops that simulate this activity and show all the concerned parties that each person's knowledge and opinion is valuable.

Hemmati et al (2001) explain that if you are bringing all stakeholders together to work towards a solution, in some cases there may be significant conflict between the various parties, making initial group work ineffective. They suggest that in this situation it may be more beneficial to start the process by having each stakeholder group prepare a discussion paper that outlines their concerns, beliefs, needs, and what they want to achieve out of the process.

The groups can do this on their own, or the educator can interview the various parties and prepare reports on their behalf. Dialogue would be used during such interviews to gain insight into a person's understanding of the situation, what leads to a problem, and the possible solutions for that problem. Probing questions can be asked that require the person to reflect on their perceptions and to identify examples that confirm or disconfirm their mental models. Through this process the person's and the researchers' understandings of the situation are enhanced.

Hemmati et al (2001 p.209) explain that

> The MSP [Multi Stakeholder Process] coordinating group and/or the facilitating body can be charged with analysing the preparatory material in a manner that encourages dialogue at the MSP meeting(s). One option is to put all positions into a matrix format for comparison. Another option is 'cognitive mapping': Via interviews or document analysis or a combination of the two, trains of thought, points and arguments are mapped out in a graphic structure which not only portrays the content of a paper but also the structure of causes and effects, values and proposed action and other components of the views that a person or a group has of a particular subject. Such 'individual maps' can be combined into 'meta-maps' portraying the various arguments, thoughts and suggestions of a

> number of individuals or groups. Meta-maps can then also be put forward to a group for discussion. They help identify commonalities and differences in understanding and priorities.

Indeed, as Hemmati et al (2001) are suggesting, diagrams such as qualitative systems maps or quantitative system dynamics models, as introduced in Chapter Three, could be very useful in facilitating dialogue and understanding of the complexity of the issues involved (Allen et al 1998; Forester 1996; Meadows 1997; Wolfenden 1999). Stave and Cloud (2000) are US-based educators who are already doing this. They state that developing and using system dynamics models during community consultation sessions helps the individuals to see the complexity of the issue, and to develop a shared understanding of the problem.

Using a report format like Hemmati et al (2001) suggest has the benefit of stimulating new ways of thinking about and understanding the issues, before risking face-to-face contact – and possible conflict – between the stakeholders. This prior understanding makes the process of undertaking dialogue much easier, when the parties are ready to come together and work on the issues in a group setting. The process helps people to see the many different perspectives and the complexity of the situation. This helps them to realise that there is no point blaming any one factor or person. It also provides a way to summarise the process and the information generated, which can then be used to introduce it to those who have not been involved.

When the parties are ready to work together, actions will need to be taken to create a safe, learning-supportive atmosphere. This will require overcoming any distrusts that the participants have about the operation of such a program and the intentions of those involved (Allen 2000; Allen et al 2002; Forester 1996; Gunderson, Holling & Light 1995; Hemmati et al 2001; Meppem 2000; PCI 1999). Staff members of the government body managing the process must commit to doing what the group wants. They cannot disregard the findings, as doing so will halt the problem solving process, and worsen relationships between the parties (Gunderson, Holling & Light 1995; Healey 1996; Hemmati et al 2001; Meppem 2000; PCI 1999).

Many authors advise that it is beneficial to introduce people to the concept of dialogue at the very first meeting, if not before, and to have the group develop ground rules by which they agree to abide (Davis et al 1996; Healey 1996; Hemmati et al 2001; PCI 1999). These rules would include the right of everyone to have an equal say, to question each others' statements to clarify assumptions and reasoning, and to point out when people are not using dialogue skills (Davis et al 1996; Hemmati et al 2001; PCI 1999). It should be agreed that there will be no blaming, and that the focus will be on solving the problem, not on the people involved, not on interests, nor positions (PCI 1999). The group will need to agree on how decisions will be made and communicated (Davis et al 1996).

To build trust, it helps if the parties develop a shared vision of what the participative process is to achieve (Davis et al 1996; Grieser 2000; Hemmati et al 2001; Innes 1995; Khan 1996; Ryan, Brown & Ball 2000). Most parties will have different views on what this means and what is needed. These need to be discussed and clarified. The group can then begin working together to develop a shared understanding of the issues, to learn from each other, to identify constraints that need to be removed and ways this can be achieved, as well as deciding on actions to implement in their daily lives. In between meetings the parties take these agreed actions and then report back on the impact of them at the next meeting. The process becomes a cycle of dialogue, learning, action, and reflection. Such a process is known as 'action learning' (Enderby & Phelan 1994; Fisher, Rooke & Torbert 2000; Gibbons 1999; McGill & Beaty 1992; Mumford 1997; Smith & Dodds 1997).

Evaluation of critical sustainability education programs is very different from that of the scientific process involved with the positivist education programs. At the level of each problem solving group

> A good evaluation process is one that helps individuals and groups reflect on themselves and their goals, and to think about ways that the group process might be improved. The process must be constructive and internally driven. Participants should see it as a useful tool for moving forward rather than as an external assessment process. (Allen et al 2002 p.53)

At the larger scale

> The monitoring and evaluation component of sustainable development programmes, therefore, needs to be equally about building capacity, diagnosing constraints and opportunities, and trying to make programmes

> grow and expand, as it is about measuring and describing on-the-ground progress against pre-set targets… As collaborative learning approaches are scaled up to regional levels, they will bring different challenges for evaluation. Most evaluation efforts tend to involve looking at individual groups or projects. However, in a large-scale action there is a need to learn from loosely coupled activities that occur in multiple locations, i.e., across case studies (Ledford & Mohrmann 1993). In this situation, good evaluation is also needed to generate useful feedback to guide implementation. Managers need feedback from evaluation to assess progress, assist with planning, and to refine ongoing operations. (Allen et al 2002 p.53)

Like the positivists who called for a learning community between their many practitioners, Allen et al (2002) are calling for a learning community between the critical educators, so that they can continue to learn from each other and improve the processes used. Smyth (2002) echoes this call. It would be useful if such a learning community involved practitioners from all three of the environmental education paradigms, so that they can debate the best methods to use in different situations. Indeed some authors already appear to be blurring the boundaries and combining aspects of the different approaches.

Greenall Gough (1997 p.109) reports that Bowers (1991a, 1991b, 1993a, 1993b, 1995) has criticised critical approaches to environmental education. He claims that they are anthropocentric; they focus on understanding and protecting the environment for the sake of humans, rather than for the sake of the environment itself. Bowers (1991a, 1991b, 1993a, 1993b, 1995) also claims that critical education approaches discount the influence of tradition and culture and embrace cartesian dualisms, equating knowledge with mental processes, separating mind and body and implying that the irrational world can be made rational through critical reflection by the individual. Bowers calls instead for learning through the experience of traditional cultures and nature. He, like Van Matre, favours the interpretivist approach.

Fien (1993 p.97) acknowledges these criticisms and agrees that 'Critical education *for* the environment can be enriched by paying more attention to the personal transformation and holistic ethics focus of these writers [ecocentric thinkers such as Bowers and Sterling], provided that this does not lead to the neglect of the critical concern for ideology critique and structural change ...'. Greenall Gough (1997 p.110) is adamant that '… romanticising nature and traditional cultures is not a direction that should be followed'. She argues that

the wisdom of traditional cultures should be included in the critical process as one of the many different perspectives or approaches to be discussed by participants. She agrees that some applications of critical approaches have been anthropocentric and believes that developing a partnership ethic as promoted by Merchant (1992, 1996), and the incorporation of some feminist theory, would help.

Di Chiro (1990 p.6) also calls for the use of feminist theory, claiming that by breaking apart the dominant portrayal of the issue, feminist critiques can help people develop a greater understanding of the system affecting it. Grieser and Rawlins (2000 p.23) provide an example of what this means. They detail the development of national park policies in Madagascar. The government instituted policies protecting parts of the native forests and hired local males to guard the parks and be tourist guides. The employment was expected to be a positive outcome for local villagers, enabling a higher quality of life. However, the government policy makers had not consulted with the female population or considered the impact of their decisions on them. Grieser and Rawlins (2000 p.23) explain the result:

> When men became salaried employees, they passed the work on their family agricultural plots to women, adding to the women's burden. Program planners asked few questions about where women would get fuel and water once traditional sources in the park became off-limits, or about how much more time it would take. They failed to consider where women, often the traditional healers for the community, would obtain the herbs and medicinal products that they used to get in the forests, or whether the income from traditional medicines or forest products would disappear. They also failed to find out which tasks the women would have to neglect to carry out these additional burdens. (Often, it turned out, women had to cut their time with young children, meaning older daughters had to assume family responsibility earlier.)

While these authors state that feminist theory would help, it would appear that the critical approach, and its focus on understanding the system and working with all stakeholders, should have resulted in such insights. There appears to be much dispute in the environmental education field over such issues.

Jickling and Spork (1998 p.315[4]) claim that critical educators attempt to convince students to take certain actions. They feel that this is unethical and that 'To educate is not to

[4] Approximate page number. The downloaded article does not show page divisions or page numbers.

promulgate, indoctrinate, propagandise or in any other way coerce students into adhering to predetermined attitudes, assumptions or values'. Fien (2000) argues that critical educators are given much advice on how to implement critical education programs without indoctrinating students to their way of thinking. He lists several documents where such guidance is provided.

Jickling and Spork (1998) also claim that critical educators seek to silence the other types of environmental educators by declaring that education *for* the environment is the only real type of environmental education. Fien (2000 p.183) states that in making this claim Jickling and Spork (1998) failed to 'acknowledge the recent arguments by Tilbury (1996), Palmer (1998) and myself (Fien, 1993a) that education *for* the environment is based upon and embodies education *in* and *about* the environment'. He claims that critical approaches include these approaches in resolving the problem under investigation.

Walker (1997) also feels that critical educators attempt to convince targeted stakeholders to adopt what the educators believe is the appropriate goal to strive for. Furthermore she claims that the critical education approach is not effective in solving problems (Walker 1997 p.156). She believes that it ignores the constraints faced by the targeted stakeholders and those responsible for its implementation. She is specifically referring to the issue of environmental education in schools, where some state curriculum documents encourage teachers to implement critical environmental education programs in their classrooms. To do so this requires:

- a teacher with specific expertise in relation to the problem being investigated or an outside 'expert';
- committed teachers and principal;
- financial support;
- a committed community;
- the recognition of a shared, community-based environmental problem;
- a preparedness on behalf of the teachers, students and community participants to confront their own values and the values held by others;
- school and parental agreement that the environmental problem will become the focus of the curriculum;
- the acquisition of the appropriate skills and a willingness to take action to remedy the environmental problem identified;
- a problem that is solvable by school students.

Walker (1995, 1997) argues that many schools will not have the conditions listed above. Without assistance to create these conditions, she believes that the teachers will not implement critical environmental education programs. She therefore feels that in many schools the approach is ineffective in solving environmental education problems. Indeed she reports much evidence that shows few schools are implementing critical education approaches.

Walker (1995, 1997) contends that problem based methodology is more effective than critical education approaches. Problem based methodology involves the researcher working with the teacher to identify what they would like to do, the constraints to change that they face, and developing a plan of action that either solves the problem within the current constraint structure or by providing the teacher with the skills to change the constraint structure. It focuses on helping the teacher to implement initiatives that they want to do. The researcher does not tell the teacher what they should be doing. The process can and does result in initiatives that change current practice (Walker 1995).

Many critical educators would argue with Walker (1995, 1997) claiming that critical approaches do involve the identification of constraints to change and addressing them (Greenall Gough 1993; Kaplan 2000; Martin 1996). This debate cannot be resolved within this thesis. What is clear is that many parties recognise that a problem solving approach, where stakeholders are involved in the design and implementation of the education program, where they identify their constraints to change and ways to remove them, where the educator builds the capacity of the stakeholders to change and coaches them with their implementation, is more effective in obtaining behaviour change than the use of positivist, expert derived awareness raising approaches that have dominated environmental education initiatives in the past.

4.5 Conclusions

It has been shown within this chapter that there are several very different approaches to environmental education. The methods and theories underpinning each of these have been explored. It has been argued that a problem solving, learning-focussed, participative approach is believed to be more effective than the positivist, expert-determined and controlled, mechanistic approach.

Within the next chapter the implications from the theory explored within Chapters Two, Three, and Four for government educators designing and implementing sustainability education programs for business personnel will be outlined.

Chapter 5. Analysis of government sustainability education programs

Implications of the theoretical foundations for government sustainability education programs for business personnel.

> *The educational scene since Rio might be summed up as one of growing if scattered activity, enthusiastic effort often poorly supported by society, a lack of overall leadership in matters of conceptual structure, a tendency of vested interests in both academic disciplines and promoting organizations to withdraw behind defensive boundaries, and a general difficulty about perceiving large systems and differing points of view. (Smyth 2002 p.5)*

5.1 Introduction

The main areas of literature to be reviewed for this thesis have now been completed. Literature on sustainability and sustainable business practices was reviewed in Chapter Two; systems thinking and organizational learning literature was reviewed in Chapter Three; while environmental education literature was reviewed in Chapter Four. The implications from these three bodies of literature for government officers designing and implementing sustainability education programs for business personnel will be discussed within the next section of this chapter.

The recommendations from these three bodies of literature will then be synthesised to produce recommendations for the development, implementation and evaluation of the ideal approach to sustainability education programs for business personnel, according to the literature reviewed.

A review of the literature detailing past and current environmental education programs undertaken within Australia will then be conducted. This will show which methods educators have utilised and whether or not these comply with the ideal approach proposed. It will show that while the methods being recommended in this thesis are not yet in common use, there has been significant recognition by educators and government officials alike of the need to use them.

5.2 Implications for government sustainability education programs for business personnel

The review of environmental education theory conducted in Chapter Four has shown that whilst positivist approaches to environmental education have been the most commonly used, they are widely recognised as ineffective in obtaining behaviour change. Problem solving education approaches are recommended by many authors as the most effective approach to use to obtain behaviour change. The findings presented in Chapter Four therefore suggest that it would be significantly more effective for government sustainability educators working with business personnel to use problem solving education approaches rather than positivist approaches.

It was shown in the review of the systems thinking and organizational learning literature in Chapter Three that obtaining behaviour change in business organizations is difficult when managers issue mechanistic directions for change. Such directions are largely resisted. Like positivist educators, these mechanistic managers attempt to coerce their staff members to change their behaviour and adopt what the manager deems to be the correct behaviour. It was shown that when staff members are invited to participate, explore the reasons why change is necessary, discuss the options, decide on the changes to be made, and are supported when implementing those changes, the resistance to change largely disappears. In essence, this is the approach taken by educators focussing on problem solving. The targeted stakeholders work together to understand the issues, build their skills, decide on action to take, and then take those actions. The educator coaches the stakeholders with their efforts and facilitates the process. The findings from the systems thinking and organizational learning literature concur with those of the environmental education literature, which reported that participative, problem solving approaches to education are the most effective in obtaining behaviour change.

It was shown in Chapter Three that obtaining behaviour change within business organizations requires a learning-supportive culture in which all staff members are committed to taking action and supported by management when doing so. This includes building their capacity to take action, providing them with time to do this, and supporting

them in their efforts. This suggests that for sustainability to be addressed successfully within a business, it would require more than a single staff member participating in a local environmental education program and meeting regularly with other committed business people in the area who wish to discuss sustainability and decide on actions to take. A single person may wish to make changes to the practices within their business organization, but to be successful and avoid resistance they would need to involve all of their staff members. Together they would need to create understanding, commitment, and a shared vision; decide on actions to take, build their capacity to do so, implement their plans, and evaluate them. This suggests that it may be necessary for the educator to work with these committed individuals, or a key group of committed people within each business organization, to help them create a learning-supportive culture and build all of their staff members' capacity to implement sustainability.

One way of helping these committed business personnel to do this would be for the educator to provide them with templates and activities, based on systems theory and organizational learning, that would guide them in the implementation of sustainability. Guides could be produced that would help business personnel with the following processes:

- Exploring the importance of sustainability with the CEO, Senior Executives, and Board Members. These would be designed to help them understand what is involved and explain that any implementation is not likely to succeed without their commitment to the process;

- Establishing a learning-supportive culture with staff involvement, dealing with resistance and fear, helping staff to surface mental models, identify their internal constraints to change, develop a systems map of their business, and foster understanding of it as a system;

- Understanding sustainability and the many processes that can be used to address it, and developing a shared vision of their organization as a sustainable entity;

- Helping them to develop criteria for assessing different sustainability options and deciding between them;

- Preparing implementation plans including evaluation criteria; and

- Helping them implement the changes, with the educator being available to coach them with their efforts.

A range of the systems thinking and organizational learning tools described in Chapter Three could be used within these guides. This could include systems maps and systems thinking archetypes to help build understanding and explore possible actions to take. System dynamics models and learning environments could be used to enable business personnel to experiment with a virtual business and see the impact of different changes. This way they can learn about the complexity of the issues and gain confidence in what action to take without risking consequences in their own organizations. This may help them to overcome their fears or concerns, and would aid in the creation of a positive attitude towards sustainability. Many such learning environments on sustainability already exist and could be used by educators. Examples include: *Fishbanks*, which looks at how to manage fisheries sustainably (for more information see http://www.unh.edu/ipssr/Lab/FishBank.html); *AgLand*, which looks at how to manage farming land sustainably (for more information see http://www.extension.umn.edu/agland); and *The Green World MFS* which looks at practices in a manufacturing industry (for more information see Marrone, Sruogis & Zhiqi 2000).

The above approach, in which the educator supports a committed individual, or key group of committed individuals, to build the capacity of others within their organization and implement sustainability, is likely to be of most use to larger companies who have training departments and staff who can coordinate and implement the sustainability initiatives. It can be seen as a type of 'train the trainer' approach.

Such an approach is being used within the sustainability consortium of the Society for Organizational Learning (SoL Sustainability Consortium 2000, 2000b). The membership of this international consortium includes staff members from a wide range of sustainability committed multi-national organizations such as BP, Xerox, Harley Davidson, Interface, Nike, The World Bank, and Shell (SoL 2000). The members of the consortium meet

regularly to discuss what is occurring within their organizations, the changes they can make and how best to achieve those changes. They mentor each other and also undertake group projects investigating ways to improve practices. Together they develop new technologies and sustainability solutions. (For more information see http://www.solonline.org/).

While the above approach may be beneficial for larger organizations, it is likely that the managers of smaller businesses may require further assistance. If they do not have the time and / or skills, or are simply not comfortable in implementing the sustainability process, it may be necessary for the educator to actually facilitate it within their organization. That is, to work with all of the staff and management to develop their skills and undertake implementation of sustainability initiatives. The educator's role would be not to recommend solutions, but to help those within the company develop and implement them themselves. This fosters commitment to the process and builds the capacity of the staff to continue the process once the educator leaves. As Bubna-Litic and de Leeuw (1999) point out, '… collectively SMEs [small to medium sized enterprises] make up approximately 90% of Australian businesses'. Combined, they have a significant environmental impact. These authors also believe that without an in-depth level of assistance, it is unlikely that operators of SMEs will find the time or resources to take action on sustainability.

It was shown in Chapter Three that obtaining behaviour change could be made easier by taking actions that catalyse growth (support change) and remove the limits to growth (the constraints to change). This suggests that educators should work with business personnel to help them understand the system surrounding them, help them identify what actions would make it easier for them to change, and discuss ways to remove their constraints to change. Changing the system surrounding business personnel, to make it easier and more worthwhile for them to address sustainability, is likely to result in more business personnel wanting to participate in the sustainability education program, which would then help them undertake the changes within their organizations.

Systems maps and causal loop diagrams could be used to summarise the findings from the discussions with business personnel. Two examples are shown below. The first, Figure 27, is a simplistic systems map showing a range of constraints that discourage business

personnel from taking action. Many of these constraints were discussed in Chapter Two. The second, Figure 28, is a more complex causal loop diagram showing the relationship between many of the factors that affect the decisions business personnel make on sustainability.

Figure 27: Constraints leading to business personnel's in-action on sustainability (Adapted from: Smith 2000c p.2)

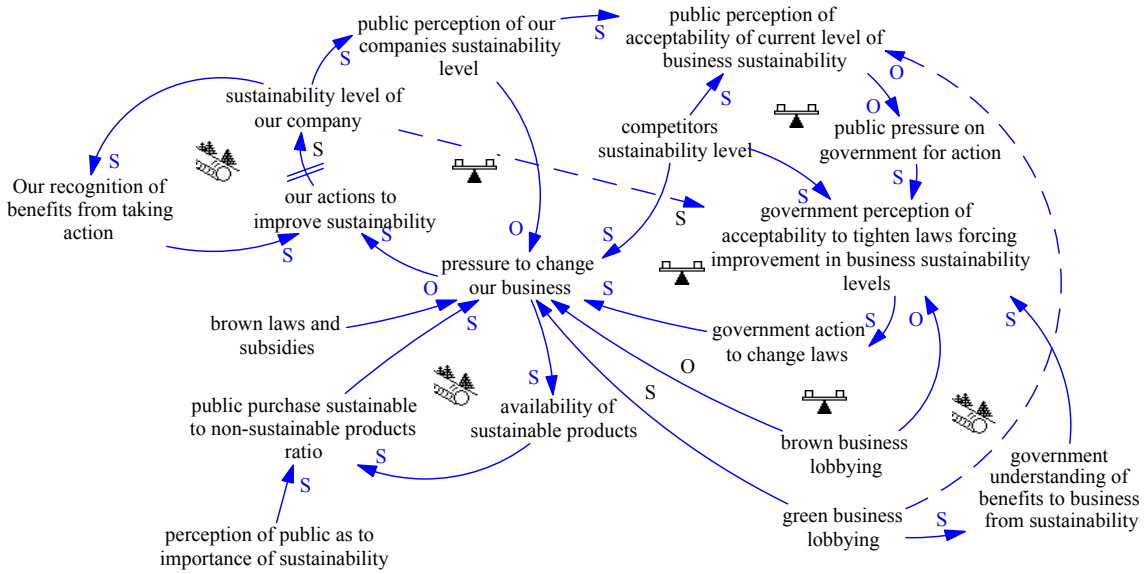


Figure 28: An example causal loop diagram showing parts of the system affecting the decisions which business personnel make on sustainability (Adapted from: Smith 2000c p.9)

A systems map developed participatively with representatives of all parties involved would shed light on the key leverage points, where action could be taken to make it easier for

business personnel to address sustainability. Suggestions, and ideally decisions, on what actions are to be undertaken could then be developed through dialogue between all of the parties whose actions could influence business personnel's decisions. This could include industry associations, regulatory bodies, consumer groups and environmental groups, as well as business personnel themselves. Specialists in sustainability methods, educational methods and behaviour change could also be involved.

Together these parties could decide on ways to alter the system surrounding business personnel to make it in their own best interest to take action. This could be done by the creation of incentive schemes, and the alteration of taxation and market systems to reward cleaner practices. It could also be achieved by the introduction of labelling schemes that help consumers to determine which companies are the most sustainable. This would enable them to use their purchasing power to pressure poor performing businesses to improve, and reward those businesses that are in the lead. Another possibility is load-based government licensing processes, where license costs reduce as pollution levels are reduced. Many other mechanisms are possible, some of which were discussed in Chapters Two and Four.

As Meadows (1997) explains, when the system is altered to make it in business personnel's own best interest to take action, they do not need to be coerced to do so. They take action, because it makes sense to do so. She claims that this also reduces the need for expensive regulation and enforcement. The government no longer needs to be a controlling, manipulative entity, but can work in partnership with business personnel to help them maximize their sustainability and their profitability. The actions taken to alter the system help business personnel to develop a positive attitude towards sustainability. This is achieved by increasing the *importance* of taking action and making it more *worthwhile* for them to do so. The educator, using problem solving education approaches, then helps build business personnel's understanding, critical thinking skills and their capacity to take action. They coach them with their efforts. Hence making the changes more easily *achievable*. All three aspects required to create a positive attitude and enable behaviour change are therefore addressed.

Many authors recognize the need to use a range of methods together in order to maximize behaviour change for sustainability (AED 2002; ANZECC 1998; Cunningham, Sinclair &

Burritt 1997; Environment Australia 1999; Fien, Scott & Tilbury 2002; Graborsky & Grant 2000; Newland 2000; NSW Council on Environmental Education 2001, 2002; NSW EPA & DLWC 1997; NSW Government 1996; P&TCWMB 2000; WCED 1987). Together the methods form an integrated environment protection system. Fien, Scott and Tilbury (2002 p.159) explain:

> Effective programs are not stand-alone activities or ones conducted in isolation from other conservation [or environment protection] strategies. Effective education programs are conceived, planned, and conducted as full and equal partners with other social instruments such as providing information, communication, and capacity building (Fien, Scott, & Tilbury, 2001), as well as policy work, legislation lobbying, conservation biology, environmental monitoring, and environmental planning.

Many of the changes to the system surrounding business personnel suggested above will require action to be taken at the state and federal government level. For example this will be required in order to alter legislation, change taxation and market systems and implement labelling schemes. Critical educators, however, recommend that education programs be implemented at the local level. This enables the participants to address issues specific to their local area, to interact and learn from each other, and build a sense of community. There are further advantages to a local education program for business personnel. These include the ability to identify any industrial ecology opportunities, where one company's waste can become another's resource, as was explained in Chapter Two. If the companies are in close proximity, costs associated with transport of the wastes are reduced, making such exchanges more viable. The participants may also decide that

- They want to implement projects within their local area to build social capital, for example developing and delivering a program for school children that builds workplace skills, thus making them more employable when they graduate, or funding shelter or soup kitchens for those in need; or

- They may wish to address environmentally degraded areas by funding, donating equipment, or involving staff in rehabilitation tasks; or

- They may decide on a joint investment in natural capital, researching how to better perform a particular task by learning from and mimicking nature; and

- Due to all being located within close proximity it makes it easier to attend regular meetings, to visit each other's premises to compare activities, and mentor each other.

While a local program presents the above benefits, it is impossible for the local level educators to make the necessary changes to legislation, taxation and market systems. They can certainly lobby for such changes to be made, but they cannot make the changes themselves. Some of these changes need to be made at the federal government level, while others require action by state governments. This suggests that all three levels of Australian government will need to take action in order to alter the system to make it in business personnel's own best interest to address sustainability.

In Chapter Two it was stated that pollution reduction approaches to sustainability would not be effective in stopping environmental degradation. Furthermore it was shown that having numerous education programs each addressing a single environmental issue was ineffective, as the educators competed against each other for the attention of business personnel. Each of these educators asked business personnel to undertake different activities, which added to their confusion about what sustainability means and what they should do. Ideally, there should only be a single education program that works with business personnel to address sustainability holistically. This suggests the need for a whole-of-government approach, whereby the many different government agencies with responsibility for environmental issues work together to implement a single sustainability education program for business personnel. This education program would be delivered at the local level to gain the above listed benefits and ensure that business personnel receive the same treatment regardless of the location of their business.

If this were to occur, each level of Australian government could be allocated specific roles to undertake in order to reduce duplication and maximise the effectiveness of this single government sustainability education program for business personnel. It is likely that Environment Australia at the federal level and the EPAs at the state level would undertake these roles, since they currently have the majority of responsibility for environmental issues within their levels of government. The federal responsibility would probably, however, be transferred to the staff of the Australian Environmental Education Foundation

once it has been established. This Foundation was foreshadowed in the Environment Australia (2000) *Environmental education for a sustainable future – national action plan*. The roles of the Foundation will include researching best practice environmental education and building the capacity of government educators.

At the federal level, staff members within Environment Australia or the Australian Environmental Education Foundation could:

- Research educational methods and sustainability approaches, demystifying the jargon and the many different methods by showing how the methods are all interrelated, thereby simplifying the process for business personnel to take;

- Research solutions for industry sectors, including looking at natural capitalism and industrial ecology options between sectors;

- Undertake initiatives designed to facilitate changes to the system surrounding business personnel to make it easier for them to address sustainability. This would include reviewing the activities of the staff at the many federal government departments to ensure that their policies and practices support business personnel taking action on sustainability. The staff members of Environment Australia or the Australian Environmental Education Foundation could also work with politicians to change the national laws, change the market systems and introduce labelling schemes. They could also work with the staff of the national industry associations to encourage their members to take action, and with other personnel as appropriate to make it as easy as possible and worthwhile for business personnel to address sustainability.

- Design and fund mass media advertisements that inform business personnel of the existence of the local level education programs and encourage them to become involved. These advertisements could also address the most common attitudinal constraints to change found within business personnel. They should show that sustainability is important, and that taking action is worthwhile and achievable.

- Develop training programs for the local level educators to build their capacity to implement the ideal approach to education programs. These programs should focus on building the educators' knowledge and skills in behaviour change, critical education, problem solving, business sustainability, systems thinking and facilitation processes.

- Develop training programs that the local level educators could use with business personnel to build their capacities, including the development of the systems thinking and organizational learning templates and guides suggested within this section; and

- Coordinate the whole process throughout Australia and support the states and local governments with their efforts.

These materials, training modules and reports on what is achievable could then be provided to staff members within the EPAs of each state, to work with their local level educators, to build their capacity, and coach them with their efforts. These EPA staff members should also work to alter the conditions specific to their state to make it easier and more worthwhile for business personnel to take action. This could include changing their state legislation and reviewing the staff practices and policies within the various state government departments.

The local level educators would work with the elected members, management and staff of their council to ensure that they understand the importance of the education program. They would build the capacity of all staff members who interact with business personnel so that they can reconfirm the educational messages. The educators would also work with the relevant staff members to review and alter the council's practices and policies as required making it as worthwhile and as easy as possible for business personnel to take action. In addition to the above roles, they would actually implement a problem solving sustainability education program with business personnel in their local area.

Different actions would be undertaken in each local program to meet the needs of the participants and to follow the direction they wish to take. However, there would be enough

commonality in direction that the above kinds of information and guides developed by staff members of Environment Australia or the Australian Environmental Education Foundation would still be useful to the local level educators when working with business personnel. This would enable the educators to focus their time on working with those business personnel who are committed to sustainability, to help them understand the issues, decide on action they want to take, and to facilitate their efforts. This would be much more effective than the current situation, in which the many local level educators each spend their time preparing the educational materials and undertaking extensive research on sustainability solutions.

Local government may not wish to accept these roles unless the higher levels of government provide funding for them to do so. This could occur through redirecting all of the existing funding for environmental education programs for business personnel, at all levels of government, or by altering the current system to generate a new source of income that local government could use. The NSW Council on Environmental Education (2002 p.32) has suggested the use of a '… mixture of grants, sponsorship, levies, user-pays approaches, subsidies and other funding sources'. The SA EPA (2002 p.1) has recommended new funding sources such as '… investigation fees, expiation fees, an environmental levy and additional fees for environmental assessment of development applications'.

Creating funding in order for local government to undertake environmental protection and education roles will only be part of the challenge. Other parts include helping local government to accept the importance of the issues, gaining their cooperation to undertake the roles, and building their capacity to do so. As will be shown in Section 5.4, staff at many local governments are already undertaking sustainability education programs for business personnel, indicating that many may well be willing to accept the role if it were funded.

If a whole-of-government approach was taken, and a single education program implemented at the local level, evaluation would occur by reporting on the activities undertaken within each local learning community or group of business personnel working together. This would include identifying the numbers of participants over time and the

outcomes of projects undertaken jointly by the learning community, as well as changes the individual participants have made within their own organizations and the outcomes of their efforts.

The staff members of the EPAs could collect the learnings from each of the local learning communities across their state. These 'learning stories' could then be placed on a shared website managed by the staff members of Environment Australia or the Australian Environmental Education Foundation, with an annual summary report produced and distributed to the staff members of the EPAs and the local level educators. The learning stories to be recorded would be of two types: the stories of the business personnel participating, and their advice to other business personnel; and the stories of the educators, summarising what techniques they have found work well in the education program, those that did not, and any other advice they have for achieving successful program outcomes.

Fien, Scott and Tilbury (2002 p.154) acknowledge the benefit of a case study or learning stories approach. They have called for the collection of case studies from environmental education programs and the analysis of these to identify 'good practice' from which other educators can learn. Fien and Tilbury (1996 p.67) explain that such an approach has been taken for the professional development of teachers and the incorporation of environmental education into schools. A joint program between UNESCO's Asia Pacific Centre of Educational Innovation for Development and Griffith University in Australia commenced in 1994.

> The primary goal of the project is to assist teacher educators in the Asia-Pacific region to include the educational purposes and innovative teaching and learning strategies of environmental education in their programs… this will be done by the development of a network of teacher educators in the region who are willing to share in the development of carefully researched and evaluated, and culturally sensitive, workshop modules… these modules will be accompanied by train-the-trainer programmes, which will assist teacher educators to adapt them in accordance with local needs and to prepare action research case studies of their use of the materials and their own continuing professional development.

Fien and Tilbury (1996) believe that the above project will result in '… a spiralling network of innovative teacher education practices and practitioners in environmental education'. A similar process of continuous learning and improvement should occur for

local level sustainability educators working with business personnel. Actions taken by the staff of the state EPAs, Environment Australia or the Australian Environmental Education Foundation to support the local level educators should also be recorded as a part of the annual evaluation process. Beneficial support activities could include an email discussion group, regular meetings, and capacity building initiatives. This would lead to an ongoing reinforcing loop of improvement to business sustainability education practices within Australia.

5.3 The ideal approach to government sustainability education programs for business personnel according to the literature reviewed

In summary, the findings of the literature reviewed suggest that the ideal institutional arrangement for government sustainability education programs with business personnel is a whole-of-government approach. This would involve the staff of federal and state government departments working together to alter the system within Australia to make it in business personnel's own best interest to participate in a single, problem solving, sustainability education program, operated within each local government of Australia. This would ensure that business personnel receive the same level of assistance regardless of the location of their business premises. It is likely that funding will be required before the management of many local governments will agree to undertake this role. Processes to establish this funding were suggested.

The staff of the federal and state government departments would support the local level educators with their efforts, design materials for them to use, and build their capacity to work with business personnel on sustainability. The inclusion of staff members to perform these roles within the state EPAs and either Environment Australia or the Australian Environmental Education Foundation once it is established was recommended.

The literature review has indicated that the ideal educational methods are those that focus on problem solving, where the educator would work with the business personnel committed to addressing sustainability within their area. They would form a group or learning community, discuss what they believe sustainability is, why it is important to

them, and how they think they could achieve it. Together they decide the focus of the education program and the actions they will take individually and as a group. An action learning process is used whereby the group continues to interact over time, meeting regularly to discuss their progress, mentor each other, and decide on further actions to be taken.

The educator would build the participating business personnel's capacity to think critically, analyse issues, identify constraints and devise possible solutions; build their abilities to implement changes within their organizations and their understanding of the many different sustainability methods and how they interrelate; and coach them with their efforts. While the educator would prefer that all business personnel use the holistic and more transformative sustainability methods, they would need to respect the right of business personnel to take actions at whichever level they wish, and help them to do so. Some business personnel may initially only want to look at compliance issues, others at pollution reduction, and a few at the more transformative methods of life cycle analysis, natural capitalism, and industrial ecology. The educator needs to respect this and support the business personnel with their efforts, recognising that over time they may be prepared to take the more complex actions. The educator would keep those business personnel not yet committed to sustainability up to date with the efforts and achievements of the group, answer their questions, and invite them to join in when ever they want to.

Evaluation would occur through measurement of changes to behaviour within the individual business organizations, and changes undertaken as a result of group actions. The collection of learning stories from business personnel summarising their advice for other business personnel, and those of the educators summarising their advice for other educators, was also suggested. Evaluation of the group process would also occur in order for the participants and the local level educators to identify ways to improve the processes they use. It was suggested that the staff members within the state EPAs and either Environment Australia or the Australian Environmental Education Foundation once it is established, could undertake a range of activities to support and further build the capacity of local government educators to undertake their roles. Likewise they could undertake a range of activities to make it easier and more worthwhile for business personnel to address sustainability. A summary of the actions that have been taken by these staff members

should be collated. All of this information could be placed on the Environment Australia website and made available to all government educators for review. This would result in a spiral of continuous learning and improvement to government sustainability education programs for business personnel throughout Australia.

The above represents the ideal educational methods, funding and institutional arrangements for government sustainability education programs for business personnel, according to the literature reviewed for this thesis.

5.4 Analysis of literature on Australian sustainability education programs

The current practice of sustainability education programs within Australia presents a very different picture from the ideal approach outlined above. These differences will now be explored under the headings of educational methods, institutional arrangements and addressing the larger constraints to change. It will be shown that there is considerable recognition of the benefits of the ideal approach, and that there are calls for the use of many of its components by the staff of some Australian government agencies.

5.4.1 Educational methods

It is emphasised within the findings of this thesis that educators designing and implementing effective education programs use problem solving approaches. They focus on building the capacity of business personnel to take action and facilitate the change process. The majority of government educators, however, still use positivist education approaches, mostly awareness raising (Cunningham, Sinclair & Burritt 1997; Environment Australia 1999; Infotech & Australian Centre for Cleaner Production 1997; NSW Council on Environmental Education 2001).

Part of the reason for government educators focussing on positivist methods is that their use is promoted in the international policy documents on sustainability. Some authors, such as Gough (1990) and Greenall Gough (1997), argue that this is because the documents promote the technocratic-accomodationist approach to sustainability, as was shown in

Table 15. However, the focus on positivist methods may also be partly due to the fact that the critical approach is young and still evolving, as Sterling (1996b) pointed out.

While many of the international policy documents do promote positivist methods, they do not promote simple awareness raising. UNCED (1992) *Agenda 21* (Chapter 28, Section 3, and Chapter 36, Section 5) promotes the more scientific end of positivism; that of community-based social marketing with a focus on the government officers consulting with targeted stakeholders to identify the constraints to change, and then designing an appropriate program. This is also the approach being recommended nationally with Cunningham, Sinclair and Burritt (1997 p.101) recommending a sector-specific approach, in their commissioned report to Environment Australia. They suggested that governments:

(i) Identify the relevant characteristics of the specified industry (e.g. "the economic, institutional, cultural, technical, life-cycle, and regulatory factors that may promote or hinder environmental improvements"…

(ii) Identify the driver factors and barriers that influence corporate decision-making and environmental performance: "the regulatory, informational, economic, or other factors that provide the greatest incentives (drivers) or impose the most significant obstacles (barriers) …

(iii) Prioritise these corporate decision-factors. By so doing it is possible to produce a menu of policy options and recommendations that have the greatest potential to promote cleaner production in the targeted industries…

(iv) Determine who are the key stakeholders for the targeted industry (e.g. trade associations, EPA, NGOs. local governments etc). This is important not only in terms of gaining input from all concerned, but also in terms of building consensus for industry specific policy options, and in developing workable plans for implementation. The experience is that open ended dialogue among key stakeholders with different viewpoints has helped sharpen understanding of the true underlying causes of environmental outcomes.

Despite these recommendations, the focus of the majority of Australian government sustainability education programs continues to be simple awareness raising. Another reason for this is that there are no Australian guidelines on how to design sustainability education programs for business personnel. This leaves educators using whichever methods they feel are appropriate. People who do not have qualifications in environmental education or behaviour change theory often develop education programs (Environment Australia 1999; NSW Council on Environmental Education 2001, 2002; Smith 2000). This adds to the likelihood of simplistic, awareness raising approaches being used.

While there are no Australian guidelines for the design, implementation and evaluation of sustainability education programs for business personnel, the current author was able to locate two documents from the NSW government which are still being distributed as best practice. Both of the NSW government documents promote the positivist approach. The NSW EPA and the DLWC (Department of Land & Water Conservation) published the first document in 1997. It is titled 'W*hat we need is... a community education project'*. This document outlines what education is and how to plan a project. It outlines the many different educational methods, such as brochures, case studies and seminars, which can be used within programs and highlights their strengths and weaknesses. The authors recommend a three-stage design process with eight steps that have reflection, review, and revision throughout. Their recommended process is reproduced in Table 27.

Table 27: Recommended project design process (From: NSW EPA & DLWC 1997 p.11)

Stage 1	Step 1	Analyse the issue or problem
	Step 2	Identify stakeholders
	Step 3	Know your target group
	Step 4	Determine objectives and outcomes
Stage 2	Step 5	Design your methods
	Step 6	Consider funding
	Step 7	Make an action plan and implement it
Stage 3	Step 8	Monitor and evaluate

The recommended process is a positivist approach, with the educator designing and delivering the education program without involvement of the targeted stakeholders. Process evaluation and the more scientific evaluation processes, as outlined in Section 4.3, are recommended. The document contains advice for designing the program. It recommends that educators identify what the '… stakeholders know, feel, want, believe and value in relation to the problem or issue' (NSW EPA & DLWC 1997 p.15) and suggests that they 'Clearly identify your target group and gain an understanding of their current knowledge, attitudes and practices concerning the issue' (NSW EPA & DLWC

1997 p.17). The educator is then meant to design and deliver what they believe to be an appropriate program for that audience.

However, in the five program examples provided the above issues have not been addressed. In the examples provided, the educators have simply listed who the stakeholders and audience are, then continued to design their program (NSW EPA & DLWC 1997). It would not be surprising, therefore, if those using the guide also skip these tasks, and design the programs themselves, without consultation or involvement of the targeted stakeholders.

The NSW EPA published the second guideline document in 1995. It is designed to show staff at local governments how to run environmental education programs for industry. It is based on a pilot project implemented by the NSW EPA in partnership with Shoalhaven City Council, and also promotes the positivist approach. The document is titled '*Solutions to pollution: an environmental review and education program (EREP)'*. It is suggested within the document that officers at local governments should implement an education program, using processes such as one-on-one site visits, audits, letters, and information given to industry personnel. The goal of the program is to raise awareness of business proprietors, as well as to identify poor practices and recommend improvements (NSW EPA 1995).

The NSW EPA describes four phases in running an EREP. These are scoping and resourcing, planning and preparing, implementing, and monitoring and evaluating. Advice is provided for each phase, as shown in Table 28. Clearly, the process is expert designed, delivered, and controlled, with the educator telling business personnel what they should do.

