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THE NATURE AND STRUCTURE OF ATTITUDES TOWARDS THE ENVIRONMENT

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ABSTRACT

It appears that environmental concern is becoming an important issue in contemporary society. At this stage little is known about New Zealand public opinion with respect to environmental issues. This thesis is an exploratory study within one typical region of New Zealand covering two electorates and with both urban and rural residents. It is an investigation into the nature and structure of attitudes towards the environment.

An underlying proposition that directs this thesis is that those people who are concerned about the environmental problem are confronted with alternative ideological networks which shape their perceptions of environmental problems and how they attempt to address these problems. Two ideological constructs and networks of belief have been advanced in other Western industrialized societies as dominant influences on the way in which people think about and act towards the environment. The primary intention of this investigation is to examine the extent to which the ecocentric and technocentric attitude structures occur in New Zealand. A self administered survey was conducted. The questionnaire was developed to assess the nature and structure of those belief systems, using Kerlinger's (1984) Criterial Referent Theory: - a "methodological theory" which explains social attitudes in the factor analytic tradition. In addition, this investigation also incorporated a partial replication of Cotgrove's (1982) survey of the nature and extent of support for environmental issues in Britain.

This thesis targeted four sample groups - the general population, decision makers, environmentalists, and manufacturers. The study of attitude structures revealed that for the general population ecocentrism and technocentrism operate as distinguishable and independent belief systems. The general population's environmental attitude is best described as a dualistic domain that draws upon both ideologies. It was a domain that had a substantial ecocentric bias and had as its strongest dimension a concern for environmental degradation. The ecocentric bias of the general population was a fairly universal phenomenon - emerging from most sections of the sample. The attitudes of the environmentalists, decision makers and the manufacturers exhibited a similar ecocentric bias but also revealed characteristic differences. The manufacturers revealed considerably more opposition to technocentric variables than was expected. Like the environmentalists their attitude domain was ecocentric but incorporated a minor technocentric orientation as well. The findings suggest that ecocentric ideology may be having a larger effect than technocentrism on the perception of environmental problems in New Zealand society today.

The partial replication of Cotgrove's (1982) survey produced similar results to those found by Cotgrove but with some important differences. One of the main differences was that manufacturers had a high rather than a low level of environmental concern. Finally this investigation has also revealed some evidence to tentatively support the notion that the influence of social class position and certain value commitments can account for some of the variation in technocentric and ecocentric attitudes.

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Chapter One

Purpose of Investigation

The argument in this chapter is that there are real environmental conditions which have become collective concerns in what may be described as an objective environmental problem.

1.1 The objective environmental problem: a global issue

In 1988 a survey was conducted for the United Nations Environment Programme (UNEP) to measure public opinion and leadership attitudes towards the environment. This investigation, put forward as the most comprehensive study ever on environmental attitudes, involved 14 nations on four continents and concluded that most people were pessimistic about the environmental outlook (see Our Planet 1989). It found that large majorities in all 14 nations agreed on the necessity for stronger government action, stronger action by international organizations and stronger laws to contain industrial pollution. The survey also revealed that the call for tougher environmental programmes went beyond western industrial countries. It was found that such attitudes emerged in the East and West, in the North and South and in both rich and poor nations.

Some of the surveys findings were listed as follows (Our Planet 1989):

"Majorities or pluralities of the public and leaders in all of the countries surveyed except Saudi Arabia, believed their environments had become worse in the past ten years.

Large majorities of both the public and leaders in all nations believed there was a direct link between the quality of the environment and public health.

Younger people showed more concern for the environment - and the link with public health - than older people, and younger people and women expressed more concern about the future than older people or men.

Very high levels of anxiety and concern were expressed almost everywhere about the pollution of drinking water, of rivers and lakes, of the air and of the land.

Sizeable majorities in almost all countries also expressed grave concern about the loss of agricultural land, the cutting down of trees and forests, radioactivity, desertification, toxic wastes, and acid rain.

But, there was less awareness of- and less concern about- climatic change such as that attributable to the greenhouse effect, or the shrinking ozone layer."

The message from this survey is that environmental issues are real concerns for many people. That is, most people recognize that there are real environmental conditions which have become collective concerns and may be described as objective environmental problems. A short version of the (UNEP) survey conducted in North America also revealed this situation. Almost 97 per cent of the Americans surveyed felt that more should be done to protect the environment and to curb pollution. In all countries the major concerns that people had were for air and water pollution and waste disposal followed by extinction of species and the depletion of natural resources.

There is no doubt that there are conditions within the environment that translate into objective problems. The evidence that suggests this has been accumulating for decades. Even in the early years of the industrial revolution it was noted that in some areas pollution had become so bad that local inhabitants had to re-locate (Newby,1979:202). In more contemporary times, especially in the last two decades, the environmental problem has become even more acute. People now find it increasingly difficult to avoid the consequences of environmental exploitation and industrial waste. Furthermore, in recent times it has been realized that many environmental issues are now global concerns.

One of the most disconcerting features about this realization is the understanding that the cumulative affect of environmentally harmful human activity is possibly bringing about global climatic change which could have a disastrous affect for millions of people. A scenario advanced by Lazarus (1990a:12) illustrates the possibilities. He states:

"It is the year 2030. The earth is the warmest it has been in the past 120,000 years. The oceans have been growing since the late 1900s, expanding with the change in temperature and the melting of the polar ice caps. The land has shrunk. High seas and storms penetrate further inland. Wet areas are wetter, dry areas are drier. The one-metre sea-level rise has flooded Bangladesh, threatening the lives of 10 million

people. The Maldives are in danger of disappearing completely. In Mauritius, towns and airports are continually flooded, aquifers are contaminated by salt water, governments around the world rush through new legislation to deal with what could possibly be the greatest swell of refugees since the Second World War."

There are a multitude of interrelated environmental concerns that are adding to a possible climate change on a global scale. The greenhouse effect and ozone depletion are two broad changes that encompass many of these concerns. Underlying these changes are continued high emissions of carbon into the atmosphere by the use of fossil fuels and the burning off of large areas of forest.

The problem of deforestation exacerbates the carbon emission problem even further. The annihilation of large areas of forest destroys an efficient mechanism by which carbon is removed from the atmosphere (Bunyard,1987:139-141). Additionally, the destruction of forests not only removes a carbon sink it also contributes in a more direct way to atmospheric warming. In the Amazon basin, where 2-3 million hectares are cleared each year, 80 percent of the solar energy that hits the region is used up in raising water vapor from the forest canopy. As the forests go this energy goes directly into heating up the air.

Deforestation also contributes to erosion and soil loss. Soil degradation or the loss of arable land is a major problem throughout the world. Only about 22 percent of the Earth's land has the potential for agriculture. At present, the annual loss of land due to soil degradation is just about the same as the amount of land brought under cultivation each year (Lazarus,1990b:10-11).

Species extinction is another environmental problem related to forest destruction and although it is associated to climate change in a complex way, this problem has other ramifications as well. Biodiversity is necessary to provide resources to ensure human life. As the United Nations Environment Programme (UNEP,1988:8) points out:

"Our very survival depends on the conservation of biodiversity: from the world's genetic bank comes all our agricultural development work and most of our new medicines."

A further environmental resource which is increasingly under threat from human activity and which is fundamentally necessary to any form of life, is water. By the turn of the century numerous countries throughout the world will have about 50

percent less water per capita than they had in the mid 1970s and yet demand for water will be greatly increased (Our Planet,1991:13).

Acid rain contaminates various water supplies and like other contemporary environmental problems it is now a global concern. It induces widespread damage to the biosphere across much of the northern hemisphere and affects millions of people. In Europe more than a third of the total forest area is damaged to some degree by acidic precipitation. (Our Planet,1991:10).

The threat of nuclear pollution is also a world wide concern. The fall out from a nuclear accident can cover enormous areas. The 1957 disaster in the Eastern Urals and the Chernobyl disaster in 1985 are proof of this. Additionally the threat of nuclear war is an obvious concern (though perhaps less so than in the recent past) not only because of the immediate destruction and loss of life it would cause but also because it could bring on a nuclear winter and could change the nature of the environment forever.

These conditions are only a few of the afflictions in the world today which contribute to the environmental problem. There are many more. Others include the increasingly difficult task of finding sites to dispose of wastes (Cave,1990:4) and the persistent problem of chemical residues in food and in the atmosphere (Snell,1989:94). In fact, there is an enormous variety of conditions that combine to increase environmental concerns both globally and locally.

1.2 A New Zealand issue

It appears that in New Zealand public opinion towards the environment is similar to the international trend. The likeness of opinion can be observed in the Report From the Royal Commission on Social Policy 1988. The environmental submissions in that report indicated a real concern for the environmental outlook.

The 1989 New Zealand Study of Values (Perry & Webster, unpublished) also indicates a similarity between the opinions held by the local New Zealand population and opinions measured in the UNEP survey. When the New Zealand Study of Values asked the respondents to indicate how urgent protection of the environment was, a large majority of the population (controlling for age, level of education and political preference) indicated that it was urgent and immediate. Like people overseas

it appears that people in New Zealand believe that environmental issues are real concerns. Real concerns in the sense that there are certain conditions within the environment that are objective environmental problems.

It goes without saying that many of the problems that occur in other parts of the world also occur in New Zealand. Of course world issues, such as global warming, affect everybody and as Kopp (1991:20) indicates the New Zealand scientific community generally accepts that global warming is occurring. In New Zealand the Climate Change Programme (NZCCP) has been formally recognized and New Zealand scientists (who side with the majority of scientific opinion) advocate a precautionary approach to climate change.

New Zealand has a list of environmental problems. Deforestation is one. Eighty percent of all native forest has been cleared and native beech forests are still being felled. Ozone depletion is already having an effect in New Zealand, yet, as Young (1991:9) points out, as much as "95 percent of all discarded chlorofluorocarbons (CFCs) in New Zealand are still being released into the atmosphere." Water pollution is another problem. Bercusson (1991:17) states that the "Tamamki estuary has been described as a microcosm for every conceivable environmental problem within an enclosed body of water." Further, Shields (1991:24) notes that domestic sewage is a major water pollutant in New Zealand, yet many of the treatment and disposal methods used by local authorities can be significantly improved. Another environmental problem is the continued loss of wetlands. Pike (1991:22) claims that by 1976 263,000 *ha.* of wetland had been destroyed by development. The loss of wetlands has serious consequences for many plants, fish and birds. These issues are only a few of the environmental problems that New Zealand has to contend with. There are many more, including such issues as soil erosion, waste disposal and resource depletion.

1.3 The general purpose of the investigation

The existence of ecologically unsound conditions within the environment appears to make it obvious that there is a need for people to change the way they behave towards the biosphere. Yet the persistence of ecologically harmful activity may also suggest that people are reasonably comfortable with the way things are and that there is no real need to change attitudes towards the environment. Perhaps increased media attention has raised enough questions about the environment so that certain

ecologically orientated perspectives have become more mainstream? The purpose of this thesis was to conduct an investigation to explore these and related questions.

1.4 The Technocentric and Ecocentric perspectives

The literature suggests that there are two lines of thought (ideologies or belief systems) which dominate the way people, in western industrialized societies think about and act towards the environment. These two ideological structures can be called the "Technocentric" and "Ecocentric" perspectives. The understanding that these two orientations exist is based on the work of O'Riordan (1981) and Pepper (1984). O'Riordan coined the terms "Ecocentrism" and "Technocentrism" and provides an original description of the two perspectives. Pepper incorporates this line of thought in his socio-historical account of the emergence of environmentalism as a means to classify and analyze attitudes towards the environment.

Having noted that in Western industrialized societies ecocentrism and technocentrism are the two dominant belief systems that influence attitudes towards the environment,¹ it must also be noted that there has been little work done to explore the nature of this model. On the other hand, Cotgrove's (1982) work, *Catastrophe or Cornucopia*, is one study that has investigated elements of new environmentalism and therefore can be translated into a study of ecocentric and technocentric attitudes. However, Cotgrove's study may not be able to be generalized to the New Zealand context.

The technocentric and ecocentric perspectives are advanced in the literature as competing alternatives in a dominant/subordinate relationship. In general terms technocentrism is viewed as the dominant ideology, or commonsense world view, that directs most contemporary social behavior (see Pepper, 1984:37) while ecocentrism is seen to emerge as a rival belief system primarily concerned with a different view of environmental issues and problems.

The suggestion that technocentrism has been accepted as a commonsense world view implies that it has gained a form of hegemonic control and that this dominance seems to disguise its existence as ideological. It appears that its features are so common and expansive that it could be described as a meta-belief system which

¹ It is not suggested that these are the only two belief systems which operate in western industrialized societies.

transcends those conceptions of ideology that pertain to a system of political practice. That is, its characteristics are shared, in one form or another, by most modern (or modernizing) countries either left or right in the political spectrum. The ecocentric ideology, on the other hand, is seen as a subordinate or a minority position within modern industrialized societies and therefore its importance as an ideological influence is presumably not well established.

Because these competing perspectives were conceptualized as alternative belief systems they have sometimes been treated as polar opposites. But as Pepper (1984:26) has argued:

"...they are not hard and fast or mutually exclusive classifications. Thus, some groups show characteristics of both ecocentrism and technocentrism."

Or as O'Riordan (1981:2 as cited in Pepper 1984:27) states:

"...we should avoid the temptation to divide the world neatly into an ecocentric camp of environmentalists and a technocentric camp of manipulative professionals and administrators. In real life the boundaries are much more blurred."

Therefore, the suggestion is that attitudes towards the environment are influenced by both technocentric and ecocentric beliefs. For example, a decision maker whose duties are concerned with addressing environmental problems could have an attitude towards the fulfillment of those duties which is influenced to some degree by both the technocentric and ecocentric ideologies.

1.5 The basic research problem

In line with the above possibility therefore, one of the motivating purposes of this thesis was to investigate the extent to which the ecocentric and technocentric belief systems could influence the decisions made by bureaucrats concerned with addressing environmental problems. However, before such an objective could be attained this thesis had to first investigate how the ecocentric and technocentric belief systems occur within the general population. Thus far little sociological research has been done in this area and many of the assertions made in relation to the sociological dimension of environmental issues are rather conjectural. This includes assertions about the existence and influence of ecocentric and technocentric ideologies.

The primary intention therefore was to examine the nature and content of the ecocentric and technocentric attitudinal structures and secondly, to describe the relationship between these structures. The questions here are whether or not attitudes towards the environment share characteristics from one or the other ideological perspective or do they in fact stand in opposition to each other. Once these concerns have been addressed, it may then be possible, to investigate the way in which ecocentric and technocentric ideologies influence the attitudes of those decision makers concerned with addressing environmental problems. To achieve these goals this investigation conducted a survey to examine technocentric/ecocentric belief systems that occur as attitudinal structures.

Chapter Two

The Cultural Context of Environmental Problems

The position adopted in this thesis is that environmental issues are to be regarded as public problems. They are public problems in the sense that environmental conditions have become, what Gusfield (1981:5) calls: "matters of conflict or controversy in the arenas of public action".

In line with this argument environmental problems are conceptualized as objective conditions that are subjectively constructed by cultural beliefs in a series of public processes. That is, a particular objective condition deemed harmful to the environment and attributed to unwanted human activity is seen to require improvement or ameliorative action. The point of interest is that to define problems, such as environmental problems, depends less on the objective realities that are "out there" (like the hole in the ozone layer) than on the alternative cultural beliefs that influence our perceptions of the conditions. An explanation of this notion is advanced by Gusfield (1981) in his study titled, The Culture of Public Problems. Though Gusfield studied the drink-driving problem his arguments about the culture of problems are applicable to other issues. Gusfield implied that alcohol had become the target in the resolution of road fatalities because it was selected via a certain cultural belief system which formulated a reality in which drink-driving was the problem as opposed to alternative realities in which other issues could have been put forward as the way to address road deaths. Gusfield (1983:3) states:

"Alcohol has already been perceived as important as a target in the resolution of the problem. That target character is not a given, is not in the nature of reality as a *ding an sich* (a thing in itself), but represents a selective process from a multiplicity of possible and potential realities which can be seen as affecting auto fatalities and injuries"

Similarly, environmental concerns have come to be defined as public problems because they are in accord with a view of reality fostered by a certain belief system or ideology.

It can be argued then, that environmental problems may be perceived as a set of ideas or a form of consciousness which is dependent on shared cultural values and attitudes. Thus, in order to understand how people deal with environmental concerns it is necessary to understand the underlying culturally-based presuppositions that make up their cultural belief system. This necessity to analyze the cultural context from which environmental perceptions emerge has been acknowledged by Cotgrove (1982:25) :

" We need also to discover the underlying systems of beliefs and values which provide the framework for interpreting the evidence. We need to discover and bring to light the implicit cultural meanings which give significance to some explicit condition of nature".

This idea that perceptions of the environment are dependent on the influence of the cultural context (the underlying belief systems) emerges from two important understandings. First, the environment is not just seen to be "out there" as a mere objective fact. On the contrary it is related to, experienced, and has certain meaning. As Weston (1984:14) states : "it is we, as a society, who shape our environment by deciding which social and economic priorities should prevail." That is, the environment, as a reality for human beings, is socially constructed and is a product of cultural belief systems.

The second understanding that gives importance to the study of belief systems is the understanding that the cultural contexts that give rise to environmental perceptions are always subject to variation or change. As Arnoux (1982:12) states, "The ultimate reality, if any, is not unique and fixed. It is perpetually changing and affected by conflicts, oppositions, and contradictions."

Environmental perceptions change in relation to belief systems and have varied throughout history. In Western societies, the wilderness was once viewed as something harsh, something to be avoided or to be conquered. Yet in contemporary times, when urban living and technological power have increased, nature has come to be viewed as something beautiful or as something people enjoy. In different places the environment can be viewed in different ways. For example the significance of rain in the desert is not the same as in wet regions (see Cotgrove, 1982:25).

Within a society, the way the environment is perceived can change because more than one belief system operates to influence such perceptions. Here in New Zealand Pakeha perceptions of the environment (as in other Western industrialized nations) vary according to the acceptance of the two alternative systems of belief outlined earlier. At present, environmental perceptions are presumed to be dominated by the technocentric

approach. Alternatively, Pakeha perceptions of the environment may also be influenced by a rival belief system which is orientated towards environmental protection. That is, the ecocentric approach.

The way the environment is perceived also varies across cultures. The Maori perception of the environment has at least two sides. One is a concern with environmental maintenance to ensure its ability to provide a variety of uncontaminated necessities such as food, water and shelter. A second is concerned with maintaining connections with ancestral lands necessary for identity and mana. It is these two concerns that have been at the heart of Maori land ownership claims. Dann (1988:336) points out that:

"The issue of ownership of land (especially the coastline) and its resources are of course paramount. The waters of the land are also a primary interest, and the right to the food resources of unpolluted waters is a universal concern. The food resources of land, rivers and sea are a foundation of tiakitanga, which is a source of individual and collective mana to Maori people, and thus vital to their well-being."

Maori culture, unlike the dominant pakeha view incorporates in its relationship with the environment ancestral and spiritual dimensions which play a significant role in the relationship between Maori people and the environment.