Table 28: Guidelines for developing an EREP (Adapted from: NSW EPA 1995 p.6-8)

Phase 1	Scoping and resourcing • Identify the scope of the program (level of assessment – environmental review, audit or compliance audit) • Prioritise the premises for review • Prioritise the geographic areas • Identify resources available internally and externally
Phase 2	Planning and preparing • Identify individual premises • Set up a review team and/or a steering committee that includes representatives from the businesses and industries • Set program targets with timelines • Determine available support systems and materials required • Develop a community involvement and promotion plan • Use the environmental review checklist as a basis for preparing your council's review questionnaire
Phase 3	Implementing Stage 1 • Launch the program • Contact the premises • Make appointments for the review Stage 2 • Conduct the review • Educate (discuss the issues and problems, use the information sheets, encourage the development and ongoing implementation of an environmental plan for each business) • Keep the community involved (prepare local media releases highlighting the positives, develop a regular newsletter to inform about program developments; consider establishing an environmental awards scheme) Stage 3 • Summarise the findings for each premises • Identify the necessary action • Enter information collected from the reviews in database Stage 4 • Check the recommended action for all premises has been prepared and implemented • Revisit the premises that were unsatisfactory • Provide feedback to the community • Educate and involve: identify opportunities for further education, such as trade nights, newsletters, follow up services or resources that may be needed in the local area

Table 28 continued: Guidelines for developing an EREP (Adapted from: NSW EPA 1995 p.6-8)

Phase 4	Monitoring and evaluating • Analyse information collected from all the reviews • Summarise the overall findings • Discuss and publish the findings • Identify future actions • Revise the program if necessary • Prepare an ongoing strategy for developing the program in relation to council's overall environmental management

Several of these EREP type programs are being implemented with industry in South Australia. Catchment Water Management Boards, the EPA and local governments jointly fund the initiatives, which are undertaken at the local level (Newland 2000). Two projects commenced in 1996 with the Patawalonga and Torrens Catchment Water Management Board funding a joint initiative within the Cities of Marion and Mitcham, and a second project within the City of West Torrens[5]. Since then the programs have expanded, as Newland (2000 p.1) explains:

> From these beginnings seven projects have been established that collectively employ 16 project officers based in 11 local government offices across metropolitan Adelaide. A total of 15 councils are directly involved in the projects.

As the programs are funded through money raised for catchment management, the main focus is stormwater issues. However, it became obvious in the early days of the projects that business personnel wanted information on other environmental issues. As a result the programs also address issues '… such as waste minimisation, chemical storage, other pollution sources, and alternative practices' (Newland 2000 p.6).

Newland (2000 p.6) reports that

> The methodology is essentially similar across projects. SPPOs [Stormwater Pollution Prevention Officers – the educators] canvass businesses, usually by phone and make an appointment with a responsible person (preferably the manager or owner) at the business. They then visit the business, explain their purpose, provide a kit of background information, and work through a checklist of issues. Follow up material is provided on request… Site visits are recorded and follow up visits are

[5] The current author was the initial project officer from 1996 to 1998 for the City of West Torrens project. It was her experiences with it that led to this PhD research.

> made in Projects where it is possible. Newsletters and recognition and promotion of good practice are also used. Development of demonstration sites is also being pursued in some of the Projects.

The SA EPA provides technical advice and holds cleaner production training sessions for business personnel within some of the local government areas that are undertaking projects (Newland 2000). These are workshop-based training programs designed to help those that attend (usually a single individual from any company within the area) to understand the issues, and look at how improvements can be made within their business operations.

The City of West Torrens undertook a review of their education program in 2000. A survey of business personnel's attitudes was conducted. The review revealed that

- Only '47% [of business personnel] could identify the main difference between the stormwater system and the sewerage system' (City of West Torrens 2000 p.8). This is despite stormwater issues being the main focus of the program;
- 'Only half of respondents claimed a project officer has visited their site, despite all having been visited' (City of West Torrens 2000 p.18); and
- '40% [of business personnel] do not know what the City of West Torrens is doing to reduce pollutants' (City of West Torrens p.17). They did not even mention the project, despite its having been in operation for four years, having been visited by the project officer, having received information kits, regular newsletters and much more.

The above results are quite disturbing when it is considered that hundreds of thousands of dollars have been spent on the program, and much more is being spent on similar education programs in other local government areas. Even more disturbing is the reaction of the educators to the above findings.

Their response to the finding that only 47 per cent knew the difference between the stormwater and sewerage system was '… this indicates that education needs to focus on the basic issues' (City of West Torrens 2000 p.18). They fail to consider the possibility that they should change their educational methods, deciding instead that more of the same should occur, but with a simpler message.

Their response to the finding that only half of respondents claimed a project officer had visited their site, when all had been visited – 'The reason for this inconsistency may be due to the fact that the person responding to the survey may not necessarily have been the person spoken to when the project officer visited' (City of West Torrens 2000 p.20). They fail to identify the implications of this finding, namely that their messages are not being spread throughout the organizations. This in turn implies that few changes have been implemented within those organizations, and suggests a definite need to alter the educational methods being used.

In response to the finding that 40 per cent of business personnel did not know what actions the local government had been taking to reduce pollutants, the project officers stated that 'One possible explanation for this is a lack of interest in environmental issues'. They do not question this assumption, or consider any other reasons for their program's ineffectiveness.

While the above results indicate that little may have been achieved for the money spent, the programs have been successful in raising the awareness of some business personnel, and have achieved some changes to business practices, resulting in less pollution entering the stormwater system. Examples of changes include the installation of wash-bays, oil separators, and settlement traps within some companies (City of West Torrens 2000). However, it was shown in Chapter Two that merely removing individual sources of pollution is not enough to halt degradation to the environment.

The disappointing results from the West Torrens and other local government projects has led the project coordinator to suggest that the time for education is past, and that the educators now need to focus on enforcement. Two of the educators have already become authorised to enforce (Newland 2000). They do not appear to be concerned about the impact that this will have on their relationship with the business personnel involved. The literature reviewed in Chapter Four suggests that the focus on enforcement is likely to make business people more resistant, not more likely to act. The enforcement may be successful in stopping an individual source of pollution in a breach of the legislation, but it decreases the likelihood that business personnel will stay involved with the project and go

beyond basic compliance to embrace sustainability. This is why it was recommended in the ideal approach that separate officers undertake these two roles.

The above type of positivist education program is still the most common educational approach used with business personnel on sustainability. It can be seen as an example of the 'fixes that fail' systems archetype (Smith 2000b). This archetype consists of two causal loops: a reinforcing and a balancing loop, as shown in Figure 29 (Kim 1994, 1994b; Kim & Anderson 1998). In the typical situation, a problem is noticed and a solution is quickly implemented, but the chosen solution is ineffective. It may appear to improve the situation for a short time, but it does not actually solve the problem, and the problem symptoms return, often stronger than they were initially. Often the fix is reapplied over and over as people do not recognise that the fix they are using is ineffective (Kim & Anderson 1998).

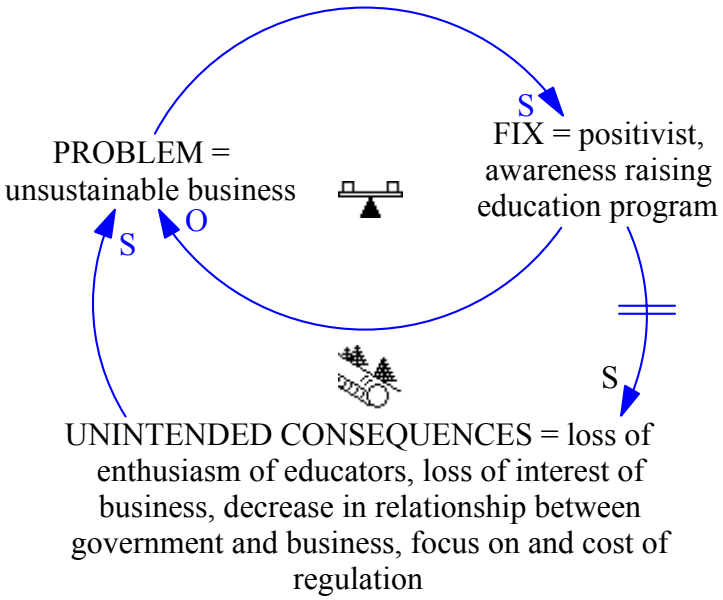


Figure 29: Education programs as a fixes that fail archetype (Adapted from: Smith 2000b p.3)

In the case of sustainability education programs for business personnel, the symptom is the existence of inappropriate business practices resulting in pollution and environmental degradation. As a result the government implements an education program – the fix – which they believe will reduce the pollution by making business personnel more aware of

sustainability and its benefits. The educational methods they use, however, are ineffective. The government does not realise this, and assumes that its awareness raising approaches will work. Indeed some business personnel may take small amounts of action to reduce individual sources of pollution, leading the government to think that its methods are working. This therefore reduces the pressure for further government action. However, it soon becomes apparent that only a small fraction of business personnel respond, and even if they do, a focus on pollution reduction is not enough to stop environmental degradation from occurring. The pressure for the government to take action therefore returns at a heightened level, as pollution levels increase and environmental degradation worsens.

Several unintended consequences also appear as a result of using ineffective educational methods. These include frustration in business personnel that the government does not understand their needs, and frustration of the government educators who do not understand why business personnel have not changed their behaviour. Scriabine (1996) acknowledges this pattern, while Ryan and Brown (2000) report the existence of disillusionment in implementing officials. This frustration could lead the government officers to focus on penalties (as has occurred with the Patawalonga and Torrens Catchment Water Management Board), which may further deteriorate the relationship between the government and business personnel. Business personnel, feeling a threat to their freedom of choice, may then deliberately resist taking action, as was described in Chapter Four.

The danger in this situation is that the government may not realise the ineffectiveness of its methods and may reapply them over and over, wasting significant amounts of money, and risking further deterioration of their relationship with business personnel. DeYoung (1993 p.491) explains that

> There has been little appreciation of the fact that an intervention can, with the best of intentions, actually do harm. A common misconception is that, at worst, an intervention will have no effect. The issue here is more complex than one might first imagine. It involves not merely the possibility of *indirect side effects* (e.g., effects on untargeted behaviours, effects on behaviour at a later time). It also includes whether an intervention promotes *unintended direct effects* (e.g., psychological reactance).

The lesson to learn from the 'fixes that fail' archetype is to recognise that there are many possible actions that can be taken when faced with a problem situation, and that each of

these actions will lead to different outcomes – some desirable and some undesirable. Each option should be thought through carefully, and individuals should seek to understand the whole system within which they are operating. By mapping the system and tracing through the linkages, they will be able to discover many of the impacts – intended and unintended – of their planned action. They can then decide on which action they believe will be the most effective overall, and carry it out (Kim & Anderson 1998).

In the case of government sustainability education programs it is important to recognise the need for alternative educational approaches. This is occurring to some extent, with several authors acknowledging the need to move away from simple awareness raising (Environment Australia 1999, 2000; Infotech & Australian Centre for Cleaner Production 1997; NSW Council on Environmental Education 2001). In fact, Environment Australia (2000 p.5) released a national action plan on environmental education in 2000. A key element of the plan '… is a move from an emphasis on awareness raising to an emphasis on providing people with the knowledge, values, and skills to actually make a difference to the protection of and conservation of Australia's environment'.

The NSW Council on Environmental Education (2001 p.iv) has recognised the need for a focus on capacity building, which it defines as '… programs or initiatives aimed at enhancing the effectiveness of individuals, organizations, and systems to achieve or define outcomes, by strengthening their knowledge base, competence, resources, networks, infrastructure, and other forms of support'.

The ineffectiveness of simply holding sustainability training for an individual from each business to attend has also been recognised (ANZECC 1998; Cooke & Tilbury 2001; Cunningham, Sinclair & Burritt 1997; Infotech & Cleaner Production 1997).

Cooke and Tilbury (2001 p.3) point out that there is a need for education programs to '… bridge the gap from individual learning to organizational learning by being able to be delivered in-house or across a group of staff within the same organization'. ANZECC (1998 p.53) highlight that

> It is only when all employees in a firm have a clear grasp of cleaner production and its advantages, that cultural change will start to take place… when all employees are trained and committed to the principles of

> cleaner production, communication and input between different levels of staff is easier, and thus, cleaner production strategies are more effectively designed, supported, and implemented.

Geller (1989) agrees, reporting that many interventions have been unsuccessful in obtaining lasting behaviour change because they have not focussed on training enough people and institutionalising the changes within the organization. This shows support for the recommendation contained in the ideal approach; namely that educators provide training to build the capacity of the entire staff of business organizations, or to key people, who will then undertake the training of the remaining staff in the organization and coordinate the implementation of the sustainability initiatives.

Infotech and Australian Centre for Cleaner Production (1997 p.16) suggest that training for business personnel should occur through '… staged delivery, starting with management awareness, which progresses to implementation skills development, and finishes with practical skills developed in operational staff'. They state that all three types of training are required for sustainability initiatives to be undertaken successfully within a business. Cooke and Tilbury (2001) agree with the need to train all staff members. They have called for two levels of training: one for top-level management and one for staff at the implementation level. Business personnel themselves have called for on-site training that is time efficient, flexible, and minimally disruptive to production systems (ANZECC 1998).

Personnel of larger businesses have called for the design of a 'train the trainer' program that they can implement within their organizations (ANZECC 1998; Infotech & Australian Centre for Cleaner Production 1997). The need to include change management skills in this process has been acknowledged (Allen 2000; Cooke & Tilbury 2001; Infotech & Australian Centre for Cleaner Production 1997). Cooke and Tilbury (2001 p.3) clearly express this in their report on the needs of the corporate sector. They explain that

> It was felt a stronger emphasis is required on the challenging aspects of sustainability, such as incorporating systems thinking into business, which will also require the development of skills relating to changing existing practices. A focus on change management and organizational culture was seen as critical to the achievement of sustainable development goals.

Several authors have highlighted the need for dialogue between the different stakeholders so that they can understand each other, question their mental models, and learn (Allen et al

2002; Enayati 2001; Hawken, Lovins & Lovins 1999; Ryan, Brown & Ball 2000). Cunningham, Sinclair and Burritt (1997 p.54) are adamant about this, stating that 'It is essential that governments provide information which addresses actual risks and uncertainty regarding the adoption of clean technology, and also corrects distorted images and false information'. UNEP (2002) recommend cross-sectoral approaches, enabling parties to dialogue about possibilities for utilising each other's wastes and learning from each other.

The need to address sustainability holistically has been acknowledged both internationally and nationally. UNEP (2002 p.20) emphasise that 'An integrated, cleaner production approach should be the preferred option over single-pollutant or single-medium approaches'. The NSW Council on Environmental Education (2001 p.58) warns that 'Many [current] activities focus on single issues and do not communicate interconnectedness. The use of integrating concepts such as sustainability is weak'. Environment Australia (1999 p.5) agrees. They are calling for a holistic approach, recognising the complexity of factors that affect sustainability. They highlight that

> In order to address environmental challenges, we need people who think broadly and who understand systems, connections, patterns and causes. The challenges themselves frequently have social, scientific, cultural, economic and ethical aspects, all of which must be considered for their effective management. Specialist discipline-based knowledge, while contributing critically, is no longer adequate by itself - holistic appreciation of the context of environmental problems is essential'.

These government bodies call for improved professional development and training for educators, acknowledging that educators who do not possess the necessary skills often design education programs. This is clearly stated in the following extract from The NSW Council on Environmental Education (2001 p.13):

> In some situations, the planning, implementation and evaluation of environmental education is being undertaken by staff who do not have adequate training to enable them to realise the full potential of their work. On occasions, decisions on environmental education are being made without appropriate information and expertise. In general, environmental education, as a tool for achieving sustainability, is not well understood. There is a need:
>
> - For enhanced ongoing professional development opportunities for those working in the field of environmental education…

- For improved training in approaches to consultation, community involvement, participation, and liaison skills for those working in environmental education.

The need for educators to have these broader ranges of skills was also recognised during a recent Environment Australia workshop, which aimed to identify the needs of industry in relation to sustainability and how environmental education could help:

> There was general agreement, amongst those present at the Summit, that there is lack of graduates with the necessary skills needed to address the sustainability challenges within the corporate sector. Innovative programs, which helped develop professional skills in this area were valued, but were considered to be rare. As a result the following recommendations were made:
>
> 1. Universities need to provide students with the *critical, creative and futures thinking skills* to develop innovative and alternative solutions to sustainability issues.
>
> 2 Universities need to provide students with *needs assessment and action-oriented skills* needed to motivate, manage and measure change towards sustainability.
>
> 3. Universities need to provide students with the *interpersonal and intercultural skills* needed to redefine relationships amongst stakeholders (directors and board executives, workforce, legislators and government agencies, clients, community). This is key to addressing the challenge of sustainability.
>
> 4. Universities need to provide students with the confidence and skills to deal with *complexity and uncertainty*. (Tilbury & Cooke 2002 p.3)

They have also been recognised by Allen et al (2002 p.52), who state that

> Agencies need staff to manage dependent and independent groups, and to coordinate a number of different sector and interest groups. Thus staff must have the skills to undertake leadership and facilitation functions.

Environment Australia (1999 p.6) has acknowledged the need to move from positivist to problem solving approaches. In their 1999 discussion paper on environmental education they recommended that education programs should focus on four learning components. These are based on the work of Fien (1996):

1) Awareness raising- 'does it matter to me?'
2) Shaping of values – 'should I do something about it?'
3) Developing knowledge and skills – 'how can I do something about it?' and

4) Making decisions and taking action – 'what will I do?' (Environment Australia 1999 p.6)

They suggested that education programs should involve participants in a cyclic process of asking and answering these questions, with periods focused on reflection, research, development, and action (Environment Australia 1999).

The NSW Government (1996 p.20) has also recognised the need for changes from the positivist approaches to problem solving approaches. They have stated that effective environmental education is 'lifelong, holistic, locally relevant, emphasising of values, future oriented, action oriented, learner centred, problem solving, systematic, experiential, flexible and adaptable'. Their 1996 green paper promoted seeing education as a problem solving process, in which stakeholders are involved in planning the program and developing and implementing their own solutions.

The NSW Council on Environmental Education (2001 p.5, 2002 p.15), which was formed in 1998 as a result of the findings of the NSW government review of environmental education, has shown even greater support for the ideal approach recommended in this thesis. They have stated that environmental education is changing from '… the reactive approach of the past to a more proactive, holistic, and systemic perspective on environmental issues'. They report:

> Most notably, the focus has moved from specific, local environmental problems (such as water pollution and waste disposal) to the underlying causes of problems (such as human values, behaviour and lifestyles or the policies, practices and infrastructure of organizations, communities and societies).

They explain these changes in diagrammatic and tabular form, reproduced here as Table 29 and Figure 30 respectively.

Table 29: The shifting emphases in environmental education over time (From: NSW Council on Environmental Education 2002 p.15)

Aspect	From:	To:
Problem	Pollution / end of pipe	Pollution/ source reduction
Solution	Environment protection	Sustainability solutions
Connectedness	Humans separate from ecosystems	Humans as part of ecosystems
Time frame	Present / short term	Future / long term
Goals	Awareness and knowledge	Changed behaviours, practices, and structures
Education methods	Predominantly information-based	Participatory and experiential learning, community development, and capacity building
Learners	Audiences / target groups	Participants / stakeholders
Implementation	Mainly top down	Through partnerships / networks
Legitimacy	Predominantly technical	Based on different ways of knowing

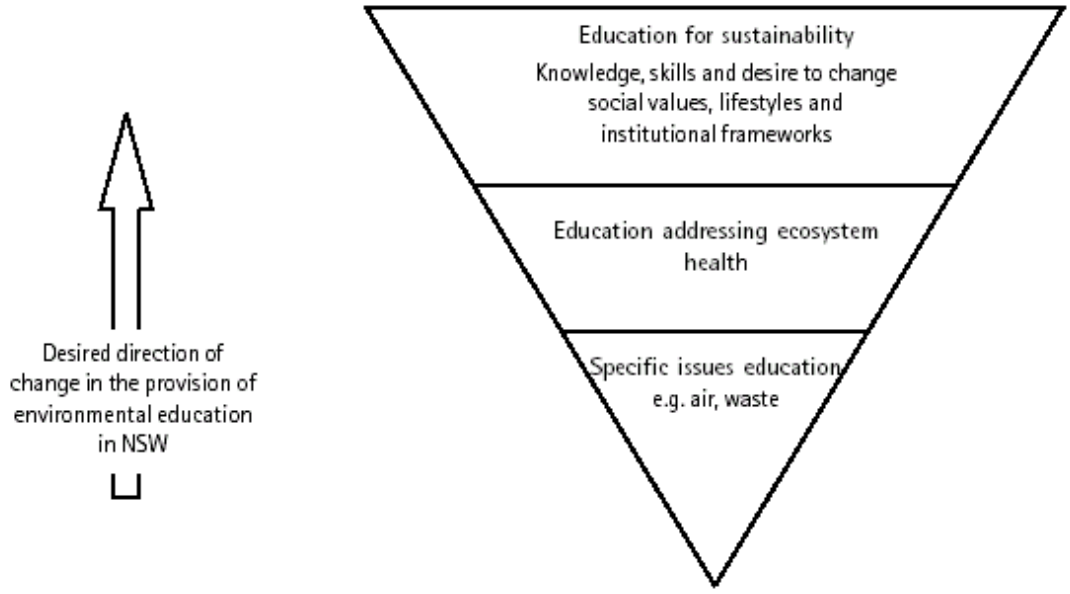


Figure 30: Strategic directions in education for sustainability (From: NSW Council on Environmental Education 2001 p.7).

The NSW Council on Environmental Education (2001 p.5) stresses that 'It is essential that environmental education into the future continues to move towards broader more integrated goals and uses methods which are participatory and involving, rather than didactic and solely information-based'. The newly released document *Learning for sustainability: NSW environmental education plan 2002-2005* (NSW Council on

Environmental Education 2002) further supports the use of approaches similar to those recommended in this thesis.

While the above discussion demonstrates considerable recognition of the need to move environmental education from the positivist to problem solving approaches, there appears to be little evidence that the transition has occurred in practice. This is typified by the fact that there are no Australian government guidelines to help educators design, implement, and evaluate a problem solving focussed sustainability education program for business personnel. Furthermore, the current author was not able to locate literature that described examples of Australian government sustainability education programs for business personnel in which problem solving education approaches had been utilised. Examples of information that could be included in such government guides have been developed within this thesis.

5.4.2 Institutional arrangements

It was suggested in Section 5.3 that the ideal institutional arrangements for environmental education within Australia, would be for a whole-of-government approach in which

- Staff members within Environment Australia or the Australian Environmental Education Foundation, once it is established, would research and prepare material for use by local level educators. They would design training to build the local level educators capacities. They would review the policies and practices of the staff at the many federal government departments who interact with business, to ensure that their actions support business personnel addressing sustainability. They would also undertake initiatives designed to facilitate changes to the system surrounding business personnel that make it easier and more worthwhile for them to change their practices. This might include initiatives to facilitate changes to the market, taxation, legislation, and labelling requirements within Australia. In addition to the above they would design and fund mass media advertisements to inform business personnel of the existence of the local sustainability education programs and encourage them to become involved. These advertisements should show business personnel how important, worthwhile and easy it is to take action on sustainability.

- Staff members at the EPAs in each state would deliver the training developed by the staff at Environment Australia or the Australian Environmental Education Foundation, thereby building the capacity of their local level educators to implement problem solving education programs. They would also coach them with their efforts. They would review the policies and practices of the staff at the many state government departments to ensure that their actions support business personnel addressing sustainability. They would also take actions to change the state specific conditions and legislation that affect business personnel, thereby making it easier and more worthwhile for them to change their practices.

- Staff members at the local government level (the educators) would review the policies and practices within their organization to ensure that they make it as easy as possible for business personnel to change. They would build the capacity of the other local government staff members who interact with business personnel to reconfirm the educational message, and they would implement the single problem solving sustainability education program.

The current institutional arrangements are far from those described above. There are many environmental education programs being implemented by many different government agencies at local, state and federal level. These programs often address individual pollution media, such as water, air, noise and energy, representing the focus of their respective agencies. The results being that their educators compete against each other for the attention of business personnel, and undermine each other's effectiveness (NSW Council on Environmental Education 2001; Smith 2002). There is little coordination or consistency between programs; the consequence being that business personnel receive different treatment dependent on the geographical location of their business (NSW Council on Environmental Education 2001; Salier 2000; Smith 2002; Smyth 2002).

The current institutional arrangements, with their lack of coordination and their many programs competing against each other, can be seen as an example of the 'tragedy of the commons' systems archetype. This archetype was explained in Chapter Three. It involves many people competing for a common resource, in this case the attention of business personnel. Since each person does not communicate with the other users of the commons,

they do not realise the extent of the demands that are being made. Often such a situation will continue until the individual users start to receive lowered returns for their efforts because the commons becomes strained. Faced with this, the individuals will often try harder. In this case educators may send out more newsletters and brochures, and run more training programs. With the individuals all trying harder the demand may become too great for the commons to sustain, resulting in its collapse. In this case collapse would occur when business personnel become unwilling to listen or participate in education programs. The dynamics involved in this situation are shown in Figure 31.

Senge (1990) reports that there are two main ways to deal with a tragedy of the commons situation. These are establishing a central managing body, or establishing warning signals that will alert each player when the commons is in danger, so that they can modify their individual behaviour. In the case of sustainability education programs warning signals do not seem an effective option. A warning that a business person is already frustrated and about to say 'stop', does not help achieve the goal of behaviour change.

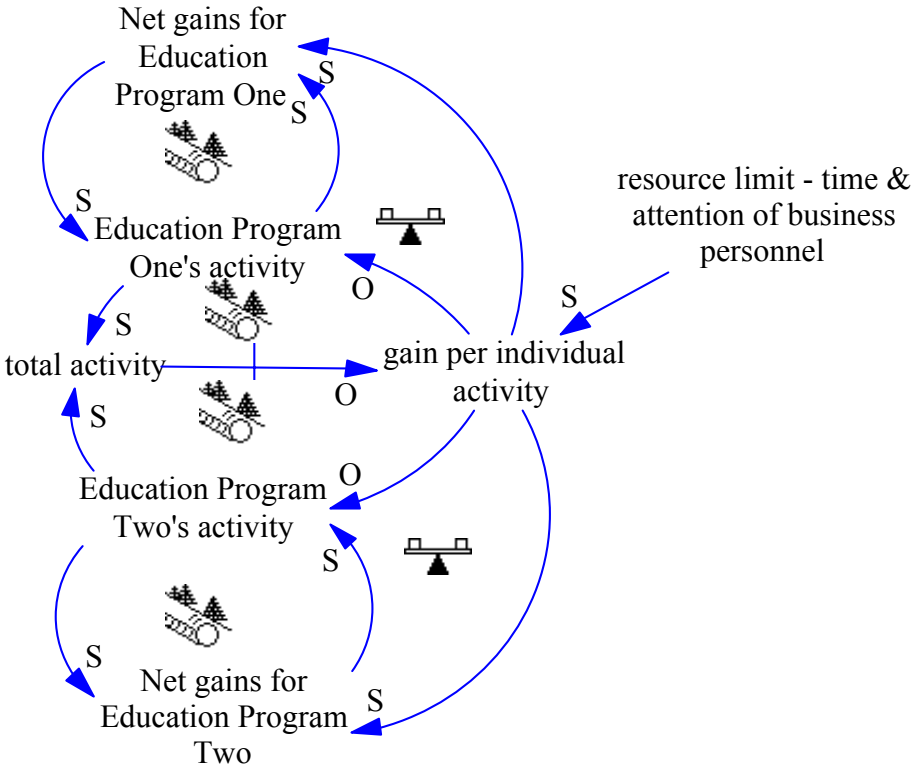


Figure 31: Environmental Education Programs as a tragedy of the commons situation.

The system needs to be restructured so that there are fewer time demands placed on business personnel by educators. This can occur by reducing the number of programs and / or making them more effective, so that less time is required to achieve their goals. Both can be done and the need to do so has been recognised, with both Environment Australia (1999) and Smyth (2002) calling for a whole-of-government approach to environmental education. It should be noted, however, that the call by Environment Australia (1999) extended only so far as coordinating the efforts of all the different federal agencies into a whole-of-government approach. While this will help to improve coordination, this author suggests that coordination needs to occur through all three levels of Australian government.

The NSW Council on Environmental Education (2001 p.13) has also recognised the problems created from the lack of coordination of sustainability education programs. They express concern that

> Many programs are dealing with specific environmental issues in isolation from key factors that are causally related or relevant to solutions. Many organizations are dealing with environmental issues in 'silos' or 'boxes' based on a narrow interpretation of their responsibilities, or as a result of limited consultation with key stakeholders.

They call for a more integrated approach to framing environmental issues, problems, and design of education programs. They state that there is a need

- For Government agency providers to consider the full range of interrelationships that might be relevant to the environmental issue or problem under consideration;
- To provide environmental education that addresses wider systems aspects, e.g. sustainability, rather than just specific problems and issues (e.g. stormwater); [and]
- For better integration of environmental education delivery within specific programs—these could be packaged together better and delivered as interrelated programs. (NSW Council on Environmental Education 2001 p.13; NSW Council on Environmental Education 2002 p.12)

This will require changes to our current government policies. The Productivity Commission (1999 p.14) has identified that there is '… a lack of rewards, or incentives, in bureaucracies for intersectoral approaches', and that performance management across Commonwealth departments on ESD is generally poor. The Productivity Commission (1999 p.101) highlighted that the failure of policy makers to understand the needs of

stakeholders and the whole system has resulted in policy that appears reasonable, but is difficult to implement. They add that '… coordination (with respect to particular problems) is sometimes driven by a response to crisis and therefore can suffer from a lack of overall strategy'.

Linked to the changes required to institutional arrangements is the need to reform the funding system for government sustainability education programs for business personnel. Several authors are calling for reform to enable local government to implement sustainability education programs (Allen et al 2002; Salier 2002; Smith 2002; UTS Centre for Local Govt 2000). Local governments are the preferred provider under international conventions such as UNCED (1992) *Agenda 21,* national policy such as the Commonwealth of Australia (1992) *National Strategy For Ecologically Sustainable Development,* and state legislation. However, no dedicated funding is provided to them to carry out this role. Instead, local governments are required to either find the money themselves, or to apply for a small number of grants available from the federal and state governments.

This has several unintended negative outcomes. First, it results in different levels of activity within different local government areas, dependent on whether or not they win a grant. Second, it results in expenditure of significant amounts of time by staff at each local government in the application for grants, rather than on implementation of education programs. Third, if a grant is won the educator positions are usually offered as short-term contracts reflecting the length of the grant, which leads to a difficulty in attracting and retaining qualified educators. Finally, if no grant is won then either no education is undertaken or a range of local government officers are expected to undertake the role in addition to their normal duties. As these officers do not have training in behaviour change or educational approaches, they tend to implement ineffective positivist measures, which it has been shown can lead to a deterioration of the relationship between government and business personnel.

The Patawalonga and Torrens Catchment Water Management Boards provide one example of education programs impacted upon by the grant process. The executives of the local governments, who were successful in winning grants from the Boards, offered their

educator positions as short-term contracts. As a result, those hired tended to be recent environmental graduates from university, or people with little career experience. These people tended to use the positions as a 'stepping stone' to longer-term contracts or permanent government and private sector positions. The result has been a continual problem of high turnover and time involved with recruiting new project officers, who then need time to 'come up to speed' and continue the educational efforts (Smith 2000; PCWMB 1998, 1999).

This turnover also has the negative impact of breaking the trust and relationships that have been developed between the project officers and business personnel. Time has to be taken to re-establish this each time there is a new project officer. A further hindrance to program success is the fact that many of these project officers are environmentalists with little business knowledge or experience (Smith 2000). They are often not aware of the jargon used by business personnel, and their lack of business experience makes it difficult for them to understand the complexity of what they are asking business personnel to do.

As Allen et al (2002 p.61) explain, the grant process '… result[s] in a stop/start approach to community-based initiatives, with much energy being diverted to securing future funding'. If no further funds are received programs often stop, leaving business personnel to address the issue alone (Allen et al 2002; Salier 2000; Smith 2002).

Salier (2000) presents the case of the Cooks River education program, a 12-month EREP type program designed to target stormwater issues with industry in the Cooks River Catchment in NSW. This program was said to be the first education program to be conducted over an entire catchment area. It involved thirteen councils and received AUS$1.3 million funding from the NSW EPA. The program experienced delays in commencement due to the difficulty of finding suitable educators, and the unexpected need to train the educators who were eventually hired. The result was a three-month delay in project commencement (Salier 2000).

The NSW EPA was not prepared to extend the deadline of the project, which forced the project's management to undertake the whole project within the remaining nine months. At the end of the nine months further funding was not received, and the educators' activity

ceased. Salier (2000 p.39), who managed the project, expressed dismay at the NSW EPA's refusal to continue contributing funds to the project. He explained that

> A major concern with this type of project is that you need to invest a lot of time and effort at the beginning to enlist support, establish credibility and generate the required involvement from those you are trying to influence. This process, done properly takes time, however having once gained that support the project will generally move on under its own momentum. This means that subsequent funding would appear to produce a greater outcome than the original grant as the groundwork has been done and the project enters a natural growth stage.

In an attempt to ensure that the staff of the individual local governments would continue the work of the project, Salier and his staff organised training for local government officers, so that they could learn how to undertake the educational process with business personnel and the community. The training was cancelled due to a lack of interest, and many of the local governments originally involved have simply abandoned the initiative, with management stating that they will not take action without funding to do so (Salier 2000; Thomas A 2001 pers.comm. 27 March).

The NSW Local Government and Shires Association (2001) found a similar poor response from local government when they offered Local Agenda 21 training in October 2000. When local government staff members were asked why they had not attended, many stated that their organizations did not have a commitment to ESD, and that other priorities were seen as more important to the council.

The NSW Council on Environmental Education (2001, 2002 p.32) promotes local government being the delivery point of education programs, and has recognised the funding problems that local government face. They have suggested that funds could be raised through a '… mixture of grants, sponsorship, levies, user-pays approaches, subsidies and other funding sources'. The SA EPA (2002 p.1) is also discussing ways to raise funding for local government to undertake environmental protection and education roles. They have recommended new funding sources such as '… investigation fees, expiation fees, an environmental levy and additional fees for environmental assessment of development applications'.

In addition to recognition of the need to improve the coordination and funding of education programs, there is also wide recognition of the need for improvements to the coordination between the different environmental protection mechanisms (ANZECC 1998; Cunningham, Sinclair & Burritt 1997; Environment Australia 1999; Fien, Scott & Tilbury 2002; Graborsky & Grant 2000; Newland 2000; NSW EPA & DLWC 1997; NSW Council on Environmental Education 2001, 2002; NSW Government 1996; P&TCWMB 2000; WCED 1987). The NSW Council on Environmental Education (2002 p.9) is adamant about this, stating that 'To achieve sustainability, environmental education must be integrated with public policy, regulation, economic incentives, infrastructure, research, and monitoring and reporting'. Developing an effective, integrated system of environmental protection measures will also require resolution of the dispute between state and local government about who is responsible for enforcement of environmental laws with business.

Despite being given the responsibility under many of the state governments' environmental protection legislations, some local governments have been reluctant to take on the role because they have not been given funding to do so. This has led to differing levels of enforcement in different geographical areas. In some areas there is no enforcement, as was discovered by educators in South Australia who referred offences to both local government and the SA EPA, only to find that neither took action (Newland 2000). In the South Australian situation this has led to a trial program by the Patawalonga and Torrens Catchment Water Management Board and the SA EPA to reimburse local governments for their enforcement expenditure (Howard 2001; TCWMB 2000; SA EPA 2002). Resolution of this dispute throughout the whole of Australia is of extreme importance, because, as many authors point out, ineffective enforcement undermines educational efforts, by reducing the pressure on business personnel to address the issue (Graborsky & Grant 2000; Newland 2000; Smith 2002; UNEP 1994).

The NSW Council on Environmental Education (2001 p.59) highlights that

> The use of effective combinations of tools for environmental issues is still at an early stage. At present there is a relatively underdeveloped policy debate about the appropriate role for education and training in environment protection, and there are few mechanisms for sharing research and learning about these issues.

This suggests the need to establish a learning community for educators to discuss the issues. Allen (2000 p.6) agrees, stating there is '… a need for cross-case analysis which can provide more valuable and robust lessons by sharing reflections across programmes and projects'. Allen et al (2002 p.47) state that

> The problem is often not that we do not have enough information to address an issue, but rather that information and knowledge are fragmented between professional disciplines, economic sectors (public, private), levels of government, agencies, organizations and different end-user groups.

Fien, Scott and Tilbury (2002) agree. They call for a meta-analysis of programmes to distil lessons that can be shared between educators. Dovers (2001 p.29) recognises the benefit of this too. He has called for the establishment of a central government agency to manage sustainability within Australia. He calls this an Australian Institute for Ecologically Sustainable Development. This institute would '… enable strategic policy and management analyses: gather, synthesise and communicate policy and management experiences; maintain an information service for government agencies, community groups and private sector environmental managers; and undertake training programs'. Speth (2002 p.3) has called for a similar body to be established at the global level. He calls for the establishment of a '… World Environment Organization, which could be as effective as the World Trade Organization is in its sphere'.

Young and Binning (2002) report that the CSIRO has developed a business plan, in conjunction with the Australian Local Government Association and supported by Environment Australia, to develop a whole-of-government approach to natural resource management. They want local government to work with the state and federal governments to develop and implement accredited, regional, natural resource action plans. A similar process could occur for sustainability education programs for business personnel as recommended within this thesis.

Infotech and Australian Centre for Cleaner Production (1997 p.20) have also recognised the value of the different levels of government working together. They have recommended to Environment Australia the '… development of [sustainability] resource material for local government to use to raise awareness in the small and medium business sectors'.

To establish the whole-of-government approach to sustainability education programs for business personnel, which is being called for in this thesis, will require significant changes to current government practices and institutional relationships. It is therefore likely to generate defensiveness and resistance from some of those involved. This suggests that significant amounts of work would need to be undertaken to build trust and commitment to the idea before it could be successfully conceived and implemented. Those government officers and managers who would be affected need to be invited to participate in dialogue about the issues, so that they can raise their concerns and questions and debate the need for the changes and the benefits of different alternatives. Just like the business personnel, the government officers will need to see that the changes are *important*, that they will be *worthwhile* undertaking, and that they will be *achievable*. Without a positive attitude towards the idea, the changes to government practices and institutional relationships are unlikely to eventuate.

Once a positive attitude has been created, the parties involved can start to identify the constraints to the change, and plan how to overcome them. The above planing process may take considerable time and effort. It is made easier if a skilled facilitator is used to oversee the process; to assist the participants in their use of systems thinking to see the complexity of the issue and to promote dialogue so that people may learn each other's views without feelings of defensiveness (Allen 2000b; Meppem & Gill 2001).

Meppem and Gill (2001) advise that addressing this culture change issue is one of the most important factors in determining the success of new start up whole-of-government approaches. They report, however, that there are few facilitators with the appropriate skills to oversee the process.

While still relatively rare within Australia, whole-of-government approaches are increasing in use. Boyce (2000) refers to programs that commenced in 1996 at Kings Cross / Woolloomooloo, in 1997 at Cabramatta and in 1998 at Moree. These programs have focussed on improving the economic and social quality of these places, coordinating government programs to meet the needs of the people who live and work there. They are based on similar programs that are commonplace in Europe, the USA and Canada. They

are known in the UK as Town Centre Management, and as Business Improvement Districts in the USA and Canada (Moree Place Management 1998).

The use of whole-of-government approaches within Australia to specifically address sustainability issues has also commenced, with the establishment of the Sydney Harbour Manager in 1999. This involved the establishment of an overarching body to coordinate the many government departments that have involvement with, and whose activities could adversely impact on, Sydney Harbour (Meppem & Gill 2001). In South Australia a similar approach has occurred in relation to water related environmental education programs. The joint initiative, called 'WaterCare', involves all government departments with a responsibility for water and environmental protection working together, along with the state's water utility, catchment water management boards, and others, to ensure consistency in educational messages and reduction of duplication. The program includes activities targeting all segments of society – business, community and schools (SA EPA 2002b).

These programs show that while the establishment of a whole-of-government approach can be complex, requiring significant effort and change, it is achievable.

5.4.3 Addressing the larger constraints to change

It has been shown throughout the chapters of this thesis that there are many constraints that hinder business personnel from taking action on sustainability. Ideally educators implementing environmental education programs should work with business personnel to identify and remove these constraints, making it as easy as possible for them to take action. This includes addressing the larger constraints that are outside of the control of business personnel and local government educators. It was suggested in Section 5.3 that if the ideal approach recommended in this thesis was used, the staff of Environment Australia or the Australian Environmental Education Foundation, and those at the EPAs within each state, could work with politicians and others to remove these larger constraints. The majority of educators conducting education programs do not currently address these issues; they focus upon simple awareness raising (Australian Centre for Cleaner Production 1997;

Environment Australia 1999; Infotech &; Cunningham, Sinclair & Burritt 1997; NSW Council on Environmental Education 2001).

The need to focus on and remove the constraints to change has been recognised by many authors (Hawken 1993; Healey 1996; Hemmati et al 2001; Holling 2000; Hudson 2001; Meppem 2000; NSW Council on Environmental Education 2001; PCI 1999; Sterling 1996b; UNEP 2002). Calls to remove constraints have occurred internationally. For example UNCED (1992) *Agenda 21*, Chapter 34, Section 18, states that governments should examine '… existing policies, including subsidies and tax policies, and regulations to determine whether they encourage or impede the access to, transfer of, and introduction of environmentally sound technologies'. This call was echoed ten years later by UNEP (2002 p.20) which called on governments to '… review government policies, regulatory and market mechanisms that act as disincentives to industry in becoming more energy or resource efficient'. Cunningham, Sinclair and Burritt made the same calls in 1997 in a commissioned report for Environment Australia. They specifically identified the constraints and motivators to the adoption of cleaner production practices within Australia.

While failing to address many of these constraints, Environment Australia (2000b, 2001d) has introduced initiatives to make it easier for the public to know which companies are addressing sustainability, hence increasing the public's ability to support those companies that care. Examples of these initiatives include the national pollutant inventory, which requires businesses to publicly report the levels of a limited range of specific pollutants that they emit, and the newly proposed financial legislation, which will require '… investment product providers to disclose the extent to which investments such as superannuation, managed investment and life insurance products take into account labour standards, or environmental, social or ethical considerations' (Environment Australia 2002c p.8).

It has not, however, addressed constraints such as the taxation systems, subsidies and market conditions that inhibit business personnel taking action. Christof (2002 p.3) is very scathing of the Australian government for their failure to act. He argues that the commitment to environmental initiatives within Australia has reversed, not increased, since the 1992 Earth Summit. He explains that perverse subsidies which '… totalled at least

[AUS]$8 billion, equal to 6 percent of total government revenue' in 1996 still exist, and any actions that the government has taken have tended not to be enforced or adequately funded. As a result, he claims that Australia

> … has performed significantly behind other industrialised countries on most environmental measures. It has the second highest level of per capita waste production, the highest percentage of arable land degraded, the world's fifth highest per capita level of water consumption, and the world's worst record of any nation for known extinctions during the past 250 years. Australia also has the highest per capita greenhouse emissions of any developed country. At 27.9 tonnes CO_2-e per person, this is more than double the average 12.8 tonnes per capita for all industrialised countries. (Christof 2002 p.3)

The failure to remove many of these constraints can be seen as an example of the 'eroding goals' or 'drifting goals' systems archetype. This archetype consists of two balancing loops. It applies in situations where an initial goal or standard to be reached is lowered due to the pressures and difficulty of achieving the goal. Rather than persevering to achieve the goal, it is seen as being easier to lower it, in the belief that it was unrealistic or unnecessarily high. Unfortunately, this can result in a continued lowering of the goal, and therefore failure to improve (Kim & Anderson 1998; Kim 1992, 1994).

Governments worldwide have acknowledged the need for sustainable communities and businesses. In several global policy documents they have committed to taking action, yet movement towards the goal is occurring extremely slowly. This can be partly explained by looking at the system surrounding the actions of politicians. There are many pressures that politicians face that reduce the attention they give to achieving sustainability. The priority of addressing the goal gets lowered amongst all of the other competing issues. The process is depicted in Figure 32.

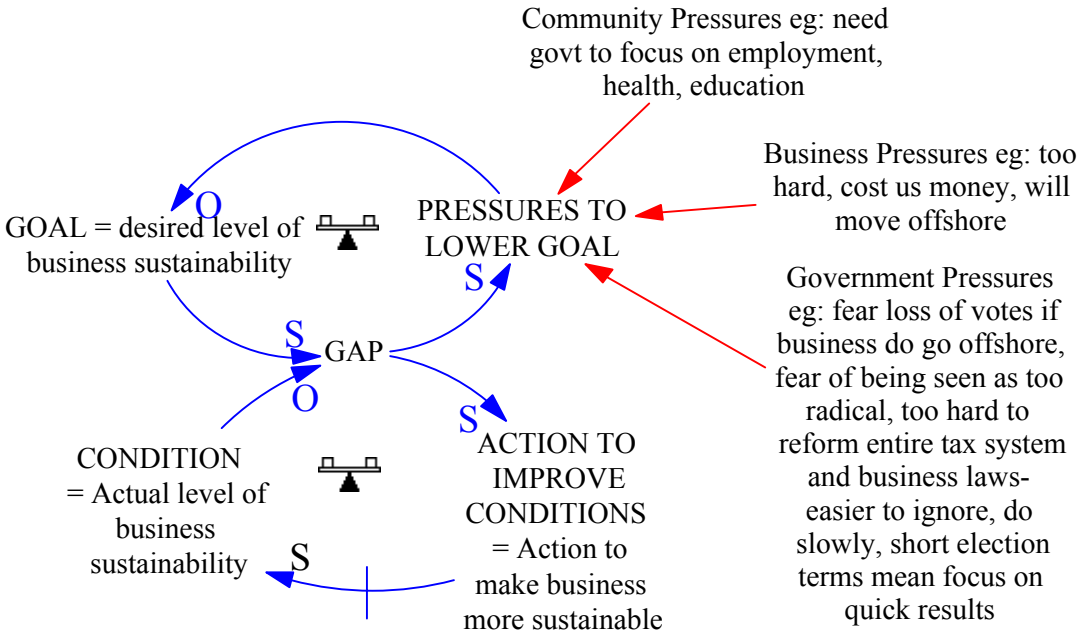


Figure 32: Eroding goals loops

The lesson to be learnt from the eroding goals archetype is the need to stay focussed on the goal, and to understand the system affecting it. Steps can then be designed to alter the system, enabling the closure of the gap between desired and actual level of the goal. In the case of sustainability it is important to understand the pressures that politicians face, and to help them and the community understand the need for action. It requires addressing the needs, concerns, and constraints of politicians, so that they feel safe and supported to take action for sustainability (Hudson 2001).

It was shown in Chapter Two that many countries that have implemented major changes to laws, taxes and subsidies have actually found that it led to business innovation and benefits for all parties – the companies, the communities and the environment. These changes to the market and legal systems made it in business personnel's own best interest to take action; as they reduced pollution, they reduced the amount of tax they had to pay. This in turn reduced the need for enforcement, as continuous improvement initiatives were taken by businesses to maximise the savings they received. Hence, a reinforcing loop of sustainability improvement and benefits was created.

Educators need to help politicians the world over to change their mental models, to see that sustainability needs to be addressed, and really has a positive, not negative, impact on business. Carson et al (2002) argue for increased community consultation on environmental issues, so that politicians can see that the community supports them taking action. Passey (2001) recommends educating the community, so that they can in turn place pressure on the government, forcing them to act. He states that if large segments of the community can be convinced to support political parties who favour the environment, then the major parties will adopt more sustainable policies and practices. Fien, Scott and Tilbury (2002 p.160) suggest a further step. They advocate critical sustainability education programs, which would actually help the community develop the necessary skills to '… challenge and change the structures and social conditions that undermine efforts to promote conservation and live sustainably'. This would enable the community to take actions that encourage politicians to address the issue at all times, not just at election times.

The failure of governments to address these larger constraints can also be seen as an example of the 'shifting the burden' systems archetype. This archetype builds on the above eroding goals archetype, showing that rather than taking the action that is required to achieve the goal, the individuals involved often 'move the burden' to someone or something else. They implement a quick fix solution to take attention away from themselves and the more difficult actions required. While this distracts people from the issue temporarily, implementing the quick fix often leads to unintended circumstances that make it even more difficult to undertake the fundamental problem solving action in the future (Kim 1992, 1994; Kim& Anderson 1998; Senge 1990).

In the case of sustainable business, governments have failed to take action to remove the constraints to change such as those posed by the tax and subsidy systems. Instead, they have shifted the burden of obtaining sustainable businesses to education programs and new pollution laws, without providing adequate funding for either of these approaches to be carried out effectively (Pears 2000). This diverts attention away from the need for politicians to act to remove the constraints. However, the quick fix of positivist education programs and laws that are not enforced has not been effective in moving society very far towards sustainability. The problem remains and environmental degradation continues. As has been argued previously, these ineffective processes can result in the unintended

consequence of deterioration of the relationship between government officers and business personnel, making it more difficult for them to work together on the issue in the future. The process is shown in Figure 33.

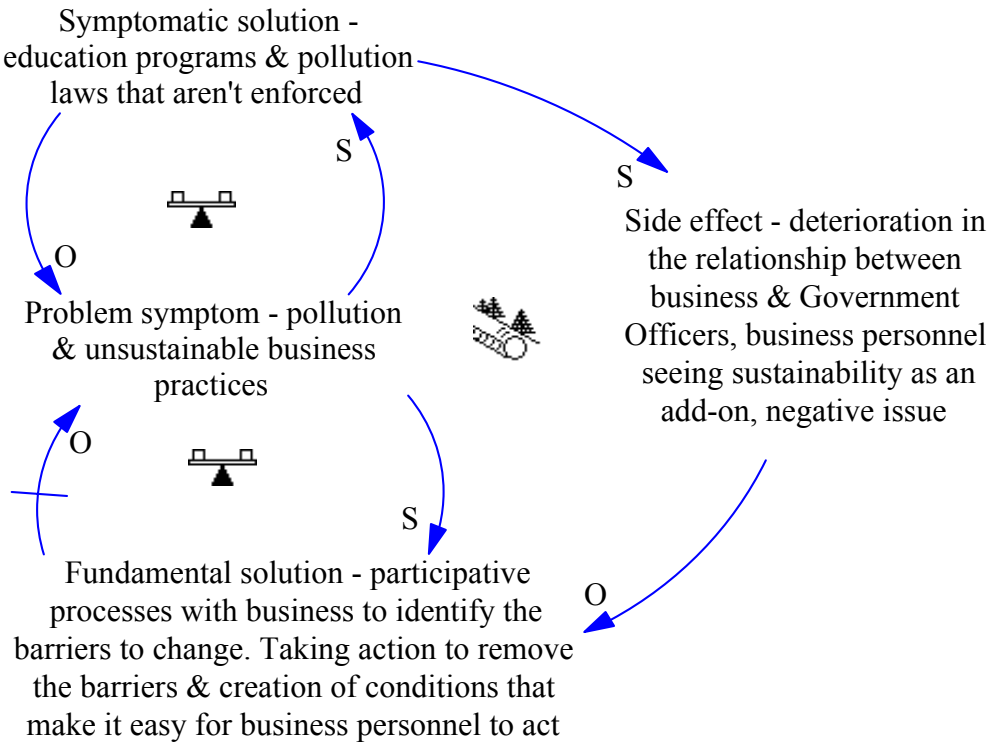


Figure 33: Government actions as an example of the shifting the burden systems archetype.

The lesson to learn from this archetype is that the fundamental solution will still be needed and cannot be ignored. Until the constraints to change are removed, it will remain difficult for business personnel to take action on sustainability. These constraints need to be removed and educators should lobby and work with politicians to take such action, while removing those constraints that they themselves can address.

5.5 Conclusion

Within this chapter, the recommendations from the literature reviewed in this thesis for the design and implementation of government sustainability education programs for business personnel have been summarised. It has been shown that the majority of educators conducting education programs within Australia have not utilised the recommended ideal approach, leaving considerable room for improvement. It has also been shown that many of the changes being recommended have been recognised as necessary by educators and government officials alike. The challenge now is to implement these changes. In the next chapter the case studies of the thesis will be presented.

Chapter 6. Case studies

Review of local government sustainability education programs for the construction sector

> *Because so many of the problems and solutions being addressed by Agenda 21 have their roots in local activities, the participation and cooperation of local authorities will be a determining factor in fulfilling its objectives. As the level of governance closest to the people, they play a vital role in educating, mobilizing and responding to the public to promote sustainable development. (*UNCED 1992, *Agenda 21,* Chapter 28, Section1)

6.1 Introduction

The case studies of the thesis are presented within this chapter. Three case studies were conducted. Each consisted of a review of the education practices undertaken by local government officers, who were attempting to get builders to change their behaviour and stop polluting the stormwater system. The councils did not have a designated education officer. Instead, a range of officers were expected to undertake the task on top of their normal duties.

It will be shown that the officers at all three councils were using positivist awareness raising techniques, threats, and fines. They were not aware of the problem solving education approaches and had not consulted with or included the builders in the design of their education programs.

It will be shown that the majority of officers believed that builders simply did not care about the environment and that education either did not work, or the messages just needed to be repeated over and over until the builders did listen. Many believed only fines would work and hence focussed their efforts on these.

Through the case study review process, a wide range of factors that inhibited the impact of the officers' education efforts were identified. Some of these related to the educational methods used and beliefs of the individual officers. Others related to the councils'

organizational cultures and politics between departments, management, and elected members. All of these issues affect the outcomes of their educational efforts. Having this improved understanding of the system affecting the actions that the officers and builders take revealed many leverage points for improvement to the councils' educational programs. The improvement opportunities for each case study council will be identified.

The case studies confirm the findings of the literature review conducted in Chapter Five. They show that the government educators are not using the problem solving education approaches recommended within this thesis, and more importantly that the officers are not even aware of them. Without this knowledge they cannot improve their practices.

The case studies show that achieving the transition from positivist awareness raising approaches to problem solving education approaches within Australian government sustainability education programs will require significant effort. Not only do the officers' skills and capacities need to be improved, but also their managers and elected members need to become aware of, and convinced of the benefit of, undertaking the alternative educational approaches. The managers need to recognise and accept that their actions affect those of their officers and the builders. Hence they need to accept that they must change their behaviour as well.

6.2 Research Approach

The research approach used is a qualitative action inquiry or applied research approach, recommended by many authors as an appropriate method for reviewing and improving organizational practices (Argyris 1993; Robinson 1993; Walker 1995; Forester 1996; Fisher, Rooke & Torbert 2000; Fien 1993; Wals 1990; Allen 2000, 2000b; Schein 1995; Bossi 2000).

The approach involves a constructivist / interactionist methodology. It is a process in which those involved are interviewed using dialogue principles to ascertain their understanding of the system surrounding an issue, to identify what works well and what does not and their perceptions of why people behave the way they do. Those involved are then invited to suggest improvements. By comparing case study similarities and

differences, information can be gleaned in regard to general practice across the local government sector. This enables development of theories of current action and theories for improvement (Allen 2000; Walker 1995).

The dialogue based process used requires individuals to stop *doing* and take time to *reflect* on their' own and others' practices. This helps the individuals to identify conflicts between their mental models in-use and espoused, to understand the larger system, and to develop more effective suggestions for improvement based on their improved understanding of the system and the behaviour exhibited within it. Forester (1996) reports that this results in insights and ideas for improvement that could not have been predicted prior to the dialogue process. Grieser (2000) adds that these are ideas and solutions that outside experts are unlikely to develop on their own. It results in double loop learning in the individuals, who retain ownership because they have 'discovered' the ideas themselves (Robinson 1993; Sterman 1994). These changes to mental models and reflections on the status quo result in changes to the way people think and interact. It can lead to new levels of openness to discuss the issues, motivation for action, and ultimately changes to the culture of the organization (Allen 2000b; Schein 1995; Argyris et al 1985; Williamson et al 2001; Robottom & Hart 1993).

In addition to the conducting of interviews, the behaviour of staff in the workplace was observed to see if those interviewed indeed behaved in the way that they said they did. This determined whether or not their mental models in-use and espoused were aligned. Organizational reports were collected and reviewed to ascertain if staff members' actions were in compliance with the written policy, which equates to the espoused policy of the organization. This ascertains whether or not the policy is actually used; that is, if it is a policy in-use. All of the above resulted in a greater understanding of the system surrounding the issue of focus, and the 'real' reasons for the behaviour that is exhibited within it.

The procedures recommended by Argyris (1993) were used. Each individual interview was tape-recorded, with interviewees given the researcher's guarantee that their comments would remain confidential. Transcripts of the interviews were analysed to identify the causal reasoning of the person, their mental models, conflicts between mental models in-

use and espoused, untested attributions about others' behaviours and reasoning, their suggested improvements, and the consequences of these.

Where different interviewees have provided competing theories of why behaviour occurs, Argyris (1993) recommends selecting those that appear most accurate according to the directly observable data. Robinson (1993) agrees, referring to this as explanatory accuracy. She also suggests additional techniques for identifying whether or not solution ideas or suggested improvements to practices identified by interviewees would be effective. She states that each solution idea should be checked for

- Effectiveness: 'Does it achieve what we want at an acceptable cost?' (Robinson 1993 p.38). Does all of the data suggest that the solution idea will actually lead to improvement?

- Coherence: 'Does the solution fit with our other goals or does it make it harder to solve the other ones?' (Robinson 1993 p.39); and

- Improvability '[Are there] options for improvement? Does it suggest what to do and how to detect its inadequacies?' (Robinson 1993 p.41). Have people explained their reasoning and invited others to query it? If so, does the solution idea still seem the most appropriate one to adopt?

A combination of these techniques will be used to explore the 'real' reasons for the behaviour exhibited within each council, and the likely effectiveness of the staff members' solution ideas.

In addition to checking the interviewees' theories, the researcher also needs to check the conclusions that he or she draws from the data. Cantrell (1990 p.15) states that 'Although researchers vary in the terms they use, they agree that adequate procedures exist to assure the quality of the research and the findings'. A selection of recommended approaches were used to assess the case study data (Walker 1995; Cantrell 1990; Palmer 1998).

These included:

- Seeking and investigating counter examples from the practitioners within the same and other case study organizations. (Are there examples that contradict the researcher's conclusions or show that their suggestions would not be effective?).

- Triangulation across interviewees and data sources. Ideas and conclusions are checked with interviewees within and across the case study organizations. This practice is known as face validity. (Do the interviewees agree with the researcher's conclusions and suggestions?) Observing the individual's actions and reviewing their work documents also checks the truthfulness of the conclusions. This process is known as construct validity. (Do the actions of the individuals confirm the researcher's conclusion?).

- Testing the case analysis with the researcher's academic colleagues for validity – an informal peer review. (Are the researcher's conclusions and suggestions a reasonable and valid interpretation of the data?).

Argyris (1993) adds that ultimately, others can test the researcher's findings by reading and reviewing the interview transcripts, policy documents, and the researcher's notes from behaviour observation. They can then draw their own conclusions. He points out that this approach can appease both dedicated positivists and interpretivists. Appendix A contains a detailed explanation of the data analysis process and examples of it.

6.3 Background to the case studies

The local governments that participated in this research belong to the Southern Sydney Regional Organization of Councils (SSROC). This is a network of 12 councils in NSW, whose staff members work together on areas of common interest, including environmental issues.

Under the *NSW Protection of the Environment Operations Act 1997* each council is responsible for the protection of its environment from pollution. The council officers undertake a range of activities to stop pollution that is currently occurring and to prevent future occurrences. This includes enforcement of laws where warning, notices, on the spot

fines and court action are taken. The officers also undertake education programs to encourage environmentally responsible behaviour.

Environmental officers at the SSROC member councils have identified the construction sector as a key polluter of the stormwater system. Pollution from construction sites that is commonly found to enter the stormwater system includes brick cutting waste, soil, sand, paints, glues, plaster, cement, and chemicals (Beaupert & Wright 1998; Gaudry & Geier 2000a; SA EPA 1999; KESAB 2000; Smith 2001). In addition to polluting waterways these wastes can block council stormwater drains. In the case of cement, it permanently narrows the diameter of stormwater pipes. These blockages increase the risk of flooding and property damage, for which the councils can be held liable. As a result, council staff members spend considerable amounts of time and money each year cleaning stormwater pipes (Pavan 2000; Smith 2001). The officers at the SSROC member councils have been working to reduce stormwater pollution from construction sites for many years. They introduced their first education program for the sector in 1998. This involved

- A major education campaign including seminars for developers and council staff.
- The region wide distribution of the soil and water management guideline with all development approvals.
- The requirement for developers to submit a soil and water management plan with development or building applications, unless otherwise determined by council.
- Councils adopting common conditions of consent, including the requirement that the penalty warning sign be displayed at all times on the building site.
- Councils inspecting soil and water management structures at the first building inspection and, if found inadequate, not undertaking further inspections until adequate measures are in place [thereby preventing the construction of the site entering into the next phase until environmental controls are improved].
- An enforcement blitz after four months from the start of the campaign.
- Councils leading by example by reviewing their own practices to ensure they comply at least with the standard required of developers. (SSROC 1998 p.2)

The program was implemented and declared a success, as the councils' staff had raised awareness of the importance of the issues within the minds of individuals in their own organizations, the public and the construction sector. Minor changes were observed in

some builders' practices, but within two years it was determined that a new program was needed because pollution was still occurring. The individual councils did not have the funds to each have an educator and decided that the new education program should be designed and implemented once again through SSROC. This would ensure consistency across the region, reduce duplication of effort, and enable application for a regional grant, which state and federal governments were now favouring.

The environment officers of the SSROC councils recognised that there was a range of staff within each of their organizations whose actions affected what builders did. They decided that the project officer hired should work with these staff members to ensure that their interactions with builders reaffirmed the educational messages and encouraged behaviour change. It was hypothesised that this way the educational process with builders should continue after the grant had been spent and the project officer's employment ceased.

The staff to be involved included

- Inspectors (also known as rangers), environment officers, and environmental health officers who are responsible for enforcement and education of the public on environmental issues.

- Customer service staff, who provide information to people who inquire about building within the council area, accept development applications from builders and take phone calls reporting pollution incidents.

- Building inspectors and planning officers, who play a key role. They interact with builders and are responsible for assessing their development applications. This includes ensuring that a Soil and Water Management Plan (SWMP) is submitted with development plans and is sufficient to prevent pollution occurring. A SWMP is a diagrammatic map of the construction site layout, with drawings showing how the builders will minimise erosion and waste water generation, as well as where they will place sedimentation control devices to capture any wastes that are generated. Building officers also inspect the buildings at various stages of development, and can therefore check to see if the soil and water controls are in place and effective. If they are found to be ineffective, the inspectors can refuse to

undertake their building inspection, educate, warn, serve a notice, fine the builders or pass the details of the transgression on to the relevant council officer to deal with; and

- The managers, who oversee the operations of all these people, and set the policy and procedures of how these people should interact with customers, including builders.

The current author was hired as the project officer to undertake the program, which included four main elements:

1) The design of new educational material that council officers could give to builders;
2) A review of three member councils' staff practices, which form the case studies of this thesis;
3) The design and delivery of training for council staff; and
4) Visits to construction sites, where the project officer would observe council staff interactions with builders, and make suggestions to improve their approach.

6.4 Case Study 1: Calandore Council

6.4.1 Introduction

In this council a range of staff are involved in the issues. They belong to three different departments each of which has its own manager. The division of responsibilities in relation to stormwater pollution from construction sites is shown in Figure 34.

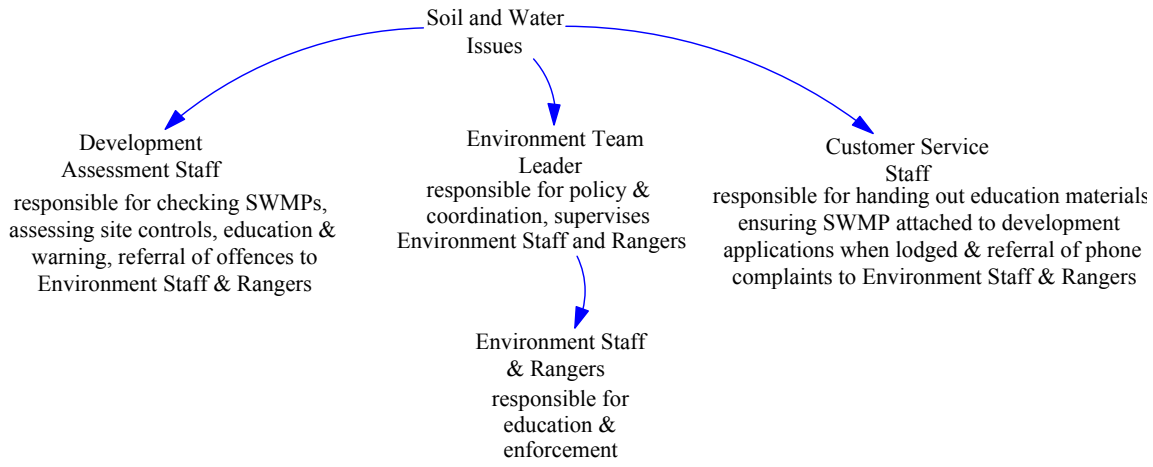


Figure 34: Division of responsibility for soil and water management with construction sites at Calandore Council

Staff members from each of these departments were interviewed to review what is currently occurring within their council, and their ideas for improvement. These included:

- The environment team leader - John
- The manager of development (building and planning services) - Martin
- The environment officer - Cameron
- A ranger - Sylvio; and
- The manager of customer service - Justin

6.4.2 Findings

The handling of the issue at Calandore Council is very informal. There is little coordination between the relevant staff in the different departments, no policy or procedures, and no list of building sites for the officers to be checking. Each officer addresses the issue in the way that he or she thinks is appropriate. However, it became clear through the review process that little is really done, as there is a shared mental model between the staff that the issue is of low priority. This is highlighted by the following statement from the environment team leader John, who is responsible for coordinating the council's activities on the issue:

> …a problem I guess with this council is that there isn't formal procedures for a lot of things. It just sort of happens on a reactive basis, which sometimes it works with the right people but often, it doesn't… I wouldn't mind formalising the system but I just know that there's so much

> overlapping what people do and so many other procedures that probably need to be done, say before this one. Umm, but I'm not sure whether people would give it the priority even if it was formally developed, in that I think there is procedures basically in our department and the planning department which haven't been formalised that, you know, maybe should be given more priority than this. Certainly I think formalising it will help, umm, and that's something that I sort of have on the cards to do.

The interview process revealed that the staff members have very different beliefs about how large the problem is, and what needs to be done to address it. This is shown in the contrast of opinions between Sylvio and Cameron, both of whom are responsible for education and enforcement. Sylvio feels that most sites within the area, around '80-90 per cent' are complying with the law, and that there is little need for changes to the approach taken within the council. He believes that there is no need for additional staff or further focus on the issue, as pollution from construction sites is rare:

> …It doesn't happen, it's not an everyday issue, you know, it's not an everyday issue, like when we deal with parking or with abandoned vehicles, which we do about 50 a month in such a small municipality. It doesn't come up… I don't think, I don't think its happening. Like everything else when it came in the offences now have minimised, you know, it's got barely any offences. [Sylvio is reported to issue more fines than the other two rangers combined.]

Cameron, the environment officer, held a very different view:

> …I don't know if some builders were doing well because of their site layout and so it was by chance or not, but including that and saying that they were doing the right thing, rather than they were just lucky, it's probably about 60/40, like 60 would be needing some, you know, pretty big improvements where as 40 per cent they are on sort of the cusp, more than yeah, saying look if you just did something little here, smaller things for them, but I would say 60 per cent would need, they need to take like a good look at what they are doing.

Unlike Sylvio, Cameron feels further resources would help, as his other responsibilities take up most of his time and limit what he can achieve with construction sites. Cameron admits that he only gets to audit three or four sites a month, and these audits usually occur when he drives past a site doing his other duties and sees pollution occurring, or when he receives a complaint from the community. He states that the Council does not get many complaints and when residents do complain, it tends to be because the wastewater has pooled in front of their driveways and is inconveniencing them, rather than because they

are concerned about the pollution to the environment. He admits that even though he understands the impact of pollution from construction sites, he is sometimes tempted to ignore offences if he is having a 'busy day' or 'not feeling particularly motivated'. The manager of building services, Martin, also confirms that his staff members, the building officers, occasionally ignore the issues. He believes, however, that this occurs due to the conflict involved:

> Well. See if you have to confront someone, some brick-layers mixing concrete on the road, they can become very aggressive if you tell them to shift… Very aggressive… some of our people, they may avoid that issue because they know… They will avoid the unpleasantness… very, very confrontational sometimes particularly with subcontractors.

Despite his recognition of this, Martin has not arranged training for his staff members to help them resolve conflict or handle difficult people. Nor have the staff members been disciplined over their inaction:

> Jodi: The fact that you know that sometimes they ignore the issue…
>
> Martin: I won't say ignore, they just may not choose to go where they know it may be happening.
>
> Jodi: Is that something that will get tackled or…
>
> Martin: I think it will be tackled eventually, yeah, when they are forced into doing it.
>
> Jodi: And how would they be forced into doing it?
>
> Martin: Given a direction to go and do it. A certain part of their job is professionalism and professionalism means that they know someone is doing the wrong thing and they have to take initiative to address that, sometimes they avoid the issue for the consequences. It's certainly very hard dealing with these builders, but that is only in a minority. It all adds up I guess.

This failure to discipline or support staff in addressing the issue once again shows that it is seen as an issue of low importance, which as Martin states, will get 'tackled eventually'. While training may help the staff, it would seem that confrontation is simply an excuse not to undertake the role, because building officers handle confrontation with builders on a daily basis. This occurs when the building that is being constructed is not structurally sound, or when the builder has deviated from the approved plan. John reports that the building officers are also failing to place the conditions of consent about stormwater

pollution on all development applications, and are not collecting and checking SWMPs. He states that in a recent review of applications he found that the conditions were placed on only half of the files. This means that many builders were not receiving any information on the issue prior to commencing building. A comment later in Martin's interview revealed why he is not pushing his staff to address the issue properly:

> Now if it [stormwater pollution] is such an important issue, maybe the EP&A Act [*Environment Planning & Assessment Act*] has got to have a further provision that they prepay a bond for sedimentation control… I think it has got to come under, I think it has to become a whole state thing. It is an expectation that they pay it. They know they have to pay a damage deposit at Calandore and at Timbuktu there's no questions asked, because that's normal, that's the uniform practice and if they know if they damage, they lose it. That's what I'm saying, it has got to be uniform. We can't jump up and down here, when no one else does it. Somebody has to introduce the mechanism that they prepay a bond, if they don't do it then they lose it. And that has got to be in the EP&A Act. So that it goes through the whole state. Everybody becomes aware of it then.

Despite his strong feelings about the issue, Martin has not lobbied the state government to introduce such changes to the legislation, nor has he raised it as an issue for which SSROC could lobby. He fails to see that his council could be a catalyst for the issue, if they did initiate a bond payment system through their bylaws. This suggests that while he espouses a need for action, his mental model in-use is that the issue is not that important.

John showed a similar tendency to rely on someone else to improve the situation. When asked what needs to occur to improve practices, he felt that the environment needed its own manager at the same level as the other departmental managers. However, he felt that this was unlikely to occur within the organization, as the environment was not a priority for the elected members or other managers. When asked if he thought he could take action to encourage the elected members and management to be more supportive of environmental issues, in particular pollution from construction sites, he stated:

> Umm. Not really I don't think. You see that's something which I don't think I can directly do, because in relation to reporting I am supposed to report to Steve, Steve reports to the director, and the director is the only one that can go speak to the general manager… I don't feel, I don't think that my role is to change, like attitudes towards every single area and every single department, it's hard enough to try and get some things up and running, but to actually change culture, unless there's a will from upstairs or the general manager's level or all the councillors to do that, then you know, I think you're just hitting your head against a brick wall.

Despite these feelings he explains that his director:

> … is fairly supportive of everything I have to admit, but it's often priorities as well. I know the amount of things I work on there's just no time, umm, [to] try and get everything that you want to get done, so I have to try and think what might I achieve, or what is the best thing I can achieve in my time and try and suss that out and do what I can, rather than think ah let's aim for this and know that there won't be hope of getting it done. Because when I first started the previous person had written the Calandore Environment Improvement Program, to a draft, not quite finalised yet and that was going to be a platform for an election in relation to environment strategy for the whole of the City of Calandore and umm, yeah, just basically didn't get up though, like, I think there was consultation with the person who put that together and the director and also the mayor and people like that, but in the end it wasn't actually adopted by council… when he first started Steve said to me oh, do you think it is worthwhile fixing this and trying to run with it, but I thought if the support isn't there, [and] I don't think it is, it is better taking actions out of there and try to get them done, rather than having an environment strategy, which we wouldn't get any extra funding to do or any extra staff to do, it just makes, just more of a token document and I'm not into that really.

The above response from John raises some interesting points. It shows that the elected members and management have been exposed to and consulted with on environmental issues, suggesting that he would be able to access them, if he pushed for it. It also shows that his manager is prepared for him to take action on environmental issues, such as the creation of an environment plan for the council, but John has decided that it is not worth it. He fails to see that the plan could be used as a catalyst to help raise awareness of the issues, and that this could lead to funding and extra staff in the future. The plan would reveal the gaps between the current and desired reality, leading to creative tension to close the gap.

While providing the excuse of hierarchy and reporting mechanisms for not educating elected members and management, John states in a different part of the interview that he does break the chain of command regularly on issues that he believes are important:

> John: One of the local environment groups recently went out and had a look at our drainage which was quite good and I … sort of helped them out to show them where they should go… they took photos of all the weeds and overgrown areas and things like that, sent a letter to the Mayor and we had to follow it through which is one way to get things done… I

> know that I used to send in those [similar reports] to various managers and nothing was done and I had to step over so many different departments to be able to do that, because you've got the manager of engineering services, as well as the manager of outdoor staff and… so anyway we got approval to go and remove the weeds and also to get our landscape department to do a plan for replanting around the drains…
>
> Jodi: So would you use that kind of mechanism to almost force things to happen very often?
>
> John: You have to. Yeah.

This again suggests that the issue of soil and water management on construction sites is just not seen as a priority by the staff. Both John and Cameron doubt that the elected members would provide further financial support for the issue if they did raise it with them. They claim that the elected members espouse a commitment to the environment, as evidenced by their agreement to participate in the SSROC regional education program, but they do not provide funds to support the initiatives. John believes that they either have to obtain a grant or manage as best they can within their current resource levels. As a result of this belief he has not asked for further funds, and all parties appear to accept the current poor performance, as John explains:

> John: I don't think they're that bad generally with the resource level that we have and the support that we have, we are not doing too bad.
>
> Jodi: As compared to other councils?
>
> John: Umm. It's hard to know because you only hear certain things from other councils, umm. I just, if I came in and had a look and just umm assessed what is being done, I would say that it is fair, I wouldn't say that it is great. But I would say that it is probably not bad for the level of resourcing, that we have to be able to do that in relation to the staff levels here.

When asked if education was needed, everyone interviewed thought that builders were already aware of the issues. Cameron, John and Justin felt that further education and warnings would be beneficial, while Martin and Sylvio did not. They believe that builders simply ignore the issue. Martin assumes that this occurs because the required controls

> Inhibits their activities because we've got to limit, in some cases you limit their site access to one … you've got to watch where they deliver the materials and transporting materials from the delivery to the site becomes

> difficult and they like to make it as easy for themselves as they can, in dealing with building materials, in using them in the building, then the sedimentation controls get in the way, they suffer.

He believes that builders just need to accept what is required of them and implement the changes to their practices:

> I think the only way you are going to do it now, the period of education may come back, but there has to be a period of enforcement now and it has to be uniform… Once they know that there is a uniform approach then if, I think, [if] everybody did the same thing over a period of 12 months, the message would go through the industry quite quickly.

Sylvio, who is adamant that he does not give warnings, believing that fines should be issued, later reported that he only issues the lower fine even in repeat offence situations. He does this because he believes that for many of the smaller companies the larger fines could send them bankrupt. He fails to see that issuing the lower fine also decreases the impetus for the builders to change their ways. Both Sylvio and John stated that they were reluctant to fine the supervisor of a site, if the subcontractor was the one who caused the pollution. They fail to see that this reduces the impetus for the builder to supervise his site and subcontractors appropriately. If both builder and subcontractor were fined, it is possible that this would motivate the builder to ensure his subcontractors did not breach the law. He or she could do this by refusing to rehire anyone found polluting. Cameron reports that some supervisors are starting to address these issues:

> It is becoming more the case these days where particularly on larger contracts, there are performance criteria being written into the [subcontractors] contract saying you will be responsible for this, it will be maintained on a weekly basis or after rain, that sort of thing but umm, I think that's more, you know, the more proactive people at the top of the, doing good generally, rather than the industry as a whole, yeah.

In addition to their differing opinions about the need for education, all the interviewees had differing opinions on who were the worst offenders and who therefore required the most attention, if the council did have time to devote to it. Justin felt that large construction companies comply, but small ones do not. Martin felt that large and small companies complied, but it was the medium ones that did not. Cameron and Sylvio disagreed completely stating that size was irrelevant, they all offend as much as each other. John suggested that company size was irrelevant; it was the fact that some construction companies worked within the Calandore Council area regularly, and needed to maintain a

good relationship with the council, that led to their compliance. To him it was the companies that operated in the council area infrequently that were the most problematic. These different opinions would, if the officers had time to dedicate to the issue, affect how each of them undertook their responsibilities in relation to environmental protection.

When it came to educational methods, the interviews revealed that most people interviewed thought that education meant simple positivist awareness raising measures, such as telling builders what to do when on the site, threatening them with fines, providing them with brochures and information kits, inviting them to training and seminars and publishing newspaper articles. Both John and Martin expressed dismay at the difficulty of getting builders to attend seminars. Cameron suggested that instead of trying to get builders to come to the council's seminars, the officers should go to meetings of the sector's industry bodies and present at them. He had not, however, done this in relation to the construction sector. Cameron reported that one thing he does do is send copies of the fines or notices issued to supervisors of sites to the head office of their construction companies. This way the site supervisors cannot hide from their bosses the fact they were fined. Cameron hopes that this may lead the head office to arrange training for all of their supervisors or develop a policy and standard operating procedures regarding the issue. He has not, however, approached the staff at the head offices and offered to help them do this.

Cameron was the only one who reported going beyond simple awareness raising, utilising several of the other positivist education techniques described in Chapter Four. This included simplifying what was required, explaining its importance, making the message personally relevant and helping builders to understand and problem solve what they should do. Unfortunately, as was stated earlier, Cameron actually spends very little time addressing the issue, and the lack of communication between staff means the others have not adopted his techniques. Below is his explanation of his educational approach:

> Cameron: I don't know, it's sort of like people say the first step to overcoming an addiction is to say oh well, I've got a problem, I suppose it is a similar type scenario, you know, saying well I've got a problem with soil and water management, you know, what am I going to do? and that is, you've got to get people to take that step I suppose… generally I try to say look this is no good because there's clouds over there, it could be rain, if it does, it's this and that and try and you know make the connections for them, so that they can see what's wrong with how they are doing stuff yeah.

Jodi: And does it help getting them to understand why it is a problem?

Cameron: Yeah, sometimes it does, yep. Other people are just continuing doing their own thing anyway, but most of the time, I would say people once you join the dots for them or help them join the dots, they um go oh well it's probably not a bad thing… Yeah particularly the umm, like one of the, like with building sites in, oh any pollutant, stormwater pollution I say look do you go fishing and lots of fishermen out there and more often than not they go yeah, and if they don't I say do you go to the beach, oh yeah and I say well, if you're swimming down at Calandore or fishing down at Calandore, well this is where it is all going straight there and they tend to go ooh and it makes them think a little about that and yeah I find that, that is quite effective, putting the problem in their own backyard …And generally with the smaller blokes, most of them respond better I've found to education, they are more willing to work with you if you can just go look, you know, this is what you need to do [spell out the steps] and umm, umm, yeah you really don't have a choice but I'm not going to be a bastard and start slapping you around and having you in court and that sort of thing, you know, unless you don't do it, you know.

6.4.3 Conclusions from Calandore Council

The staff members within this council express a concern for the environment and a desire to address the issue, but they admit that little time is dedicated to it due to workload pressure. They believe that they are doing the best they can within their current resource levels, and assume that the only way to improve would be to receive further funding. They do not believe that management or elected members would support this. They therefore accept their current poor performance and take solace in blaming others.

They have not come together to discuss how they can best address the issue with their limited funds, nor have they developed a procedure for all to use. The result is inconsistent and ineffective approaches to education and enforcement. The officers have different ideas on actions that could be taken, but due to their failure to communicate, these remain unknown and un-actioned. By coming together, discussing their different beliefs, and developing a shared vision and approach, they would be able to greatly improve their current practices. This is unlikely to occur, though, until they alter their mental models that say their current performance is acceptable.

The officers do not appear to have considered the system surrounding the builders and its effects on the builders' actions. They have not worked with the builders to find out their needs, the constraints they face, and ways to overcome those constraints. They have not involved the builders in the design of a more effective educational program. Many of the officers have simply assumed that builders do not care, because they have not changed their behaviour as a result of the awareness raising efforts, threats and fines that have been issued. The officers' lack of understanding is not surprising considering that they do not have any training in, or knowledge of, problem solving education approaches or systems thinking approaches. Training in the education approaches recommended in this thesis would greatly help these officers to improve their practices.

6.5 Case Study 2: Pollotial Council

6.5.1 Introduction

Unlike Calandore Council, the staff members involved in soil and water issues in Pollotial Council all belong to the one department, with one manager over seeing the whole operation, as shown in Figure 35. The rangers belong to a different department and are not currently involved in soil and water issues.

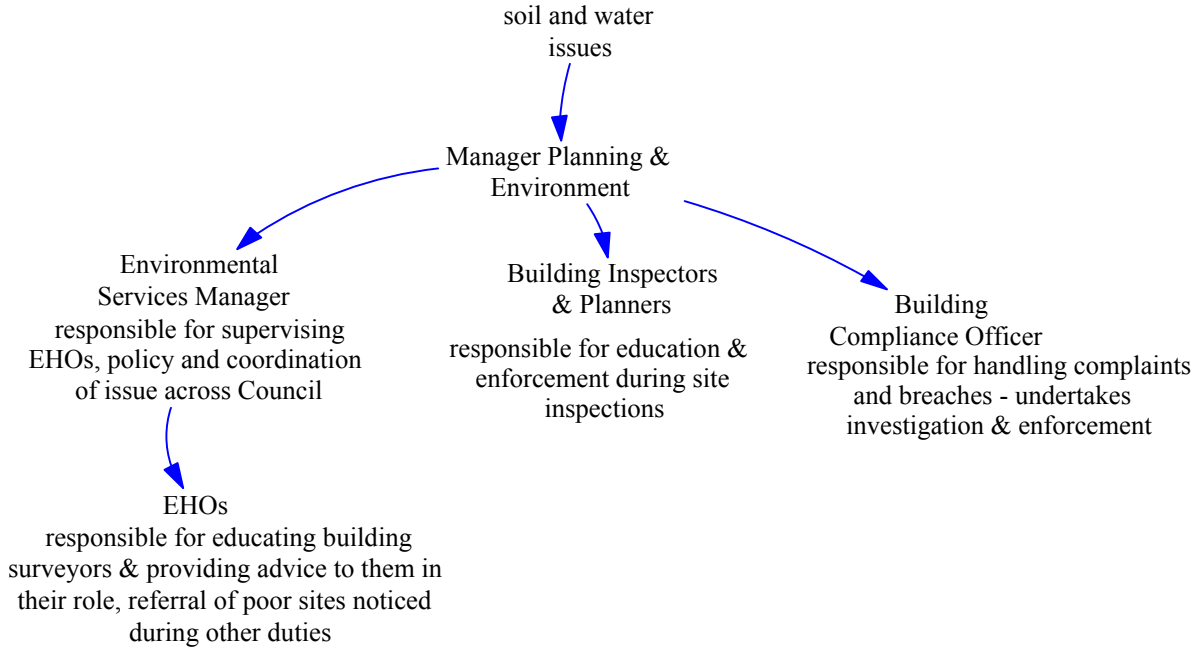


Figure 35: Division of responsibility for soil and water management with construction sites at Pollotial Council

A selection of staff members were interviewed. These included:

- Team leader environment – Chad
- Environmental health officers – Geoffrey, Frank
- Team leaders building – Chris, Bob
- Building inspectors- Sam, Daniel, Bill,
- Building compliance officer – Adam
- Manager - George

6.5.2 Findings

Like Calandore Council, it was found that those involved at Pollotial felt the issue was of low priority, as shown by Adam's statement:

> I think everyone is so busy in other parts of their work that umm the site management issues are of less consequence than say, you know, an unauthorised backpackers… I would say it's fairly low down on the list, I mean in the general scheme of things.

Their manager George, like the manager at Calandore, accepts the fact that his staff members often ignore the issue.

> If we, if someone raised the question regarding the sediment control site management on a building site, it would not get forgotten about. It would get attended to guaranteed, but whether there's people who might drive past before hand and see it and not do anything about it, is a different kettle of fish. I think sometimes that happens.