The different ways in which the environment is viewed indicates that the assumptions that underlie environmental perceptions vary across time, location and within and between cultures. Therefore the way a particular society approaches environmental concerns should not be taken for granted or understood to be the only way of seeing things. It is often necessary to analyze the underlying belief systems or ideologies that shape both the way the environment is perceived and the ways in which environmental concerns are addressed. As Pepper (1984:7) notes:

"...what we do about nature and ecology is a function not of what is 'out there', but of how we perceive it, and our perception is a function of our cultural filter and the assumptions in it."

In this thesis, the view is that environmental problems are objective conditions that do exist. However, the perception of these conditions and the way that they are addressed results from the relationship between the material world and humanity's ideas and actions. Therefore, in a basic sense the interest of this thesis is focused on the ideological and the attitudinal filter which influences or constrains the way people perceive and address environmental problems.

2.1 Ideology and the perception of environmental concerns

Ideology is one of those terms which has a contested meaning within the discipline of sociology. McLellan (1986:1) states:

"Ideology is the most elusive concept in the whole of social science. For it asks about the bases and validity of our most fundamental ideas. As such, it is an essentially contested concept, that is, a concept about the very definition (and therefore application) of which there is acute controversy "

No attempt will be made here to advance a conclusive outline of the concept "ideology". All that will be done is to provide a particular view of ideology (or of certain parts of the thoughts about ideology) in order to explain the relationship between ideology and environmental problems as objective realities.

In general terms ideology may be viewed as any expression of a particular set of ideas. It can also be thought of as "systems of thought" or as "systems of belief" or "symbolic practices", which pertain to social action or political projects (see Thompson, 1984:4). Ideologies can also be perceived as objective realities - objective realities in a sense that they are identifiable sets of collectively shared beliefs.

This objective nature of ideologies also arises out of the understanding that they do not just exist or float around in a sphere of their own. That is, they are not developed in a vacuum but are developed in a "real" world that stimulates human senses and provides the experiences from which they emerge. Environmental issues are not always bound up by social relations having no reality other than the one that exists in relation to people's subjective beliefs. The concept of material reality must be extended to incorporate the "concrete" world beyond our perceptions and subjective processes. Though ideas may direct human actions in relation to culturally shared myths and symbols, we are always operating in an environment that will react to abusive exploitation. As Duncan (1959:681) states:

"A concrete human population exists not in a limbo but in an environment. Moreover, to continue to exist, it must cope with the problems posed by an environment which is indifferent to its survival but offering (in varying degree) resources potentially useful for the maintenance of life."

2.2 The unavoidable nature of ideology

The argument that environmental concerns are objective issues in the sense that they can have a reality beyond that which is determined by human culture is itself an articulation of a particular viewpoint. To take an ideological stance is unavoidable. Once language is written or spoken it is the moment that an ideology is expressed. The unavoidable nature of ideological expression arises because language is not neutral, rather, it is the expression of purposive sets of ideas. As Pecheux (1975 cited in Macdonnell, 1986:24) has stated, "words, expressions, propositions, etc change their meaning according to the positions held by those who use them." To put it another way, language is the medium through which ideologies are voiced. Thompson (1984:2) says:

"ideas circulate in the social world as utterances, as expressions, as words which are spoken or inscribed. Hence to study ideology is, in some part and in some way, to study language in the social world."

To accept that environmental factors are objective realities does not diminish the importance of examining the encompassing ideologies. For once a concern is recognized and articulated various belief systems or ideologies are expressed and the objective concerns are subjected to perceptions that arise from the way the environment is related to and experienced in the cultural context.

2.3 Structural factors

As noted earlier, Gusfield (1981) recognized the significance of cultural context in determining how a problem is perceived and attended to. Drink-driving was seen to be the irresponsible choice by a culpable person. Its emergence as an issue in this form arose out of the individualistic belief systems operating within the cultural milieu. Alternatively drink-driving as a problem could have been associated more with the sale of alcohol itself, the large number of liquor outlets and the social norms and values that encourage the heavy consumption of alcohol.

Additionally Gusfield's work reveals that the consciousness of a public problem is also determined by institutionalized patterns of relations (see Gusfield, 1981:5-6). Sociologically this is significant in that it extends the formation of consciousness surrounding public problems beyond that of the personal level. If for nothing else Gusfield's work is useful for recognizing this. Without going too far into the structure/agency debate, it appears that if the role that ideology plays in the formation of

consciousness is examined solely through such methods as discourse analysis then there is a tendency to ignore the significance of structure in the formation of consciousness. Those that employ discourse analysis or other such hermeneutically orientated methodologies have on occasion understated the importance of structure in the formation of consciousness by arguing that the operations of institutions are no more than reflections of ideas. As O'Connor (1981:54) states :

"...to a greater or lesser extent the related institutional forms and procedures are a reflection of how members of a society perceive a subject of social importance and consequently set about dealing with it."

Although this is undoubtedly true and is an underlying position that directs the formation of ideas in this thesis, the point is that structural factors can not be ignored even if they are not the focus of discussion. For as Bourdieu (1988:782) has pointed out agency and structure stand in a dialectical relationship with each other.

Gusfield reveals that the cultural level by itself does not provide a complete explanation of how particular public problems are dealt with. Structural factors must also be added to the equation. The structure of a public problem is the ordered way in which ideas and activities pertaining to a particular problem emerge in the public arena. He exposes this idea of the structural dimension in his work on drink-driving. Gusfield (1981:8) notes:

"There was a structure of thought and action, of institutions and groups within which the problem was contained and the alternatives excluded."

In tangible terms the structural dimension amounts to how the responsibility for resolving a public problem is distributed, thought about, and acted on by particular institutions and people who follow generalized rules of thought. It can be said that the structural level of a public problem is that which is concerned with the ordered way in which it is conceptualized and dealt with by institutions and groups.

2.4 Ownership of the problem

In order to understand how the responsibility for resolving public problems is distributed and thought about Gusfield used the concept of "ownership". He argued that because public problems may be perceived as a set of ideas or a form of consciousness, they are therefore open to opinion and debate. That is, the reality of the problem is dependent upon the struggle between the ideologies advanced by various groups.

However, the concept of "ownership" was advanced in recognition of the fact that not all groups have equal power in forming realities. Gusfield (1981:10) states:

"The concept of "ownership of the problem" is derived from the recognition that in the arenas of public opinion and debate all groups do not have equal power, influence, and authority to define the reality of the problem. The ability to create and influence the public definition of a problem is what I refer to as "ownership". "

Hence, the "ownership of the problem" is fundamental to how it is perceived and addressed. In order to understand the reality of a public problem it is necessary to know which groups and institutions are the owners of that problem.

The reality of a problem may also be revealed by identifying those institutions and agencies that do or do not own or take responsibility for problems. Those who "own" the problem may define it in a very selective fashion. For example, assuming river pollution was the objective condition of concern it would be important to identify which groups were recognized as the legitimate authorities on that subject. The owners of that problem would describe it and then specify what is responsible for causing it and identify those who are responsible for resolving the problem. Because waste disposal engineers are seen as experts on sewage treatment, their ownership of the problem of water pollution could point the finger at heavy industrial and chemical inputs rather than poorly designed or obsolete treatment plants. On the other hand, those agencies that avoid ownership of the problem may also set the boundaries on how the problem may be perceived. For example, if medical authorities did not participate in defining river pollution as an issue of concern, then river pollution would probably not be perceived as a medical problem. Even though the causes and effects of river pollution may be defined in medical terms.

The question of ownership also adds a political dimension to understanding the reality of a problem. The way in which a problem is perceived and addressed becomes a question of power; the power that groups and institutions have in obtaining or avoiding input into defining the problem. The fact that the reality of a problem is dependent upon negotiation and power relations reveals that reality formulation is a matter of struggle. As Green (1990:15) argued, the study of social problems is:

"the study of a field of struggle where different and conflicting theories, value commitments and methods vie for influence in the professional and public arenas."

There are two reasons why this happens. First because ideologies are fundamentally value based arguments and therefore can not be proved wrong or right. Whether a

particular condition is seen as good or bad is based on value judgements. Therefore, because the rightness of those values can not be tested they are always open to political debate. Secondly, the study of a social problem is a study of struggle because ideologies always evolve in contrast to other ideologies, and therefore they always have alternatives.

In light of this view it could be argued that neither the technocentric nor the ecocentric approach can be viewed as the only rational or reasonable way in which to perceive and address environmental concerns. This is the issue that this thesis has investigated.

2.5 Technocentrism/Ecocentrism as a class issue

As noted earlier ecocentrism and technocentrism are two prominent ideological strains that seem to influence ideas about the environment and environmental problems.

The assertion has been made that issues are realities in as much as they are the products of perception based on certain belief systems. Environmental issues get reconstructed as social problems because of ideological contests. Therefore, it may be argued that the struggle between technocentrism and ecocentrism amounts to a hegemonic contest. The way environmental issues are perceived depends on a power struggle between opposing views - technocentrism which is presumed to have established a form of hegemony and ecocentrism which contests that position.

This notion that the contest of ideas between technocentrism and ecocentrism is a hegemonic struggle suggests that the understanding of the ecocentric/technocentric debate could possibly be reduced to a class issue (Cotgrove, 1982:93-97). It has been argued that it may be possible to identify modern environmentalists as a class or class fraction which attempts to distance itself from the dominant technocentric belief system.

This idea of a "class struggle" is supported by the notion that ecocentrics are essentially concerned with taking political and or economic power from one section of society and giving it to another. Porritt (1984:8) states this position quite clearly when he spoke of an intention that the Greens have. He asserted:

"There are many people in positions of power who hang on to that power only through the ruthless exploitation of both people and planet. They have no intention of relinquishing it - and from them power must be taken."

Therefore an additional goal for this investigation was to explore the idea that technocentrism and ecocentrism could possibly be reduced to a class issue and thus perceived as a hegemonic contest.

Chapter Three

An outline of the Belief Systems

This chapter outlines some of the primary features which characterize and influence the technocentric and ecocentric environmental perspectives.

3.1 Technocentrism

It has been argued that the technocentric approach is politically the dominant ideological system² in Western industrial societies and is that form of consciousness which has the most influence on policy issues and practical decision making in powerful circles. As Pepper (1984,37) states:

"Technological environmentalism, or 'technocentrism', as O'Riordan calls it, represents in modern Western societies the official, dominant set of attitudes to the environment. "

It can also be said that the dominance of technocentrism is now taken for granted. Technocentrism has been established as a form of common sense and could serve to restrict the influence of alternative forms of environmental consciousness.

3.1.1 The human relationship with nature

The first distinguishing characteristic of the technocentric ideology is the view that humanity has a relationship with nature that places people in a dominant position over the biosphere. That is, human beings are thought to be separate from nature and are viewed as having the right to exploit the environment for their own well being. Christian beliefs

² As Cotgrove (1982:27) states, "It is dominant not in the statistical sense of being held by the most people, but in the sense that it is the paradigm held by dominant groups in industrial societies..."

have been put forward as one factor that has led to this view. Pepper (1984:45) identifies several writers who have argued in this way and notes at least one publication has made reference to the book of Genesis to show how the view that humans are separate from nature and dominant over it could have emerged. It was said that the book of Genesis commands humanity to multiply, spread over the earth and assert their domination over it.

On the other hand, other writers have asserted that the Christian doctrine supports beneficent attitudes towards nature. Glacken (1967 cited in Pepper 1984:45) has argued that the Christian objective was for people to act as environmental stewards.

3.1.2 Classical science

The second primary element that characterizes technocentrism is the classical scientific perspective. This perspective is intimately connected to the above idea that humanity has a dominant position over nature. The term classical science refers to that science which is guided by the basic rules and procedures set out by the Newtonian paradigm. Primary to the Newtonian paradigm is the metaphorical perspective that views nature as a great machine. This analogy arose from the cosmological re-conception that took place between the mid sixteenth century through to the end of the seventeenth century ("the scientific revolution"). Basic to this re-conception was Copernicus's repositioning of the sun at the center of the solar system. The planets were placed in orbit around it. The view of the universe as a great machine arose out of Johannes Kepler's explanation for orbital movement. He argued that both the sun and the planets acted like magnets, with the rotating sun pushing the planets around as it turned. The sun therefore, was perceived as a driving force, and the universe as some kind of clock like mechanism.

This view of nature and the universe as a machine provided a context that allowed the advancement of geometry and mathematics to be used as devices for explaining nature. The logic was, that if God had created the universe as a machine then mathematical principles could be used to explain it. This led to the belief that the true reality of nature was mathematical and regular. Thus, in classical scientific terms, reality and truth became that which could be measured. This immediately "objectified" nature. Nature became that which was measurable. It can be argued that nature was separated from certain aspects of humanity, for much of that which characterizes people, such as values and emotions were not viewed as having measurable properties. Instead some human qualities were disunited with nature by the fact that they involved unreliable subjective processes. Humans were recognized as thinking and feeling beings and it was

this emotional quality that set humanity apart from the rest of the biosphere. Cotgrove (1982:62) states:

"Science involves an emphasis on the distinction between the subjective and the objective, between the observer and the external world, between fantasy and reality, and between subjective states of emotion and imagination on the one hand, and a 'reality' which lives outside the observer which is known only by observation and reason."

Thus, in classical science truth relies on empiricism. The only source of real knowledge is experience, and nature can only be defined in positivistic terms. Therefore, over the years nature had become an external sphere, separated from people. It was something out there, that could be quantified and manipulated.

This outlook combined with the Christian view that humanity had mastery over the universe and science became the vehicle by which this domination could be expressed. That is, science provided knowledge of a pragmatic value which increased the ability of Christian people to spread their dominion over nature.

Fundamentally the suggestion is that there are two primary elements that provide the basis of technocentrism. First, the religious notion that humans have the right to dominate nature and second, the classical scientific perspective. However, it is the classical scientific perspective which has been highlighted as the main component of technocentrism. The religious notion of humanity's domination over nature is essentially caught up in the classical science finding expression in that view. Pepper (1984:37) notes:

"The main component of technocentrism, the official attitude to the environment, is classical science and the beliefs and perspectives which it fosters."

3.1.3 Scientific rationality

It is the beliefs and perspectives fostered by classical science that further help to outline technocentrism. Emerging out of classical science and a distinguishing feature of technocentrism is a particular rational perspective. A rational perspective is that which attempts to base perception on beliefs that are coherent, not contradictory and compatible with experience. In technocentric terms rationality is scientific. The emphasis is on systematic thought. Knowledge is rational when beliefs are based on ideas that are not incoherent or contradictory but are essentially founded on scientific or technical issues. The technocentric attitude to rationality is fundamentally one of getting the facts right. It is

concerned with logical arguments based on empirical facts and assumes that the facts have an objective reality of their own. That is, facts are believed to have their own identity free from human input. In technocentric terms rational argument is argument based on empirical evidence.

3.1.4 The economic

The underlying scientific orientation of technocentrism and the rational approach associated with it translates into a third distinguishing feature of the technocentric perspective, - economic reductionism. The technocentric world view tends to reduce the perception of most things into economic conceptualizations. Decisions are based on profit, cost-benefit analysis, utility, efficiency and so on. Economics is part of technocentric scientism and has been elevated to the position of scientific "law". These "laws" are viewed as forces which determine the way society and nature operate. Therefore, much of how the technocentric approach explains the world is done by using economic terminology. For example, Park (1988:2) provides a definition of the environment that illustrates the economic orientation of technocentrism. He states:

"The environment has traditionally been seen as a public good, available in almost unlimited supply, and free for use (generally without restrictions) by all who desire to use it. It is an exploitable asset, to be carefully allocated among competing users."

The economic model is manifest in this example by the use of such terms as: "unlimited supply", "free for use" "exploitable asset" and "competing users". Economics is not only a manifestation of the scientific and rational underpinning's of technocentrism, it is also the means by which the scientific and rational orientations of the technocentric approach are expressed and which in turn has construed the way people perceive the world. The consciousness of the world becomes dominated by economic logic. As O'Connor (1981:22) points out, in Western society, the formulation of reality is founded on economic concepts and terminology. "These are our society's ideas about reality. They comprise therefore an ideology of the society." Or as Baudrillard (1975 cited in O'Connor, 1982:22) remarks:

"all these concepts are in fact historical products. Beyond the field that produced them they are only a meta-language of a western culture that speaks from the height of its abstraction."

3.1.5 Management

A Belief in the possibility of sound management practice is an aspect of technocentrism firmly linked to the economic dimension. This invariably incorporates the notion of managing the environment. Environmental problems which are usually conceptualized in economic terms are thought to be resolvable through the process of good management. In addition all important management decisions must be founded upon the authoritative advice of economic and scientific experts. That is, ordinary people are excluded from participating in decision making while experts are harnessed to support particular management decisions or to solve particular problems.

3.1.6 Technology

The commitment to technology also distinguishes the technocentric approach. Schnaiberg (1980:114) defines technology as "...a utilized method of production..". However, the technocentric view of technology is more expansive. Technocentrists see technology as a means of solving all social problems and believe that humanity has the ability to reason its way out of any predicament. That is, technocentrists have faith in the ability of people to develop technology to overcome any form of resource depletion and thus they believe all problems are ultimately solvable through technology (Porritt, 1984:49-50).

The faith in technology appears to be founded on the positive nature of past experience. As Catton (1982:17-18) reveals, human history has been interspersed by a series of technological breakthroughs all of which have increased the capacity of humans to forge a survival from the environment. The first of these technological breakthroughs came in the form of simple tools and the use of fire. Clubs and adze were some of the earliest examples of tools. Fire enabled people to warm themselves, cook and to ward off predators. The development of the spear thrower and the bow and arrow were the next significant technological steps. Then between 8000 *BC* and 1400 *AD* came agriculture, the Bronze Age, the invention of the plough, iron tools, and fire arms. About two hundred years ago came the industrial revolution (fossil fueled machinery) followed by medical improvements such as anti-septic surgery.

The perceived consequences of these technological breakthroughs have made it possible for humans to temporarily increase the carrying capacity of the environment.

Thus, technology has enabled human populations to increase in size, and therefore technology has come to be seen as favorable.

In contemporary times technological change has been commonly associated with scientific progress. Since World War Two (see Schnaiberg, 1980:124) there has been a realization that scientific research could be applied to increase the growth of production, and much scientific research is now focused on the development of industrial technology (Schnaiberg, 1980). It has come to signify more than a method of production, and is generally associated with mechanized developments based on scientific research and industrialization. Technocentrism today can be regarded as synonymous with the industrial world view.

3.1.7 Growth

A consequence of the faith in scientific technology and its favorable image is the view that the world has a limitless capacity to sustain economic growth. In technocentric societies economic growth is usually reduced to the accumulation of profit and is typically seen as the driving force of society. Growth via scientific industrialism is viewed as the means by which the most important social problems can be solved.

The marketplace takes a central place in relation to technological progress which entails the accumulation of profits to finance more growth. Growth (progress) has come to imply that the quality of life can be improved by increased consumption of material goods, that more is better than less, that higher technology is better than lower technology, that sophisticated management structures (bureaucracies) are better than less organized methods of management, that the reclamation of land for production is better than wilderness and that the spread of civilization is the mark of humanity. Primarily though, progress in technocentric terms, is a commitment to economic growth.

3.1.8 Conclusion (Technocentrism)

To conclude this section it must be pointed out that only the primary characteristics of the technocentric approach have been outlined and that this section can only be described as a brief generalized profile. We now have an operational definition of technocentrism as an economically orientated management practice that is fundamentally

committed to science, industrialism and growth. It is the dominant perspective of industrialized societies.