He continues explaining that:

> I wouldn't say that it is not a priority now, really, I think probably that's not the right way of saying it, I guess we need to remind people. You see the problem I guess with our, with any, I guess with any job really where you've got limited resources, most of your work is reactive. You really have to cope with the reactive work, before you can get on to the proactive stuff, in reality, otherwise things keep piling up and the quantity of the reactive work, is obviously from the building surveyors point of view, they've got to do all of their building inspections, deal with all of their building and fire safety issues, and all of those are coming in. Not at their, they don't activate those, the customer does or whatever else is happening out there. Likewise with the environmental health people, they've got a lot of issues as well to address, as well, again to meet the management plan, food premises, legionella, inspections to carry out and obviously the importance of the approvals process, not saying that it is more important than this, but again, we don't get abusive phone calls or

> the like or pressure put on you to deal with matters on site management, but if I don't deal with someone's application with in what they think is a reasonable time, then that's where the pressure is, so you have to cope with that and do this as well. So it is balancing [act], I think and it is a matter of doing that.

The above statement from George raises two important points. First it clearly shows that he sees stormwater protection as an optional activity, which should be attended to after other more important issues such as building inspections or food inspections. In reality the council is responsible for all of these activities under legislation; none of them are optional. Second, George implies that his priorities reflect what he gets pressured about. Pressure in relation to pollution from building sites occurs when elected members or the community members complain, or initiatives like the SSROC project bring attention to it. When this occurs George pushes his staff to act. This suggests that one way to increase the attention to the issue within councils is to increase community and elected member awareness. George confirms that this is effective:

> The green councillors in particular for the last sort of two, three years have been very proactive in ahh, which resulted in us including it in the DCP [Development Control Plan], including it in the management plan, including it in my operational plan, and including it in the standard conditions… I think if we didn't have them to remind us then we might not have, well I think it has got us as far as we have, so it's good, it's good in that respect for sure.

The staff members have learnt to respond to George's pushes, but slow their efforts as soon as George stops pushing. The result is that only spasmodic efforts are made with the builders on the ground. During the interviews the building surveyors, who are the ones with major responsibility for the issue at Pollotial Council, admitted that they do not always address soil and water issues on construction sites. One task that they are not performing is asking for or checking soil and water management plans, as Sam explains.

> Sam: Well, we only ask for them on the larger developments and it's not even really sort of a soil and water management plan type thing. All we ask for is the details of their sediment control, okay and they are usually using hay bales or geotech fabric or a combination of both. Umm they just quickly draw that on the site where they think it should go. Nine times out of ten it's in the wrong place ummm and that's it… So, as far as a soil and water and management plan on site there's really well none issued basically and none asked for either.

> Jodi: Right, so with the nine out of ten times that it is drawn incorrectly, would you guys go back to them and say hey that's not correct, you need to do it differently?
>
> Sam: Oh, if you need to modify it, you would just modify it on the plan in red and to be honest with you a lot of times that is not even done, it's just look, yep they've got detail there, bang because they wont draw [install] it on site, they will just give you details of what it is going to be, which I say, is like a photocopy out of the, some manual or the EPA manual or whether it be something that council's got and then you go out to site and that's when you see, oh you've got it completely wrong.
>
> Jodi: So there is no process at this stage to say sorry you can't lodge that application because that is incorrect?
>
> Sam: No.

While Sam emphasizes that there is no point checking soil and water management plans because the builders do not implement them, Daniel feels that the failure to check them is more related to pressure. Pressure to:

> … get those assessments out, why are these taking so long? Why haven't we dealt with that complaint? There is a lot of pressure on to do things expeditiously and prioritise matters, so what am I leading to. Well yeh we look at the site SWMP's but ahh generally I think I take more regard to the conditions on site when I've gone to a site, see there is a deficiency there.

Daniel's comments reflect George's attitude in regard to attending to the issues about which he receives pressure from others. The staff members, like those at Calandore, do not appear to see that their failure to collect and correct soil and water management plans, means that builders do not get the chance to learn how to do it properly, before they commence work on their sites. They do not see the correction of the plans as an opportunity to prevent problems from occurring. This would appear to be particularly important at Pollotial, because the building surveyors do not attend the site for some time after its commencement, as George explains:

> We would normally only find out about it when we go down there for an inspection, which might be possibly two, three months after they have actually started… Because there is nothing to actually inspect apart from a mess and a hole and something like that.

The result is that the phase with one of the highest pollution potentials, the excavation phase, is not being monitored. Another task that many of the building surveyors admitted

they were not performing is issuing fines. Many reasons were given for this. Some reasons, such as workload, conflict, and concern that the fines were so large they would hurt companies, were similar to those provided by staff at Calandore. However, many other reasons were also provided.

One of these reasons was a lack of confidence in how to issue the fine and what evidence to collect. The officers raising this concern requested training. Another reason given for not fining was the fact that it damages the officer's relationship with the builder. Daniel explains:

> It's difficult because we have to maintain a working relationship with these builders and we've got a client relationship on one hand and an enforcement on the other hand… Because I want them to call me out to sites. I want to be invited to look at the things that I want to see, because I know at the end of the job you are going to ask me, can you sign this to say its okay and like a lot of other surveyors I want to see the elements of construction, but maybe they get a bit reluctant if each time we come out we are giving [AUS]$750 fine … it might be a bit easier to separate that [enforcement role to another person]. But having said that I have issued fines and occasionally there has been no appeal.

Adam expanded on this, explaining that private certification, where a developer can choose to have someone other than council inspect their sites and certify that the building has been built correctly, means that building officers now have to compete for work. They therefore want to maintain a good relationship with builders, so that the builder will continue to use the council as a certifier. If builders do not, council income and involvement decreases, which could possibly lead to a decrease in the number of building officers required. Adam points out that this makes building officers reluctant to 'hassle' builders about environmental issues, since many of the private certifiers do not worry about them. It also means that on sites where the private certifiers are in control, often no one is enforcing the laws. Adam explained that the council cannot afford to send the building officers to inspect the sites because they are no longer being paid to do so. Further more they are discouraged from visiting the sites for fear of liability if something goes wrong with the construction occurring on the site.

Daniel and others point out that this problem could be avoided if someone other than the building officers were responsible for the stormwater education and enforcement role.

They suggest a separate, dedicated officer, who would then have time to address the issue, which the building officers claim they do not have. They suggested that the person could be self-funded through fines. George, the manager, however, did not like this idea, stating that if the person is successful the fines would diminish, and then the council would be left to cover the person's salary. Instead George considered involving the rangers, but felt that this would not be effective as they belong to a different department and their backgrounds tend to be policing, not educational or environmental. Some, like Chris and Frank, felt that the building officers should just do it, as Frank explains:

> They've already got the relationship with the site manager, so rather than have someone new come in all the time and going you've got to do it. They already know the site manager, they've got his number, they know him, go, just look do it. Come by tomorrow, if I see it, I'll give you a PIN [Penalty Infringement Notice – a fine] or whatever.

Clearly, the parties involved need to come together, share their concerns, and decide upon who is going to perform the role and to what extent. Another reason provided by staff for not enforcing stormwater pollution issues was a perceived lack of management and elected member support. Daniel explains:

> I rarely issue penalty infringement notices. I think I've given some people dozens and dozens of warnings and finally issued them with a penalty notice. It's been put to me, that I'm going around it the wrong way, but in the world we're working in, there's a lot of politics and you can't easily infuriate or aggravate, or you could but you might not get the support. You see the politics says that if you issue a penalty or infringement notice, and the person starts to make claims that they've been harassed, then you're in a position where your management might be going - What are you doing? Why are you doing that? Well hang on, I'm issuing it because I've got this information and he's saying no no no, he's saying that… I mean you can't tell your officer go and pinch them, go and knock them off, I want to see some fines and should the officers do that, you then cannot go and quiz those officers because you have had a complaint, an allegation which is a standard response. If you are under attack, attack the messenger, or attack, you know, try and destabilise the person who is regulating your activity or go to the boss or go higher.

Bill agrees:

> If they have a political contact so to speak and it gets, it filters back through that political contact back into council and down to us and we're told, do your best to help these guys and sort of lay off a bit, you know. Which shouldn't happen but that's the nature of local government and it does…

Geoffrey confirms that this occurs. He states that:

> A lot of people are under the perception that if you do this you are going to be seen as being too hard, and you don't want to be seen as being too hard. Or if you do this someone is going to say don't worry about it, so you have wasted your time and you don't want to waste your time. If you do this for instance, you issue or order a PIN, legal action takes place. If you do this, your manager will think you've got nothing better to do or something like that. It's like the weirdest things, you know.

He believes that the problem arises as the officers cannot attend all sites and then the

> councillors or you know the general manager will say why are you being hard on this person and not on the other person, so then you have got to be hard on everyone and you can't be hard on everyone… you can't be driving around and every time you see something stop, I don't believe you can do that, because if you don't have time to stop at one and then you stop at another then you are being a bit unfair.

Geoffrey's comments show a conflict in his mental models. Throughout his interview he claims to care about the environment, but in practice his actions suggest that he cares more about fairness. He is prepared to ignore pollution from sites, because he cannot regulate them all. The issue of management and elected member support needs to be discussed and clarified before the officers at this council will change their behaviour. It appears to be a critical issue for the council and was identified as a priority area for improvement by several staff. Bill explains:

> If we sell it to the councillors properly, you can get them to accept it and once they have accepted it, they can't very well go back and then say to a builder right, no worries, leave it to me because they know that all the other councillors then are pressuring them as well.

Bob provided a further reason for reluctance to fine:

> I don't like issuing fines because I think it puts more of an onus on a person, especially if they have a difficult situation and their only option is to put it there. I mean for example because we have got narrow streets and high traffic areas, people put hay bales in the footpaths, in the gutter or sand bags and they will get run over, they burst and then they are ineffective. People come and steal the hay bales. People put site fencing up and two days later someone has stolen it or pushed it over, so there is a lot of circumstances where the builder has attempted to do something, but it is ineffective whether through their own fault or someone else's and unfortunately if he hasn't got it, then we have to give him a fine, give him a warning, give him a caution, [I] try to give them some leeway but [I] have to be fair to everyone in the street.

George, the manager, expressed a similar concern:

> I think, well, one of the problems is the practicality in a built up area. It is easier said than done in many cases. When you are building, we allow building, from one boundary to the other. Where the hell are you going to store your materials without causing any problems? In a way that's sort of asking for trouble, but the planning, I guess, instruments and the like allow that to an extent. I will take that back slightly, some of the planning instruments were changed as such, earlier on this year, going from memory around February, March, which requires more landscaping to be provided, which in turn reduces the outline of the building, which will reduce the opportunity to build boundary to boundary, but we are probably building now what was approved 12, 18 months ago.

George also stated that he felt it was hypocritical for the council to be fining builders for stormwater pollution when the council's own staff and contractors often caused similar pollution, such as when they are undertaking road works.

While it was identified that different officers performed in different ways at Calandore Council, this was not shown to overly influence each officer's behaviour, since they had little interaction. At Pollotial however, there appears to be a shared mental model that results in all officers undertaking a low level of activity. Geoffrey explains:

> Geoffrey: So one person does it, so another person might feel a little bit more comfortable about doing something. Whereas I know, if you have two blokes, it's a very blokey thing isn't it, ten blokes doing one thing and the one guy differentiated and took a different approach, he might be looked upon as being too strict or too soft or different and that's not a good blokey image, is it? So it is an image thing…
>
> Jodi: So if you were driving past [a polluting site] then you might not necessarily stop, but would you record the details to then pass on to the relevant person so that they would go out?
>
> Geoffrey: In passing conversation. I wouldn't like [to] formalise it, because then it would be bad on me and they would look at me and go god your harsh, and I'm already harsh as it is, I'm already as strict and you know, if I did that, then it would be totally out of order.
>
> Jodi: Despite the fact that in reality that is what everybody should be doing, you would think that it would be seen as a negative?
>
> Geoffrey: Yeh, you could easily ring up from you know, a mobile phone anonymously and say you know, oh yeh there's this messy site. And then the next day say, I was driving past and saw that. They'd say oh yeh, we got a complaint about that it must be really bad.

> Jodi: Have you ever resorted to that?
>
> Geoffrey: Yeh that is one option, but I can't say I have had to resort to that. Crossed my mind but no.

Sam presents a very interesting case that shows this shared mental model of 'acceptable level of behaviour' varies from council to council. His previous council took a much stricter approach:

> Yeh, basically there was a sort of unwritten policy in Kolma that if you went out on site for a steel inspection, if the sediment control wasn't up or not adequate then you didn't even walk on site. You just say I'm sorry, I'm not even going to bother with that until it is fixed.

He states that this culture developed as:

> It's a big issue because of the lakes up there, you know the Entrance and every now and again they have to dredge it because of all the sediment that goes into the lakes, so it is a big issue up there.

By comparison he states that at Pollotial:

> Sam: here it is not so much an issue, it doesn't seem to be that much an issue, it is totally different. A big contrast.
>
> Jodi: Do you find that if you are used to Kolma being really full on did you try and be really full on when you got here?
>
> Sam: No, to a certain extent, because it just wasn't their way. Like, I did question it when I first got here, the guy who took me under his wing when I first came here, and he said, no, don't do nothing like that here. So it was like okay, fair enough.
>
> Jodi: So you have just adjusted to doing it the way they do it now?
>
> Sam: You see, I didn't want to come in and sort of start kicking people when it wasn't consistent across the board with what everyone else was doing… You fit into what is common practice across the board I guess.

Sam's statements show how powerful a shared mental model or cultural norm can be. While staff may express a preference to act differently to an interviewer, they are reluctant to admit this to their colleagues. Until they do become prepared to discuss the matter, the handling of the issue will not improve. Sam feels that in order to gain improvement

> It would need to go through a resolution, I guess, through council that, that was going to be the attitude adopted by council officers and then

> made basically as a policy amongst the guys, everyone sort of called in and say this is how it is. If it is not up [the stormwater protection controls], then don't do it [the normal building inspection].

Unfortunately, since the officers do not admit the reasons for their behaviour to each other, there is little chance of them being discussed and addressed. The result is that Chad, who is responsible for coordinating the process, assumes the building officers are not taking action simply because of workload pressures. Chad is therefore taking a two-pronged approach to improve the situation. First, the short-term measure is to simply keep reminding the building surveyors to take on the role. Chad assumes that over time this will lead the officers to accept it as a part of their daily practice. The second, longer-term measure is to gain elected member and management support for the issue. Chad believes that if he can get the elected members to understand the revenue raising possibilities, that they may push George, the manager, to get the building surveyors to do more. Another possibility he suggested would be the establishment of an environmental levy on rates. However, the review process undertaken suggests that even if more funds were available, handling of the issue would still not improve until the many other reasons for not undertaking the role were addressed.

When asked if his two-pronged approach was working, Chad admitted that so far it had only had a minimal impact. He concluded that it would just take time for everyone to understand the importance of the issue. Reflecting further, he stated that everyone needs to feel ownership of the issue and that fostering ownership may be a more effective approach. He felt that:

> What we're doing today is giving them some ownership. What are your ideas? What do you think? So that's a start.

Since few of the officers at Pollotial embraced the role, it was not surprising to find that there is little proactive education undertaken to prevent problems from developing on construction sites. The officers did however have ideas of what could be done, if there was time and money to commit to it. Chris suggested that builders could be educated through the Department of Fair Trading and through their licensing board. Sam suggested that the issue should be incorporated into TAFE courses that builders undertake. Chad touched on critical approaches with the suggestion to work through industry associations and ask builders their problems. However, he has not done this.

> Work with the industry, go through the builders industry, labourers industry, whatever it is. Entice them, perhaps, to come along to a meeting. Say, we want to hear from you guys what the problems are, get them to work with us, instead of telling them what they have to do, get them to be part of the game, like the strategy from going top down [with the elected members and management]. Get them to work in and give them ownership. Give them ownership although they don't, you know, get them to work with you. You know, putting a keg [of beer] on might work for them, who knows!

Several officers suggested that education should occur for the public as well as the builders. Chad suggested that this could lead the public to be 'watchdogs' and notify the council of offences, making it easier for the council to manage the issue within their current resources. Geoffrey suggested that the education could occur through articles in the newspaper and through local community radio broadcasts. Bill suggested a display of poor sites in the council foyer, while Bob suggested actually listing in the newspaper the sites that had been fined. He felt this would embarrass the builders into performing better.

While the above ideas were identified, they have not been implemented. The actual practices on the ground tended to be reactive, telling builders what to do to clean up pollution that has already occurred, and threatening them with fines. Bob explains that the threats do not have to be antagonistic:

> I do know that when I say to them like how long, how much will it cost for a labourer you know, two days to do the work to fix it up, they say oh [AUS]$200 a day. Well I explain to them I can give them a [AUS]$1,500 fine on the spot each day. They realise okay, well it is cheaper for me to get someone to come in and do it than to cop the fine.

Sam and Geoffrey identified the need to make the issues personally relevant to the builders, however neither of these two staff members actually undertakes the educational role. Others interviewed, such as Chris, simply said the building officers do not have time to stop and explain the issues. Geoffrey feels that time is just an excuse and that the officers should be stopping and explaining the issues to builders. However, at a different point of the interview he admitted that he does not always stop, and that he feels that if one cannot stop at all sites, it is unfair to stop at some. Regardless of this contradiction, Geoffrey believes that the failure to address the issue has had significant consequences:

> I think what has been happening is because they [the Building Surveyors] haven't been educating, and they don't want to regulate, like do any thing

> about it because it requires them to talk to them [builders] about it, because then you've got to spend the time talking to them and then spend the time following it up and you've got to spend the time following up your follow up and, why do all that, just turn a blind eye. It's just, has happened everywhere. Every council within the SSROC region, you find it happens. No-one does anything, so the building surveyors are responsible because they have all got to go on site. Building Surveyors don't do anything, so all the builders know that nothing will happen. So they are educated that you've got to do it, but you don't have to do it, because no one will worry about it. We've got to change that, that mentality.

Bob agrees that some builders do not act, as they know council officers have difficulty following up warnings:

> I can walk to one site and say I need you to clean this up by this afternoon and they will do it. Say the next guy three doors down, might say yeah, yeah, no worries because they know that councils are under resourced. Not like when I first worked when there was two men for every street. I do an area that might have five square kilometre radius area in it, which makes it hard to maintain and they know. And they go, we've got say four or five days to fix it up before he comes back again. Those are the sort of things that hinder us. Some of their attitudes. It's only when you say look, I can give you a fine now, do you want me to make it out to you now or do you want to clean it up and I'll give you a chance, that they actually do it sometimes.

Many of the staff members agree that builders are aware of the issues and choose not to address them. Some, such as Bob and Bill, feel that this is partly because builders do not understand the significance of the pollution. They believe that builders think it is just a bit of sand or concrete, that they don't realise its impact, or how much enters the waterways when you combine the little bit from each construction site. Bill explains:

> The ones that do understand it usually run their sites really well…I think you find that they are [at] a great advantage because, as their sites are far more manageable. If they set the site out properly and don't have haphazard dumping of stockpile materials here and there. It's so far easier to run the site. The site looks a lot neater, we don't get as many complaints about it, they don't have us coming down hassling them all the time. You know. As soon as you walk on, the first time you walk on, you know it is going to be okay.

When asked why more builders did not see the benefits and act appropriately, Bill replied:

> It all comes down to the dollar as well. I mean they see by setting out their site like that, that it's going to take them time and time is money and that cuts into their profit margins. They are in a very competitive business

> and they are probably tendering for jobs, you know. It's getting to a point where, they are undercutting to get the job, and then they try to do the job as cheaply as they can, so they make the most profit out of it, and to put in place certain control measures costs them time and money [that other builders are not spending].

Geoffrey feels that the building surveyors' dislike of educating relates to their lack of understanding on the issue:

> When they are talking to people, they can't fully explain or understand for themselves what they are talking about. So, there's that lack of confidence, which they don't want to enter into, because they know the builders will pick up on that and they don't want to be embarrassed, as well as, you know, trying to be enforcing a situation, so they think it is a lot easier to be too busy to worry about working on this.

This belief led Geoffrey to hold training sessions for building surveyors at his previous council.

> Training was offered to a group of building surveyors, they didn't have the time, so they didn't attend, so you offer it again… and I thought by simply telling them, you have to do it would work but it doesn't. It works for them out in the field telling people, but not us… I found that umm a lot of people would say, I don't care about this rubbish, whatever, its environmental, it's green, we don't want to be green, we're macho. This is not only men this is females as well… I don't think that they don't see it as their role, they just don't want it to be their role!

The lack of attendance at the training is not surprising, if indeed the building surveyors did not believe the issue was important. Geoffrey reports that he then tried another approach:

> I tried the approach that came to be, with linking it back to an appraisal system. Say this is your job description, part of your job description is working with the DA's [Development Assessments]. DA conditions are not only BCA [Building Code of Australia] requirements, but [also] sediment control so if you do that you will get a tick. Yep, you get a good appraisal, which might mean a pay rise. If you don't do it then you get a cross and when you ask for that pay rise, it's maybe you should have done this. Slight impact. I think that was the only force that made the difference, if any difference, after the training phase but it wasn't significant. But at least it made everyone shut up about not getting paid enough!

Inclusion of the issue in the council's strategic plan, the department's operations plan and the individual job descriptions was suggested by some staff as an area for improvement at Pollotial Council. George assumes that doing this will lead to 'ownership all the way

down'. This clearly shows that George believes in the mechanistic theories of management, where change results from a management directive. If the issue is included in the plans it is unlikely that improvement will result unless the many other issues identified through this process are also addressed. This includes seeing the issue as important and measuring people's performance on the issue. Adam states that at the moment this does not occur.

> Jodi: so when it comes round to job measurement and they do performance appraisal and stuff like that, would it just be [an] understood thing, that the reason you haven't spent time on that, is that its resourcing or would they be saying look you should have been doing this?
>
> Adam: Yep, yeh. The former.
>
> Jodi: They would acknowledge that it's the resourcing. (He nods).
>
> Adam: My priorities are set by the management basically and its where their priorities are set to, umm, what gets carried out… and my feeling is that unless it is driven from the top and there is a priority placed on it then you get what we have, as we do it when we find time to do it, and if something else crops up between which is a higher priority than this, all these things regarding public safety, you know, fire issues and that, just take precedent over this, because there is no designated resourcings specifically to that area… I'm not saying that, you know, to throw money at it would solve the problem but I think it's a combination of that, education, the way that the organization views all those environmental issues, and having some systems to address the issues.

It appears that some of the staff members also believe that simply issuing a directive for action will work. Two officers suggested an official quota system. Frank was one of these staff members:

> The only other thing I can think that would make it happen more often, is if we had like a quota to give out. If we had to give a quota per week, one PIN a week. I think you could probably quite easily give out one PIN a week for sediment control and if you don't give out a PIN, you have to have a justification for it like, just you gave out some warnings or something… I mean if we started giving out fines say every week on a regular basis then people would soon start to learn. A site manager can't afford to be losing [AUS]$1,500 every week… Even if you work for a big company you are still going to get his arse kicked by people above him.

This too would appear unlikely to be effective unless the many other issues are addressed, including improving perceptions on the importance of the issue. If the other changes do not

occur, officers are likely to simply ignore the quota or just issue warnings as they currently do.

6.5.3 Conclusions from Pollotial Council

Pollotial Council provides an interesting case study, showing the power of mental models and cultural norms. Each staff member has made assumptions about other officers' and builders' motivations. These assumptions are untested, and their shared mental model about 'acceptable levels of behaviour' for officers prevents them from raising the issues with each other and improving their handling of it. As with practices at Calandore Council, there is significant room for improvement.

The parties would benefit from coming together, undertaking dialogue to understand each other's concerns and the many factors affecting their behaviour, and developing a shared vision of how they are going to address the issue. This will include clarifying councillor and management support, clarifying who is going to undertake the role, and developing policy and procedures for everyone to use.

Like the staff members at Calandore, those at Pollotial are undertaking little education. When they do, they use positivist awareness raising, threats, and fines. Training staff in problem solving education approaches and coaching of them in their use should greatly improve the effectiveness of the staff members' efforts to obtain behaviour change in the construction sector.

6.6 Case Study 3: Craftle Council

6.6.1 Introduction

Like Pollotial Council, the majority of staff members involved with the issue at Craftle belong to one department. Only the customer service staff belonged to a different area as shown in Figure 36.

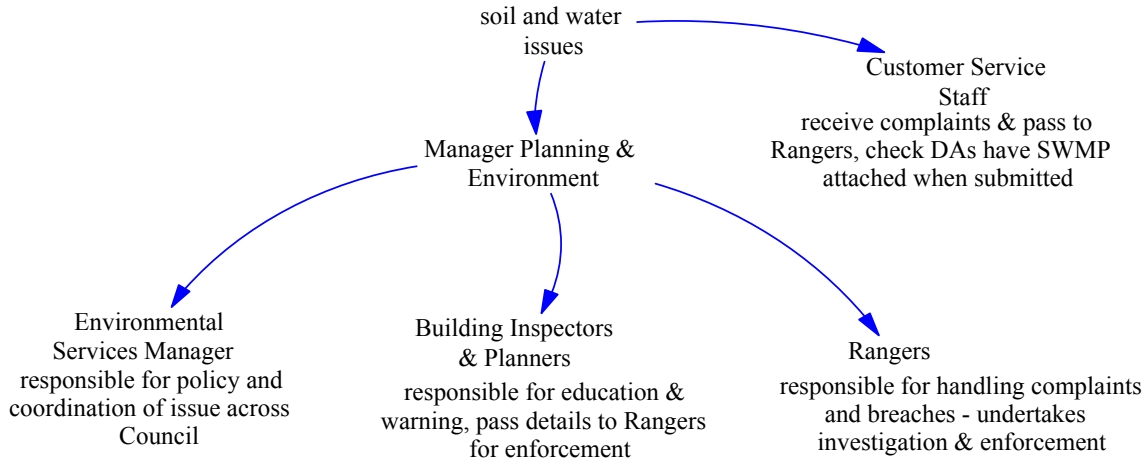


Figure 36: Division of responsibility for soil and water issues at Craftle Council

The following staff members were interviewed to review what was currently occurring within their council:

- The environmental services manager – Stephen;
- Manager strategic planning (building officers) – Matthew;
- Manager of rangers – Charles; and
- Acting team leader for rangers – Louis.

6.6.2 Findings

Craftle Council presents a very different situation from those at Calandore and Pollotial Councils. All staff spoken to at Craftle stated that stormwater pollution from construction sites is a high priority for them to address. Management has told them that it should be a priority, and the elected members are aware of the issue and continually push for action to be taken by the staff.

The staff members interviewed suggested many reasons why the issue has become a high priority. These included the following:

- Some of the elected members are green political party members, who push environmental issues;
- The community has strong neighbourhood watch groups who notify the council of problems and demand that they fix them;

- The council is densely populated, making it more likely that anyone doing the wrong thing will be seen and the council notified;
- The area contains some of the most popular beaches in the metropolitan area, which may mean that people care more about stormwater issues;
- The council has run previous education programs, which have added to the community's awareness;
- The council has also run internal education programs, developed policies and procedures, and committed resources to address it; and
- It is a small council with high morale and staff members who care about the environment, discuss issues, and focus on improving practices.

It is impossible to tell from the interviews, if all of the reasons the officers suggest have in fact influenced the status of the issue within the council. They do, however, appear to be reasonable assumptions, and will be discussed further in Chapter Seven.

Unlike the other two councils, Craftle does have set procedures for handling the issue, and the roles of the different staff members are clear. Officers from the environment, building, and rangers sections are all involved. The building officers place the conditions of consent on to the applications, distribute educational material, collect and check SWMPs and check the condition of soil and water management controls on sites during their routine inspections. If they notice an area of concern, they inform the builder that it needs to be improved and advise them that a ranger will be visiting to make sure it has been done. They then notify the rangers of the situation.

While staff in all three areas are authorised to issue fines, this is left mostly to the rangers; this way the building officers are able to maintain their relationship with the builder and focus their time on their normal inspections. Matthew, the manager of the building officers, adds that he has told his staff that if they do feel the need to issue a fine, they can say 'look, my manager told me I have to'. By doing this the officer can avoid incurring the resentment of the builder. Matthew does not believe that conflict should be an issue, and unlike staff at the other two councils, who suggested that the fines were too big, Matthew states that they are too small, and that councils have been too lenient. He is adamant that warnings need to be followed through with fines when deserved, stating 'that way they

understand that you mean business and generally from that day on, you should get on well, and we do get on well'.

The rangers do not just respond to the referrals from the building officers and community complaints. They also keep a list of active building sites and dedicate a particular officer each week to check them. Louis is quick to point out that this does not mean the other rangers ignore the issue:

> If I'm driving past the building sites and I see cement in the gutter, I'm not going to keep driving and say, oh look sorry that's not my job this week, each and every one of us would definitely stop and investigate that, if it wasn't brought to our attention through a complaint and we just saw it out and about. You would certainly go well hang on, we need to have a stop and a talk to this person, there's a pile of sand on the roadway, it's uncovered, it's two o'clock in the afternoon, they're never going to use this sand by knock off time at 3.00, we need to tell them now… we prioritise pollution.

The education and enforcement role in relation to building sites is listed in the rangers' job descriptions and is rotated between the various officers, all of whom are multi-skilled. Charles explains that this came about as a result of a previous enterprise bargaining agreement. He states that the way they have established their rosters enables a strong focus on communication and learning within the team:

> We have two teams of four rangers and they are on duty seven days a week, 12 hours a day. We don't even do parking, they've got a special group of up to 12 to 16 people who just do parking. We only have to do regulatory work… [our roster] it's eight days on and six days off, so this team is on for eight days and the teams overlap on Monday and that way we only need four vehicles, four of this, four of that … So what I try to push and encourage, and what I am still pushing is that the person who did dogs for that shift, has to go out on the change over day with the person who is going to do dogs, the person who is doing pollution [goes with the pollution person] and they drive around together and you can say look I've served a fine here, this bloke is a problem.

Charles explains that as a result of this approach:

> In the team everyone is aware of nearly everything that everyone else does, and they'll know that Louis took those factors into account on that job and they'll either generally agree, or they might discuss it or argue and say you should have fined them.

If the rangers are not confident about how to handle a particular situation after discussing it between themselves, they will call on Stephen, the environmental services manager, for advice. Stephen encourages this kind of interaction and learning amongst staff at all levels within the council. He sees the motivational benefits that result:

> When you're talking about a cultural change, how do you go about it? You need everyone involved, you need the person from the cleaner, to the designer, to the person that is coming off the bus to do it. So, yeah. It's an integrated approach and I think that is quite important. Or as a manager, I think that is important… I would involve the relevant people within council umm like a group or a forum sit down and thrash out some ideas, you've got to give people ownership, that's the most important thing, I mean it's been flogged to death at everything ownership, ownership, ownership but preparation and ownership makes it work, and I think um yeah it's just small, small projects if you can't do the big ones in the meantime, do the small ones.

This focus on communication, involvement, learning, and improvement does appear to be spread across the organization, at least in relation to environmental issues. Examples were provided throughout the interviews that showed that the engineers and depot staff members also interact with Stephen to improve the council's environmental practices. Stephen, who is reasonably new to the council, largely credits the positive environmental culture to his predecessor who was very proactive. He states that often the effectiveness of educational efforts depends on the level of enthusiasm of the environmental officer. He states that this is also the case in schools, with the enthusiasm level of the educator affecting how well they implement programs such as 'Streamwatch'.

The Craftle Council has been very active for many years in educating builders and the community on this particular stormwater issue. It was the efforts of Stephen's predecessor that led to the first SSROC education program back in 1998, and that person is now a consultant working on these issues with both government and the private sector. The methods that they have used at Craftle Council include many of the traditional positivist awareness raising measures such as brochures, newspaper articles, and displays, but they have also gone beyond this. They have involved the community in activities such as drain stencilling, and at the time of interviewing had commenced an education project in conjunction with researchers at the University of NSW and the NSW EPA. This project involves the researchers consulting with the community and inviting them to participate in solving stormwater pollution problems within their local areas.

Stephen believes that the way in which education programs currently operate can be greatly improved. He feels that the grant process that is being used by the state and federal governments is not effective:

> A lot of the education programs are re-jigged, but at the moment it gets to that, its like a feeding frenzy at the zoo, that's the way I see it. Like particularly the NHT [Natural Heritage Trust] money, um, a lot of the grant money, people will just come up with projects, the granting authorities really should be looking into how that money is being spent. I mean you've got to do reports back but it is very hard, everyone wants to get their fingers into the pie. It's the only way, a lot of the environmental work is being done, and the common thing that I've noticed is that really, that money that people applied for should be divvied up like, even if you are unsuccessful you should be notified of somebody who is doing a very similar project, and then the two of them get together, it's like exactly what SSROC does and that is some thing that I admire, it is something that I think is really good from SSROC's point of view, is that they get all the councils in the area together and work on projects. So it's like a joint resourcing thing, but I can't see why they can't do that for the grant and because like everyone is saying NHT grants are running out, we are coming to the end of them. This is the time that we should really be sitting down together and saying well I know Litsfield Council is doing a particular project, why don't we work in with someone there… There's no point in like trying to get some kudos and reinventing your own program when someone has already done it.

This again shows Stephen's focus on learning and cooperation. Stephen explains that grant applications take a lot of time to prepare, and that he prefers to utilise other methods to gain resources, such as using work experience students and working with the universities on projects like the one mentioned above. Stephen also strongly feels that the way brochures are developed and used is wasteful:

> … it's like pamphlets and posters, we all know they only have a shelf life of, I think it is six weeks. To be honest, after six weeks it is useless, it becomes background information. There's a lot of experience to be learnt from the media people, the marketing people, I think that's good when you speak to them, you learn a lot about those things. Um, you know everyone wants to design brochures, everyone wants to design pamphlets, you can be pamphletted out of your brain and after like these ones (points to boxes of pamphlets on the floor of the office) still going there's thousands… Millions of them, and eventually they just get tossed out and I think to a degree it's a printers dream to get those kind of jobs, but it is not necessarily the most effective way of marketing it all…

Matthew agrees stating:

> It's not really consistent, I think it's got a lot to do with other factors rather than the advertising, I think, like people know if you smoke, you die but people still smoke… You live with it, you know, what I mean. People know if you hop in a car drunk, you've got chances of getting booked, but people still do it because it is a risk you take. I think it's always, it's something that's not so much seasonal but that, what you do, is you keep maintaining what you've got, not probably at a high level, but at a level so that's there's always pamphlets, new things. For instance, do a cycle, like at 3 months maybe be site waste, next might be something else, next might be something else, so you are constantly changing the information that gets sent out, but if it's the same thing all the time, what would you think you'd be doing, you know, at the end of the day, you think- I know, I know, so you don't even get to read it, you throw it in the bin. Whereas if it is something different, oh that's right, but made link to that - did you realise that while you're worried about site contamination, there are other site management controls which you need to look at?

When asked if they thought builders were aware of the issue, all interviewees thought that there was a general level of awareness. They felt however that some people would not respond until they were fined. Charles believed that this was partly due to the builders failing to appreciate the problems that the pollution from construction sites causes:

> … you really don't see a bad result from that sort of thing, but if a tanker has ruptured off Dolyn beach and all the birds and rocks and sand was covered in that much oil, you can see that, but I mean if you let ½ a tonne of sand go down the stormwater, you don't see much wrong with it, whereas if you let some oil go into the ponds at Memorial Park, you see dead things coming up**.**

All felt that further education and fining was needed. Louis likened this to the introduction of seat belts, explaining that 'once upon a time there used to be a lot of resistance to them, like for some people it was "I only wear it because if I don't wear it, I'll get a fine", [but] how many people jump into a car now without putting on a seat belt? … if you don't you just feel really weird'.

Matthew believes that once people have been fined they improve:

> … because they've got to come back and deal with us again. So I don't think, as much as the staff might have a bit of conflict, there's more conflict [in] that person having to deal with council again. I mean I know to this day, that there are people that, who if they come to the counter and want to do something, they know as soon as I know, that they have done something, that I will be keeping an eye on them, so they will go out of their way doing the right thing.

Both Stephen and Louis stated that education is more effective when they make the message personally relevant to the builder, and when they simplify what is required and show that it is achievable. This includes explaining to the builder that it is cheaper to prevent a problem from developing, than to risk a fine and clean up costs. Stephen also recognises the knowledge of builders and will problem solve with them, as the following quote shows:

> A lot of builders though, generally like to think they know a lot and they probably do, there's a lot of things that I don't know about building and I'm not professing to being an expert in it, but they just like to talk, a lot of times they just want to tell people things and a lot of that anecdotal stuff you eventually learn off them, [they] say like, look we've got nowhere to store this concrete but here, and then when you explain to them your concrete shouldn't be getting wet and if you put it here it will basically, if anything comes down it, it will get wet, oh yeah, we will store it inside… It is coming to an agreeable way of doing it… so taking it easy and explaining it to them why you have to do it, giving them options as to what they can do and you know explaining, letting them ask questions, like they ask questions like what's bunding, you and I kind of know that back to front, that's educating them as far as I'm concerned, umm yeah, some people [other officers] don't think of it, maybe they don't know.

The staff members had several suggestions of what they could do in addition to their current practices and what the other levels of government could do. Louis suggested developing brochures in different languages, the incorporation of the issues into TAFE courses and a brochure to encourage the community to only hire builders and architects with acceptable environmental practices. Stephen stated that it would help if the suppliers of sediment control equipment promoted their services to builders more, and that the council could encourage supervisors to add environmental clauses into their contracts with their subcontractors. Charles highlighted that consistency between councils in handling the issue would help:

> But it would be good if it was consistent especially across SSROC because we are surrounded by SSROC and if they, their defence, you know, we didn't know or they don't do that in Pollotial or Frasier, well, we could say you're wrong buddy, everyone does this and this is the same thing for everybody.

This is meant to already be occurring, as all 12 councils of SSROC have agreed to implement the same measures in relation to the issue. However, as these case studies have shown, there are many differences between the actions taken at each council.

6.6.3 Conclusions from Craftle Council

The practices at Craftle Council appear to be much better than those at the other two councils. The roles and procedures are clearly defined, resources are provided to undertake them, and staff members communicate and learn from each other. They are all prepared to issue fines and educate builders, resulting in a greater level of consistency between the council officers and thus a clearer message to builders on the ground. Staff can take action knowing that their management and the elected members, who have stated that the issue is a priority for their council, will support them.

Staff members at Craftle appear to have a wider understanding of educational methods than staff at the other councils. However, they still all undertake different actions, and they are all still using positivist approaches. As in the other two councils the officers have no training in systems thinking or problem solving environmental education approaches. Clearly this is one area for improvement. Once such training is undertaken, this council would appear to be the most likely of the three to be able to discuss the possibilities and implement changes to their practices, due to their learning-supportive culture.

6.7 Conclusions

The case studies have shown that there are significant differences in how the stormwater protection issue is handled at each of the three councils, despite them having agreed to utilise the same approach through the SSROC education program. They have shown that the individual officers often hold competing beliefs and ideas, and that the culture of their organizations can prevent these from being discussed. They have also shown that dialogue can help to identify the 'real reasons' for staff behaviour and reveal discrepancies between their mental models in-use and espoused. This wider understanding of the system reveals the high leverage points for change that exist. However, these leverage points are unlikely to be recognised and addressed by the people involved until they become prepared to discuss the issues, face the politics, admit a lack of knowledge, and learn from each other.

Without this wider understanding of the system, the majority of the interviewees' solution ideas fail the tests recommended by Robinson (1993). They are unlikely to be effective because they do not address the real reasons for the behaviour exhibited within the system. Some of the solution ideas also lack coherence; they make it more difficult to achieve the overall goal of obtaining behaviour change in builders' practices. An example of this is the tendency of officers in all councils to rely on threats and fines to get builders to change their behaviour. As was shown in Chapter Three, threats and fines are likely to create resistance to change. Similarly, chastising the council officers for not taking satisfactory action is unlikely to lead to improved practices. In order to improve practices, the real reasons for their current behaviour need to be addressed.

The case study reviews have shown that most of the officers involved believe that education is largely equivalent to positivist awareness raising, threats, and fines. Their educational activities have been undertaken without consultation with or the involvement of the targeted stakeholders. The officers expect to deliver their message and have the builders respond appropriately. All of these issues and their implications will be discussed in the next chapter.

Chapter 7. Discussion

Implications from the case studies.

> *Social learning for sustainability does not 'just happen'. It requires concerted efforts from government, business and industry and civil society. It requires 'top-down' leadership from government and the creation of policies, institutional frameworks and incentives that facilitate dialogue and innovation. It also requires a 'bottom-up' approach based upon principles of: (1) inclusiveness – getting all stakeholders together; (2) partnerships among all actors and sectors; (3) transparency and honesty in all discussions, plans and actions; (4) subsidiarity – devolving decision making skills and responsibilities to the level closest to those most affected; and (5) accountability of decision makers, at whatever levels, for their actions.* (Fien 2002 p.10)

7.1 Introduction

The implications of the case studies for the design and delivery of government sustainability education programs for business personnel will now be explored. The practices at the councils reviewed will be discussed. This will include comparing them to the findings of the literature review undertaken in, and the ideal education approach synthesised in, Chapter Five.

7.2 Discussion of case study findings

It has been shown within the case studies that there are many factors affecting the effectiveness of government sustainability education programs. The educational methods used by the officers are only one component of this. Training in, and use of, problem solving education approaches will help to improve the effectiveness of their education programs, but the many constraints to implementing education programs also need to be addressed. These include not only the constraints faced by the targeted stakeholders that make it difficult for them to change their behaviour, but also the government organizational constraints that affect the actions that the officers take.

The power of mental models to affect the behaviour of staff members and the importance of an organizational learning focus to enable continuous improvement has been shown

within the case studies. In the case of Pollotial and Calandore Councils, their teams did not communicate openly about how they should address the issue. As a result, they did not focus on learning or improving their practices. Their staff held many different beliefs about the issue and ideas of what could be done, but these were not discussed. This was largely due to the majority of their staff having a shared mental model that the issue was of 'low priority'. They therefore devoted little time and effort to it. Builders received little information or guidance on the issue prior to commencement of building and little attention during construction.

Unfortunately, this is not an uncommon phenomenon. Price (2002 p.4) surveyed staff members at Western Australian local governments to identify their constraints to implementing environmental issues through Agenda 21. She reports that 55 per cent of people stated that '… Agenda 21 was not seen as a council priority'. Agyeman, Morris and Bishop (1996 p.186) agree. They have found that unless staff members '… (or a senior officer or member) are personally committed to an educational role, it can often fall down the list of priorities for action'. Stephen at Craftle raised this point, suggesting that program success was often largely dependent on educator enthusiasm.