3.2 Environmentalism and ecocentrism

The ecocentric perspective is a rival belief system in western industrial societies that is said to have influence on our perceptions of environmental problems. As an ideology the existence of this belief system is to be expected for, as pointed out earlier, ideologies emerge and are defined in relation to alternative ideologies. In its extreme form it is that belief system which is advanced by the most passionate modern environmentalists.

3.2.1 The meaning of environmentalism

Johnston (1981 cited in Pepper, 1984:13) defines environmentalism as "the ideologies and practices which inform and flow from a concern for the environment." However, the idea that ecocentrism and modern environmentalism are synonymous has to be clarified. The complicating aspect of the term environmentalism is that as a concept it can have different meanings for different people. Environmentalism is a contested term. As Pepper (1984:13) points out the term environmentalism can be used as a synonym for "environmental determinism". He states,

"The Oxford English Dictionary (1972 supplement) has an 'environmentalist' as one who believes and promotes the principles of 'environmentalism' (which is a theory of the primary influence of the environment on the development of a person or group)".

In contrast, according to Pepper, the same dictionary puts forward an alternative meaning which is more in line with the one advanced by Johnston (1981). The second definition cited by Pepper (1984:13) defines an environmentalist as "one who is concerned with the preservation of the environment (from pollution, etc)."

For the purpose of this thesis Johnson's (1981) definition of environmentalism is preferred. However, this definition can be as applicable to those who hold a technocentric view as to those who hold an ecocentric position. In order to relate ecocentrism to a modern environmentalist position one must note its historic emergence.

3.2.2 Old and Modern environmentalism

The notion of old environmentalism emerges from the fact that groups that have had some concern for environmental issues have been around for quite some time. Cotgrove (1982:2) identified several British environmental organizations that were formed last century. Two such groups were the Commons, Open Spaces and Footpaths Preservation Society (founded in 1865), and the Society For The Protection Of Birds (established in 1889).

Typically old type environmental groups are parochial in nature and are usually interested in producing amenity type services. However, collectively they cover an extensive range of interests. Cotgrove (1982:2) states, that such environmental groups embrace

" a very wide diversity of interests and approaches, from the preservation of wildlife and the national heritage of buildings, to the enjoyment of the countryside through rambling, hostelling and caravanning."

Modern environmentalism is different to old environmentalism in a fundamental way. Modern environmentalism is a mass movement with political orientations. Most important, their message is that an environmental catastrophe can only be avoided by making fundamental and radical changes in the values and institutions of industrial societies.

3.2.3 The emergence of modern environmentalism

The 1960s has been identified as the period in which modern environmentalism emerged (Newby,1979; Cotgrove,1982; Pepper,1984). An important element in its ascendancy was the contribution made by the mass media. It was the media which has raised public consciousness enough to form a mass movement by revealing to the public the enormous scope of the environmental issue. Pepper (1984:15-16) asserts:

"...what perhaps distinguished the environmentalist movement of the past two decades from the earlier movements was that the former was a mass movement... Environmental concerns entered mass consciousness through the mass media, frequently at the prompting of mass demonstration of dissent over threats to the environment. To an extent this all-pervasive influence was a result of the mass nature of the threats that were perceived."

There were however other elements in the 1960s which provided many of the conditions suitable for the emergence of modern environmentalism. One such element was the Peace Movement (Newby,1979; Pepper,1984). The Peace Movement originated with the anti-nuclear bomb protests in the late 1950s. In the 1960s it soon became clear that the peace movement was fundamentally an environmental movement. The possible destruction from nuclear war was seen as the greatest environmental threat. It was also concluded that environmental and peace groups were attacking the same elements in society. By confronting those who were harmful to humanity's harmonious relationship with nature, environmentalists were rejecting the same dominant philosophies and economic structures that promoted the production of nuclear weapons.

A further movement in the 1960s which influenced the emergence of politically orientated environmentalism was the Civil Rights campaign in North America (Pepper,1984:16). This too was seen to involve environmental issues. The environmental aspects of the Civil Rights protest involved such issues as claims for better urban environments and the redistribution of resources to the underprivileged.

An additional element of the 1960s era which helped to formulate modern environmentalism was the rise of youth culture. Allied to this was the emergence of the Hippy Movement. The Hippy Movement rejected (in one way or another) many of the dominant values and attitudes that directed the way society functioned. In outlining the Hippy orientation, Nash (cited in Pepper,(1984:17) puts forward several notions which were incorporated into the thinking of modern environmentalism. Nash states:

"It (*the Hippy movement*) was a shorthand way of indicating that they were disenchanted with prevailing American ideals concerning technology, power, profit and growth...centralization, urbanization and industrialization appeared as devourers rather than as saviours of mankind..."

The rise of modern environmentalism can also be considered in terms that relate to every day life. For example, as Newby (1979:202) points out, it was in the late 1950s and 1960s when people began to realize "that new forms of pollution and disruption became much more difficult if not impossible to avoid". Overall it can be argued, at least in one sense, that modern environmentalism is a manifestation of the ideas tossed around by the "Vietnam generation". A generation which was influenced by various social movements which had in one way or another questioned the dominant attitudes and values of their society. That is, they had started to question the technocentric ideology.

3.2.4 Traditional and radical modern environmentalism

It is modern environmentalism that exhibits most of the ideas advanced by the ecocentric perspective, but the movement is split into two: a traditional type and a radical type.

The traditional form of modern environmentalism according to Cotgrove (1982:5) sees:

" the return to small scale decentralized communities as the only way to halt the growing disintegration and disorder of mass industrial society. But the emphasis is on the restoration of order, based on what is seen to be the natural order of a close knit community."

Radical environmentalism differs from traditional modern environmentalism in that, according to Cotgrove (1982:6), it is attracted to:

"small-scale self-sufficient communities by their promise of personal autonomy, and escape from the restrictions of hierarchical and bureaucratic structures."

These two forms of modern environmentalism also have other differences. There is direct opposition around the question of differentiation and inequality. Traditional forms of modern environmentalism support notions of inequality, competition and hierarchy based on the idea of "the natural order". Radicals on the other hand stand against such functionalist orientations and oppose inequality and most notions of hierarchical power structures. A further difference between the attitudes of traditional and radical forms of modern environmentalism concerns attitudes towards scientific modes of thought. Although both traditional and radical modern environmentalism are critical of scientific reductionism radicals are more concerned with the liberation of humanity whereas traditional utopianism seeks a resurgence of alternative or mystical explanation.

3.3 Ecocentrism

Overall modern environmentalism is the medium through which most ecocentric attitudes and beliefs are conveyed. Further, it would appear that radical modern environmentalism is the foremost manifestation of ecocentric thought. Radical modern environmentalism exhibits most of the features that characterize the ecocentric perspective and it is the form of environmentalism which is most critical of technocentrism. The

primary feature of ecocentrism and its guiding principle is the notion that humanity is not separate from the environment. Rather, humanity is seen to be part of nature.

3.3.1 Theological and Romantic notions of unity

There are several sources for this type of thinking. The first possible source was the theological idea of the "Great Chain of Being" prominent in the medieval period (Pepper, 1984). This conception of reality advanced the notion that all components of the universe, animate and inanimate, were linked together in a hierarchical order. This interconnectedness stemmed from a Christian understanding that their god had created everything for a purpose, and that the ultimate purpose was to satisfy this god's desires. Thus, a coherent world was one in which everything was linked together in a hierarchy of superior and inferior orders.

A second source of the idea that humanity and nature are inseparable is the romantic school of thought. Romanticism being that orientation derived from the Romantic movement of the eighteenth and nineteenth centuries and exemplified by the American transcendentalists. The romantic movement emerged in reaction to the radical changes and social upheavals brought about by the scientific enlightenment, the rise of democracy and the industrial revolution. The derivatives of this intellectual movement stand in opposition to many technocentric features and have had a significant impact on the formulation of the ecocentric perspective. It is non-rational, in a scientific sense, and may be described as an emotional orientation that stands as an alternative to the scientific approach.

The idea of humanity as part of nature can be related to the romantic understanding of nature as an entity in its own right and that the existence of nature goes beyond the existence of humanity. The romantic view sees humanity as only one small encapsulated part of nature. It would matter little to the world if humanity disappeared, for nature would still continue to exist.

The romantic understanding of the relationship between people and the environment can be likened to another feature that distinguishes the ecocentric perspective - the notion of bio-ethics.

3.3.2 Bio-ethics

The bio-ethical position suggests that because nature has an existence that goes beyond that of humanity's, nature is worth respect and reverence in its own right. O'Riordan (1984:4) asserts:

"Supporters of the bioethic line of reasoning seek to protect the integrity of natural ecosystems, not simply for the pleasure of man but as a biotic right. Nature they contend, contains it's own 'purpose' which should be respected as a matter of ethical principle."

It can be said then, that the ecocentric perspective incorporates a view of the environment that goes beyond merely recognizing nature in terms of its utility to humanity. Nature it is argued has an autonomous existence that has a worth, at least as equal to that of humanity's.

3.3.3 Scientific ecology

The ecocentric notion that people are part of nature is also based on scientific ecological principles. In fact it has been argued that ecology provides the conceptual foundation for ecocentric thought. Spretnak and Capra (1984:30) state that: "Ecology is the secure and scientifically sound foundation for the entire Green philosophy." Thus, it can be argued that ecocentrism is an ideology that is primarily based on an ecological paradigm.

Before going on to outline some of the main ecological principles that guide ecocentric thought, it is first necessary to discuss how ecology, a scientific discipline, has obtained a primary position within ecocentrism when ecocentrism is a belief system that confronts the scientifically orientated technocentric perspective.

The central position of the ecological paradigm as a guiding force within ecocentrism is related to the position that science holds in Western societies. Because technocentrism is the dominant ideology it is generally accepted that science is the means for obtaining "true knowledge". Knowledge in the sense that it has been obtained from systematic investigation of empirical data and is deemed to be a reliable and a valid representation of particular concepts (see Babbie, 1986). This understanding of science as the legitimate source of knowledge is the reason that the ecological paradigm is used to underpin much of the ecocentric perspective. Ecology according to Cotgrove (1982:66) "provides an authoritative backing for environmentalists policies". It could be said that ecocentrism uses

a technocentric device (e.g a rational paradigm) in an attempt to legitimate itself in the eyes of the dominant world view.

3.3.4 Holistic paradigm

Ecology is advanced as a different scientific paradigm that is an alternative to the technocentric approach. Ecology is a science that sees humanity as part of nature. It sees nature as an interconnected system in which all parts are mutually dependent and of equal importance. Ecology is a holistic paradigm and an alternative to the atomistic reductionist approach of technocentrism which is seen as the basis of destructive behavior towards the environment.

The ecocentric belief that people are part of the bio-sphere is derived from the fundamental ecological principle which asserts that the world is made up of a series of interrelated ecological sub-systems (weather/ climate, water, landforms, soils and biota). Each part of the environment (which incorporates humanity) is believed to interact with every other part to utilize energy and matter to produce life. Ultimately then, from an ecocentric point of view, humanity can not be separated from nature.

3.3.5 Thermodynamic principles

In association with the ecological notion that asserts that the world is made up of interrelated ecological systems is a second argument that asserts that the total system (the biosphere) is ultimately constrained to operate within the principles of thermodynamics. The first of these principles concerns the conservation of matter and energy. It asserts that matter and energy can not be created or destroyed, but can only be transformed. The second principle is the "law" of entropy. Entropy is the process by which all energy transformations are degradations, changing energy from more to less organized forms. Energy enters the finite natural system from the sun via photosynthesis and is continually dispersed (disorganized).

In ecological terms the use of energy and matter in the production of life is a global phenomenon. For life to exist, as it is at present, life requires all the ecological sub-systems to exist in a state of equilibrium. That is, the on going survival of all species requires a biosphere in which all the forces of nature are combined in a finely balanced way so as to provide a world environment which is conducive to the continuous existence of all life in more or less stable forms. Thermodynamics must operate globally. Any

catastrophic disruption to the state of equilibrium, such as the cumulative effects of species extinction or the destruction of too many forests, could eventually lead to a total crash of the biosphere (see Lovelock, 1989). Alternatively a biospheric transformation could occur that would allow a new equilibrium to be obtained irrespective of whether the new equilibrium is suitable for present life forms.

3.3.6 Limited carrying capacity

Related to this second set of ecological principles is a third idea that heavily influences the ecocentric mode of thought. It is the notion of "carrying capacity". This concept has been outlined by Catton (1982:4). He states:

"all creatures, human or otherwise, impose a load upon their environment's ability to supply what they need and to absorb and transform what they excrete or discard. An environment's carrying capacity for a given kind of creature (living a given way of life) is the maximum persistently feasible load - just short of the load that would damage the environment's ability to support life of that kind. Carrying capacity can be expressed quantitatively as the number of us, living in a given manner, which a given environment can support indefinitely."

The notion of carrying capacity is derived from the work of Thomas Malthus (1766-1834). Malthus's (1798) work, "Essay on the principle of population", was one of the first theories to argue from a perspective of limits. It emerged as a scarcity theory in reaction to earlier social theories which indicated the possibility of unlimited or rapid growth and abundance (the view espoused by technocentrism). Basically Malthus argued that the theory of growth economics was wrong because it did not take into account biophysical realities. Malthus's argument was based on his claim that if left unchecked populations would grow faster than the food supply, eventually leading to a state of scarcity. This proclivity Malthus claimed was due to population numbers increasing in a geometric ratio while the increase in food supply would only occur in arithmetic proportions. In other words, the human species would increase as the numbers 1, 2, 4, 8, 16, 32, and so on, while subsistence would increase as 1, 2, 3, 4, 5, etc. In line with Malthus's thesis the notion of carrying capacity asserts that populations are limited by the biophysical realities of a given ecosystem or the biosphere in total. A population will increase exponentially until limits set by available resources (such as food) are reached.

The concern for humans according to ecocentrics is that the growth of the human population has exceeded the natural sustainable carrying capacity. Additionally they claim that humans have over used the environment and reduced its total carrying capacity, not only for themselves but for other species as well. In other words, humans have upset the equilibrium necessary to maintain the indefinite continuance of life in its present state, and according to the ecocentric perspective this amounts to an environmental crisis. The scale of human existence is set to collapse and a propensity for global environmental change has been set in motion. This change is not necessarily conducive to life in its present form. Ecocentrics believe that this problem is the direct result of the technocentric desire for material wealth creation through growth orientated industrialism. According to ecocentrics such as Porrit (1984:120): "all economic growth in the future must be sustainable: that is to say, it must operate within and not beyond the finite limits of the planet."

3.3.7 Immediate needs

Although ecocentrics focus on the demise of humanity and the natural environment, the ecocentric emphasis is not totally targeted at humanity's long term predicament. The notion of bioethics, opposition to growth and industrialization, and the taking into account the right that non-human organisms have to exist are post-materialistic values (Inglehart, 1977) and are concerned with more immediate issues such as preserving the beauty of the environment or with preserving the pleasure derived from enjoying wildlife, natural habitats, and outdoor recreational activities. The ecocentric concern for environmental protection is also an eagerness to preserve nature in its pristine state to satisfy immediate needs; needs that are unrelated to material wealth and which are viewed as necessities that have to be realized in order for the human identity to be totally fulfilled.

3.3.8 Spirituality

Related to the need to help fulfill the human identity is the connection that ecocentrism makes between the biosphere and human spirituality. The ecocentric perspective would argue that that much of human identity is founded in a sense of belonging to the environment. Further, the environment may not be seen as inanimate, rather it may be perceived to contain, in various forms, human spirits or the essence of humanity. Maori spirituality concerning the land is well known (see Walker 1990, King 1992), but Dominy (1990) provides an example of how the spiritual dimension can be

expressed in Pakeha culture. She notes that a spiritual affinity with the environment is expressed by some Pakeha families; Dominy (1990:13) states:

"High country station families have a culture, a heritage, a distinctive way of life unique to New Zealand. When one talks about the New Zealand high country one is talking about land not only as a physical plane, but as an inhabited landscape. We must place humans there as part of the landscape...high country station families have both a material and a spiritual affinity to place which is evident in an examination of their behavior and symbolic forms...spiritual affinity is a cultural concept in which connectedness to the land and identity are inseparable. It is expressed in kinship and inheritance patterns as well as in ways of thinking about the place."

Unlike technocentrism, ecocentrism incorporates a desire to protect the environment in order to preserve what ecocentrics believe to be a significant part of that which makes up the human character; and the environmental dimension of human spirituality.

Ecocentrism would also argue, as Dominy (1990) does, that the environment provides a sense of "belonging" for people. People develop their sense of identity not only from the social relations in which they participate but also from their relationship with the specific natural environment in which they live.

3.3.9 Generalized non-violence and non-exploitation

In addition to the main elements that make up the ecocentric view there are features that further distinguish the ecocentric perspective. Unfortunately, the large number of these features makes it difficult to describe them all. However, an outline of some of the more prominent aspects can add to the understanding of the ecocentric perspective. The first of these features is the orientation towards non-violence. Greens argue for an end to both personal violence and violence imposed by the state and institutions. The origin of this non-violent orientation emanates from the connection between environmentalism and the peace movement. The second feature is the drive to dismantle the dominant patriarchal systems within society. This objective aims to end the violence and oppression imposed on women and children by systems that are male dominated. For analogous reasons ecocentrism is associated with an anti-racist perspective, urging the elimination of all forms of ethnic oppression and discrimination.

The reason ecocentrism is a perspective that advocates the elimination of violence, patriarchy and racism is that these changes would have a benefit beyond that which is solely connected to the relationships between people. These changes would also serve to

transform the violent and exploitative way humans relate to the environment into one which is guided by the limits set out by ecological principles. In other words, before the environment can be treated in a non-violent and non-exploitative manner, humans must first relate to each other in a non-violent and non-exploitative way. As Commoner (cited in Dann, 1988:330) puts it:

"The world of nature will be treated as it deserves to be treated, only when mankind treats one another as we deserve to be treated in the ancient coin of social justice."

However, this line of thought can also be deepened. Ecocentrism is an ideology that does not just seek to preserve the welfare of the environment. It is inherently concerned with the welfare of human beings. Therefore, it can also be said that humans will only treat one another as they deserve to be treated when humans first treat nature as it deserves to be treated. That is, if humans stop relating to the environment in a violent and exploitative manner then this would go along way towards eradicating the violent and exploitative ways humans relate to each other.

Ecocentrism, thus has a social objective beyond that of just ensuring humanity's survival. Ecocentrism has revealed some utopian tendencies. It incorporates a desire to change the social world into one which, ecocentrics believe, would be devoid of some of the most negative aspects evident in present day industrial societies.

Emerging from its utopian orientation is a fourth distinguishing feature of the ecocentric perspective. It is the position that argues for the transformation of economies into non-exploitative systems in which employee owned and controlled businesses replace large operations dictated by the state or corporate interests. In line with this feature ecocentrics argue for the establishment of small scale organic agriculture. This in turn reveals a fifth feature of ecocentrism. A desire to move away from industrial farming. Industrial agriculture relies heavily on energy input and therefore operates beyond ecological limits. The quest to reduce industrial agriculture is also based on the fact that this type of agriculture normally involves air and water pollution through the use of chemical sprays and the release of harmful gases from machinery and stock. A sixth feature that helps to characterize ecocentrism is the goal to increase individual self determination. Ecocentrism argues for the dismantling of hierarchical power structures. Bureaucracies and class systems should be eliminated. According to the Greens bureaucracies take power away from the individual. As Spretnak and Capra (1984:45) state: "...over-bureaucratization and the hierarchic structure of government thwart the initiative of citizens." In addition to the dismantling of bureaucracies ecocentrism argues for increasing individual self determination by increasing the level of participation and

involvement in decision making. This is a position which seeks to increase participation in the political sphere through protest and direct action, arguing that for there to be any confidence in any political system there must be both a high degree of accessibility and responsiveness.