A range of beliefs surrounded this 'low priority' shared mental model in Pollotial and Calandore Councils. In the case of Calandore, some staff members such as Cameron and John felt that they could not improve their practices without further funds. They believed that the elected members would not provide additional funds, and they therefore accepted their low level of performance. They were content to blame forces outside of their control rather than look at how they could maximise what they could do with their current resources.

In the case of Pollotial Council, some staff members such as Daniel and Bill felt that there was not elected member or management support to address the issue. As a result, they felt that addressing the issue would not be a worthwhile use of their time. Sam and Geoffrey's comments revealed that the behaviour of officers was also affected by their concerns about 'fitting in'. They took a low level of action because they did not want to be seen as any stricter than the other team members. They both admitted a desire to do more, but would not act on this for fear of violating the accepted low performance culture. As the issues

were seen as non-discussable, the team's practices could not be improved. In addition to the above, there were many other reasons given for a low level of performance. These are shown in Figure 37.

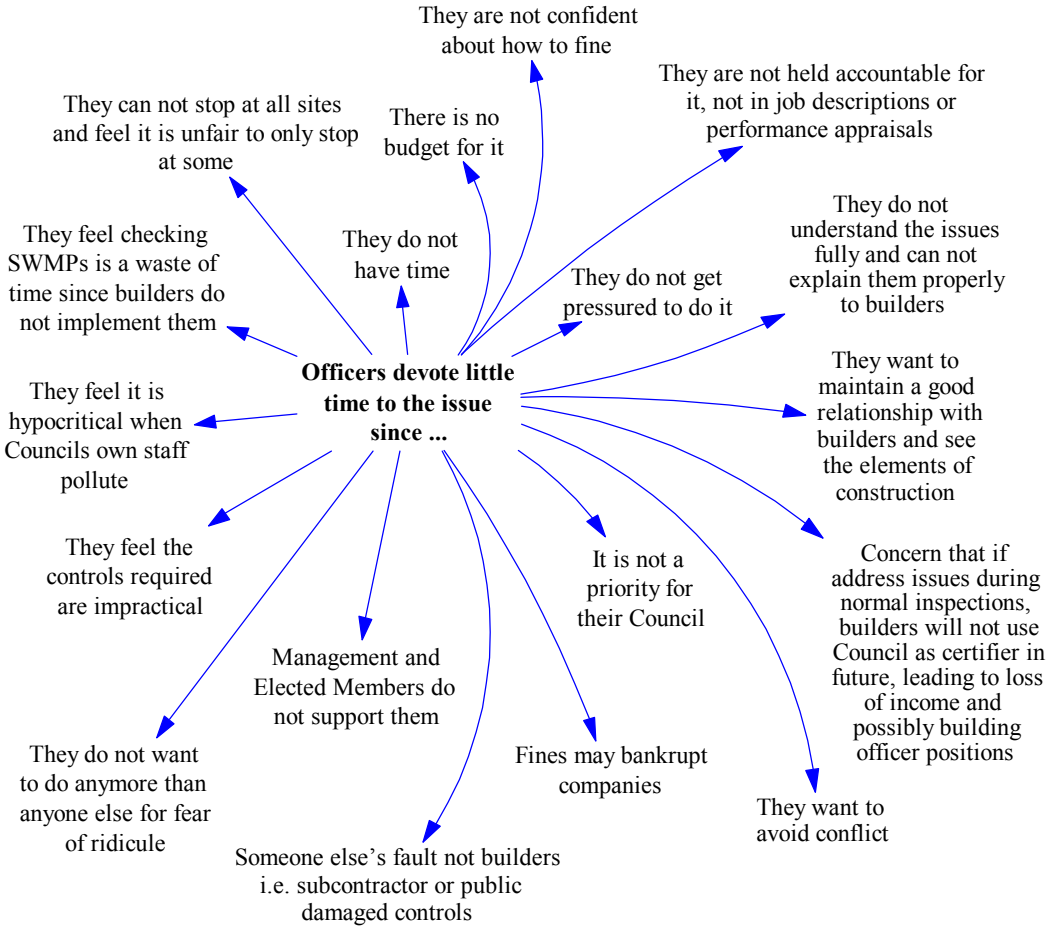


Figure 37: Reasons for inaction provided by council officers at case study councils

One of the reasons for low performance mentioned by George and Bob at Pollotial was their empathy for builders in having to implement controls that the officers themselves did not even believe were entirely practical. This appears to be a common concern, with Tai (1994b) finding that of the council officers he surveyed, 15 per cent felt that the erosion and sediment control methods they were meant to be promoting for the construction sector were impractical. Another 38 per cent were unsure of their practicality. He reports that this affected the willingness of these officers to enforce the laws.

Sylvio at Calandore and Sam at Pollotial explained that they were reluctant to issue fines because they felt the fines might result in significant hardship to or even bankruptcy of

construction companies. Research by Tai (1994) suggests that the officers' concerns are unfounded. Tai (1994) found that the majority of builders who replied to his survey felt that the fines issued were of only a moderate amount, indicating that they did not see them as a significant deterrent or threat to their businesses.

Another factor impacting on the actions of officers was the issue of private certification. Property developers can now use a private certifier to oversee and inspect the building throughout its development. In such a case the fees for inspections and services no longer go to local government. Despite not being paid for these services, officers in some councils still visited sites because they suspected that many private certifiers were not vigilant in ensuring that builders were undertaking the construction correctly, or in enforcing environmental protection measures. This was undertaken at the councils' own expense.

Some building officers at Pollotial explained the fact that a developer has the choice to use private certification makes it difficult for the council to enforce the laws. The officers are concerned that if they do enforce environmental issues, or fine builders during normal inspections of sites at which developers have chosen the council as the certifier, this may lead the builder to recommend to developers not to use the council as the certifier in the future. This would reduce the income from building inspections, which in turn threatens to reduce the number of building inspectors needed at the council. Hence, the officers worry that their positions will be threatened if they do enforce environmental conditions when private certifiers do not. This issue was of greatest concern to building officers at Pollotial who were expected to issue fines. The building officers at Calandore and Craftle Councils were only expected to educate, warn, and pass details on to the relevant council officer to conduct the enforcement.

Adam explains another complication. He states that some councils like Pollotial discourage their officers from entering private certified sites, for fear that the council may be held liable for not detecting any faults that may be found within the building at a later stage. Martin at Calandore pointed out that as a result, in some council areas no one is enforcing the laws, if the private certifiers are indeed negligent in their practices.

The officers involved in the SSROC education program, including Matthew at Craftle, were annoyed at this situation, stating that they had warned the state government that this would occur when the changes to the certification laws were first being proposed. In their eyes, the state government did not listen and the officers feel they are now placed in a difficult situation (Smith 2001).

The factors shown in Figure 37 were found to interrelate and lead to the officers at Pollotial and Calandore Councils devoting little time to the issue. Until these issues are recognised and discussed, little improvement to their practices is likely to occur. Sadly, the staff members failed to realise that their limited actions made it difficult for builders to comply with the law. Research shows that the building industry operates on very small profit margins. UNEP (2002b p.10) explains:

> Competition for work in the industry is intense. Because construction activities require comparatively little investment in capital, firms are able to survive on wafer-thin profit margins (2% or even less) and still show an adequate return on capital. On the other hand, construction activities can carry significant risks and small margins of profit can easily turn into significant losses.

Firms compete very strongly on price. This makes it very difficult for any one builder to spend money on factors such as environmental protection if other builders do not. Complying with the law costs builders money. They need to purchase controls and allocate staff to install, check, and maintain them. These costs put those complying builders at a disadvantage when tendering for work. Some officers, such as Bill at Pollotial, suggest that builders who comply actually save money or are better off. However, Tai (1994) found that 61 per cent of builders he surveyed believed that the costs of compliance outweighed the benefits.

As a result of council officers' inactivity and failure to fine those who are polluting, those builders who do care and want to comply are faced with a dilemma. They either have to accept the additional cost, or choose not to implement the controls and pollute like the other builders. UNEP (2002b p.11) acknowledges this pattern, stating that 'Construction activities are heavily regulated in nearly all countries and the quality and effective implementation of regulations play a crucial role in the manner in which the industry operates'. Pears (2000 p.184) strongly agrees, stating that the failure to enforce regulations

'… make it more difficult for businesses that genuinely wish to pursue socially and environmentally responsible practices'.

Geoffrey at Pollotial suggests that the issue is being handled poorly across most councils. The results of the survey conducted by Tai (1994b) suggest that he is right. Tai (1994b p.10) asked officers at 22 councils in NSW to '… rate the overall success of their council in implementing the control of erosion on construction sites, on a scale of 1 to 10'. Sixty-two per cent rated their implementation as poor. Tai (1994b p.5) also found that 74 per cent of council officers admitted that their councils would not fine builders, only warn them. A further four per cent stated that they completely ignored non-compliance.

It is not surprising therefore that Tai (1994) found that 80 per cent of builders rated the professional competence of officers as poor or moderate. Only 55 per cent believed that officers could detect negligence or breaches, and 61 per cent of builders felt that councils were unlikely to fine them. Under these conditions there is little to motivate builders to spend the extra money and comply with the law. Many do not, as Tai (1994b p.1) discovered. His review of '… 68 construction sites on the fringe of metropolitan Sydney… found that over 75% of sites evaluated fell well below the goals of the guidelines to mitigate erosion and sedimentation from construction sites'.

Unfortunately, the council officers have not recognised that their actions make it difficult for builders to comply. As was shown in the case studies, most officers simply assumed that builders do not care about the environment, and that they will only respond to fines. Partly as a result of this belief, and also because of the fact that they were not aware of the more effective education techniques, most staff in the case studies undertook little education of builders. Instead, they relied on orders and threats of fines.

While the officers believe that builders do not care and will only respond to fines, research has shown that they do care about the environment. Tai (1994) found that 80 per cent of builders believed that the guidelines were necessary and 77 per cent were aware of the consequences of sediment loss. Further support was shown when he asked builders if they believed small sites should be exempt from submitting SWMPs and regulation. Two-thirds replied that they should not be exempt.

Other studies have also found that business personnel care about the environment. An example of this was reported by Salier (2000): a survey of business personnel participating in the Cooks River education project indicated that they felt that 'more council resources should be directed towards fining and following up complaints' (Salier 2000 p.32). The business personnel also admitted that '… they needed the occasional reminder otherwise they become complacent about being environmentally responsible' (Salier 2000 p.38) and that they '… felt strongly that Environmental Assessments should be conducted [of the businesses by council] at least annually' (Salier 2000 p.39). Positive attitudes were also found in the City of West Torrens (2000 p.22) education program. Their survey of business personnel found that '68% said they would consider spending a small sum of money to help improve our waterways'.

In addition to the officers' belief about fines leading builders to change their behaviour, the individual staff members suggested many other factors that they thought would lead to behaviour change. These are shown in Figure 38. The belief that each individual officer has, will affect how he or she approaches discussing the issue with builders.

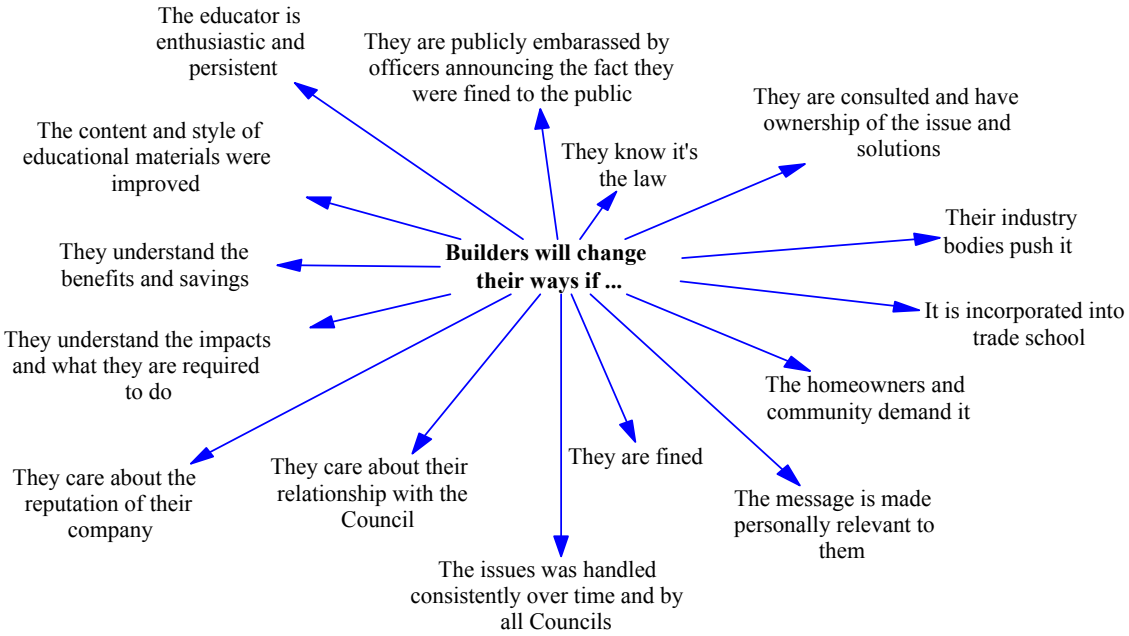


Figure 38: Beliefs officers interviewed for case studies held about what would lead builders to change their behaviour.

As the staff members at Calandore and Pollotial Councils do not openly discuss the issues or their thoughts, they are not aware of the different beliefs they each hold, or the ideas that they have for improving the situation. The result is that the different officers undertake different actions, resulting in inconsistent messages to the builders. As Geoffrey stated, 'all the builders know that nothing will happen. So they are educated that you've got to do it, but you don't have to do it, because no one will worry about it'.

In contrast to the above, the staff members at the third case study council, Craftle, do openly discuss the issue and focus on improving their practices. The staff members at this council see the issue as a high priority. Several reasons were suggested for this. These are shown in Figure 39.

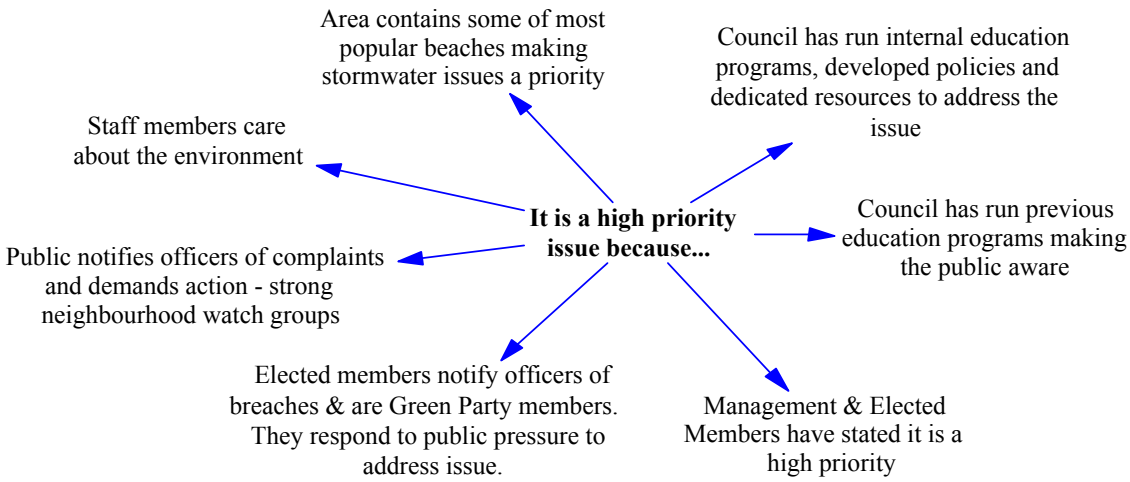


Figure 39: Reasons provided by officers interviewed in case study for issue being a high priority

As the staff members at this third council felt that the issue was a priority, time and resources were dedicated to it. It cannot be determined which factor first led to the issue being a high priority, but together the factors form several reinforcing loops for improvement, which lead to continued action on the issue. These are shown in Figure 40. The power of these reinforcing loops will only decrease when the actual performance of the builders improves, resulting in less need for the officers to take action. To date, this has not significantly occurred which confirms that consistent enforcement and positivist awareness raising is not effective in gaining behaviour change. As was shown in Chapter

Four, obtaining behaviour change requires the individual to have a positive attitude towards the change. This requires the individual to believe that the change is important, that it is worthwhile taking action, and that they can undertake the change successfully. The current educational approaches used by the officers do not achieve this.

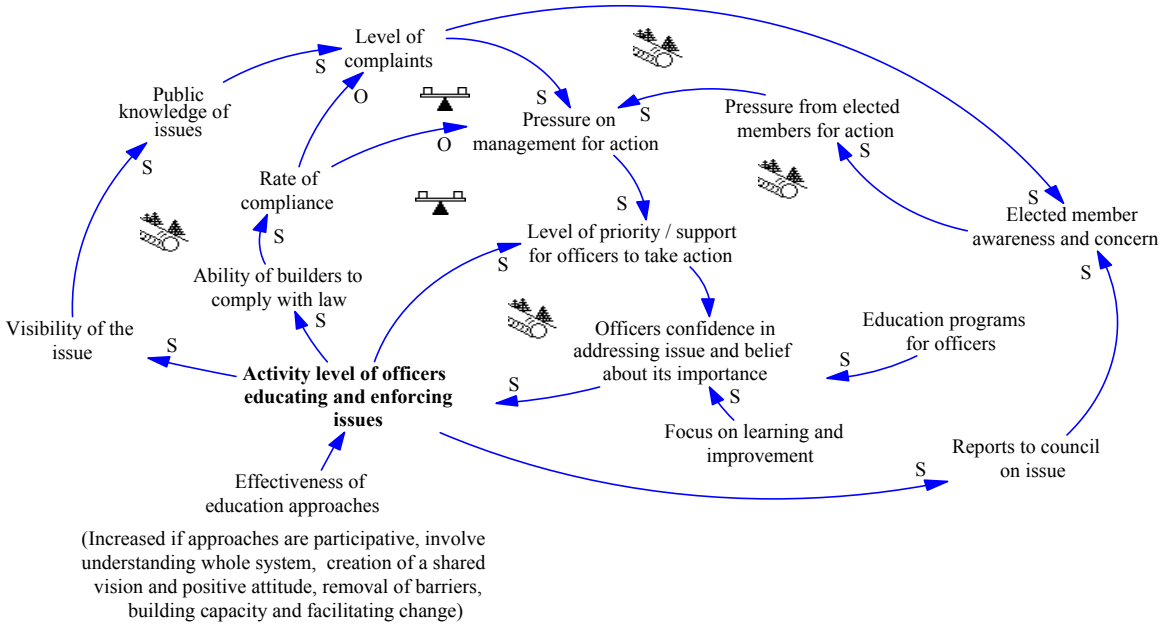


Figure 40: Factors at Calandore that interrelate and lead to issue being seen as high priority and resources devoted to it.

The level of priority that councils place on the issue appears to be affected by many factors. However, a common factor suggested by staff at all three councils is that of whether or not the public and elected members demand action. If they do, it was reported that management would devote resources to it, and support staff in addressing it. This suggests that along with improvements to educational methods and enforcement of the laws, a key leverage point for improvement would be education of the public and elected members. Tai (1994) agrees. He found that most developers who responded to his survey cared what the public thought, but felt that the public was not aware of the issue, and therefore felt no pressure to act. Indeed, his results showed that of the 22 councils he surveyed, only 24 per cent were involved in actively educating the public about the issue. Eighteen per cent stated they undertook basic or partial education, while 58 per cent admitted not taking any action at all (Tai 1994b).

John at Calandore Council felt that he could not access elected members to educate them about the issue. However, his comments about the actions of his predecessor suggest that that person was able to access them. This means John probably could too, if he tried. At Pollotial Council Chad stated that he had provided educational material and reports on the issue to the elected members. However, this had little impact. Staff members at Pollotial reported contradictory actions from the elected members. Some, they said, would occasionally complain to management and demand action on the issue. This resulted in a 'push', a short-lived focus on the issue, until the elected members and therefore their manager reduced the pressure to address it. Other elected members were reported as having asked officers not to take action, the result being that the officers tended not to address the issue, being unsure of whether or not they would be supported.

Chad suggested that it might be more effective if he could find a way to give the elected members ownership of the issue, but he was not sure how to achieve this. In his first educational attempts with the elected members, he had focussed upon the revenue raising potential, the council's legal obligations, and the environmental implications of pollution from construction sites. These are what he thought the elected members needed to know, and should care about – he took a positivist approach.

If Chad had skills in problem solving education or systems thinking approaches, he may have recognised the benefit of working with the elected members to identify their beliefs about the issues, the reasons for their current practice, and the factors preventing them from supporting officers in addressing the issue. Without an understanding of these beliefs and reasons, it was impossible for Chad's written report and educational materials to convince the elected members to fully support the issue. The parties needed an opportunity to work together, to identify and discuss the issues, to develop a shared understanding of the situation and a vision of how their council would address it.

There are many reasons why elected members may not fully support environmental education initiatives with builders or other business personnel. These include:

- The fact that local government has been given many additional environmental roles and responsibilities under state legislation in recent years (ALGA 2000; Brown 1994; NOLG 2001; Soul 2000; UTS Centre for Local Government 2000; Young &

Binning 2002). Councils are now expected to undertake programs on biodiversity, climate change, energy efficiency, water conservation, stormwater, noise and air pollution, contaminated land, Agenda 21 and many more (Brown 1994). The elected members and management of local governments have to decide how they will undertake all of these additional responsibilities. All councils, regardless of their size and income, are expected to address these issues (NOLG 2001; Soul 2000). The issues compete against each other for attention and few councils address them all, as ALGA (2000b) and Brown (1994) report. Stephen at Craftle pointed out that what gets addressed largely depends on what the elected members see as the greatest priority.

- Despite the significant increase in responsibilities, local government has not received a proportionate increase in resources to undertake them. The Financial Assistance Grants from the Commonwealth have actually decreased from a fixed share of one per cent of total federal taxation revenue in 1974, to a share of 0.6 per cent 25 years later (ALGA 2000). State funds have also decreased, as demonstrated by the removal in 1982 of the NSW state government AUS$15 million per annum general-purpose grants to local government. The UTS Centre for Local Government (2000) reports that while state governments have decreased funding, they have increased charges on local government.

  Federal and state governments have also made changes to laws that have resulted in reduced incomes for local government, for example the private certification changes for building authorisations discussed earlier (UTS Centre for Local Government 2000). To make matters worse, local governments are unable to raise additional funds themselves, making them even more reliant on income such as those from building inspections. They cannot levy taxes because they are not recognised in the Constitution (Soul 2000). They have also had rate capping imposed on them by state governments (UTS Centre for Local Government 2000). The result is a major inequity between the roles that local government is required to perform and the funding they have to do so.

Environs Australia (2002 p.1) identified that 'Australian Local Governments spent a total of [AUS]$2.5 billion on measures to protect the environment in 1999 – 2000'. The environmental expenditure exceeded revenue received for such works by AUS$232 million. 'Of the total revenue for Local Government expenditure on environmental activities, ratepayers funded 86% ([AUS]$2 billion) while State/Territory and Federal governments contributed only 6% (Federal – [AUS]$26 million, States – [AUS]$102 million)'.

- In addition to having to cope with increased environmental roles, a decrease in funds, and inability to raise their own funds, local governments have also had to cope with expansion of their other roles, such as aged care and community services (UTS Centre for Local Government 2000). They have had to cope with requirements imposed by state and federal government aimed to increase the accountability of local government. Through legislative changes, local governments have been required to develop strategic plans, benchmark their performance, undertake community consultation and open their services up to competition (NOLG 2001; Soul 2000; UTS Centre for Local Government 2000). On top of all of this, they have been undergoing rapid reform to boundaries via voluntary and forced amalgamations, which have reduced the number of Australian local governments by 45 per cent since 1910 (NOLG 2001).

- Due to all of the above changes staff members of local governments are often expected to undertake more than their original roles. As was explained in Chapter Three, change can be an emotional process for individuals to go through. Local government elected members, management and staff have had to cope with all of the above changes occurring within a reasonably short time frame. The result is that they have addressed the issues that they feel are most important for their organization to focus upon. It is perhaps not surprising that for many of them, concerned about their future positions, the priority has been issues such as amalgamations, corporatisation and accountability that they see as affecting the future existence of their organization.

Unfortunately, all of the above issues have a negative impact on the willingness and ability of local government to undertake the sustainability roles for which they are responsible under federal and state legislation. Local governments have had to redistribute funds from traditional areas to these newer areas, with everyone having to do the best they can within the limited resources. Brown (1994) reports that this has produced several undesirable outcomes. One of these is that many environmental roles are either being under performed or not being performed at all. Another undesirable outcome is that there is rivalry between departments for funding, which decreases the likelihood of cooperation on sustainability issues. A third outcome is that every local government undertakes different levels of activity, dependent more on their financial situation than on the environmental or community needs of their areas.

These results are quite alarming considering, that as Huckle (1996 p.14) points out, 'Over two thirds of the statements in Agenda 21 cannot be delivered without the cooperation and commitment of local government'. These issues need to be recognised and addressed cooperatively by all levels of government. Discussions need to be held and solutions developed, that will build the capacity of local government to fulfil their environmental roles.

If Chad used problem solving education or systems thinking approaches with his council's elected members, they would at least have a clearer picture of what they can do, and commitment to achieve it. They may have also identified other actions that they could take to improve their situation, such as lobbying state and federal governments for changes to funding methods, as the UTS Centre for Local Government (2000) is doing. Alternatively they may have identified other ways to maximise use of their current resources, such as taking enforcement responsibilities away from building officers and giving them to the rangers instead. This would not only remove the dilemma relating to private certification for building officers, but would also reduce costs, because rangers are paid less than building officers. Chad, unaware of the complexity of the issues, was left wondering why the elected members did not respond to his report and educational materials.

Like Chad, none of the staff members interviewed had qualifications in environmental education or behaviour change theory. They were not aware of problem solving education

or systems thinking approaches. A few staff members stated that they used techniques such as 'making the issue personally relevant' and 'helping builders to see the bigger picture'. Those that were using these techniques had discovered their effectiveness by trial and error in the field. All of the officers were being asked to undertake education as an extra task within their normal roles. Agyeman, Morris and Bishop (1996 p.190) report:

> From our experience, the local government officer who 'does education' in addition to his or her other duties, often by default rather than by design, is still the most common model. This must change.

These officers utilise whatever methods they believe will work. In most cases this results in a reliance on positivist awareness raising, threatening and fining because the officers are not aware of alternative educational methods. It was shown in Chapter Four that awareness raising, threatening and fining are recognised as ineffective, even detrimental, as they can lead to deterioration in the relationship between the parties and resistance to change. It was also shown that many educators do not recognise this, and have a tendency to assume that if the targeted stakeholders do not respond to the educational efforts they must not care about the issue. This was the case with many of the officers interviewed for the case studies. These officers therefore believe that enforcement is the only solution. It was shown in Chapter Five that the managers of the Patawalonga and Torrens Catchment Water Management Board education programs also drew this conclusion, after business personnel failed to respond to their educational efforts.

A second common assumption made when education programs fail was identified in Chapter Five. This is the assumption that educators just need to keep repeating the same message until the stakeholders do listen. The result is repetition of the same educational initiatives, often by staff of many different government departments who are operating programs addressing a single environmental medium independently of each other, as discussed in Chapter Five.

This pattern has occurred with the construction sector. Many local governments have run educational initiatives in conjunction with their release of stormwater codes of practice for the sector. Examples in NSW include initiatives by Gosford City Council in 1996, Hornsby Shire Council in 1997 and SSROC in 1998 and 2000. Staff members at NSW state government departments have also released similar documents. Examples include codes or

guidelines released by the Department of Conservation and Land Management in 1992 and 1993, the Lake Macquarie Catchment Management Committee in 1994, the Hunter Catchment Management Trust in 1995, the NSW EPA in 1998 and the Department of Land and Water Conservation, Lower Hunter and Central Coast Regional Environmental Management Strategy and Hunter Catchment Management Trust in 1998. In addition to these documents, four major education programs for the construction sector have been conducted in NSW. These are the two SSROC programs as well as a program by the Department of Land and Water Conservation in 1997-1998 entitled '*Sitewise'* and a program by the Hawkesbury Nepean Catchment Management Trust in 2000 entitled '*Keep the soil on the site'*.

Similar documents and educational programs have also been released and operated in other states of Australia. For instance, in South Australia the EPA released a 'S*tormwater pollution prevention code of practice for the building and construction industry*' in 1999, and in conjunction with Keep South Australia Beautiful (KESAB) initiated an education program for the construction sector called 'C*lean site'* in 2000.

The professional associations for the construction sector have also been involved in designing policy and delivering environmental education to their members. Examples of this include the 1998 joint publication by the Master Builders Association of NSW and the NSW EPA '*Environmental information for Builders'* and the Master Builders Association of NSW 1998 publication '*Smart resourceful building: save on waste*'. The Australian Pre-Mixed Concrete Association of NSW has also addressed these issues, developing an undated educational poster entitled '*Concrete matters'*.

Work at the commonwealth government level has also occurred. In 1995 Environment Australia (2000c) implemented the '*Waste wise construction program*', which was developed 'with voluntary participation by leading construction companies in waste reduction'. The construction sector was targeted 'because up to 40 per cent of landfill waste has come from the construction and demolition (C&D) sector' (Environment Australia 2000c p.3). In 1998 Environment Australia negotiated an eco-efficiency agreement with the Housing Industry Association (HIA) (Environment Australia 1998, 2002). As a result of this agreement the HIA committed to promote eco-efficiency to its

members. A similar agreement has also been made internationally with the Confederation of International Contractors Associations (CICA). They signed a UNEP international declaration on cleaner production in 2001. 'CICA is the representative body of the construction and infrastructure sector, bringing together contractors from 78 countries in the world, accounting for $3.5 trillion in revenues and employing more than 50 million people' (UNEP 2002 p.34). Clearly, significant amounts of time, effort and money have been and are continuing to be spent by staff members at all three levels of Australian government, as well as by staff members at the relevant industry bodies, on educating the construction sector about environmental issues. Yet the problems have not been resolved, and pollution continues to occur, even though the technical know-how to stop the pollution from building sites has existed for years.

Chad at Pollotial showed that this tendency to just repeat the same message is not reserved only for the stakeholders targeted within government education programs. He assumed that all he needed to do to get the building officers to undertake the desired role was to 'keep reminding them about it until they get used to it'. The review process showed, however, that there were many reasons why the building officers were not taking action. Telling them to do so will not change their practices, just as telling business personnel to address sustainability will not result in them doing so. To obtain change the *educators* need to change their ways.

None of the officers in the case study councils had used the problem solving educational methods recommended in this thesis to work with builders to identify their beliefs, level of understanding, needs, and reasons for non-compliance. Two officers, Stephen at Craftle and Chad at Pollotial, recognised that involving builders might be a beneficial process, leading to empowerment and ownership of the issues. They had not, however, acted upon these thoughts. Most officers interviewed just expected builders to respond to their requests because they were legally obliged to do so. If they had worked *with* the builders, it is likely that the process would have identified ways that the council officers could improve their practices, thereby making it easier for builders to comply.

Several authors have identified such areas for improvement to council practices. Tai (1994) found that only 50 per cent of builders felt that the advice they got from council officers on

how to address stormwater issues was adequate. Passey (2001) reports that another factor undermining the success of education programs is that governments themselves have not implemented their own recommendations. Salier (2000) found that business people involved in the Cooks River education program would point out instances of local government polluting, and question why they should have to take action when the government did not. George at Pollotial mentioned the hypocritical nature of this as one reason why he did not push his staff to address the issue all the time. The problem of local government not practicing what it preaches has been recognised, and initiatives to improve local government sector practices are occurring throughout Australia (GEMS Pty Ltd 2001; Smith 2001; TAFE NSW & NSW EPA 2000).

Salier (2000) also found the NSW EPA came in for criticism by business personnel participating in the Cooks River education program. Participants stated that they had difficulty obtaining advice. When they called the EPA they either got no answer or would be passed from one person to another and would eventually give up in frustration.

The relationship that business people have with government agencies also affects the actions they are willing to take. This adds another level of complication to government sustainability education programs. An educator who faces a business person who has had a negative experience with the council, will often have to help heal these hurts before they will be able to gain the trust and support of the business person, and their commitment to become involved in the sustainability education program. This may mean that the educator will need to work on issues outside of their usual scope, or pass these requests on to staff in the relevant departments. It is important in this situation that the staff in those departments do address the issue, no matter how small they may think it is, because if they do not the educator's efforts will be undermined.

This shows the need to have the whole of local government – the elected members, management, and staff in all areas – supportive of the sustainability education program. All of these people need to not only respond to business people's requests as suggested above, but also ensure that their interactions with business people reaffirm the educator's message. Furthermore, they need to alter their policies and practices to make it as easy as possible for business people to comply with the regulations. This will mean reviewing

planning and development approval procedures to ensure that they include sustainability issues, and ensuring that the building and planning officers understand the issues and can help business people with them. Agyeman, Morris and Bishop (1996 p.185) echo this sentiment:

> It is essential that *all* the information and skills found within a local authority are used to consult, raise awareness, educate and ultimately empower the wider community, with a view to giving it the skill, will and confidence to take individual and/or collective action.

These and many other factors, such as the number of education programs, the education methods used, and the lack of coordination between programs as discussed in Chapter Five, interact and effect what action builders take. This was found to occur in relation to waste reduction with the construction sector. Those companies involved in the Waste Wise Construction Program operated by Environment Australia (2000c p.1) reported that

> … the diverse arrangements applied by state and territory governments was making compliance difficult and limiting progress in waste reduction. Industry sought a cooperative national approach based on voluntary agreements between governments and industry, in lieu of greater regulation.

These recognised opportunities for improvement to government practices are summarised in Figure 41.

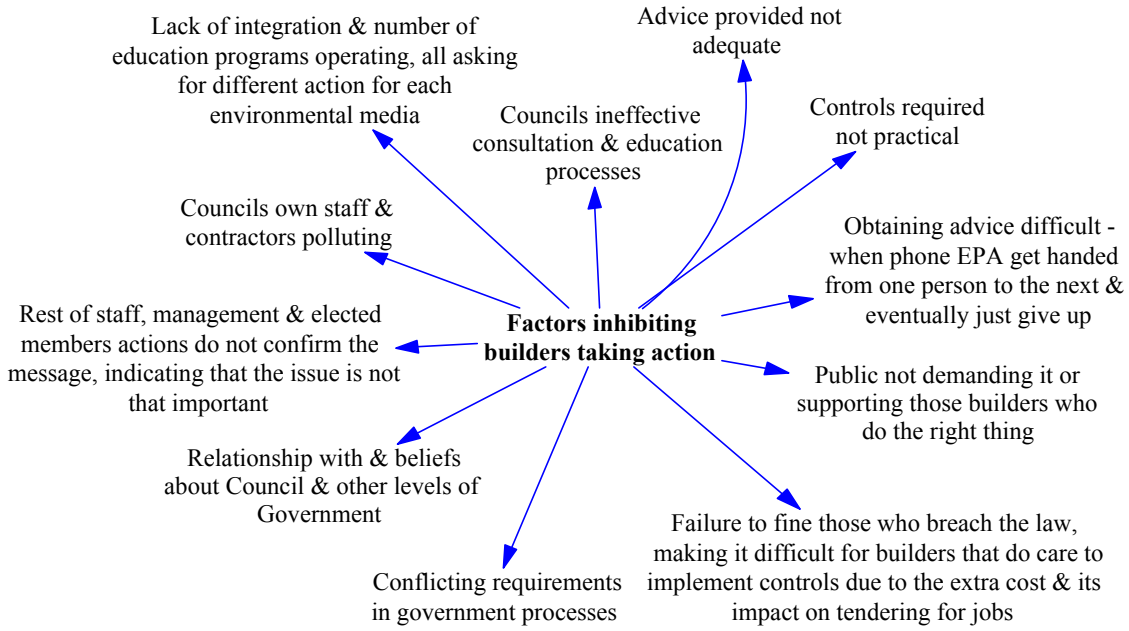


Figure 41: Opportunities for government officers to improve their practices to make it easier for builders to take action.

Tai (1994b p.11) concluded that

> Overall the data indicates the fact that, the more active councils were in their vigilance, offers of technical assistance to developers, and promotion of public awareness, the more successful were their achievements in administering the guidelines. Time and money spent on these activities did generate dividends in the quality of sediment and erosion control. The results also reflect quite favourably on the developers, suggesting that they are responsive to council assistance if it is appropriate, informed, and timely.

This is the key. The assistance provided must be appropriate *and* must make it as easy as possible for business personnel to take action. This can only be achieved if the problem solving education approaches recommended in this thesis are used to work *with* business personnel and develop an education program that addresses *their* needs, as outlined in Chapter Five.

Cameron at Calandore said that his council did not like undertaking consultation or allowing the public to have a voice. He feels that some elected members see this as a threat, as it gives other individuals an opportunity to become known and possibly run for election. Others, he believes, feel that they are the elected representatives and should be

able to make decisions on behalf of the population, making consultation unnecessary. The reluctance of the elected members at Calandore Council to consultation processes was not confirmed. Sterling (1996), however, reports similar government concerns about the effect of consultation and empowerment of the public. This indicates that the concerns may be widespread. These fears or misconceptions about consultation and working together need to be addressed if the problem solving education approaches recommended in this thesis are to become more commonly used.

7.3 Implications of case study findings for government sustainability education programs for business personnel

The case studies have shown that there is a wide range of factors that affect how well officers within local government will address sustainability issues with builders. How well these officers handle the issues has in turn been shown to affect what the builders do.

Initially the officers saw the problem as being how to motivate builders to change. They did not realise the impact of their own actions on what the builders did. The discovery of such insights is common with participative research approaches. As Forester (1996 p.313) highlights, 'Decision-making, planning and participatory processes more generally are dances in which the initially relevant can come to appear irrelevant and the apparently irrelevant can come to appear relevant'.

The case study process has enabled a greater understanding of the factors affecting the actions builders take on the ground. It has provided a clearer picture of the leverage points for improvement to the councils' actions. Such improvements, if implemented, should result in greater levels of behaviour change in builders.

The process has also shown that simplistic solutions such as making local government responsible for education and enforcement under legislation will not necessarily mean that adequate action will be taken. Similarly, having councils agree to undertake the same actions, as a part of a regional approach, does not mean that there will be consistency in practice. Furthermore, providing additional funding for officers to educate and enforce is unlikely to result in improved practice or behaviour change in the targeted stakeholders

unless the officers become aware of the ineffectiveness of their current educational approaches and the existence of critical education methods. Price (2002 p.3) agrees, stating that her survey of staff at Western Australian local governments revealed that most believed that if further funds were provided for addressing sustainability issues through Agenda 21 they '… would be spent on other areas of higher council priority'.

Local government elected members and management need to be helped to see that sustainability issues should be a priority within their organizations. Until this change in attitude occurs, their actions will not alter. The importance of attitude was demonstrated in the case studies, with a significantly higher level of activity by staff at Craftle Council, whose elected members and management saw the issue as a high priority, than at Calandore and Pollotial Councils, where the issue was given a lower priority. Brown (1994 p.24) also reports on the importance of attitudes. In her review of 50 Australian councils' practices she found that there were '… numerous examples of councils, with no more resources than any others, creatively and innovatively adapting to integrated environmental management'.

To foster commitment to sustainability issues in all local governments will require the development of a positive attitude to the changes required. The elected members, management and staff at local governments will need to be helped to see that the issues are *important*, that they are *worthwhile* addressing, and that the changes are *achievable*. Staff members at the higher levels of government need to work with elected members, management and staff at local government to create this positive attitude. It will require identifying each others' needs and concerns, developing a shared vision of what should occur, identifying and removing constraints to change and building the capacity of all parties to make it happen. Without doing this the current haphazard system of environmental education and enforcement will remain unchanged. This confirms the need for a whole-of-government approach as recommended in Chapter Five.

Several authors are calling for the use of such approaches on sustainability issues (Dovers 2001; Environment Australia 1999; Fien 2002; Young & Binning 2002). Fien (2002 p.45) points out that implementing such an approach will 'not require large additional sums of

money; [but] it does require political will, from governments willing to model an inter-departmental, cooperative approach to sustainable development'.

7.4 Conclusions

The findings from the case studies corroborate the findings from the literature review of past and current government education programs reported in Chapter Five. They have confirmed that officers at many government organizations are undertaking educational roles without any training in environmental education theory or behaviour change principles. These officers are utilising positivist awareness raising approaches, threats, and fines, none of which have been successful in resolving the problem. The officers at the case study councils have not used the problem solving education approaches recommended in this thesis to work *with* the builders. Many officers simply assume that builders do not care, or that they just need to keep repeating the same message until the builders do listen.

It was shown within this chapter that there are many factors that affect the willingness and ability of builders to take action. The officers have not recognised these constraints to change and have therefore not addressed them. They have not built the capacity of the builders to take action or coached them with their efforts. The findings from the literature reviews conducted for this thesis suggests that until these issues are addressed, little improvement to the builders' practices is likely to occur.

It has also been shown that there are many organizational factors that can inhibit the ability of local government officers to implement effective education programs. This has highlighted the importance of understanding the whole system affecting the education program, including the mental models of elected members, management, and staff, the organizational culture, and other organizational constraints that impact on the actions those officers take. The need to help all government parties understand the importance of the education program, and to alter their beliefs and behaviours to support the education program and reconfirm its message, has also been shown. All of these internal constraints need to be addressed if an effective education program is to be implemented.

The next chapter contains the conclusions of the thesis and will reflect on whether or not the objectives set in Chapter One have been achieved. Calls for action to be taken to implement the recommendations of this thesis and outlines of further research required will also be made.

Chapter 8. Conclusions and Implications

> *'Entreating people to try harder, to become more committed, to be more passionate cannot possibly have much lasting effect. The biological world teaches that sustaining change requires understanding the reinforcing growth processes and what is needed to catalyse them, and addressing the limits that keep change from occurring'* (Senge 1999 p.8).

8.1 Introduction

In this chapter the conclusions about the research problem and the thesis objectives will be presented, as will the implications for policy, practice, and theory. The limitations of the research and the recommended ideal approach to government sustainability education programs for business personnel within Australia will be identified. Solutions to these limitations will be suggested and calls for further research and implementation of the findings will be made.

8.2 The Research Problem affirmed

The research problem focused on the fact that despite expenditure of considerable amounts of money and effort on government sustainability education programs for business personnel, little change has occurred to their practices.