3.3.10 Non-anthropocentrism

In addition to the distinguishing characteristics outlined above, ecocentrism is also characterized by what may be described as a propensity to move away from anthropocentrism. In general terms anthropocentrism is the process of viewing everything from the human perspective which incorporates the view that humans can solve any problem through their ability to reason. This translates into a world view that underlies virtually all established theory in contemporary Western societies. Catton and Dunlap 1978 (cited in Buttell, 1986:344-345) have labelled this the Human Exemptionalism paradigm (HEP). They outline this paradigm by arguing that anthropocentric theories share certain assumptions:

- "1. Humans are unique among the earth's creatures, for they have culture.
2. Culture can vary almost infinitely and can change much more rapidly than biological traits.
3. Thus, many human differences are socially induced rather than inborn, they can be socially altered, and inconvenient differences can be eliminated.
4. Thus, also, cultural accumulation means that progress can continue without limit, making all social problems ultimately soluble."

In crude terms anthropocentrism amounts to nothing other than the technocentric perspective; a view that has separated humanity from the bounds of ecological principles, suggesting that cultural systems can operate as if from above or outside the environment. The way the economy is perceived of as a system within itself or as some "thing" which is separate from nature is an example of this. Spretnak and Capra (1984:78) state:

"Instead of recognizing the economy as one aspect of a whole ecological and social fabric, They (economists) tend to isolate it and to describe it in terms of highly unrealistic theoretical models."

In opposition to the Human Exemptionalism paradigm (HEP) Catton and Dunlap argue that people have to adopt what they describe as the "new ecological paradigm" (NEP). In other words, operate by ecological principles. This ecocentric perspective is an orientation that tries to adopt or incorporate a non-anthropocentric view of the

environment and environmental problems. A view that could be described as coming from the "ecological perspective".

3.2.11 Conclusion (ecocentrism)

This sketch of the ecocentric view, like that of the technocentric perspective, has only been a skeletal outline. However, it incorporates some of the major points which characterize the belief system. Ecocentrism can be described as an emerging alternative ideology. It is a perspective that is of the view that humanity and nature are not separate and that human beings are ethically obligated to preserve the environment for its own sake. Furthermore, it is a view that is primarily based on ecological principles and incorporates a belief that human spirituality and the environment are connected. Also it is an ideology having utopian features and seeks to protect the welfare of human beings. Finally, it is a perspective which attempts to address issues from a non-anthropocentric viewpoint.

Chapter Four

Methodological Theory

The purpose of this chapter is to outline the "methodological theory" used to empirically examine the influence of technocentric and ecocentric ideologies on shared public attitudes. The "theory" employed was Kerlinger's (1984) Criterial Referent Theory, developed through his research on Liberal and Conservative attitudes.

Though a methodological theory, it is also an explanation of the structure of social attitudes in the factor analytic tradition. It attempts to establish a descriptive outline of the structure and nature of attitudes towards specific social objects. The advantage of this theory is that it avoids the bipolar assumption that has traditionally underpinned attitude measurement and asserts that attitudes can exist relatively independently of each other. Therefore, it may be appropriate to conceive of attitude structures as a variable set of ideas that can draw upon various beliefs systems or ideologies. In terms of the ecocentric/technocentric argument, and as suggested by Pepper (1984) and O'Riordan (1981), it may be more appropriate to conceive of attitudes towards the environment as a domain that draws upon both ideological perspectives rather than as an area where only polarized dispute can occur.

4.1 The polarization of ideas

Ecocentrism has been put forward as a belief system that stands as an alternative to the technocentric view. However, the relationship between technocentrism and ecocentrism can be advanced as more than just a juxtaposed set of ideas even though the attitude systems are often conceived as though they too were simply polar opposites (Cotgrove, 1982). As an ideological domain it is "normal" to conceive of them as logically opposed but as attitudinal systems their various features may be mixed and matched in a variety of ways.

In other words it is questionable as to whether the logic of the ideological models fits the logic of the real world. While this thesis does not dispute the notion that ideologies emerge out of and are described in relation to other ideologies it does question whether their influence produces diametrically opposed or polarized viewpoints when translated into the empirical world of shared attitudes. Although the literature often suggests that public viewpoints are as polarized as the ideological systems, this thesis proposes that, as attitudinal systems, technocentrism and ecocentrism will vary according to political and socio-economic circumstances.

4.2 The difference between ideology and attitudes

The idea that there are ecocentric and technocentric attitude systems emerges from the understanding that the features that combine to form the ideologies can be reformulated under different social circumstances. It is proposed that an acceptance of either technocentric or ecocentric ideas can collectively culminate into attitudes that may be described as either technocentric, ecocentric or some mixture of those.

In this thesis ideologies are defined as formal belief systems. They are characterized as logically related ideas about the world which commit those who share them to act in ways that are consistent. Thus, the values, norms and expectations formulated within ideological systems are able to be regarded as a kind of theoretical model that can tell believers what is or isn't real, good or appropriate in their thought and behavior. Such a definition is consistent with Kerlinger's (1984:13) notion of ideology as:

"...a set of coherent concepts and beliefs centered around a general idea or concept that usually commits believers of the ideology to behavior consistent with the beliefs of the ideology."

Attitudes, according to Kerlinger (1984:5) on the other hand, are, to be differentiated as social psychological structures that operate on a different level as:

"...enduring and organized structures of social beliefs that predispose individuals to think, feel, perceive, and behave selectively towards referents of "cognitive objects" of attitudes."

Although individuals may take on or internalize attitudes which closely approximate a given ideological system, that system itself is regarded as a cognitive object. Through interaction with one another individuals may be influenced by entire systems or by their specific features. Depending on the situation, people will be differentially disposed to

different referents in the same ideology. They may or may not perceive the same force of logic or accept the same depth of commitment to the various features of ideological systems. Given this relationship between the concepts of ideology and attitude, it becomes clear that attitudes will tend to govern the way ideologies have their impact in societies. As Kerlinger (1984:10) states:

" attitudes are the psychological bridge between people and their complex environment: they provide psychological means to cope with many aspects of what is an extremely diverse and perplexing social environment. Much of this environment cannot be experienced and known directly. Yet we have to cope with it; we have to react to people and events about which we are only partly informed. Attitudes help us do so."

The importance of studying attitudes arises from the understanding that they affect social behavior in a more direct way than do ideologies. It is assumed that the expression of a social attitude is the expression of a psychological orientation towards an environment. Attitudes represent the cognitive reactions that people have towards the objects of their environment and these cognitive reactions influence the way people behave.

In this thesis the cognitive objects of most interest are the natural environment and the relevant ideologies, and the social behaviors of interest are the way people relate to one another as well as their social and natural environments. Having assumed that technocentric/ecocentric ideologies can be expressed as individually held attitudes it follows that our attitude measures indicate the influence of those competing ideologies on individuals.

4.3 Ideology and attitudes are both belief systems

Although both ideologies and attitudes are shared systems of belief that "express presumed knowledge, faith or opinion" they are nonetheless "statements and propositions" that have become manifest at different levels. Kerlinger (1984:5) is asserting that people are capable of knowing about certain ideological models of the world and the behavioral commitments that go with them without accepting them as their own attitudes. The beliefs people share and know about include both sorts of systems, the abstract theoretical ones and the individually internalized ones - the attitudes that guide their behavior. At one extreme people may derive their attitudes completely from one or the other model of the environment while at the other extreme people may develop attitudes (perceptions, thoughts, feelings and intentions to act) without being aware of any influence or connection to an ideology. The translations of collectively shared ideologies like

ecocentrism and technocentrism into collectively shared social attitudes is presumed to be an observable process. In this thesis, however, it is the existence of technocentric, ecocentric and potentially combined forms of those attitudinal structures that are being investigated and explored. From this it is assumed, that to some degree, the nature of the influence that the ideologies have on the attitude systems can be inferred.

4.4 The structural nature of attitudes

A fundamental point made by Kerlinger is that, like ideologies, the concept attitude is to be thought of as a structural entity; a structure of ideas and beliefs. The structural nature of attitudes emerges from the understanding that, like ideologies, they are multidimensional and are made up out of the relationships between various components (dimensions). That is, attitudes are made up out of the relationships between various ideas directed at particular social objects or issues. It is this notion of relationship that implies structure. This idea was outlined by Kerlinger (1984:3), who stated:

"Structure can only be approached, at least empirically, through the relations among things. When we compare, for example, A to B to C, and when we find that A is greater than B and C, we are defining a hierarchical structure based on size. Somewhat similarly we can compare responses to attitude objects and ideas and find, perhaps, a hierarchical structure or, more likely, more complex structures..."

According to Kerlinger it is possible to determine the structure of attitudes in relation to how they are related to specific social objects. If so, it must also be possible to determine the structure of technocentric and ecocentric attitudes towards the environment. Further, because these two perspectives can be directed at the same social object, it must be possible to investigate the structural relationship between the two perspectives. In other words it must be possible to determine the structure of the "sphere of environmental attitudes".