The majority of government sustainability education programs implemented have focussed on awareness raising. These programs have been successful in achieving higher awareness. Many authors report that the majority of business personnel now acknowledge the impact of their operations on the environment, and accept that they have a responsibility to reduce this (Graborsky & Grant 2000; Rosen 2001; Soderbaum 2000).

The awareness raising programs have not, however, been successful in obtaining substantial amounts of behaviour change. This is demonstrated by the fact that many businesses are still operated in an environmentally destructive manner, and the state of the environment continues to worsen (WRI 2001).

The implication of this is that the focus of government sustainability education programs needs to move away from the awareness raising approaches previously used, towards the use of educational methods that help business personnel actually change their practices.

Both Environment Australia (1999) and the NSW Council on Environmental Education (2001) have recognised the need for this change in emphasis. They have called for a systems approach whereby educators address sustainability holistically, consulting with the targeted stakeholders to identify and understand the complexity surrounding the issue, thus enabling them to take action that addresses the reasons for the problems rather than just the symptoms. They have called for a move away from top-down, awareness raising programs, to bottom-up, participatory, problem-solving programs, which help build the capacity of individuals to take action. They have also called for improved coordination between programs. Environment Australia (1999) has recognised the benefit of a whole-of-government approach to sustainability education programs, calling for this to occur at the federal level. Despite these calls, there are no Australian government guidelines on how to design, implement and evaluate a sustainability education program utilising these preferred approaches.

The reasons for the ineffectiveness of the awareness raising approach in obtaining behaviour change has been revealed through the literature reviews conducted for this thesis. The educational methods that are believed to be most effective in assisting business personnel to implement changes to their practices to make them more sustainable were also identified. These findings were summarised in Chapter Five, to outline an ideal approach to government sustainability education programs for business personnel within Australia, according to the literature reviewed.

The literature review of government sustainability education programs conducted in Chapter Five, and the case studies reported on in Chapters Six and Seven, have shown that there is significant difference between the ideal education approach, collated in Chapter Five, and the actual practices used by government educators. This suggests that significant changes need to occur not only to the educational methods used by government educators, but also the funding and institutional arrangements within Australia, if we are to increase the return on investment and effectiveness of the sustainability education programs

implemented. Hence it has shown that the problem statement of this thesis was valid, and the issue is indeed a serious problem worthy of investigation.

8.3 Findings in relation to the Research Objectives

8.3.1 Objective One:

To show that current and past Australian government sustainability education programs for business personnel have not been effective in obtaining substantial behaviour change towards sustainable practices.

A review of the literature on current and existing Australian government sustainability education programs for business personnel was undertaken in Chapter Five. It revealed that many programs, like the program implemented by the Patawalonga and Torrens Catchment Water Management Board in conjunction with the City of West Torrens, have resulted in minimal changes to business practices. This is despite the investment of significant time and energy by the program's educators and the expenditure of hundreds of thousands of dollars on the programs. The manager of the Patawalonga and Torrens Catchment Water Management Board education programs has called for a greater focus on enforcement, believing that education does not work. It was shown in the case studies that this is not an uncommon assumption, with many officers at the three case study councils also assuming that education would not work, and that only fines would result in behaviour change.

Both Environment Australia (2001) and the NSW Council on Environmental Education (2001) have recognised that the majority of Australian government sustainability education programs have been relatively ineffective in obtaining behaviour change. They have called for significant changes to the educational methods used, the coordination between programs, and the focus of those programs. Further evidence of the ineffectiveness of past and current government sustainability education programs is shown by the fact that the state of the environment continues to degrade (Christof 2002; Yencken & Wilkinson 2000). Clearly, what governments have done to date has not been successful in obtaining substantial behaviour change towards sustainable business practices.

8.3.2 Objective Two:

To review the literature on business sustainability, on obtaining behaviour change in business organizations and on obtaining behaviour change through environmental education, in order to identify why government sustainability education programs for business personnel have not been effective in obtaining substantial behaviour change and what will be required to improve their effectiveness.

A review of literature relating to business sustainability (Chapter Two), obtaining behaviour change in business organizations – the systems thinking and organizational learning literature (Chapter Three), and obtaining behaviour change through environmental education approaches (Chapter Four), was undertaken to identify the many factors that affect the success of government sustainability education programs for business personnel. In Chapters Six and Seven the case studies were reported and discussed. These provided further insight into factors affecting the success of education programs. The result from all of the above is a greater understanding of why government sustainability education programs have been ineffective in obtaining substantial behaviour change, and how they could be made more effective. A summary of these reasons and ways to improve the effectiveness of government sustainability education programs for business personnel is provided in Table 30.

Table 30: Reasons for ineffectiveness of many government sustainability education programs and recommendations for improvement.

Reasons for ineffectiveness	Recommendation for improvement
Educators have not clarified the meaning of sustainability or a sustainable business within their education programs. It was shown in Chapter Two that there are many different definitions of sustainability and sustainable business. Different goals or end-points that business personnel should aim to achieve are recommended within these definitions. These multiple definitions confuse business personnel about what they should be aiming for.	*Educators should clarify within their education programs what it means to be a sustainable business.* It was recommended that sustainability should be seen as a continuous learning journey. This recognises that what is possible changes over time as technology and knowledge improves. A sustainable business is therefore one whose staff continue to learn about and implement the changes that are possible, to maximise their triple bottom line performance. Educators should discuss this definition with the business personnel with whom they are working and come to an agreement on what they believe sustainability is.

Table 30 continued: Reasons for ineffectiveness of many government sustainability education programs and recommendations for improvement.

Reasons for ineffectiveness	Recommendation for improvement
Educators promote different sustainability methods and have failed to help business personnel understand the different options. It was shown in Chapter Two that there is a wide range of sustainability methods, from end-of-pipe approaches through to approaches that require the redesign of the products, processes, and purpose of companies. These different methods make it difficult for business personnel to know which one they should use.	*Educators should show business personnel how the different methods interrelate and help them decide on what actions they want to take.* It was shown in Chapter Two that all of the sustainability methods could actually be seen as interrelated. They all aim to achieve dematerialisation and substitution. Educators should help business personnel understand this and decide on the actions that they want to take.
Educators have promoted pollution reduction approaches to sustainability within education programs. This has happened despite research showing that simply reducing pollution from manufacturing will not be effective in stopping environmental degradation.	*Educators should promote holistic approaches to sustainability.* These approaches redesign products to minimise their impact throughout their entire life cycle(s), enabling them to be remanufactured, reused and recycled so that they never end up as waste. They can also involve many organizations working together to address common issues. Educators should support this process and help each business person take the actions that they feel ready to take.
Educators have failed to address change management issues within their sustainability education programs. It was shown in Chapter Three that implementing change within business organizations requires a participative approach where management involves staff in all stages, builds their capacity to take action, and supports them in their efforts. Sustainability requires a significant amount of change, suggesting that it will be difficult to implement unless change management issues are addressed.	*As a part of their sustainability education programs educators should help business personnel implement change effectively.* In Chapter Three a definition of a sustainable business, and the institutional conditions required according to systems and organizational learning theory in order for it to be achieved, were identified. This showed the need to create a learning-supportive culture and build the capacity of staff to take action. A range of templates and activities based on systems thinking and organizational learning, which could be used to help business personnel with this process, were suggested in Chapter Five. Educators should develop and use these templates to help business personnel implement sustainability.

Table 30 continued: Reasons for ineffectiveness of many government sustainability education programs and recommendations for improvement.

Reasons for ineffectiveness	Recommendation for improvement
Educators have used expert developed positivist awareness raising, threats, and fines in an attempt to coerce business personnel to adopt what the educators believe are the correct behaviours. It was shown in Chapter Four that such an approach could actually lead to resistance to change.	*Educators should use participative, problem solving approaches to sustainability education. These focus on working together, identifying and removing constraints, building capacity to take action, and coaching business personnel with their efforts.* It was shown in Chapter Four that problem solving education approaches are more effective than positivist ones. Educators should use these approaches.
Educators have competed against each other for the attention of business personnel. Educators within each level of government of Australia have operated multiple education programs for business personnel, each with educator asking business personnel to undertake different actions. This has increased the confusion business personnel face.	*A single sustainability education program should be implemented with business personnel.* A whole-of-government approach was suggested to enable a single sustainability education program to be implemented with business personnel. This would reduce duplication and make it easier for business personnel to understand what they should do. Specific roles for each level of government were suggested in Chapter Five.
Local government is expected to undertake the sustainability education roles, but does not have the capacity to do so. It was explained in Chapter Five that local government is recommended as the appropriate provider of sustainability education, however there is no guaranteed funding for them to do so. This has resulted in many adverse outcomes including mental models that the issue is not that important or not a priority, officers spending the time they do have to devote to education on applying for grants, different levels of activity undertaken in different local government areas, and the use of existing staff as educators despite having no training in behaviour change or education theory.	*The capacity of local government to undertake the sustainability education role should be enhanced.* If local government is to continue to be the preferred level of government to implement sustainability education programs for business personnel, then they should be supported to do so by the higher levels of government. This will include either redistributing the existing funding from all levels of government for sustainability education programs for business personnel, or creation of a new funding source. Staff members of the higher levels of government will also need to work with the management, elected members, and staff of local government to answer their concerns and queries in order to gain their acceptance of the role. They will also need to build the capacity of the local officers and educators, and encourage them to review their practices to ensure that they reconfirm the educational messages, thereby making it as easy as possible for business personnel to take action.

Table 30 continued: Reasons for ineffectiveness of many government sustainability education programs and recommendations for improvement.

Reasons for ineffectiveness	Recommendation for improvement
A wide range of constraints to change faced by business personnel have not been addressed by educators. It was shown in Chapter Five that the system surrounding business personnel could be altered to make implementing sustainability easier and more worthwhile. This would encourage business personnel to participate in education programs and take action.	*Educators should understand the system surrounding business personnel and take action to alter it and make it in business personnel's own best interest to participate in the education program.* There are many possible ways to change the system to support business personnel taking action. Some of these were described in Chapter Five. Local level educators could address some of these, but many actions would need to be addressed by state and/or federal governments. This shows the need for a whole-of-government approach.

All of the above represent reasons why government sustainability education programs for business personnel have not been effective in obtaining substantial behaviour change, and ways that their effectiveness could be improved.

8.3.3 Objective Three:

To synthesise the recommendations identified through the literature review in order to outline the ideal educational methods, funding, and institutional arrangements required for an effective government sustainability education program for business personnel within Australia.

The ideal approach to government sustainability education programs for business personnel, and the necessary funding and institutional arrangements to enable its implementation, were outlined in Chapter Five. It was argued that the findings of the literature review suggested that the ideal institutional arrangement for government sustainability education programs with business personnel in Australia is a whole-of-government approach. This would involve staff members within the state EPAs and either within Environment Australia or the Australian Environmental Education Foundation once created, working to alter the system within Australia to make it in business personnel's own best interest to participate in a single, problem solving sustainability education

program, operated within each local government of Australia. This would ensure that business personnel received the same level of assistance regardless of the location of their business premises. It was explained that local government might not accept this role unless funding was provided. Funding possibilities were suggested.

Roles for each level of government were identified. Together these would maximise the effectiveness of the sustainability education program to obtain behaviour change in business personnel within Australia.

It was argued that problem solving education methods, in which the educator works with the business personnel committed to addressing sustainability within their area, are the ideal educational methods. The educator and interested business personnel form a group or learning community to discuss what they believe sustainability to be, why it is important to them, and how they think they can achieve it. Together they decide the focus of the education program, and what actions they will take individually and as a group. An action learning process is used; the group continues to interact over time, meeting regularly to discuss their progress, mentor each other, and decide on further actions to take.

The educator builds the participating business personnel's capacity to think critically, analyse issues, and devise possible solutions. He or she builds their understanding of the many different sustainability methods and how these interrelate, builds their abilities to implement changes within their organizations and coaches them with their efforts. While the educator would prefer for all business personnel to use the holistic and more transformative sustainability methods, they respect the right of business personnel to take actions at whichever level they wish, and help them to do so. Some business personnel may initially only want to look at compliance issues, others at pollution reduction, and a few at the more transformative methods of life cycle analysis, natural capitalism and industrial ecology. It was shown that the educator would need to respect this and support the business personnel with their efforts, recognising that over time they may be prepared to take the more complex actions. The educator would keep those business personnel not yet committed to sustainability up to date with the efforts and achievements of the group, answer their questions, and invite them to join in when ever they want to.

It was proposed that evaluation could occur through measurement of changes to behaviour within the individual business organizations, and changes undertaken as a result of group actions. The collection of learning stories from business personnel summarising their advice for other business personnel, and those of the educators summarising their advice for other educators, was recommended. Evaluation of the group process would also occur in order for the participants and the local level educators to identify ways to improve their methods. It was suggested that the staff members within Environment Australia or the Australian Environmental Education Foundation once established and those at the EPAs in each state who are working on these issues, should also record the actions that they have taken to support the local level educators, and make it easier and more worthwhile for business personnel to address sustainability. It was recommended that all of this information be placed on the Environment Australia website and made available to all government educators. It was suggested that this process, along with a range of other networking and capacity building activities outlined, would result in a spiral of continuous learning and improvement to government sustainability education programs for business personnel throughout Australia.

The above approach, which was explained in Chapter Five, represents the ideal educational method, funding, and institutional arrangements for government sustainability education programs for business personnel within Australia, according to the literature reviewed.

8.3.4 Objective Four:

To critique prevailing government sustainability education programs against the ideal approach developed, to show where they comply and fail to comply, and to make recommendations for improvement.

This was undertaken in two parts. First, a literature review of Australian sustainability education programs for business personnel was undertaken in Chapter Five. Second, the practices in use at three local governments were reviewed. These case studies were described in Chapter Six, and the results discussed in Chapter Seven. It was revealed through these critiques that the majority of government educators conducting sustainability

education programs within Australia still utilise positivist awareness raising methods, threats and fines to 'convince' business personnel to change their behaviour.

It was shown that in many cases there is no specific educator; a range of government officers are expected to undertake the educational roles on top of their normal duties. These officers do not have training or skills in behaviour change or education theory, and are designing their education programs without consultation or involvement of business personnel. They are simply expecting business personnel to respond to their message and change. These officers are not using the problem solving education approaches recommended, and significant changes to the knowledge, attitudes, practices, and policies governing those involved would be required before they could use them. Specific recommendations for improvement of the actions undertaken at the three case study councils were made.

8.4 Limitations

8.4.1 Limitations of the current study

Due to limited funding, this study has not involved a trial of the recommended ideal sustainability education approach. A partial trial could have occurred within the case studies, by working with the officers

- To help them understand the complex system affecting their actions;
- To identify and address the constraints to effective action within their organizations; and
- To change their educational practices from the positivist approaches they currently use to critical education approaches.

This would have provided some practical insight into the effectiveness of the ideal education approach recommended within the thesis. It would not, however, have provided a true insight into the potential of the overall approach, as this requires reform of the funding and institutional arrangements between the three levels of Australian government. It also requires a variety of actions to be taken by staff members at each level of

government to remove the constraints to change that business personnel face, therefore making it easier for them to change their behaviour.

8.4.2 Limitations of the ideal approach to government sustainability education programs for business personnel

One limitation of the ideal education approach outlined is the difficulty involved in obtaining cooperation and commitment to it from all of the relevant Australian government agencies. While difficult, such cooperation and government agency change is not unheard of. Several examples of whole-of-government approaches were documented in Chapter Five, as were some recommendations about how to undertake such institutional reforms.

Such reforms are likely to take considerable time, due to the number of parties involved and the need for them to discuss their fears, needs, and constraints to change. Once a positive attitude is created within the parties, the actual detail of the reform can be negotiated and implemented. While this process is occurring it would be beneficial for educators to utilise as much of the ideal education approach as they can. This would include changing from positivist awareness raising to problem solving education approaches. Training to support educators with this transition would be beneficial.

Funding for the local level education programs may at first appear to be a limitation. However, as was suggested in Chapter Five, this could be overcome by redistribution of the significant amounts of money currently being spent on education by staff at the many different government agencies, at all levels of government. Another possibility is the introduction of innovative funding sources, such as the taxes or levies, recommended by the NSW Council on Environmental Education (2002) and the SA EPA (2002). While a redistribution of existing funds may perhaps sound idealistic or unrealistic, such redistribution has already occurred within Australian government agencies. This was achieved with the many government agencies in NSW who had responsibility for actions that could impact detrimentally on Sydney Harbour. A whole-of-government approach was committed to, and a coordinating body established. This coordinating body obtained funds from all of the government agencies involved and then redistributed them as necessary for

the best protection of Sydney Harbour (For further information on the Sydney Harbour management process see: Meppem & Gill 2001).

A further limitation or difficulty with the ideal sustainability education approach proposed will be the need to convince local government to fully accept the role and review its own practices. These will be required in order to ensure that all local governments' officers reinforce the educator's message and their policies and practices make it as easy as possible for business personnel to take action. While daunting, this hurdle is not insurmountable. As when implementing change within business organizations, the elected members, management and staff of local governments will need the opportunity to discuss what is required, what it will involve, why they should do it, and how it can be achieved. All three aspects required for creating a positive attitude towards change – belief that it is important, worthwhile, and achievable – will need to be addressed.

This will require all parties involved to come together to undertake dialogue about the issues and develop ways forward. It will require a much closer working relationship between all three levels of Australian government than currently exists, and is achievable if everyone involved genuinely wants to achieve it. A first step may be the development of an official government discussion paper on the ideal education approach outlined, explaining why it would be more effective than current approaches, and detailing its implications for each level of government.

8.5 Implications for further research

Further research into ways to obtain behaviour change in business practices through educational approaches would be beneficial. To the current author's knowledge, this is the first major body of work that has focussed on combining systems thinking and organizational learning approaches with problem solving education approaches for business personnel. The majority of the environmental education literature reviewed reported applications of problem solving education approaches to primary and secondary schooling, and to community development programs in developing countries. The majority of the systems thinking and organizational learning literature reviewed related to understanding complex business problems and overcoming them. Further research

combining systems thinking, organizational learning, critical environmental education approaches and problem based methodology education approaches to obtaining behaviour change with business personnel is recommended.

Another area in which further research would be beneficial is the identification of constraints to change that staff at the various government agencies face in moving from current practices to the ideal education approach recommended within this thesis. A survey, interviews, or group meetings to identify the knowledge and attitudes of relevant staff throughout the many government agencies would provide useful insight into how best to progress the concept, or indeed may identify reasons why the approach might not work.

8.6 Implications for theory – the conceptual contribution

It was stated in Chapter One that the conceptual contribution would be:
A conceptual synthesis of recommendations from the literature on business sustainability, systems thinking and organizational learning, to enhance the theory and practice of environmental education for business personnel.

This has been achieved within this thesis. The result is several suggestions for enhancing the theory and practice of environmental education for business personnel.

The theory relating to sustainability and sustainable business practices was reviewed in Chapter Two. This revealed that there are many different definitions of sustainability and a sustainable business, which creates confusion for business personnel and hinders them from taking action. It was shown that one way to reduce this confusion is to view a sustainable business as one in which the staff members continue to learn and implement the possible changes to their practices, thereby maximising their triple bottom line performance. This removes the controversy about the end-point or goal, recognising that the goal will continue to move as technology develops. Discussion of this concept by the academic community and agreement to use this approach to defining a sustainable business would be beneficial. Educators implementing environmental education programs for business personnel should then use this approach. Promoting sustainability in this way should improve the effectiveness of environmental education programs.

Similarly, it was shown in Chapter Two that the many different methods that can be used to improve business practices confuse business personnel, who are left wondering which method is best. Such uncertainty leads to inaction, as described in Chapter Four. To overcome this it was suggested that educators show business personnel how the different methods interrelate. This was demonstrated in Chapter Two by showing that the different approaches build upon each other and ultimately aim to achieve the same two outcomes: dematerialisation and substitutions. Dematerialisation refers to increasing resource productivity and the removal of waste. There are four main types of substitution. The first involves changing the materials and practices used within the business organization. The second type involves a move from selling products to leasing services, and the third, a move from supplying components for manufacturing to supplying performance based services. The fourth main type of substitution involves a move from unfair to fair distribution of materials to meet the needs of all humans. By showing how the many sustainability methods interrelate and what they aim to achieve, it makes it easier for business personnel to understand what actions they can take. This in turn builds their confidence in their ability to make sustainability decisions and take action within their organizations. This suggests that it would be beneficial for the academic community theorising sustainability methods to integrate their approaches, and further develop a unified sustainability technique that can be promoted to business personnel. Utilising this unified approach should make environmental education programs for business personnel more effective.

In Chapter Three the difficulties of implementing change in business organizations were discussed. It was revealed that staff members who do not understand what proposed changes involve or how to achieve them would often resist them. Sustainability requires significant changes to policy and practices within business organizations. The findings presented within Chapter Three suggest that it would be beneficial for all academic researchers to incorporate organizational learning and change management principles into their sustainability methods. Having legislation requiring business personnel to address sustainability, and technology available that can greatly improve practices, and even result in significant savings, does not necessarily mean that business personnel will take action. To achieve behaviour change requires the creation of a positive attitude; business

personnel must see sustainability as important, worthwhile addressing, and achievable, as explained in Chapter Four.

It was shown in Chapter Three that system thinking and organizational learning practices could be used to help create this positive attitude and make implementing change easier. A list of conditions required within a workplace to enable change for sustainability, according to systems thinking and organizational learning theory was developed in Chapter Three. This suggests that incorporation of these issues into environmental education theory and practice is essential if education programs are to be effective in helping business personnel change their behaviour.

8.7 Implications for policy and practice – the applied contribution

It was stated in Chapter One that the applied contributions would be:

- *Production of the ideal approach to government sustainability education programs for business personnel within Australia. This will include outlines of the ideal educational methods, funding and institutional arrangements required within Australia to maximise effectiveness of government sustainability education programs for business personnel; and*
- *Specific recommendations for improvement to the design and operation of the sustainability education programs at the three case study local governments.*

The above has been achieved within this thesis. It was shown that problem solving education approaches are the preferred educational method. It was also shown that there should ideally be a single education program operated with business personnel that addresses sustainability holistically, and that this should be delivered at the local level. It was shown that a whole-of-government approach, ideally with staff members dedicated to these issues at each of the state EPAs and either at Environment Australia or the Australian Environmental Education Foundation once it is established, would be required to maximise the effectiveness of this single education program. These government staff members would alter the system surrounding business personnel to make it in their own best interest to address sustainability, thereby encouraging them to participate in the local level education program. They would also build the capacity of local government to implement the

program, and support them with their efforts. Ways to raise the funding for local government to undertake the educational role were identified, as were suggestions for the improvement of the practices at the three local government organizations reviewed in the case studies.

Both Environment Australia (1999, 2000) and the NSW Council on Environmental Education (2001, 2002) have recognised the need to utilise many components of the ideal education approach recommended within this thesis. It is the hope of the author that the benefits of the ideal approach to government sustainability education programs for business personnel will be further recognised, and the approach adopted by the Australian government.

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Appendix A: Explanation of Case Study Data Analysis

This appendix contains a detailed explanation of the data analysis process and examples of it. The data analysis process involved five steps, which are explained below.

Step 1: Conduct of interviews

Interviews were held with staff members at each of the councils. These were tape recorded with the participant's permission. Each participant was given the researchers guarantee that his or her comments would be kept confidential. They were also made aware that the information would be used to produce a report with recommendations for improvements to the practices of councils belonging to the Southern Sydney Regional Organisation of Councils. The staff at SSROC gave the researcher the permission to use the material for her PhD case studies.

Step 2: Transcript of interviews and initial analysis

Transcripts of the tape-recorded interviews were produced. The transcripts were analysed to identify the interviewee's understanding of the system surrounding the issue – the many factors that affect the behaviour that occurs, what they believe works well with their organisation's current approach and what does not. The transcripts were also analysed to identify the interviewee's perceptions of why people behave the way they do and to identify any suggestions they had given for improvement. An example interview transcript for each of the case study councils with its analysis is included in Section A1, A2 and A3 of this appendix.

In some instances the analysis process revealed conflicts between people's espoused mental models and their mental models in-use. For example, when interviewing Geoffrey at Pollotial Council, he espoused a commitment to the environment and its protection. He was adamant that building officers should be enforcing the stormwater pollution protection requirements on building sites. However, later in the interview he stated that if the building officers could not stop at all building sites to enforce the law, he felt it is unfair for them to stop at some. This statement is in conflict to his earlier statement, it suggests that Geoffrey believes fairness is more important than environmental protection. Further examples of

conflicts between the interviewees' mental models in-use and espoused are discussed in Chapter 6, which contains the analysis of the case studies.

Step 3: Identification and analysis of factors affecting the behaviour at each council

The analysis of each transcript revealed a number of factors that appeared significant in affecting the behaviour that occurred within each council. Robinson (1993) refers to these factors as 'classes of interest'. They are factors that appear to be important in order to understand the problem under investigation and resolve it effectively. A low-level coding system was used to identify the factors. These were collated into a summary document. They were collated for two purposes. Firstly, to understand the reasons for behaviour in each council and enable theorising on what would be required to improve practices at that council, and secondly to see if the factors were common across the councils.

Step 4: Identification and analysis of solution ideas provided by interviewees

The transcripts were also reviewed to identify any suggested improvements or solutions that the interviewees had made. These were summarised into a suggested solutions document. For each council the ideas that its staff had suggested were assessed to see if they would be likely to lead to improvement to practices. In many cases they were not likely to, as the idea did not address the factors inhibiting behaviour within that council.

For example, Frank at Pollotial Council suggested a quota system specifying the minimum number of fines and warnings that officers had to issue each week. He felt that this would result in officers taking higher levels of action. The analysis of interviews from staff at this council suggested that this was unlikely to be an effective solution. Staff members interviewed identified a wide range of factors that inhibited them taking action. This included a lack of management and elected member support; a norm of seeing the issue as one of low importance compared to other tasks; a failure to measure it in performance reviews; and fears that addressing the issue with builders would result in builders advising their clients not to choose the council as the certifier in future instances, which would lead to less work for building inspectors and potentially the loss of their jobs. Introducing a quota system would not address these factors inhibiting action. Without addressing these factors it is likely that the building officers would either ignore the quota system or simply

issue warnings as they currently do. The suggested solution was therefore judged unlikely to be effective.

Step 5: Write-up of case studies and checking of conclusions

After conducting the above steps the researcher developed what she believed would be required to improve the practices at each council. Draft case studies explaining the factors affecting current behaviour, the officers' solution ideas, and the researcher's suggested solutions were then prepared.

After preparing the draft case studies the researcher spent time with the staff members at each council, observing their behaviour to check the truthfulness of her conclusions (checking construct validity). She also checked her ideas with the interviewees across the councils to find out if they agreed with the analysis (checking face validity). In addition, she sought counter examples from the interviewees within the same council, other councils, and the staff of SSROC that would contradict or show why the researcher's solutions might not be effective. Finally she tested the case study analyses with her academic colleagues – an informal peer review, to see if her conclusions and suggestions were a reasonable and valid interpretation of the data. This process resulted in some suggested changes to the draft case studies. These changes were undertaken and the case studies finalised for use in this thesis.

A1) Example analysis of interview transcript – Calandore Council

Name: Sylvio
Role: Ranger
Council: Calandore

	Content	**Analysis**	**Classes of interest**
JS	What we are doing is conducting a review of soil and water controls at a number of the councils at SSROC and I am just taping the interview so I don't have to take hundreds of notes while we are talking. What we are going to be doing is producing a report on how things are going and some improvements but it is all going to be confidential so anything you say won't have your name next to it so that way hopefully you will be able to tell us exactly how you feel and how things happen. Okay so to start off with can you tell me what your role is with Soil and water issues?		
S	I missed the last meeting as a matter of fact, I was away and there was some sort of a conference and I missed out on it so I wasn't really invited to something else because there was no other.		
JS	Right. Okay. Are you the person they were referring to as the Environmental Services Officer or is that a different person again.		
S	That's another different person again but I'm authorised for that as well as other things here.		
JS	Okay. So as part of your role out on the street, do you deal with construction sites?		

	Content	Analysis	Classes of interest
S	Oh yes. Oh yes.		
JS	How do you find that?		
S	How do I find that? I find them quite offending so um		
JS	Okay.		
S	Yeah.		
JS	Offending as in, difficult to deal with?		
S	Polluting. Polluting.		
JS	Okay. Do you have to issue pins, those kind of things, issue warnings?		
S	I have now but I don't issue warnings I'm afraid. Because they know better in the way of when they pick up their plans and the DA and everything else here they are given free a table if you like of all the instructions on it which is stuck to a front fence in rather a proper place and they know themselves and their workers know as well that if they offend the individual is given a $750 fine and the Company gets a $1,500 fine.	Believes builders are aware and doesn't issue fines	Builders aware No warnings
JS	Okay.		

	Content	Analysis	Classes of interest
S	I could issues them a clean up order as well. So it does apply with me in the past.		
JS	Can you tell me about that?		
S	Um, Like that particular incident?		
JS	Yes.		
S	That particular incident I, I found this fellow quite offensive for a rare change I was going to give him a warning to clean up so I didn't like his language so I told him I would send him a fine through the post.		
JS	Okay.		
S	So that's what happened. I took down the details and amongst many others anyway.		
JS	He was aggressive or rude? About it all?		
S	Aggressive and wouldn't stop working and talking to me, don't ask me, I'm only a worker here but he is the one that was causing the problem to begin with anyway.		
JS	So were you able to get his name to send it to him or did you send it to the company?		
S	I eventually did send it to him. Sometimes I come back here and I		

	Content	Analysis	Classes of interest
	issue it to the company and the company can take it out with the individual. Yes.		
JS	Okay. Good. Um. Now let's see. Are there things in doing the role with soil and water that hinder or that help you?		
S	Can you give me like an example?		
JS	Yep. Is there something that would make it easier to do your job like a process or forms or guidelines or something like that?		
S	Maybe, a good idea but I don't know if this happens but when they are given the DA here and the construction starts and that instead of us giving them, I don't know if this happens again but instead of, have you seen these things,		
JS	The signs, yes, they are good.		
S	Instead of just giving them that as well we should be giving them a letter you know to that effect. That you find offending, don't expect leniency, I don't give leniency in dumping water pollution, soil, sand, cement, oil washed down the gutter or chemicals or whatever.	Not aware of other departments actions on these issues- suggests communication breakdown	Internal communication
JS	There are two other rangers I believe as well.		
S	Yes the other two.		
JS	Do they give warnings as well or is it up to the individual?		

	Content	Analysis	Classes of interest
S	They might be a little more lenient than me but		
JS	So it is up to each of you to decide how you do it?		
S	Yes, each individually. I suppose on its merits. Yeah. Yeah.		
JS	Do you cover particular areas of the Council or the whole Council?		
S	The three of us cover the whole of the municipality. We are not allotted a section or a persons, like maybe builders or maybe steel workers. No we do the lot, cover the lot.		
JS	Cover everything. Okay. Is there a way you three rangers are able to communicate to make sure that you are all doing the same thing or that you haven't duplicated what each other is doing?		
S	No we let each other know pretty well what we are doing. Col is the senior ranger so I make it a point to let them know what I am tackling or what I have tackled or what is going on and they ordinarily do the same.	Informal communication system on issues within his department and with other departments	Council processes
JS	Okay so that is just by like having a chat or something.		
S	Yeah, yeah.		
JS	Alright. Is it an important role?		

	Content	Analysis	Classes of interest
S	I like doing it. I like doing it. It deserves doing that is for sure you know, deserves doing. Its just another job amongst the very many we do.		
JS	Okay. And you don't have any problems with doing it?		
S	No. I don't have any problems.		
JS	Okay. So the conflict issue, I guess you would get that in a number of roles wouldn't you? With the enforcement not just soil and water possibly?		
S	Yeah. It happens with people who decide to wash their factory out and just where this person was moving machinery to another place of work, washed all his turning machines, steel turning machines with a chemical, washed it all out of his place onto the footpath, down the gutter and down the gully pit, you know. Stuff like that. He wanted to challenge it, wrote to the Bureau but the penalty was sustained. If it needs, if it warrants me to attend and serious enough issue an infringement I am certainly not going to cancel it later.		
JS	Well that's good so you don't have any worries at all about dealing with that kind of conflict when you get out on site.		
S	No, No. If they are in the wrong then it is a loss anyway, that's the way I look it and if they want to challenge it and take it to court, yeh that is there prerogative, they have got the chance and the right to do that and then we go to court, whatever the	He's happy to issue fines, doesn't avoid the issue- (shows that it is dependent on individual officer's attitudes towards it all as to whether they'll do it or have	Comfort in issuing fines

	Content	Analysis	Classes of interest
	magistrate decides.	problems.)	
JS	That's good because I know a number of people said to me that they find it hard sometimes dealing with that kind of conflict and sometimes people will try and avoid it because they know it's going to be difficult.		
S	Oh, well the person can be difficult but not as such because after all they are within the municipality so there is always a record of who they are and what they are doing, whether they are just outside builders or whatever, they have always got the information here, it is silly of them to think if I don't give them my name I'm not going to ..		
JS	Okay. I'm really pleased to hear that because as I said I am talking to people at a range of different councils and I'm talking to building officers to rangers to environmental officers, the whole works and customer service people just to try and look at how it is handled and it is interesting to sort of see all the different things so.		
S	From about 12 months ago I phoned ahead, where we had rather large large construction in the way of multiple home units you know 50 to a block or 100 in a block and I go there and I make myself known to the person in charge of the site, I let him know his concrete trucks should not come down say a three tonne limit Street and they are not to wash outside the site, you know how concrete trucks wash their backs or any trucks or if they are washed on site that the water itself remains on the site and doesn't	With larger sites he'll go past them at the beginning and warn them about the issues and say that he will fine them if any problems. So sets up a working relationship initially. Only with big sites.	Big v small

	Content	Analysis	Classes of interest
	flow somewhere else so I developed that with a particular site, with a few but one of them I had problems, three or four of the others I didn't have any problems because they were forewarned and		
JS	Okay so a bit of education as well.		
S	Been avoided. I told them there would be no more visits from me in the way of it, if it happens you won't be warned, you will be fined, you've been told. So, it is up to him whoever comes on site they just directly tell them it is a no no, you get caught, you wear it.		
JS	Yep. And for them as you said before to be able to pass it on to the subcontractor or whoever will be doing it. Okay. Now you're saying that it is seen as an important issue or as part of the role of the rangers area. Do you think the council as a whole sees it as an important issue?		
S	I think, my council takes it very seriously, yes.	Believes his Council aware through his efforts and takes it seriously	Council takes seriously
JS	So the elected members would be aware of it?		
S	Oh yes they would be. They would be through my reports and my fines, that is for sure.		
JS	Okay. So they all go up with reports to Council of what has occurred.		

	Content	Analysis	Classes of interest
S	Being what we are here and the municipality building plus we've got a lot of manufacturing things, chemicals, whatever, yeah, we sort of got to keep it in check all the time you know. We've got a lot of industry, like transport industry where they wash heavy vehicles or degrease vehicles, you know.		
JS	Okay. Um. Of all the sites that you deal with are, who would you say would be the worst, is it big sites or small sites? Or does it vary?		
S	I find it doesn't make any difference.	Big and small same	Big v small
JS	Oh okay.		
S	It doesn't make any difference.		
JS	They're all generally good or they're all generally poor?		
S	Um. What do you mean exactly, it doesn't make any difference who they are I found. Big manufacturers or big companies do offend and the bricker who just does his job, maybe just him and another person wash his wheelbarrow and the plaster of the thing off the mixer and wash it down the drain well, there's no	Big v small- all the same yet the big sites get more attention and education, are required to submit SWMP's and small sites are left to themselves	Big v small
JS	Okay. Again that is really good to hear because some people were saying to me that they thought the big companies so the big home building companies that they learnt and they are doing the right thing and it's the small guys who perhaps haven't yet learned but		

	Content	Analysis	Classes of interest
	I've had others like yourself who say the big guys are still got a way to go to improve as well. So.		
S	Probably there is but I think the big guys do not offend maybe as often or maybe as bad as they used to because for them the fine is phew, they don't stop at $1,500 you can take a different tier to the offence but the ordinary guy, $1,500, $750 that's		
JS	Do you find that the fine is a good deterrent? Do people change their ways once they have been fined?		
S	Well within my municipality, I have had the occasion to issue 4 $600 fines, when they were $600 to a builder in one of our streets where he, it was an ex service station site. He bought the site, built four homes and during that time he offended four times and I spoke to him on many occasions, I went there when it was raining, went to our depot, got those straw bales, put them across his driveway so the water doesn't flow onto the gutter, at least water and not with the sediment with it and he still kept offending so I gave him a fine and I told him I wouldn't be coming there again, if he wants to challenge me because I will be sending it by post and it was four, he was the only one that I know that, was I to care, didn't care or whatever. He reoffended four times.	Repeat offenders	Repeat offenders
JS	Because that is a lot of money in the end isn't it.		
S	Yeah. They were $600 then.		
JS	Okay. But for the majority of them they do change their ways.		

	Content	Analysis	Classes of interest
S	Yeah. And again with that particular person, I could have been really hard and because he is a company, I have to issue it, I don't think it was $1,500 at the time, it was a little bit less than that before.	Even though site was reoffending and not listening he was reluctant to issue the larger fine did 4 lower fines. Why? Isn't it important enough? He believes fines change behaviour so….	Reluctance to issue larger fines
JS	I think it was $1,250.		
S	So I decided to give him, help him mend his ways but he didn't. He is still building in our municipality		
JS	But has he improved now?		
S	When ever I come to the site he thinks I wonder what the bloody hell he's coming for. (laughter).		
JS	But is he actually better now?		
S	Yes he is, he is.		
JS	So it just took a little bit more time than normal.		
S	Well he thought he was being harassed or what ever and he wasn't in fact		
JS	Oh okay. Okay. But that's interesting because that's one of the things I asked people, is what do they think will actually motivate the builders to change? Is it education? Is it enforcement? Is it just		

	Content	Analysis	Classes of interest
	awareness? Like knowing the impacts? What do you believe works?		
S	Well they certainly don't worry about the environment. That is not going to change their minds, it is the pocket, it is the fines that is a deterrent. Yeah. Yeah. Not very many people you know really take it to heart, not many people take it to heart but if they know they are going to be fined then they are going to do something about it.	Change due to fines	Change due to fines
JS	So education that focuses on the environment then probably not necessarily best but education that focuses on telling them what the penalties are might help?		
S	Yeah. They should be told I suppose like I said before just that notice is maybe just not enough, maybe they should be given something in writing when they cannot deny it then. Although I'm pretty sure that you know they really know but if they are not on site managing the site and somebody else does the dirty on them as we say well ultimately they are responsible.	Need other educational materials but believes that they already know anyway. If this is so then why would you educate more, not issue the largest fines, try other things?	Education needed Believes builders know
JS	Yeah they are. Okay. How do you know what sites are being developed around the area?		
S	Um. I don't liaise with anybody here but because I travel quite a lot every day within the municipality you see houses being demolished, you see a block of land vacant then you know eventually there is going to be something going on there and even while it is being knocked down and the land is just standing still as	No formal system for identification of sites	Informal system on issues

	Content	Analysis	Classes of interest
	long as heavy rain doesn't wash it onto the road so you get to learn the sites and sometimes the other officers say look we are having a problem with this site, he's already been warned blah blah blah and if you are around		
JS	Okay. Would it help if there was a system in place that you knew from the building area? Or do you think being able to drive around and see is enough?		
S	I don't really have to be told. I don't have to be told but if the people like the building section want to tell me, I'll take it on board if they say we're having a problem with this guy or watch it because we have had problems with him before or whatever.		
JS	I was thinking more in line of actually giving you a list of properties that were going to be developed so that you knew where they were.		
S	our municipality.	List wouldn't work as it would be too much for him to do (so what ignore it instead? Despite the fact that he says it's important and council takes it seriously)	Workload
JS	Okay.		
S	Yeah.		
JS	Okay. So it just wouldn't be viable to		

	Content	Analysis	Classes of interest
S	Oh, it would be just a list for me of other jobs that I've got to do you know, when I'm, between travelling in our streets looking for say abandoned vehicles or whatever, we usually notice them, they come to your notice especially you see a, you know, you might see a truck pumping concrete on site, maybe you just stop, suspiciously or whatever you would like to call it, you just take the numbers and dates and everything, go later on in the evening and if there's cement there then you go back there, take photos and go back there the next day and say listen this was happening yesterday, here's the photos of it, you know, I've been advised by Council to question the proper person by you being the owner and then he can either give me his details or supply me with the details of the concrete people and I will issue them a fine. So, yeah. Rather than challenge them when they are still doing it otherwise they say what the bloody hell are you talking about we haven't even finished yet, we haven't even washed up.	List wouldn't work as it would be too much for him to do (so what ignore it instead? Despite the fact that he says it's important and council takes it seriously)	workload
JS	So what would happen if they saw you taking the photos, then you would have to discuss it?		
S	Well, sometimes they ask me, sometimes they don't ask what I'm doing. If they ask me, if they want to approach me I will tell them what I'm doing in case you leave a mess behind.		
JS	Okay. That's another way to avoid that sort of conflict stuff but still get the job done. Okay that's good. Okay so we've talked a little bit about builders and whether they take it seriously or not, have there been times when you've found a builder doing the right thing? That was really conscious of it.		

	Content	Analysis	Classes of interest
S	Yes, we have. He's either a decent person and those people we don't get to meet because when we drive past their site the proper fencing is up and its tied back so it is not interfering with the footpath and the bricks are in order so people can use the path, and sand is not being washed down the gutter or there is no cement slurry. You don't get to meet those people so they've either had a bad experience in the past or they say to themselves I better do the right thing here because the Council is known for if I offend then I'll get it, I don't know why the reason but I lot of them, if they don't offend, I don't get to meet them.	Says good sites exist but believes they're good for fear of fines	Change due to fines
JS	That makes sense. Obviously. Okay. You said before that the elected members would be aware of it because of the reports going up to Council, do you think that there needs to be any further resourcing on the issue or?		
S	How do you mean dear?		
JS	Just wondering if the elected members would see it as important if they would support, if you needed another person to do the role with you or if you needed some other support for the job if that would be forthcoming?		
S	I've been doing this for 30 years, I haven't found it necessary to get a back up or anything. I ask my questions I'm within my right to ask. They usually know that they are in the wrong. At the time they are either congenial or they are not, you know and if they then that's it, there's a brick wall if I may say between them and		

	Content	Analysis	Classes of interest
	me, he's on one side and I'm on the other side then I'll start. Like I said I can come back here and get all the details so it is silly for them to answer the questions and the foreman on site and it's the builder ultimately regardless of negligence of the site man or whoever it is, or the factory.		
JS	So you think there is no need for extra staff, that you are able to deal with it all much as you need to.		
S	No I don't think so. It doesn't happen, it's not an everyday issue, you know, it's not an everyday issue like when we deal with parking or with abandoned vehicles which we do about 50 a month in such a small municipality. It doesn't come up.	Believes doesn't need extra staff or resources as it doesn't occur regularly, yet he also said a list wouldn't help as there is too many sites for him to deal with	Importance Perception of frequency
JS	Do you think that it occurs but you don't actually drive past and see them or it's just not happening that commonly?		
S	I don't think, I don't think its happening. Like everything else when it came in the offences now have minimised you know, it's got barely any offences.	Believes frequency low	Perception of frequency
JS	Well that's good so maybe it's all making a difference.		
S	I think it is. Because like I said, you give a bloke a $750 fine or a $1,500 fine, he's got to make it up somewhere. I've got people, I've had people call me back on a couple of occasions last one on Horner Avenue here, he said you gave it to me, I said well the brickie was obstroperlous in answering the questions and he just told me to see the boss and I said that there was a notice who the	Believes that builders are willing to pass fines on to subcontractors and that some don't mind getting them. They cooperate	Subcontractor

	Content	Analysis	Classes of interest
	builder is coz I told him I want to meet him first and I said I'll write it to you, you can sort it out with him. He said don't worry about it write it to me and I'll give it to him because he was holding his money anyway, the brickie's money so it is just silly.		
JS	Well that's good that that kind of cooperation is happening that I know some people have sort of said that they find it difficult to pass it on whereas it sounds like the way that you've been able to handle it helps.		
S	On occasions they've said bloody hell I've already told him you know and now he's doing it so don't worry about it, I'll give you his details, so yeah.	Cooperation from builders to fine subcontractors	subcontractors
JS	So do you think that most of them are doing the right thing now? You were saying it doesn't occur that often. What percentage?		
S	I wouldn't know about percentage here but I think, yeah, I think they are pretty much aware and pretty much doing the right thing. Yeah.		
JS	So about 80% of the sites would be pretty good?		
S	Oh I guess so yeah, yeah.		
JS	Would you think that it would be only 50% or maybe		
S	No, it's not that high.		

	Content	Analysis	Classes of interest
JS	Not that high with problems?		
S	Not that high with bad sites. No it's better than that. It's just better than that, yeah.		
JS	Okay, that's good to hear.		
S	80 or 90 probably within our municipality.	Believes 80-90% of sites doing the right thing	% sites good
JS	Well that is excellent. Yeah. That's really good to be able to say. Yeah. Okay so you don't really think that there is much else the Council needs to be doing or ways that it can improve?		
S	Well, I'm open for suggestions if you can, what can you suggest, what do you suggest?		
JS	Well that comes next because what I'm doing is interviewing everyone		
S	This is going to cost me money.(laughter)		
JS	No, not at all and just going through and getting everyone's ideas and then I'll put them all together and produce a report for everyone to have a look at and you can read through it and go oh yeah, we could do that or oh no that wouldn't work for us and decide what you want to do. So it's certainly not a case of us coming in and saying do it this way, we're just trying to find out how everyone is doing it and		

	Content	Analysis	Classes of interest
S	I thought maybe you would say instead of do this, do it this way. If you had a suggestion or		
JS	We will have at the end of the process ,oh yeah. Um but it sounds like from what you are saying that things are working quite well which is good. Okay. That's probably pretty much it from what you've said. When people say that it's not working very well then I ask them some other things, um but you've said that most of it is sort of is happening. One of the other things I talk about with some people is they've said that sometimes they'll go in and warn someone and if necessary fine them and they'll improve but then they come back a week later and the person has gone down hill again, gone bad again and we were just talking about why they think that occurs or how often that occurs and you were saying that there was only that one incident you had to do the four.		
S	Yeah. Yeah.		
JS	Yeah.		
S	It was only one incident. I've never issued, apart from that incident, I've never issued a builder or anybody else more than one, like, he was issued four and everybody else I fine was only issued one. There have been no incidences where I've issued two.		
JS	Okay. So the sites where one's been issued, do you make a point of going back after a week or two to see what they're like.		

	Content	Analysis	Classes of interest
S	Oh yeah. Once I've gone there, until the site is finished with, I go there whenever I get time. I fix them, put them amongst the others.	Constant follow up to avoid deterioration of practices	Follow up
JS	Okay, that's good. Okay. Is there anything else you would like to add or		
S	I don't know. What else is there?		
JS	Um. Not sure, what the main things we were covering was how much education occurs and whether we think education works or whether it is the enforcement that works and areas that the council can improve in, how they are doing that but I think we've covered that.		
S	I think the education must be pointed fairly and squarely and the responsibility placed on the builder himself or whoever the builder is or the site manager you know because whenever a person says well don't issue it to me, issue it to the builder, I have no objection about that because after I have got his details because he works for the builder anyway and I'll eventually contact the builder, always have made it, what is it, a policy that I get in touch with them and tell them look on such and such a day this what happened, I spoke to your site foreman and he told me that this and this had happened. I've been advised by Council to serve you an infringement, if you want to challenge it you've got the right and so it will be made out to the company. He may say to me oh we've warned him enough, we'll make him pay it, whatever, whatever and then it becomes a matter between him and his site		

	Content	Analysis	Classes of interest
	foreman then, we're out of it which you know…. that's how I tackle it so I think that ultimately there must be one person for a company that must be told these things you know, then it depends on how diligent the site foreman is and how he carries his duty. What matters, the end result I suppose.		
JS	So if you do issue a fine, how, is there a way that you let the building department know that that has occurred for each site or is that just handled by yourself?		
S	What I do is like from point A, if I notice a site, I'll take the photos, sit in the car or whatever, write out the date, the time, the number of the house, site under construction, first floor or second floor, finished or nearly finished or so on and so on and I come back here and I get details, I liaise pretty well with these other Departments and I get details of who is the actual owner, not the owner of the house because he mightn't be the builder, who is building it and I say look, this is what is going to happen, I think it was an infringement and they never said to me no don't or wait till I give him a warning, they've always left it up to me which is alright. They can't do it anyway and then I'll sit on it for half a day or after I ring them up and everything just in case there was something involved that might, might, might make them change their mind so I'll hold back and if I don't here from anything in any different way I'll write the infringement then I'll post it.	Gives building department opportunity to explain why he shouldn't fine someone	
JS	And so every time that you do an infringement that		
S	They know that that site at one time or another has offended or		

	Content	Analysis	Classes of interest
	whatever		
JS	So they then record that on their files?		
S	Well if they are interested it goes with my department on a property file. On a property file.		
JS	But not on a building file?		
S	No, no. It goes on a property file which is, which is with our section and then on that property a fine was issued to the builder. And I give the original ones to my boss. He notes them and then gives them back to me and I always keep a copy which I've got a file at home now, which I've taken home.	Possible communication problems with files	Filing system
JS	With the building side of it, the building department, the building officers, they look at soil and water management plans from the applicants every time a site's put in there should be a soil and water management plan. Do you get to see them at all?		
S	Soil and water management plan?		
JS	Yeah, which is when the applicant puts in the file to say I want to build this on this property, they are meant to submit a plan that says what sediment controls are put up, so where they are going to put their fence, where they are going to put their stockpiles.		
S	I don't get to see them. No.		

	Content	Analysis	Classes of interest
JS	Do you think it would help you to see them at all?		
S	Oh, no not really. It goes this way that like I said before, if they visit a property for an inspection of or just drive by and see what the problem is and they notice it they tell me, we've given them a warning, but if you notice it again, we're told them, they're not going to get a warning, you just go and fine them or they might say to me maybe they don't like the looks of his face, they might say he's offending, please go there, see what you can see, see what you can do and if need be issue an infringement. So there's always that.		
JS	Okay.		
S	And when I write a fine without them knowing, I always let them know and say this is what I've done		
JS	So there is good communication between yourself and the building area.		
S	Oh yeah.		
JS	Well that's great. Because I know that in some councils I've spoken to that can be an issue, that the people are sort of going off in different ways and not knowing what each other is doing so		
S	No.		
JS	So it's not a formal system where it's all written down but		

	Content	**Analysis**	**Classes of interest**
	informal in that you talk with each other.		
S	I just say look this is what happened in case they might ring and say your bloody ranger was here and he gave me a fine.		
JS	I was actually doing EHOing for a while…..END OF TAPE AND INTERVIEW		

A2) Example analysis of interview transcript – Pollotial Council

Name: Daniel
Role: Building Inspector
Council: Pollotial

	Transcript	Analysis	Classes of interest
JS	What I'm doing is interviewing people around all the Councils of Southern Sydney. Southern Sydney Regional Organisations of Councils (12) about what is happening in their areas and how it can be improved. Everything that we are doing I'm recording just so I don't have to take notes but it is kept confidential but what I am going to do in the end is just produce a regional report of recommendations for improvement. So that's what's happening.		
JS	So if you can tell me your role and what you do with building and construction sites?		
D	I'm employed as a Building Surveyor and err generally I'm a technical adviser here in the office and in the field I carry out inspections of framing or steel reinforcement. Basically elements of construction and if they appear satisfactory and in accordance with the approved details I will give them the nod and they can proceed, do record keeping and whilst we're on site we try to take particular notes about site safety so that kids not being able to enter the site in particular when no one's on site, storage of materials is a constant problem. I suppose building surveyors are in a difficult position where they try to maintain a relationship with a client and you try to give them certain umm, you've got to carry out your legislative responsibilities but err you can't go in heavy handed or completely put them off side. The effect of that is you don't get done what you need to get done and sometimes we get deliveries of building materials where there are pallets of bricks or racks of steel and the truck driver will just put them on the footpath or on the road but that's not the fault of the bloke who's doing the project work or building it but we certainly expect that once it arrives he'll move it from the public area and into his site. Generally they'll do that but sometimes there's guys you have to harass them a bit, not actually harass	Believes that doing sed control puts them in bad position with builders, believes need good relationship so that can see if they are building it properly and that if do enforce everytime you go out that they won't invite you any more. Implies that he sees the building stuff as more important than soil and	Relationship with builders Importance of soil and water

	Transcript	Analysis	Classes of interest
	them but you have to go back and say look mate I thought you were going to move that, you're putting me in a difficult position where I have to issue you here with a notice or even a fine. So, but I haven't got anyone here today I told you before or Mr Jones why you do this to me? Say come on buddy. You're constantly trying to explain why it is beneficial to them to keep the stuff off site so they are not liable for any damage or injury but you will never get them to all cooperate. It will be like the coppers saying we arrested 50 people today so from now on until ever more there will be no more crime in the city. It's never going to happen. On sediment, that's a similar thing, you get sand stock piles delivered or you get perhaps drainage trenches being dug and the sediment barriers if they were ever installed are destroyed. We've got a lot of problems with project home builders who might initially set up a vertical barrier, a sediment barrier but the hopeless tradesmen and their overworked supervisors are, between those groups so there is no chance that once the sediment fence has been damaged by movement off and on site, no one wants to take responsibility for fixing it. We're in a difficult position too if we issue an on the spot fine, we're not exactly going and getting the proof of who did it, we're taking a chance that for example a project home builder XYZ project home builder, we're taking a chance that they wont challenge the penalty infringement notice because if I issued it to XYZ i'm saying that I have a case that XYZ did it and XYZ might successfully argue in court that hold on we did have a sediment barrier but it was our subcontractor that did the damage, we weren't aware that he did the damage, why did we get the penalty notice? And I think our case like that that we would be likely to have a conviction upheld if it was appealed.	water Believes that serving pins difficult to prove who did it and feels that it is not the site mangers fault if a subcontractor does the wrong thing. Result is no fine and no reason for site mgr to take responsibility or punish the subcontractors	PINS Subcontractors Let off site mgrs
JS	But shouldn't they surely be responsible for the site so that they should have seen that it was damaged or.		
D	Well that's in the best of possible worlds but that is not the reality.		
D	You've got project home builders who have a supervisor controlling 25 or 40 job sites over 15 to 20 suburbs. He doesn't have his own team of tradesmen, the tradesmen are only interested in		subcontractors

	Transcript	Analysis	Classes of interest
	doing the piece of work that they have been paid for, getting in and getting out. It's not a matter of doing voluntary work or coming to the party, its what I've been paid for and I have to finish at 2.00pm because at 3.30pm I've got a job over there.		
JS	So it is not necessarily anyone on the site all the time who will take responsibility.		
D	No.		
JS	Right. Okay.		
D	The project homebuilders are notorious. They chop and change their site supervisors, they move them around. As soon as you detect a problem on site if it is a structural matter, they'll practically shut down the site and they won't come back for months, which effects their client. But this is all about sediment control rather than the bodgey project builders so generally your owner builders and the people that you, you can explain to them what is required and occasionally they will slip up but on a verbal direction they will generally clean it up and I rarely issue penalty infringement notices. I think I've given some people dozens and dozens of warnings and finally issued them with a penalty notice. It's been put to me that I'm going around it the wrong way but in the world we're working in, there's a lot of politics and you can't easily infuriate or aggravate or you could but you might not get the support, you see the politics says that if you issue a penalty or infringement notice, and the person starts to make claims that they've been harassed then you're in a position where your management might be going what are you doing, why are you doing that, well hang on, I'm issuing it because I've got this information and he's saying no no no, he's saying that. So you've got a lot of problems and in the end you could drive around now and see messes here and there but generally we try to get them to fix it up. I've got particular awareness of the hazardous materials on footpaths. We had a site where we had haybales on the footway to act as a sediment control barrier, and the steel fixes truck was parked out front of the site and he had slab mesh on a rack on the back of a truck, I had made my inspection, see you later fellas, I went to hop over the sediment barrier which	Feels mgmt wouldn't support him if he issued pins Thinks it's hypocritical for us to tell builders off for having stuff on footpath when residents put stuff out. He acknowledges however that if we explain to builders that it's about sediment it's okay.	Mgmt support Different standards

	Transcript	Analysis	Classes of interest
	was haybales and looking down at where my feet where going I didn't realise I was walking straight into prongs of steel. I had a good couple of good scratches/scars on my face. It gave me a fright, these guys turned white, they thought I had ripped my eye out, blood coming out everywhere so definitely sediment control in a public place is probably not a good idea, it should be maintained, sediment control should be inside the boundary of the site not in the public area. We could go out and have a campaign and pinch everyone for every piece of stuff we saw and then a week later you would fall over because we have a clean up a Council clean up which happens every 2 months or 3 months and the junk and crap that gets put out on the street, possibly not a sediment situation but just unsightly. Why don't you ask me a question.		
JS	So with that were you inferring that it is not really fair for Council to be imposing on the builders when we've got stuff lying on the footpath as well?		
D	Well that's one consideration. It leaves us open to criticism. It depends how we approach it I suppose. If we explain that the problem is the sediment is either impacts upon the infrastructure, we have the pits lock up until the really heavy rains flushes out that stuff it can impair the operation of the infrastructure, we are aware that as a final discharge point is around the foreshore, that this sediment if it is sand or other building debris can impact upon the local ecology. We are aware of that or we are aware that some of the materials run off can contain certain acids or phosphates which can affect like blue metal heavy rain which can pick up chemicals which are harmful to aquatic life. We are aware of that, ahh it's just that I think that in my approach if I see it and its obvious, I say you have to clean that up and most of the time, most of the time, yes, sorry sorry and they will get it done. You get a few recalcitrants, excuse me (he burps), you've got to observe the professional fairness so that you get it done and if he hasn't done it then give him a warning, and if he still hasn't done it give him a fine and then the whinging will start. It's difficult because we have to maintain a working relationship with these builders and we've got a client relationship on one hand and an enforcement on the other hand. So when you get coppers out there who are doing the regulatory stuff, they don't have to give you information about how to build your house or be your client, they just say here's the regs,	Relationship – believes regulation interferes with that	Relationship with builders

	Transcript	Analysis	Classes of interest
	I'm going to interview you, well okay what have you done, I'm going to caution you at this point so is there anything more you want to say, okay, your name, date of birth and here this is for you but we're not just regulators, we are out providing a service and there is a big conflict in so if SSROC wants to eliminate and really heighten the awareness of this problem of sediment entering the infrastructure or the local ecology it could be done but it would be politically difficult because of the constraints of having to maintain our regular relationship.		
JS	So you would say it was better if the regulatory was done by another area.		
D	Oh yeh sure. Even as a building surveyor, look mate you've got to clean that up and I'll be referring this to our district EPA Officer or whoever is employed and they'll say, don't send him out mate, he's a real natzi. I know he's going to pin me, say well mate, I think he'll be here in 20 minutes.	Prefer separate two roles of regulation and advising / inspecting	
JS	Okay, so that would be much preferable?		
D	Because I want them to call me out to sites, I want to be invited to look at the things that I want to see because I know at the end of the job you are going to ask me can you sign this to say its okay and like a lot of other surveyors I want to see the elements of construction but maybe they get a bit reluctant if each time we come out we are giving $750 fine, $750 fine, it might be a bit easier to separate that. But having said that I have issued fines and occasionally there has been no appeal, no word but project homebuilders, big whingers, real big whingers. Oh don't issue the fine, it wont be the XYZ company, it will be me who has to pay it, so why don't you get 20 ml or 20 ton of blue metal and fix up your vehicle access so then when your vehicles leave or enter site they are not churning up the sand and contributing more debris in the curb. It's all cheaply as possible, builders do it as cheaply as possible so in the end it is a bit of a game, a bit of cat and mouse, they keep doing it, we keep chasing them and hassling them and from time to time penalty infringement notices will be issued.	Relationship Builders care about $	Relationship Builders care about $

	Transcript	Analysis	Classes of interest
JS	Do you think that Councils aware of that concept? Like do you think that if we came forward and sort of said I think that this is very difficult doing both roles.		
D	I can't say too much about that. I'm not sure if they are aware, but they might be changes to the way they are set up here. I believe they are possibly considering splitting them into two units, doing the client services and the regulatory unit which is doing all the head kicking so.		
JS	Because I know some councils have it separate.		
D	Well I mean it would certainly remove that element of conflict and you've got no, if you're the regulatory, here's my rule book and here's my comments thanks and lets have a discussion, okay, we've got some education for you, oh seen you again you're a repeat offender, this is for you and I have to come back tomorrow, I need to see this this and this, if you want to appeal then you have 21 days to go to court. Keep it formal but not vicious. I always try to give an explanation why that rule may be in place, I know I'm not required to but explain why it is required but once again you are not always dealing with the site supervisor, you are dealing with a subbie who is there for the day, don't tell me, I don't want to know errr and what have you been up to and does the Council know and I I I , I can't really answer that, you'd have to speak to others there.		
JS	Okay. With the soil and water management plan, is that part of your role to check that they are there and?		
D	Yes we are. There are conditions of development consent currently asking for these plans from sites and we get to see them with the application for construction certificate stage. Fairly cursory, fairly cursory looking at a site plan, looking at where they propose to put vertical barriers or sediment, where they propose to have stock pile, vehicle crossing, where there is going to be the shed, the toilet, some builders, developers are quite good, they will implement what they promise to do but for a lot of others it is a game, its just a game, we will tell you what	SWMPs not implemented Workload/pressure Prioritising of tasks, assessments, complaints	SWMPs not implemented Workload/pressure

	Transcript	Analysis	Classes of interest
	we need to tell you for you to give us our ticket, once we've got our ticket well we'll keep doing what we want to do until you come around and waive the chain and then we'll do something. That is a big drain on resources, especially here, get those assessments out, why are these taking so long, why haven't we dealt with that complaint, there is a lot of pressure on to do things expeditiously and prioritise matters so what am I leading to. Well yeh we look at the site WMP's but ahh generally I think I take more regard to the conditions on site when I've gone to a site, see there is a deficiency here, move the barrier here sometimes a barrier is not really priority if I've got a sloping ground that's grass and I know that grass area for some metres is going to filter out sediment before water leaves the site we might even get some benefit from infiltration. Here there is a lot of excavation going or vehicle movements so certainly should have rumble boards and vertical barriers.	come first	Prioritising of tasks, assessments, complaints come first
JS	So do you think with the soil and water management plans that do come in are they generally, you know, pretty accurate in where they put the stuff or do they not know how to do a soil and water management plan?		
D	Are they pretty accurate? Do you mean do they implement what they promise to do?		
JS	No, even in just drawing it up, do they know where to put them, like on the right spot on the site plans.		
D	Usually they are aware of the significance of slope. In fact if it is a level site you don't need any sediment control perhaps except for the vehicle access so I think they are pretty much aware of that.		
JS	And if you get plans in and they had a soil and water management plan attached and it wasn't drawn, didn't have the right stuff on it, would you go back to them and say before you go ahead, you need?		

	Transcript	Analysis	Classes of interest
D	Yeh. Send it back sure. But they'd have to have bugger up location of the proposed, you know it was a site that was sloped from the back to the front so if it was lower at the front then if they showed their sediment barriers up at the back, yeh why are you putting them there?		
JS	Okay.		
D	Certainly you are open to give them a ring and say look mate fax me or send me a revised drawing and if they're recalcitrant or slack or too busy with their clients to immediately respond, then you would probably put it in writing and say look you have 7 days to respond to give me the information or we will refuse your application. Okay maybe it is not the most critical element of assessing construction certificate applications, perhaps it comes into force really when you are going out on site and driving around on your way to other jobs and you see problem sites.	SWMPs Lack of importance placed on them	
JS	I'm just wondering if we could stop them becoming a problem if we spent more on that soil and water management plan stuff at the beginning before they even start		
D	Well Education is a key part but I think ahh with the types of characters you are dealing with, maybe the best education would be in the hip pocket and the penalty infringement notice but then it gets back to that conflict and generated yeh duties. I mean you can't absolutely get rid of all of those problems with conflict for example even if you remove the conflict over site management, if you've got a difficult builder he might disagree with something he has done with the floor or the roof and you still have to persuade him that what he has done incorrectly, is no good and that he has to change it. I suppose there might be a level of frustration as well. In the recalcitrants, I think if I find repeat offenders they don't get too much grace but I still haven't gone over the top. If I see it, I'll ring the bloke up and say what are you doing, all that's stuff is on the street, it's in the curb I just drove past, oh, it wasn't me but I'll ring him I have just taken over the job and (the tape ended here and in between putting the new tape on he took the opportunity to express more negative sentiments about the system)	Acknowledges conflict in normal building inspections	

	Transcript	Analysis	Classes of interest
JS	It's true though, it is a big point how to get them and I guess that is why we are doing this, to work that out but		
D	You know, these EPA ads, stop pollution, what goes down the drain, you know that was quite a good campaign but obviously not running for long enough and no guarantee that a TV campaign alone does it.		
JS	But that's exactly it. I mean you could have that running all the time I don't know that they would change their ways.		
D	Yeh, you get some guys who are just blatant as well, you know they will hose out a barrel in the street, the concretor, Joe the concreter, cement slurry. From time to time we make use of the clean up provisions under the POEO Act which are quite good because even just issuing it costs them some money and they are aware if they disregard it, it costs them some more money. It's quite a good provision.	Likes clean up orders	
JS	So the admin fee and then the fine.		
D	Oh don't do that and they can still possibly get a fine as well so that's a good provision. I think one of the difficulties for SSROC is the amount of work that the staff at Council have to deal with, the amount of complaints and the number of responsibilities we have, this push for the customer service. It might be a good idea to have a dedicated officer who drives around the city all day, all day, pretty quickly he or she would be out of a job because the word would have gotten around, so many people would have been fined and it would be oh, don't do that, that Rangers a real arsehole or whatever.	Dedicated person, acknowledges that word would spread and improve if start fining	Dedicated officer Acknowledge builders improve if fine lot, police it
JS	Yep some councils are doing that too.		

	Transcript	Analysis	Classes of interest
D	I don't think you'll get your building surveyor doing that because of that conflict. I think we'll go look you've got to clean it up and then the guy will clean it up and that's the end of the section so that's probably the typical motive, a typical MO.		
JS	Okay. So until from what you're saying, I'm guessing that until Management changes their attitude towards what is acceptable and what is not acceptable, it is going to be hard for you guys to change like, you know, if people are whinging and stuff and then Management comes down on you.		
D	That's right. I mean you can't tell your officer go and pinch them, go and knock them off, I want to see some fines and should the officers do that you then cannot go and quiz those officers because you have had a complaint, an allegation which is a standard response. If you are under attack, attack the messenger or attack, you know, try and destabilise the person who is regulating your activity or go to the boss or go higher. After a while you realise look, okay I know how to play, I'll just get him to clean it up, I'll make a record. Alright two days later I'll have to go back, he still hasn't done it, look I've rang you again, do it again, clean it up. I still haven't issued a fine, why are you doing, why are you picking on me David, why are you doing this? Come on you have got to do it, here's some hessian bags, they wont last long but for the time being make a gravel snake, put them in the curb to stop that stuff running down the hill and then they've done it but then they wont repair them when the vehicles driven over them so you come back and say look these gravel snakes are no good or these sand bags are no good, the sand itself is now spilling out. But I did what you wanted me to do, I know you did but they are damaged now and you need to repair them. I've got no one here, I mean really so okay, well look I've got to fill this in so now I'm waiving the book, you've got a fine book, yes I have. I'm an authorised officer, I've already told you, now do I have to issue the fine or will you clean it up. Oh, oh I'll do it. Then later on why is he picking on me, why is he harassing me. So I'm call, I'm calling, I'm recalling a particular crazy person I had to deal with.		Mgmt support
JS	You come across some interesting ones, don't you?		

	Transcript	Analysis	Classes of interest
D	Yes.		
JS	I used to be an EHO so I used to bring law enforcement on well on soil and water stuff as well as the food stuff and all the rest of it. So yeh.		
D	Well I suppose we've got to be careful to that we, what's the civic good. I mean that's the other thing that's got to be questioned and in cases there would have to be an exercise of discretion and for example in some of these clean up days its probably a good case where there's some people we should pinch even though we've invited them to put their material on the street, well perhaps for some it should be not fined but look you can't put it out like that, you have to properly bundle it or put it in a container. Yeh, you could probably improve it but its not a priority because of other priorities are taking precedence on workloads and turn around time for applications and it is not easy just to say okay no warnings, just pinch them because that backfires on you, you've also got that responsibility too, to properly investigate feasible hypotheses, you can't just say oh the address is number 26 whatever street and I know that XYZ is doing work there. I can't sort of just assume in a criminal manner that it must be them because it could be somebody else doing it.		
JS	Putting stuff down the gutter? Yeh		
D	I have to make, but I don't have the time to waste to properly or thoroughly investigate it so often it's a matter where I want to pinch, I mean this is strong enough for a pinch but who can I put it too. I can't assume it's the bloke because if it is challenged I have got no evidence and that puts Council in a bad way.		Fear of pins being challenged
JS	Has there been much training like on, I'm thinking specifically on conflict resolution and negotiation skills or evidence collection skills or all those kind of things because it sounds like your roles involve a lot of that.		

	Transcript	Analysis	Classes of interest
D	Yeh, I've had some attendance in seminars in dealing with difficult people. I haven't attended much training really in evidence gathering but I don't particularly have an issue with that. I know what I have to do in proving the elements of a case or elements of an offence.	Expressed concern about pins challenged but doesn't think needs training	
JS	Okay.		
D	And I'm familiar with the court procedures. Achieving consistency and avoiding the political ramifications are pretty desirable but I don't see how to do it. If you got 15 officers, how can you ever have consistency?		
JS	Other than have a policy that they would do it a certain way.		
D	Well yeh, but even the policy can be open to interpretation. I mean you can show us photographs of certain sites and various degrees or varying degrees of poor repair or environmental nuisance and you can say at this point issue a warning, at this point issue a written warning or a clean up notice, at this point issue a penalty infringement notice, at this point interview or whatever. You do that but it is still open to interpretation.		
JS	Okay.		
D	You probably, if they were fair dinkum, you would probably appoint an officer and then again how practical is that, that officer	Feels issue not really taken seriously by Council, if it was would have dedicated officer	Dedicated officer Importance of issue
JS	Will get around to the whole lot		

	Transcript	Analysis	Classes of interest
D	Yes, And that officer has days off or annual leave and then who does it and okay I realise we've all got to get up to speed and all the EHO and Building Surveyors authorized under the POEO Act. Ahh yes, certainly policy can help. I think you still won't get passed that basic thing with the surveyor, I mean the caution, mate you've got to clean that up and then we'll go expecting that it will be done and we'll come back to follow it up, it might not be the next day or the day after but we'll come back and if it is still there, it is like mate I've asked you and I have accepted that you will do it, why haven't you and then you've got to make a decision about well is he having a lend of me or is it really a problem, has he had these few disasters, he's just explained to me, oh jesus I'm human I can understand what you are saying. Okay, I think they have a lend of you in a lot of cases.	Acknowledges one dedicated officer not enough and better if all skilled up	
JS	Some of the stories are pretty unbelievable.		
D	Yes, But you've got to have discretion, you're a motorist, there are times when you couldn't talk your way out of it, there are times when you weren't even talking your way out of it and you're just explaining what happened and you're waiting for the ticket and he says get lost, off you go. And you think oh, they're all right. Not hard and fast. Yeh, politics that's a big problem and you will never get rid of it.		
JS	That's good to hear because it is something that I think has been ignored in the past, it seems too hard so it is kind of left for people to continue on but these issues are not addressed and they need to be if we are going to get any change.		
D	Well I mean, you will probably get the officers doing it but they would have to have some surety that they are not going to get their heads kicked because of a spurious allegation that they came in as though they were the gestapo or the jackboots.		Mgmt support
JS	Yes. So they need back up by management.		

	Transcript	Analysis	Classes of interest
D	Oh yes, for sure.		
JS	Okay. Sounds good. Thank you for your time.		
D	No worries Jodi, see you again.		

A3) Example analysis of interview transcript – Craftle Council

Name: Stephen
Role: Environmental Services Manager
Council: Craftle Council

	Content	**Analysis**	**Classes of interest**
JS	So as I said I am interviewing with some questions, I know that you are new here so when you are answering, feel free to actually tell me about your experiences at other Councils as well. So can you tell me what your role is first of all to do with soil and water issues?		
S	Okay. Um. I've been hired from Craftle or by Craftle Council as there Environmental Services Manager. As far as I understand it's a big picture thing. So any sort of environmental projects that come in anything that is topical at the moment and soil and water is one of them then I will be looking into, investigating, making sure people get the right kind of training, the right kind of information on legislation is that adhered to and made sure that it is in a digestible form like we've got Rangers who Charle's is looking after but at the same time it's a funny sweep because it is a provider service split here at council. I'm sometimes here by myself but there's all these people that I can actually give things to do, that includes beach park recreation um parts of planning and environmental service, public works department and corporate and community I think they call it here. I'm still like finding my way around in terms of the right contact people because there has been quite a change over of staff as far as I understand. Some of the people that I need to speak to such as the landscape architects, the bush regen people, I haven't been able to get in touch with yet and parks supervisor are all of the stuff particularly for in house council, maintenance procedures or how we do things I haven't been able to tap in and find out what is going on because there are a few incidences I've noticed we haven't quite got ourselves in house correct yet and we are going to start going outhouse, probably not a good term, start going out there and telling people what they should and shouldn't be do		

	Content	Analysis	Classes of interest
	So it will be good to tidy up ourselves.		
JS	That's always an ongoing challenge in every Council		
S	Absolutely so I guess it's one of those steps that we have to take.		
JS	So as far as soil and water goes your role is coordination		
S	Coordination, making sure like I said before that everyone knows what is going on, the things that SSROC or you guys are doing, making sure that they are aware of those and I have made some comments in regards to them and faxed them back		
JS	Great		
S	And when that sort of kicks off. And at the moment I am waiting for the managers to notify me because the big push at the moment, one of my priorities is to make sure that people are up to speed as to what is happening with soil and water erosion, soil and water management, particularly for building sites and so the stuff that you are doing is particularly important to me and so that is why I am keen to get it going		
JS	Was that a priority set by management?		
S	It was a priority that is set, yeah, yeah, it's an informal thing that has been said to me		
JS	Okay		
S	I'm not sure what the procedures are but effectively what one of my jobs once I've finished the state of environment reporting will be to concentrate on soil and water management and the regulation of building sites within communities	Mgmt prioritising it	Mgmt power

	Content	Analysis	Classes of interest
JS	Okay		
S	Within the municipal, I think they call it a municipality		
JS	Can you tell me at the moment who does enforcement, education, warning, follow up		
S	You've been speaking to. At the moment it should be the Health and Building guys. I'm having speech problems! The Development Applications come in and they set conditions and they really should follow those ones up. At the moment, the usual problem in local government is that there is a lot of things to do and there is not enough man power, getting people out there, but what I am going to do is come up with based on your information is a small checklist but people just do it, it's a visual observation too, make sure that this sediment fences are up, umm you know stormwaters are properly bunded, waste are properly separated, it also comes down to waste minimisation as well. So a bit of both from an environmental point of view, it's more a big picture thing. So a short check list to make sure that, that is all happening, if you see something that if you don't know what to do, contact me or contact one of the Rangers and if a fine needs to be issued and they have been warned a couple of times before we just hit them with a fine. I don't think we should muck around. We've given them warnings, given them time, been going on too long	Assumes a checklist will help but why? Coz it will focus attention on what needs to be done. This will only help if the people want to do the role.	Time / workload / resources
JS	You said environmental health and building surveyors, are they joint, like is it a joint EHO building surveyor or separate people		
S	No, they are called, what are they called, Building, I think they still go under the old title of Building Surveyor, I will have to look in the phone book. I haven't worked out what their title is, but the guy that sits next to me Bob Cairns, he actually does Food shop inspections and things like that so there is a distinct separation that is still there. A couple		

	Content	Analysis	Classes of interest
	of them I have noticed do, do like skin penetrations, tattoo shops and stuff like that. Immunisation is also done by some of these guys.		
JS	And are people called EHO's or called Building Surveyors		
S	Building surveyors		
JS	Oh really, okay. Alright. So, So they are doing the enforcement and the Rangers are doing enforcement as well		
S	The Rangers are doing regulation and enforcement I guess you'd say so there's as far as I know there's 8 of them and they drive around the shire or, I'm used to calling it a shire because, they drive around the council area and basically make sure that dogs are on leads, you know, all these sort of things. They are the authorised officers under the POEO Act.		
JS	And your building surveyors presumably are authorised as well		
S	Pretty much everyone on this floor's authorised. So if we see something we should be actually doing something about it but my predecessor Peter Davies who I said, pretty big boots to fill at the moment but he as far as I know organised for everyone to get the training, um, whether or not people are still up to speed on it because some of it has changed, particularly the litter amendments etc um, that is something I need to work on and make sure that everyone knows exactly where we stand currently because the fines have also gone up as well so	Trained and authorized lots of staff	Council Staff training
JS	Yep. Do you know and again you might not have had a chance to, do you know how the communication stuff works between the Rangers and the Building Surveyors to make sure that they are doing, not duplicating or		

	Content	Analysis	Classes of interest
S	Yeah, as far as I know, well Charles's the Manager of the Rangers so if anything happens we usually contact Charles first and I think what the Buildo's do is that there's a system, I think it's customer action request system- CARS, it's called CARS and it's basically for all complaints and requests go onto it and they go straight to the Rangers and the Rangers deal with it. They are like the first call and um if need be they need technical advise, they come and see me or Bob or anyone in here type of thing.	Complaints electronically passed on	
JS	Okay.		
S	It's more of a support. First call then if they can't deal with it or it needs further action then they speak to Charles and Charles might have a word to me and things like that		
JS	So it's basically starts off with the Rangers, comes up through Building Surveyors if necessary and then onto you		
S	It would come up to Charles and then Charles speaks to whoever not necessarily myself or if it is a development application or something that has been gone ongoing, it might even be Bill, could be the bigger picture thing		
JS	From what you've seen, is there things in the way the system works that help or hinder the process		
S	Ah to be honest I'm not really sure whether it helps or hinders, I haven't actually seen it in action because I haven't had a request pretty much um as far as I know anything that gets dialled in or called into Council, it is pretty much acted upon instantly so it works quite well from that point of view in terms of the big picture thing, whether it is effective or not I haven't had a chance yet to assess it but um in previous places where I've worked, it's worked okay. Yeah but they have had dedicated sediment and erosion, there's two		

	Content	Analysis	Classes of interest
	guys that do all the sites all the time, make sure that the sediment fences are up etc etc. Mm		
JS	Do you think the Councils sees it as a serious role, a serious issue for them to deal with		
S	Yeah. Absolutely. Craftle Council, the good thing about Craftle Council and why I applied for this job effectively is because the guy that was in this job before me took on a very proactive stand but at the same time the staff themselves are fairly um particular in the environmental field. Some Councils you go to and my previous place where I have been, they generally go yeh yeh something we have to do but in this place people actually say that's a good idea how can I help to improve it.	Staff attitudes and motivation	Staff attitudes
JS	Right. What do you think leads to that attitude?		
S	Smaller council, smaller council area, people take more ownership in what they do, um, I don't know maybe better morale, it's hard to say, I think these days the legislation stipulates that you have to be more aware of it and you have to do it but at the same time as you and I know there is always ways around things like that. It might be time that makes you not do it or a lack of funding or the fact that you've got like six jobs on all at the one time that you are trying to deal with them all, something's got to give but for some reason here, things give but it's prioritised so you get a chance to follow up on it again.		
JS	Okay. So that's good and that is the exact kind of thing we are looking at is with all these surveys is where does it work well and where doesn't it and what leads to that so we can try and duplicate it		
S	People probably say different things but at the same time we are talking about integrated environmental management here, I mean soil and water, it is not just the environment its		

	Content	Analysis	Classes of interest
	happening it is like the builders that are contributing to it, it's the guy washing his car, the guy washing his house down, whatever it is, it's everyone sort of contributes to it, it is not just one person, you can't sort of like target the building people, and say you guys are the sole cause of soil and water erosion like everyone else at Council can be, so yeah		
JS	Have you actually had a chance to drive around the area and see the conditions of the sites		
S	Yeah, I've had a look around and some of them are pretty bad ah, this morning just before I got back where we were over at the BBC Hardware shop and he's got concrete and stuff draining all over the stormwater pits and stuff, had a word to the manager, he then took us to the site foreman of that particular area and they were both very compliant, they said they would clean it up and give you a call back but um, I think it is just a lack of awareness at the same time. And generally most sites that I have noticed don't have very good what do you call it, um things like sediment fences, there is one that I am trying to think of,	Sites poor	Sites poor
JS	Controls		
S	Yeah controls. Controls or any water controls or anything like that, I think its either that Council hasn't previously been particularly hard enough on the builders in the area. Where I used to be, where I used to be at Hornsby that, because there was those two full time guys, people just knew that it was going to be tough and they put up their sediment fences otherwise they got the fine.	Builders respond to enforcement	Enforcement = change
JS	Okay. So from what you've seen on the ground, it's, would it be		
S	On a scale of 1 to 5. Probably 3.		
JS	Okay 3 on good or 3 on bad		

	Content	Analysis	Classes of interest
S	3 on in the middle neither good nor bad. It's just some parts do quite well and other parts yeah. A lot of them at the moment you don't get so much building around because it's pretty much built because a lot of it is renovations and even then, you know, concrete trucks etc etc don't do much about, had an incident yesterday where there was, they were taking waste from the development site down at Tamarama Beach which was a Telecom Facility there and it was a wet slurry driving up a hill, load shifted and started spilling out the back and the company did the right thing and he's done everything that I've asked him to do so far and they have been very compliant no hassles so far they sent out a truck, I've never seen it, it's only 3 days old, effectively like a big vacuum cleaner from the back of this truck, put the spout back and they basically came around and sucked up half the load out of the truck so that he could get on with it and basically scooped it all back in and then swept up as much as they can. It's still a bit of a mess down there but I've rung them up and I said look I want sediment bunding, sand bags all around, or socks or sand bags right around the storm water drains and they have done that with witches hats so I can't complain. I guess I will just have to wait for another couple of days and let things settle down and get, or even get them to come out and clean it up properly again.		
JS	Okay, have you had um any instances of aggressiveness or lack of compliance when you've asked to do things so far		
S	The two examples I have given you so far like with the BBC Hardware today and the truck yesterday, no problems at all. People are saying look if you've got any problems, here's the phone number, take them, when do you want us to do this by, I think people are more aware but these guys are in the business of doing that umm but the BBC Hardware, I was a little bit surprised that they came on board so quickly but sometimes you, I guess when it is a negative thing you wonder if they are really that sincere, only time will tell. We've written them a letter previously, apparently once umm, this time I will just have to wait and see. It's basically they've got, where they the builders pick up the concrete bags,	No conflict they comply	No conflict

	Content	Analysis	Classes of interest
	it just drains straight into the stormwater and there's evidence that it has been there for quite a while, because the concrete has set itself, made another little driveway. In some respects it's good because the stormwater drain is just before, just above it, this driveway and so what happens is the concrete spilt, stormwater drain, concrete spill set like a mini bund so it doesn't wash (laughter), so almost like a good thing. Yeh it's kind of interesting. If it had been downstream you know you're got to prosecute or you've got to get them to clean up and then prosecute if they don't do it as quick as they can.		
JS	Do you think that um they will change with awareness?		
S	Yeah, like basically we didn't go in there and say you are going to get a fine issued, clean this up, what we try to do is more an educational process and that is what is really good about most of the people here. They don't go in there with the attitude this is legislation you have to do it, it's an educational process in the fact that, okay this drains into the Centennial Park Ponds and all you are doing is adding to it and eventually all the water that you see around the place does originate from here like if it's rainwater it goes into there and on the other side it drains into the Beach or the Bronte Gully kind of area, so taking it easy and explaining it to them why you have to do it, giving them options as to what they can do and you know explaining, letting them ask questions, like they ask questions like what's bunding, you and I kind of know that back to front, that's educating them as far as I'm concerned, umm yeah, some people don't think of it, maybe they don't know	Education works	Education = change
JS	Okay. So you are saying that you are explaining the consequences from the environmental point of view, do you think most of them care about the environment		
S	Well, yeah, I think they do. I think ah, anecdotally generally they probably do. From the two guys that we've seen, when we've said this drains somewhere, they seemed to know where it drains to, like they both said that it's a drain to the beach, well some of it does	Point out environmental consequences relative to them	Show builders relevance to them

	Content	Analysis	Classes of interest
	but most of it drains back to Centennial Park Ponds and they said well oh we go down there on weekends, and so they were generally receptive to it and um it was good from that point of view, whether or not they do anything, then it comes into the economic side ah, they said ah well, the quiet times for us is on the weekends so they are going to attempt to do something on the weekend um, that is fine with us, we have a word to them, like I said I've just got to go back there and have a look and keep reminding them and if they don't do it after a while then hit them with a fine.		
JS	So it is an interesting issue about what makes people change, is it simply awareness, finding out about the issues, is it the fact that they could get fined and fear of fines.		
S	Some are fines, like it depends on people. Everyone is different. Like I've had experiences before where I've spoken to builders and basically um they don't care, they say well okay hit me with a fine and I'll deal with it later. But then when we try a different tack and like you try to find out whether they've got family, okay well next time you go to the beach, this is all your stuff, it's the classic cliché, they are always clichés now aren't they, you speak to people and say well this is where you swim in it, this is where you drink and all that kind of stuff, it seems to work a little bit but other people they care about the family and they don't realise, other people just got hit with a fine because that'll hit them financially and they're hard up anyway and they might be skimping just to save a couple of hundred bucks but then they get like a $1,500 fine, you see. Most of them are companies or small business, it's good that it can work that way . So there is enough, I think the legislation gives you enough leverage to say well these are your options if you don't comply than hey this	Relevance and fines = change	Relevance and fines = change
JS	You were saying before that um like everywhere there are a lot of different tasks that people have to do and some things occasionally do slip, you were saying that this is generally an issue that gets attention		

	Content	Analysis	Classes of interest
S	Soil and water erosion or soil and water management. Umm. Yeah I think within this Council it gets a fair bit of attention, the fact that I've been told that I need to sort this out, um is a good thing.		
JS	And that came from?		
S	That came from my Director.		
JS	So not the manager, the director. Oh excellent. Oh wow, okay.		
S	So there is a double thing waste, site waste minimisation and also soil and water management so double whammy		
JS	Okay. So if that is at the Director level, would you say that the CEO and the elected members and things are aware of the issues		
S	Yep. Definitely. I had a meeting this morning with one of the Councillors over a different project and she had actually mentioned about soil and water management and basically while I was sitting there, I don't know there was a really strong flow of water in one of the gutters and we ended up following that up and it turned out to be an air-conditioning coolant so we will get back onto that tomorrow. Um. But yeah like she was aware of it and she knew what was going on, she said I'd like to clean this up and you know have a nice clean gutter.	EM and Mgmt awareness	EM & Mgmt awareness
JS	Okay. Okay. And um where do you think their awareness comes from with that?		
S	I think she's just got a bit of an environmental bent. She's one of the Greens elected members. I'm not sure what the politics is for the environment or which is the best one, umm in terms of where she, I just think she is interested in that kind of thing.		

	Content	Analysis	Classes of interest
JS	Okay. With the elected members is the training done for elected members on issues like this?		
S	I never thought about it. I don't know if there has or not in this Council. In my previous experiences basically we couldn't get them to sit down for five minutes, I mean they are usually there because subject to them being paid for it, but they used to do it in their own time and they have other businesses and other things to do. Most of them by their voting or ratification or endorsement of particular resolutions or recommendations is their way of saying we will support this so, yeah, it can be a good thing.	Difficulty in training ems	EM training
JS	But from what you are saying here, it's not something that occurs regularly on any issues or ?		
S	I wouldn't be able to tell you. I don't know sorry. One of the other guys might be able like Charles or Matthew might be able to tell you that.		
JS	Okay. Umm. How successful do you think education programs are and how do you judge success?		
S	Here at Craftle? Or in general		
JS	In general.		
S	Education, um, yeah, exactly how do you, depends on who your target and who your audience is, um, depends on what kind of information you are giving out to people, um, depends on whether people are interested in it or not, a whole lot of factors come into it but effectively an education program for me is telling people even if it is just a two second one to one um letting them know where the stormwater goes, know that their waste is, that	Educational methods and effectiveness Achieving Change	Educational methods and effectiveness Achieving

	Content	Analysis	Classes of interest
	their waste is um collected on these days and should be disposed of in these ways and that's a part of education, um how do you judge whether it is effective or not, good question, how do you know it's going to rain type of thing. Um. You could say well use indicators like state of the environment reporting indicators, you could say a whole lot of things but ultimately it comes down to peoples attitude or cultural change, it's more of a cultural change that I think makes the bigger difference. It's hard, it's like trying to get you to um I don't know not use cups and use bowls to drink, that sort of, it's hard. But it's a slow process, umm, I think if you keep at it and you are getting some assistance from particularly the guys at SSROC, that's all very good stuff that comes across so in particular the pamphlet that you're creating, umm I'd like to be able to tap into those at some stage and build on other people's education programs. There's no point in like trying to get some kudos and reinventing your own program when someone has already done it. From my point of view being employed as an Environmental Services Manager, it would be nice to get some kudos and say look we came up with this idea but at the same time if SSROC has already done it or Leichardt Council has done it or Hornsby Council has done it or whatever council has done it, you should be building on that and saying okay this is a good start let's see if we can get some more, rejig it a little bit, try to do it for ourselves. I mean if it works, other councils might want to take it on.	Reinventing the wheel – looking for personal reward	Change Reinventing the wheel – looking for personal reward
JS	Do you think there is a tendency at the moment for people to reinvent the wheel, like you were saying they rejig things and stuff?		
S	There is. A lot of the education programs are rejigged but at the moment it gets to that, its like a feeding frenzy at the zoo, that's the way I see it, like particularly the NHT money, um, a lot of the grant money, people will just come up with projects, the granting authorities really should be looking into how that money is being spent, I mean you've got to do reports back but it is very hard, everyone wants to get their fingers into the pie. It's the only way, a lot of the environmental work is being done and the common thing that I've noticed is that really that money that people applied for should be divvied up like,	Grants get env work done. Often not effectively used, should be more cooperation between councils	Grants get env work done. Often not effectively used, should be more cooperation

	Content	Analysis	Classes of interest
	even if you are unsuccessful you should be notified of somebody who is doing a very similar project and then the two of them get together, it's like exactly what SSROC does and that is some thing that I admire, it is something that I think is really good from SSROC's point of view is that they get all the councils in the area together and work on projects so it's like a joint resourcing thing but I can't see why they can't do that for the grant and because like everyone is saying NHT grants are running out, we are coming to the end of them, this is the time that we should really be sitting down together and saying well I know Hornsby Councils doing a particular project, why don't we work in with someone there, sure it takes time but yeah, time is something that I think a lot of councils have. We'll be here, we are still the regulating body, you can't, it's not job security or anything but you've got to be here. Um, It's an essential.		between councils
JS	You were saying ah, a lot of the stuff, the environmental stuff, the more proactive stuff only occurs with grant funding, is that what?		
S	No I think the grant funding is the impetus for to kick it all off but I don't think it is the thing that keeps it running, ultimately it comes down to the enthusiasm of the officer running it, I noticed a few education programs um what's an example, stream watch for an example, is a good example of if you have a really strong coordinator within that school, you will always get stream watch happening, it doesn't matter which year or what group it is, it will be there but then when that teacher leaves, it's gone. It's the same with Council staff, Peter Davies had a particular bent on certain issues at Craftle Council, I may not have those same or may have a different tack or may not give them as much emphasis so they may lose, I would hope that I would be building on what he has done and then going back and revisiting it's like a perpetual recycle thing like we started off with EMS, keep EMS going, we started off with State of the Environment Reporting indicators, keep those going, and just like build on them and if they need modification, it's a dynamic process, all dynamic processes go through the usual thing and you'll hear it over and over again, you've heard this a thousand times implementation review and all	Officer enthusiasm effects outcome of projects	Change = officer enthusiasm

	Content	Analysis	Classes of interest
	those kind of things so yeah		
JS	I guess it comes down to a lot of places don't have enough staff to do all of those things to continue them on		
S	You need to be a little bit innovative and that's where I think depending on who it is, some people say look I've got no time for that but like the classic example is sitting in the office here, um, someone that has applied for work experience, I've given him a month and he is working on some water works stuff for me at the moment and also SOE. He's a final year student so I would expect him to be a certain level, we can't pay him unfortunately but for him he is gaining the experience that you wouldn't necessarily get. It's a lead in to Council. You've got to be a bit innovative about how you find resources, sure granting authorities, granting bodies are one way but they take a lot of time to so by the time you have gone and written up the grant for a particular project that you were wanting to run, you could have tapped into one of the unis and run with them a little bit so yeah, yes and no, yes and no. Like I can say resources will always be a struggle, you could have a 100 people here and then you just get bigger and its like a need, it's a want rather than a need.	Time and resources = excuse comes back to motivation and interest, can find a way	Time and resources = excuse
JS	It is isn't it, you can always find more and more work to do		
S	Yeah. So you can go out and do bigger and better projects and then you need more people and then eventually it's like empire building to a certain degree I think empire building works, you've just got to make sure that whoever is right at the top really has that big picture		
JS	And does the CEO have a pretty good big picture?		
S	If it's the General Manager that you are talking about, I'm not, I haven't had much to do	Mgmt open, trusting,	Organisation

	Content	Analysis	Classes of interest
	with him, my director or Bill who's my director um he's as far as I can tell is very switched on, gives me the freedom to do things and I think, let's me run the projects as I should be running them and that's good. And I've only had one or two runs so far, I haven't had run into any difficulties so far.	supportive empowered staff	culture Mgmt style
JS	So that's good. I know that traditional local governments did mostly the engineering and the building stuff		
S	Or all the planning stuff which is why I'm a little bit surprised because Bill is a planner by trade. That's his background but him having environmental services, I'm not sure how it all came about like this but the fact that he supports environmental services is a good thing		
JS	That's great. Yeah. Cause I know in some places I've been told that there is that conflict still about the fact that local government used to be predominantly engineering, building etc and environment was very small and now environment is growing and is going to continue to grow whereas some of those other areas just might not grow and that can be a bit of a conflict between it all		
S	Yes and no. I think the two really, like if you are talking integrated environmental management it really involves everyone and no one should be sort of excluded out from it. Some places, or the place that I previously worked had divisions where it was like the planning environment was separate and I think to a certain degree that works but if you're not there with the people all the time they run their own projects and we run our own projects and ultimately you are going in a Y shape kind of road rather than like a two lane road.	Integrate environment over whole council. Involve everyone	Whole Council Involvement
JS	Yeah so you are saying that environment isn't a discipline of just one area of council?		

	Content	Analysis	Classes of interest
S	Environment is everyone. Engineers in particular, scientists, I take it that is your background Jodi, you are a scientist, we do the common slag of engineers it's easy to blame them in the same way, how many scientists are making a push towards making their, there is now the environmental engineering and there's more points that you can do before you couldn't honestly say well we made a concerted effort to get them to change their way of thinking, it comes down to a lot of the time we keep blaming economics but economics is, the triple bottom line is important but at the same time, the three of them should be working together, they shouldn't be treated as three separate things		
JS	Okay, that's good. It's a very healthy way, particularly if you are able to get it through to the department to see it that way as something for everyone		
S	A lot of the time the engineers don't really know and they are looking for help, um, people say oh at Council you've got a lot of dinosaurs up in the works department etc but I think a lot of them want to do something it's just whether or not they know how to and whether or not it is the most cost effective way so it comes down to them running a project and if they go over budget, they get rapped on the knuckles so it's working together like at the moment there is a couple of, at work here there's a guy that's looking after, he's a project manager for Bondi Pavilion and he needs to replace a light but he's given thought about solar lighting and so we are chasing up information for him now in regards to that. I know there's not that many manufacturers but if it comes down to a cost thing and it suits his application then we are half way home.	Staff willing to admit don't know, trust, openness	Organisation culture-openness
JS	Yeah. Okay. That's good that they are thinking things like that. Yeah and that they, there is enough cooperation in the place that they feel that they can come to people and get help. Okay. You mentioned before cultural change is hard, the cup to the bowl sort of analogy, um, what methods would you use to tackle that kind of cultural change		
S	Good question. Um. Well it's not, here we go again, you're sort of asking the question of	Change involves all	Organisation

	Content	Analysis	Classes of interest
	what do I do and my answer would be it's not just myself so in that case I would involve the relevant people within Council umm like a group or a forum sit down and thrash out some ideas, you've got to give people ownership, that's the most important thing, I mean it's been flogged to death at everything ownership, ownership, ownership but preparation and ownership makes it work and I think um yeah it's just small, small projects if you can't do the big ones in the meantime, do the small ones.	ownership, do what you can achieve, not focus on what you can't	culture ownership, focus
JS	Can you explain to me a bit more about what you mean by getting them to sit together and do some, umm ownership, getting the ownership		
S	A lot of the times because there is different sections, people do, they do their own things, they are not aware of, well soil and water management is a good thing, because Engineers are upstairs designing them but for a start they don't speak to the guys that have to clean them, they might ask them initially or base it on anecdotal evidence but really the person that cleans it should be going back up there and saying well look the cigarette butts are slipping through the grates, they don't work so well and it's hard for me to clean it so it becomes an issue so come back to the designer, redesign it, it's like anything, it's like people building cars, car companies making them, they could build a car, if it doesn't suit anyone's needs, no one is going to buy them, and it comes back to the same with environmental issues, if they don't understand or haven't had any involvement of it and people see scientists like out there, like knew what we were talking about ionic particles or neutrons or neutrinos and all those sorts of things and it's not, science is effectively, I guess we're like um nature's engineers, that's the way, it's a problem solving thing. You've got a stormwater problem, you get engineers to fix it up, and you use a scientists to explain why, its more background information as to why you're doing it. When you're talking about a cultural change, how do you go about it, you need everyone involved, you need the person from the cleaner to the designer to the person that is coming off the bus to do it. So. yeah. It's an integrated approach and I think that is quite important. Or as a Manager, I think that is important. Whether or not it works technically or whether you	ownership	Ownership = change

	Content	Analysis	Classes of interest
	agree with me or not, that's just my personal point of view.		
JS	I do agree. Um. And you, that confirms what you were saying earlier about the builders, um, while you were saying education when you explained it you said telling them about the issue and why it is important but also giving them their options and helping them and letting them answer questions, ask and answer questions and stuff and so not just that telling them stuff.		
S	A lot of builders though generally like to think they know a lot and they probably do, there's a lot of things that I don't know about building and I'm not professing to being an expert in it but they just like to talk, a lot of times they just want to tell people things and a lot of that anecdotal stuff you eventually learn off them, say like look we've got no where to store this concrete but here and then when you explain to them your concrete shouldn't be getting wet and if you put it here it will basically, if anything comes down it, it will get wet, oh yeah, we will store it inside so it comes down to being lazy, I mean everyone is different. You look at people's desks, I like to clean mine up when I've finished work at the end of the day so it is nice and clear other people just like to leave it like this and I think from a builder's point of view when you are talking about soil and water management it doesn't take much just to close the folders and you know put up your fencing and put your bunding, the equivalent would be doing that instead of closing folders and stapling it all together. So everyone does things differently. It is coming to an agreeable way of doing it.	Admitting not expert, willingness to learn from builders, compromising to find way forward	openness
JS	Okay		
S	Which is your management control. And all that kind of thing.		
JS	And umm having the time or the will to actually want to do that with them because a lot of officers say that they don't have the time or the will		

	Content	Analysis	Classes of interest
S	For an officer fair enough it's, well it's not really it is just an excuse, it is some thing that should be done but from a builder's point of view it takes an extra half an hour I guess. Oh if you set it up properly, it's a five minute walk around at the end of the day as he is driving out, you do it when you leave your home, you make sure the windows are closed, the stove's off and that you haven't set your house on fire by leaving a candle on, you put it out. That's all pretty much what it is I think from a control point of view. It's just part of your procedures. Like the guy at BBC Hardware said oh yeah we haven't cleaned it for a long time, well it was like you haven't cleaned it for a long time but this is what happens. A couple of minutes of sweeping every day, um building a proper concrete bunding area saves you having to do it, saves you having to get to this stage where the Council has to come in and say this is not the way it is supposed to be done.	Time = excuse	Time= excuse
JS	Okay. That is all good stuff. Umm. I've got a few more things on process but I think I'll ask the other guys because you're saying you're not so sure how it all occurs yet things like the communication about filing, how they issue them complaints and how any reports that are filed, other things about how sites are located or problems are found, whether it is by driving around or whether it is actually looking through development file applications		
S	Some of them can be found, like some of the ones that I've noticed that have come up are like by residents, some residents awareness, but I'm sure you've heard this before, the residents use it as an excuse to get their domestic disputes resolved, so like Joe Bloggs across the road had an ongoing battle with this guy across the road who has had his building approved and he doesn't like it because it is going to ruin his vista or something like that, um so he sees something leaking out of his driveway or you know builder pouring something down the drain, he rings up and says hey look Craftle Council I just noticed Joe Bloggs across the road is doing, it's not actually Joe Bloggs that's doing it, it's the builder, yeah and in some cases the subcontractor which everyone knows is on the bees knees to most of the problems, they come in and do the job and then they are gone,	Subcontractors and putting requirements into contracts	Subcontractors contracts

	Content	Analysis	Classes of interest
	they just want to get in and out. It's got to be built in, maybe it's got to be a condition in the building contract that you clean up your mess, you separate it, you use my bins where I've got them and that's a big call. Yeah		
JS	Okay. So if the community is notifying some, are there measures in place to try and encourage that?		
S	Self policing? Hmm.		
JS	I know that they have got the signs that are meant to be displayed on building sites, I was just wondering if there were any other methods to sort of educate them or make them aware that they can notify council.		
S	I have a problem, I don't have a huge problem with it but in some instances and I'm not even sure how to deal with it but you've got to take the emotive side of that whole self policing part out of it and I think that is very difficult to do.		
JS	Okay, what do you mean?		
S	Um. People get very emotional about something and I think this is how a lot of them, like it comes like barking dogs for example, a lot of times you need to just go and cross them, suggest or ask a person like, it comes down to peoples personalities as well, I think that is the hard part you've got to deal with, um, you and I in this line of business in the science kind of field, you're used to the conflict and negotiation, it's part of your job, you're trying to speak to me today to find information out of me without at the same time offending me. You could have come here and said well Patrick I want your information spit it into the tape and let's get it over and done with, but at the same time you are asking, your leading, you are encouraging so that it is good from that point of view. We're used to doing that but from the other side for example I don't know it could be anyone next	Negotiation communication skills Enval conscious	Negotiation communication skills Enval conscious

	Content	Analysis	Classes of interest
	door, like say, shut your bloody dog up, if you don't shut it up, I'm going to come and kill it. I mean they can put someone offside and the problem escalates from there, it just gets worse and so I think with a lot of environmental issues, it's just how you sell it or how you are actually proposing it and from the residents point of view if, if he's green and he is doing it for a purpose he really should be, I mean you probably do it with your neighbours, I do it with my neighbours if I see them washing the car on the lawn, I say oh good, your grass looks good, you don't actually have to say you're doing a good job and you're doing a good environmental favour for the world, you're saving the world, you say your grass looks good and like you're doing the right thing and so i've noticed he washes his car more on the grass and if he is washing it on the road just say look did you know um you shouldn't really be washing it here but you don't sort of like come across because like as far as your neighbours are concerned they are just like you, you're not, you don't work for Council, you are not in the council area, anyway, I don't live in this council area so there is no obligations for me to do anything about it but I guess it conscious or something.		
JS	And do you think that um people's environmental conscious is growing, is increasing for most people?		
S	I've noticed it in this area, people are more than where I previously worked which was Hornsby Council um people were fairly articulate in environmental already or in Hornsby's case they went there because there was water, there was bushlands, there's the lifestyle they are chasing. Around here, once again, it is the lifestyle, they like the beaches, they like the small close communities, they like the charing cross area, um, we were cleaning out one of the new stormwater drains and this lady came over and said to the truck driver you should turn off the truck, it's bad for the green house gas (laughter). The truck driver acknowledged it but from his point of view, he was only there for two minutes and there was no point in turning them off, so she came over and I don't think she really understood why she had to say it but she said it, I don't think she even understands	Closeness to water increases care Community awareness	Closeness to water increases care Community awareness

	Content	Analysis	Classes of interest
	the fact that how the particles in the diesel actually affect greenhouse gasses, the fact that she just said it, good move lady! But I was standing there and I could have said something to the truck driver but like in the end she said, she didn't rouse on him, she came across and the truck driver was a bit surprised, I think it caught him pretty off guard from an outdoor crew member I can't speak highly enough of him, he was cleaning the pits and stuff like that and he dealt with it in a way, sorry but it is just the way we've got to leave them on, basically if you start / stop them, it's like an airlock or something, even I don't understand that process but yeah you go by what people tell you and you sort of do more investigation if you want but yeh		
JS	So he actually, and again that's a good thing, he actually explained to her rather than say bugger of lady		
S	He could of got quite nasty and told her to get stuffed what do you know but at the same time he explained that he needed to have the truck on, I'm only being here for a short time, I'm cleaning up this drain and like he could easily have passed buck and said you're the Manager of Environment you explain it to her, he had a go at her and that is good, that's great	Council staff care	Council Staff Care
JS	Well that's and that might be a part of what you are saying before about umm the councils um apparent willingness on environmental issues because I know um one of the councils I worked for in South Australia, we were trying to get the outdoor staff to be able to have at least some knowledge to explain things to people because they tend to be the ones that get the contact with the public, they are out there pruning the trees so people come up to them and say you know hey how about this		
S	Like why are you cutting this tree down and you need to be able to explain to them a perennial weed or something, it can be anything, people will hit them for different things and you want them to be able to not say get stuffed mind your own business but to say	Staff ownership leads to community awareness	Staff ownership leads to

	Content	Analysis	Classes of interest
	well look I'm trimming this back because it is part of the process of Council, it's a program that we are running, it's a new project. That's what I mean by taking ownership in programs. If a few councils do it than not only does it give it more kudos around the community but it gives community awareness and they can go back and tell their kids or family and it sort of stems from there.		community awareness
JS	Okay. With the ownership stuff again and the education of the community so that they have got some ownership, what methods would be used to do that is there a regular council newspaper, would stuff go in that or is there workshops or anything that you are aware of		
S	There is a council's newspaper, see Tracy who is the media assistant or media, ah what's her title, she's an executive officer in charge of media, she works with the mayor on a lot of things um she has like small newspaper pullouts, I think they are pullouts, but they look like mini newspapers or pullouts of them, she gets a lot of articles into there, um, other than that I'm not really sure, I know there is a few avenues and now there's always email, you don't want to be seen as the guy that sort of , I remember previously we used to joke about the same Wally that used to send around the same email you know everyone just gets sick of it, turn of lights blah blah blah, but after a while one of the Councillors I'm not sure if they still do it but Ku-ring-gai Council had this um different people would send emails around, turn their computers off at the end of the afternoon, flick the lights off if you were the last one to leave, small things like that.		
JS	You were saying that you don't want to come across as the person always doing that, do you think there is a negative connotation there or ?		
S	I mean you get the same email from the same person every day, day in and day out, um, you just ignore it, it's like pamphlets and posters, we all know they only have a shelf life of I think it is six weeks to be honest, after 6 weeks it is useless it becomes background	Willingness to learn from other professions	Educational effectiveness

	Content	Analysis	Classes of interest
	information. There's a lot of experience to be learnt from the media people, the marketing people, I think that's good when you speak to them, you learn a lot about those things, um, you know everyone wants to design brochures, everyone wants to design pamphlets, you can be pamphletted out of your brain and after like these ones (points to boxes of pamphlets on the floor of the office) still going there's thousands		openness
Js	Thousands of them, the glossy ones.		
S	Millions of them, and eventually they just get tossed out and I think to a degree it's a printers dream to get those kind of jobs but it is not necessarily the most effective way of marketing it all		
JS	You mentioned the example of the lights and computers and whatever, that in itself you would think is a relatively simple thing for people to do yet they are not responding? Any sort of ideas why?		
S	Well people's work habits change every day, well I won't leave here 5 O'clock every day and there's sometimes there might be someone else here um it's hard to say, sometimes it's just convenience, you're not the last person to leave so you don't flick off the light or you are not sure if someone is coming back, um, you don't know where the light switches are, um, computers, like I don't know if you are supposed to turn them off or not, these ones are good, they've got those turn off the screen and automatic shutdown, I think energy saver buttons I think they call them. They shouldn't be on on the weekends, they should be off. But they are just small education things but also it gets to once again my integrated environmental management hat comes on we should be getting the people like the computer person on site, he send out messages- you should turn your computers off not only for environment energy saving, it gives them on the weekend time to recuperate a little bit.	Many factors affect actions and change	Many factors affect actions and change

	Content	Analysis	Classes of interest
JS	Give them a rest.		
S	Give them a rest. I mean that's what it is. It's like a machine as a person, we're used to, I usually compare machines to people, a person needs a rest and that's why he sleeps, at the same time a machine, it's the hardware but they are designed to stop and go as well, they're not designed to run perpetually, eventually they will break down, I mean cars you need to stop and give that a grease and a tune up once in a while.		
JS	I guess like they only have the certain operational life and if you have them on unnecessarily then you are wasting that life		
S	You're shorting that life. Yeah so,		
JS	Okay. A couple of really good analogies.		
S	That's like with anything environmental, you use it too much, you are going to run out or that's the usual message especially particularly with fresh water. We all know there's plenty of water around, about 99% of the earth's world is like salt water but there is only about 1% fresh water, and if you look at it from the big picture that way, well water and salt water people just think oh yeah all the oceans are out there, look at this water they don't realise you can't drink the bloody thing or you can't use it.		
JS	Let alone that we're turning our fresh water into (laughter)		
S	Yeh, we all know that we've got this new beaut $700 million to fix up salinity said sarcastically, we'll just have to wait and see		
JS	Okay, I think that's pretty much it, I wanted to go through the educational approaches and how they work and don't work and what you think is important and then the stuff about		

	Content	Analysis	Classes of interest
	how this council operates and how it can improve so I will talk to the other guys about that		
S	It will be good to see what their, like from my point of view this is all how I'd like to see it, you might be speaking to Michael and Michael says well look as far as education's concerned, I don't care about it or he has very fixed views and whether or not we as a council and this is why I say you have to work together with people because I've got this view, Michael's got his view, education then becomes zip, he's the manager of a lot of those guys that do the sum of the works, I'm supposed to be looking after the overall environmental services of council and it can get to a stage where it'll be a conflict of interest, it can be a conflict, conflicting and then you end up taking 5 steps backwards and I've either ruined his program or he's ruined my program so yeah		
JS	So you would take steps then to try and bring everyone together to work together		
S	Ideally I would like to say yes, realistically if you came back and interviewed me in like say 6 months time it would be interesting to see what I had to say then but I would hope that everything I say today is generally how, I think it is the way I operate anyway. So if I stick to it, it should work in theory, yeah.		
JS	Okay. You've said realistically then and in theory. In your past experiences or from seeing other people, do you think that it sometimes doesn't work		
S	Definitely		
JS	Can you explain why or		
S	Sometimes, I've seen it with a few other Managers, particularly in a new job, they want to make changes, they want to do this, they want to do that, they want to get kudos for	Cooperation and openness, focus on whole not self	Organisation culture,

	Content	Analysis	Classes of interest
	themselves, job security, the usual kind of stuff and they do it and then there's this big huh ha, and they haven't thought about this person that has been working on this education program for 6 months, like I could come in here and say I want to do the stormwater grants and yep Peter's being doing it for 3 years we've got Roberta Ryan working on it with the University of New South Wales, you guys are doing stuff on stormwater and I'm here doing my own stuff and it's all been done before and that is why we're rehashing work but like if I took 5 minutes to sit down and talk to a few people and not so much worry about my performance and how I am going to go I would probably get a lot more done that way and that's what I've done to a certain degree, Bill has come up to me and said I want you to concentrate on Soil and Water / Site waste minimisation and I'm thinking em, I've read about this somewhere before ah, who's been doing it, why don't I give Juanita a call, gave her a call, she let me know about you, you got in touch with me anyway, um, came up with these brochures exactly what we're after so I don't have to recreate more things all I'm doing is embellishing what you guys have done and if that, what I do helps assist you in your process as project manager on do it right on site then	achievement is more effective	openness, non self
JS	Everyone wins		
S	Yeah, everyone wins. Not just the environment but like the builders, the council, you doing the project, maybe not because you might be doing yourself out of a job if there's no problem but yeah		
JS	There's plenty of other things to move on to (laughter)		
S	Exactly that's right, you can leave building and you can go onto anything else just about - there's always a problem there		
JS	Okay. Umm. One last thing you said there umm that you would try and get everyone to		

	Content	Analysis	Classes of interest
	sit together and work together, now from what you've said, you're saying you'd do that because it would make your job easier in that if you could get everyone involved it's going to move forward		
S	You don't want to delegate work to people, I'm not trying to pass the buck but I just want people to know what I'm doing and I, I actually value, a lot of people have had much better ideas than me, I'm not here to say that I know everything about environment, I know lots of it, I know where to find a lot of it but I couldn't sit there and confess and you and I know there is no such thing as the super scientist, you can bluff people but it gets to a stage where umm you just start spinning.	Openness willing to admit not expert, learn from others	Openness learn from others
JS	And environment itself is so big there is no way that you can be an expert in all of it these days but a lot of people still think you can, because they see environment as little		
S	I've seen planners that say oh yeh well I'll put this condition on because I know how it effects but it is not and you and I know that, well the beach for example beach nourishment, that's a classic example, you know it's dynamic process, you know it's coastal, as anyone knows the beach has to shift and because people like the aesthetics of it because it is a tourist Mecca, you've got to keep putting sand on it. That was a decision that was made way before my time but I'll have to give that more thought, maybe that is a good thing. Who knows. Maybe it is a bad thing that we are stopping soil and sediment, like this is a classic question from engineers why do you want to stop the sand from getting in there, we know the sand drains out to the beach and adds to the nourishment of it, so there are arguments for both but at the same time then the other argument is that by the time, there's millions we could go in and fill up half a dozen tapes		
JS	Yeah I guess it's worth saying there's so much pollution attached to the sand and the sediment		

	Content	Analysis	Classes of interest
S	We both know that but at the same time um, you know if there were never any controls there and people didn't know about it would they really care. Like sand to a lot of people, sand is sand and this is what I was saying, they don't realise, well some people like to get into the okay, this is where it gets a bit technical like all the particles and pollution's and metals and stuff that attaches to the sand particles but is that something that really makes a person want to stop sweeping their sand into the drain		
JS	It comes back to whether they care about the environment, because it is a pollutant. Okay. So you yourself would chose to do that, to integrate it, and to get everyone involved, is there a formal encouragement to do that		
S	That meeting, the monster meeting I had this morning was with one councillor, one of the precinct, the lady that's in charge of organizing all the precinct committees, waste education officer, myself and Bob who is the Environmental Health Surveyor, um, I haven't heard of anything here but that was the basis of an environmental group.		
JS	Okay.		
S	And there was a few other people who we will pull in like the landscape architect etc but basically what we would be wanting to do is tap into those people and come up with ideas to assist in there's a stormwater project that we are looking at with the charring cross area. It would be all these people providing almost like technical advice for all these people. Because a lot of people say I would like to do it but I don't know how or bunding is too expensive but like we know that bunding can be like putting new chemicals in a plastic box, if you've got a big tin of detergent put in one of those plastic crates, that's bunding		
JS	A lot of different ways		
S	There's a lot of different ways. Well it's like that complies, if you are going to go out and		

	Content	Analysis	Classes of interest
	maybe if in some ways they bund it, it might be too big for the area then they've put this massive box and then it becomes occupational and health and safety issue, it is just coming up with some ideas for them		
JS	You mentioned		
S	Not endorsing them in any way		
JS	Which is always another tricky issue about how much you can say without being		
S	From Councils particularly, like one of them said that we should come up with a kit that tells them where to go and buy all these types of things. Well like hold on, it's good to be able to say that and it's probably very helpful but Council would be seen to be endorsing a particular company and I think from a lot of that, that's why ownership is good because if a particular shop does it and um it works out well for them, they can then recommend them, and if they're a local business then fine even better so. Joe Bloggs from down the road electrical did this lighting for me and he saved, you know I don't have to worry about the lighting bills maybe they'll come down a little bit, but those costs, those saving that he's told me is starting to kick in I can feel it a little bit. Like my bills like 20cents cheaper, 20c is better than nothing.	Difficulty of council not endorsing business Fostering business to do its self	Council endorsing business
JS	You mentioned before the Uni. of NSW and Roberta Ryan. Can you tell me what that is		
S	They are doing um a social I don't know that much about it myself but basically they are doing a lot of the social stuff coming up with the community indicators, finding what are peoples reactions are, their perceptions, reactions to stormwater pollution, I think that's what it is and I think umm they basically undertake that part of the EPA grants stormwater process.		

	Content	Analysis	Classes of interest
JS	Okay		
S	Because how I understand it, basically Council, we've got this ½ million $ grant (interruption tape stopped)		
S	Graham is one of the engineers that works on, is more strategic as well, he sees things like that, he comes up and tells me or if he is designing these pits he sort of says where do you think I should put them, from that point of view I don't know if you're impressed but that impresses me	Council staff awareness, motivation, openness	Organisation culture
JS	Yeh that's great. To see an engineer actually come in and actually ask you and let you know things are happening, that's great.		
S	Well the fact that he's picked up on the fact that it's foaming and most people would say well it's foaming, big deal, just go away and wash it. The fact that he's got an environmental bent towards it that helps a lot		
JS	Okay. Now we were just talking about, before the interruption ummm your guess is as good as mine (laughter), oh Roberta Ryan's study		
S	Roberta Ryan study at the Uni. of NSW and how they got involved. Basically out of the grant they were given the job because Council couldn't, it's not that we can't do it just that we didn't have the resources to do it at the time.		
JS	Okay, so Council won a grant from the EPA		
S	For stormwater process grants and ah I think 50% of it went to, I'm not sure what the break down is to be honest but some of it went to building the devices and others of it went to an educational processes and this is partly what it is and the one's at Charring		

	Content	Analysis	Classes of interest
	Cross there's a few places, this is the Stage 3 and I think this is the final stage of all the grants so they are just doing a follow up as to how people are and there's this last grant that I am having a meeting with Roberta next week she's going to brief me as to what she is actually doing for Stage 3 which is basically I think it is like a community indicator project, like what people perceive as umm their main concern is for the area in regards to soil and water.		
JS	Okay, so in a sense that's going to give you a whole heap of community consultation feedback on what they think		
S	Yes and no. Yeah. Um the reason I'm sort of iffy about it all is that we've been through the process once before and at times you can badger the community too much and the community say we've told you that 20 years ago, see because you get new officers at the Council someone might forget and that's where they reinvent the wheel they do the whole process again and it gets to a point where you are actually detracting from the whole education process rather than improving it all, or embellishing it all, or building on it or whatever words you would like to use so yeah, I 'd just like to sit down and hear what Roberta has to say first and form my opinions from that but um at the moment my initial thoughts would be, I've been through a community indicators project and I haven't seen that much value come out of them.	Educational effectiveness-community consultation too much	Community consultation
JS	At another council		
S	Well Hornsby has just run there's and it's an expensive process and it seemed like a good idea to a few people but basically it's just doing what, one of the Community, Corporate and Community Manager's did, Community Services Manager did, they have to write the social plan, social plans finding out what they would like to see and I guess it's a different type of facilitation, different methodology and it all of a sudden becomes a different project but the way I saw it, probably off the record kind of thing, um, I saw it as a waste	Departments not working together, detracting from process for own gain. Puts public off	Community consultation, Own gains

	Content	Analysis	Classes of interest
	of money, two too same projects and all we should have done is built on, contacted the same people and say well		
JS	So they were done separately by the different departments		
S	One was done by Environment Division because that particular Manager felt at the time that she had to do it and the way I see it maybe it was just a personality conflict but I just basically thought it was a way for her to put her mark there and say well look this would be good for my performance and so here it is.		
JS	With um Craftle, is there a strategic plan as in like a Council long term, you know five year, 10 year plan that they are going to do		
S	It's like a management plan isn't it. A management plan is linked to the social plan which is linked to the state of environment report so		
JS	Okay. Everyone has different terms, that's why I sort of asked		
S	Well okay, yeah, All councils, all Sydney councils have been put through management plans, there's pretty much what, if it is not in there, it is not budgeted for, it means you've got no money for it so forget it basically.		
JS	Okay and how do you get the environmental stuff into the management plan		
S	Well I've got my own section so mine as far as I know my management plan, I haven't had a chance to update it, i'm not sure how they update it here but before you would review it quarterly make sure you were reaching your targets, how are you going, like it gives your KPIs, you're indicators as to your performance indicators, um and then if it needs changing or your projects change, you wipe that out and you replace it with a new		

	Content	Analysis	Classes of interest
	one so if I'm like going to work on environmental issues with aborigines I can just write that in as long as I have the funds and I know where my funds are coming from so		
JS	And what if you haven't got funds and you want to start something up		
S	You put a report up, previous experience would be that you write a report to Council and say look I need funds for this and either go for the Grant and that is why people were so hell bent on getting grants for environmental stuff. It's hard to get funds from them but if you say oh look I've got $50,000 match that, somehow council always miraculously pulls it off. It is just reprioritising your process. So I get $50,000, then Graham who just walked in loses $50,000 for stormwater management, that's pretty much how it works.	Funding and effects on other depts.. Council prioritising grants. Could be loop here affecting internal relationships and cooperation	funding
JS	Well, I wonder if that is going to cause like conflict as people that was I was saying before		
S	It causes personality conflicts or causes like almost a bit of jealousy like, like between divisions Corporate and Community Services loses out $50,000 because um on the age and pension disability because someone's got a bit more on an environmental bent, or I lose $50,000 because someone has got more of an old age thing, I mean you don't have anything against them personally like ultimately it affects your program or the way you, it cramps your style.	Other depts. miss out	funding
JS	Okay. Umm. With the management plan, did they do community consultation to get the issue of what's important		
S	Management plan is always put up for an exhibition. Anyone can get it but a lot of people don't know about that whole process.		
JS	So it's consultation after it has been prepared rather than before.		

	Content	Analysis	Classes of interest
S	consultation method is, sorry?		
JS	Or with the community		
S	Um well you're supposed to design, it's a bit like a performance appraisal, a management plan is like a performance appraisal, you are supposed to be telling them, or you are supposed to be knowing of these projects as you go along, if you wait until the last day when you are going to do the appraisal it's a bit pointless isn't it because like you haven't told the person that they are not performing well and all of a sudden you are writing this formal review of he or she, umm, writing in their performance statement Jodi wasn't doing so well and like you're out here slaving your gut, umm you are interviewing people and you go back and your boss says to you well that was alright Jodi but it wasn't what I really wanted you to do so it is a bit late then and I think from a management point of view and when we're doing the corporate plan it is a two way process, you don't just design the programs for the sake of designing programs, you are doing it because there is a need for it and I think that is pretty much why we've got councillors, and it has to be endorsed by council.		
JS	So you would say that the Councillors reflect the needs.		
S	Well they are supposed to. They have to. And that is a very naïve way of looking at it but these are the elected representatives, they set the priorities to a certain degree as to what Council does. I mean at the previous place they basically listed these ten headings and you had to, anything you did had to fit within that and anything that didn't fit within that forget it	EM power	EM power
JS	Okay, I'm sort of going off the track a little bit onto that stuff because I did strategic planning in South Australia		

	Content	Analysis	Classes of interest
S	Of course		
JS	And we've just had a new legislation in there which forced councils to actually do some consultations to have it as you said out on exhibition all that kind of stuff because previously councils didn't necessarily have plans in place		
S	Yeah I think like it depends on what state you are living in at the time or what world you came from, part of the world you came from, it's all different but effectively I think New South Wales, a lot of these projects, some of the projects I feel are just done for job creation, someone wants a job so okay the whole state of environment reporting process, that was a bit of a, I don't know how much you had to do with that?		
JS	Not a lot		
S	But it was a statutory report and initially it came out with 10 environmental indicators, environmental sectors I think they're, they keep changing the names and then people have to report on them but there's no clear guidelines and only now after they basically said well this is something you have to do, they're starting to say well, producing, the complaints from councils takes up a lot of time, resources and it doesn't really achieve much. It goes to the Minister on the 31st November but who actually reads it? You don't get any feed back from it you know so why do it and then they sort of say well you need it to justify your management plan so you actions are a result of your state of the environment report which says well beach vegetation, it's a state pressure response kind of model so what the state of it is, what the pressures are, how councils responding and those responses feed back into the management plan, the management plan then says yes, we have the bucks to do that or no we are not doing it and then you come up with like a draft action list as to what you are going to do, that's kind of how it works. Whether or not all the councils do it that way, in theory that is the way it works and to a certain	Mgmt plans Wasted $	Mgmt plans Wasted $

	Content	Analysis	Classes of interest
	degree a lot of people just come up with these ideas I think just to give themselves something to do, there is a lot of wasted money, I feel there is a lot of wasted money floating around anyway		
JS	Yeah Yeah. Like you were saying before about duplication of brochures and		
S	The EPA do water quality, pollution, do a lot of cleaning, Sydney Water does pollutions, Councils, Sydney Harbour Authority does them, everyone is doing them but like um yeah effectively if you had a mega database of all the different operations that are done, you'd find that you've done it to death.	Duplication of effort Wasted $	Duplication of effort wasted $
JS	It almost raises the question of having a central per or authority or whatever to coordinate all of that kind of material and stop that duplication.		
S	A lot of people talk about it. I remember when I was working on GIS projects, I mean you'd think that everyone would want to see cadastras or you'd be able to get access but it becomes such a privacy thing that each Council says I invested X amount of dollars into that and I'm not going to let it go	Council cooperation-motivation for self or good of env	Council cooperation and motivation
JS	Unless they got the benefit from it, getting stuff from other places that have done it so		
S	Exactly yeah. So it becomes like yeah		
JS	It's unhealthy too. Because if all the money that was as you said wasted or put into things like that was channelled into other areas, you might be able to achieve a lot more		
S	You get brochures and you and I know they are not cheap, they are very expensive and then after a while, after 6 months they are not used, that's like $30 - $40,000 gone and you start doing that in to a million dollars, how many $50,000 into a million dollars, not	Educational effectiveness and wasted $	Educational effectiveness and wasted $

	Content	Analysis	Classes of interest
	many.		
JS	Let alone each council doing it		
S	Each council doing it again so or each authority doing it and there is not a lot of money, like for example that $30 million for the salinity or $700 million if you divide that around Australia and you redo all these brochures again, $700 million is about 2 dozen brochures and pamphlets and booklets and run a few research programs and that will be all.	Educational effectiveness and wasted $	Educational effectiveness and wasted $
JS	And that's um again one of the reasons we're doing this to look at what methods are effective and what aren't		
S	That's what I'm saying I fully endorse it, it's great.		
JS	Okay. Well, if you've got anything else to add, other wise we will stop there.		
S	No I'm pretty happy with that.		
JS	Okay, thankyou very much		
S	Thankyou for your time		