As noted previously ideology and attitude structures are not the same thing. This difference is further explained by the fact that the components that make up an ideology are all positively related whereas attitudinal structures may have contradictory components. Attitudes can draw upon the components of various ideologies to formulate their structure. An attitude that draws heavily, or is made up completely out of the ideas and beliefs advanced by one particular ideology may be said to be ideological. Thus, by exploring the structure and nature of attitudes it is possible to explore the extent to which ideologies exist and have an effect within a society.

By definition, the investigation of attitudinal structures refers to the exploration of ideas, statements and propositions that are closely associated and therefore can be regarded as the empirical content of an attitude. Attitudes can also be conceived of as structural in a further sense, in that they are shared by large numbers of people. Therefore attitudes reflect systematic social relations among those people and the things towards which an attitude is directed.

4.5 Factor analysis

Kerlinger (1984) argues that in light of the above understandings it is possible that an explanation of the structure of social attitudes can be formulated from the use of factor analysis. That is, the structure of attitudes can be found through the factor analysis of the responses of many individuals to attitude instruments. The relations among the "things" towards which an attitude is directed can be analyzed to indicate what the factors are that underlie the attitude responses. This analysis will enable the identification of the common sources or similarities of attitudes. Accordingly, the results of large-scale factor analysis can indicate how aspects of social attitudes cluster and therefore indicate the structure and nature of the attitudes of interest. In line with these views this thesis attempts to formulate an explanation of attitudinal structures concerning the environment using aspects of Kerlinger's factor analytic Criterial Referent Theory.

Criterial Referent theory attempts to explain, via the use of factor analysis, how social attitudes are structured. As a theory of attitude measurement, it avoids presuppositions that constrain attitudinal statements to polar opposites. However, Criterial Referent Theory is more than just this. It is a theory of attitude measurement specifically developed to avoid the assumption that attitudes must fit on a continuum between polar opposites.

4.6 The bipolar assumption and Criterial Referent Theory

The bipolar assumption has been one of the most important beliefs behind the measurement of social attitudes. It has been assumed that if a person was in favour of something then he or she would be against an opposite idea. For example, if a person was in favour of industrial development, a technocentric attitude, it is often assumed that he or she would be against say, restrictions on land reclamation for industrial real-estate,

an ecocentric perspective. Therefore, with this assumption in mind, research which has been done to investigate attitudes has often been set out with the idea that there must be two poles of measurement. A positive and a negative pole. For example, if there were only two items on the measurement device and they were both directed at the same attitude object then agreement with one would receive a positive score and agreement with the other would receive a negative score. The bipolarity assumption would put the scores at opposite ends of a presumed continuum. In other words, the measurement device would restrict attitude measurement to the belief that attitudes must be torn between polarities. The problem is that devices developed in this way may have painted an unrealistic picture of the actual nature and structure of the attitudes under investigation.

Criterial Referent Theory was developed to break away from the constraints of this bipolarity assumption. As an attitude measurement technique it allows for the possibility that there could be alternative relationships between attitudes. However, before this can be explained it is first necessary to outline some of the theory's fundamental concepts.

4.7 Basic theoretical concepts

The term referent is the first important concept to understand. Kerlinger (1984:31) outlines the term referent in the following way: " attitudes are defined as sets of beliefs that are directed toward 'objects' in the environment..." and that " These objects are known as 'referents' ". Therefore, referents are a kind of category. They can be objects, events, behaviors or any sort of construct. In general terms, referents are any object or construct of psychological regard. In terms of attitudes they are the sets of things towards which an attitude is directed. Some examples of referents are: unionism, sports, money, business, art, pollution, and the environment. In other words any object of thought is a potential referent.

Secondly, attitudes with regard to a specific referent are based on the "criteriality" or their degree of intensity. "Criteriality" according to Kerlinger (1984:31) means: "...the relevance, significance, pertinence, or importance of something in helping make a judgement or decision." Therefore, a criterial referent of an attitude, as defined by Kerlinger (1984:31) is "...a construct that is the 'object', the focus of an attitude, that is significant, salient, and relevant for an individual or for groups of individuals." According to Criterial Referent Theory, if one person holds one set of beliefs and a second person holds another set of beliefs, then the attitude referents that are criterial for the first person are different from the set that is criterial to the second. A positive attitude

towards eliminating the pollution in our waterways is criterial for those people with ecocentric attitudes. On the other hand people with technocentric attitudes may be relatively indifferent to waterway pollution. They may know little about it or not even care about its existence. It has no or low criteriality for those people. As Kerlinger (1984,32) states:

"...what is relevant or salient for one individual is not relevant or salient for another individual. What is attitudinally important for one group of individuals may not be important for another group of individuals."

Establishing the criteriality of attitudes makes it unnecessary to regard them as oppositional. Instead they could be relatively independent of each other.

Before expanding on the above proposition another important point has to be mentioned. Although the criteriality of attitude referents may be shared they are usually differentially shared. There is a continuum of relevance for any referent. For example, if two people both approve of and support Greenpeace, one person may be passionately committed to it while the other only mildly committed to it. The referents "saving the whales" and "the dumping of toxic waste at sea" may be of extreme concern to the person passionately committed to Greenpeace and of only moderate concern to the person mildly committed to Greenpeace. The aim of the theory is to determine the shape or form that the attitude structures take and to establish the criteriality of referents in relation to other referents.

4.8 The positivity principal

Another important aspect of Criterial Referent Theory is Kerlinger's (1984:33) view that:

"...what is shared among large groups of individuals is their generally positive perceptions, sentiments, and reactions to attitude referents."

The theory argues that attitudes are formulated out of the sharing of positive sentiments. Moreover, it goes on to claim that if positive reactions to certain referents are not shared by some people this does not necessarily mean that those people will have negative predispositions towards those referents. Negative sentiments do exist. The presence of prejudiced attitudes affirms this, but the theory claims that negative reactions are less important, relatively infrequent or tend to occur when the issue is extremely controversial.

4.9 Duality and orthogonality

Emerging out of the positivity principle is the assertion that " the aggregate structure of social attitudes is not bipolar: it is, normally, dualistic." For example, in terms of attitudes towards the environment the theory would argue that ecocentrism is not necessarily the opposite of technocentrism. Each would be an attitude system in its own right as evidenced by finding "orthogonal", or relatively independent factors. The two attitude systems would exist as a "duality", with the orthogonal factors emerging from how people react to criterial referents. That is, referents that are criterial for one group may not be criterial for another group.

However, because Criterial Referent Theory was developed from Kerlinger's research on conservatism and liberalism it can not be claimed with any certainty that ecocentric attitudes or technocentric attitudes are in fact orthogonal. It is quite possible that the relationship between ecocentrism and technocentrism is bipolar. Kerlinger (1984:39) has acknowledged that where referents are the objects of heated public controversy bipolar attitudes may emerge in association with more negative responses. However, the theory does take this into account. Criterial Referent Theory adopts a measurement technique which does allow for the emergence of bipolar relations where positive and negative sentiments are focused on the same criterial referents.

4.10 Attitude measurement technique

The measurement technique requires the same subjects to react to many attitude objects. Further, to avoid forcing the bipolar assumption, the criteriality of referents is only measured in relation to positive statements (positive in the grammatical sense) about each attitude object. That is, a positive statement about an attitude object is advanced and the reactions to that statement are measured on a scale. If it were a 7-point scale, '7' could be interpreted to mean a strong positive feeling, and a '1' a strong negative feeling (opposition to the idea), while '4' would indicate indifference. This avoids forcing the respondents to choose between two opposite poles. However, it must be recalled that this measurement process does allow for polarity to emerge. Any score below 4 indicates a degree of opposition to the attitude referent advanced. Thus, if enough responses were divided equally above and below the point of indifference and were located towards the

extreme ends of the measurement scale then this would indicate the existence of a bipolar relationship.

4.11 Application of the theory

It is assumed that technocentric and ecocentric attitudes emerge out of alternative ideological perspectives. However, the presumption that they are polar opposites must be avoided. It may be that both technocentric and ecocentric beliefs can, at the same time, co-exist in the minds of the public. Under different situations or in relation to different referents, it is possible that the attitudes expressed by people may be drawn from either or both the ecocentric or technocentric perspectives, depending on what people think is appropriate. According to Criterial Referent Theory you would normally expect to find an orthogonal attitude structure, or the appearance of independent dimensions of ecocentrism and technocentrism. Nonetheless it is possible that these attitudes do stand in a polar or somewhat correlated relationship with one another. Certainly the approach allows for these findings to emerge.

In addition to the possibility that the relationship between ecocentrism and technocentrism is either orthogonal or bipolar there is a third possible outcome. It may be that the two attitude sets don't exist. That is, the responses obtained could be distributed in such a way that it becomes impossible to make a distinction between them. The responses may hang together in a way which can not be described as an ecocentric/technocentric domain. This would indicate that, although ideologically different, the component items of technocentrism and ecocentrism are not attitudinally distinguishable in the public domain. Thus, the existence of ecocentrism and technocentrism as overt ideological influences within society would be minimal.

As noted in Chapter One, there are some basic questions that an application of Criterial Referent Theory attempts to answer. First, are there organized structures of social beliefs shared by portions of the population which could be described as ecocentric or technocentric attitudes? Second, what is the nature and content of the ecocentric and technocentric attitude structures? Finally, what is the relationship between the technocentric and the ecocentric attitudes? This final question asks whether or not each attitude towards the environment shares characteristics from the other perspective or do the ecocentric and technocentric beliefs formulate attitudes that stand are either correlated or in opposition to each other. Because Criterial Referent Theory does not force the respondents into a situation where they have to make a choice between the two perspectives it allows for a more "realistic" understanding of the nature of the relationship

between two attitude sets. This will hopefully allow for a more accurate examination of the nature of the relationship between ecocentrism and technocentrism.

Chapter Five

Methodology

This chapter outlines the methodology used in this study and explains why a survey was chosen for data collection. It discusses the design of the self administered questionnaire and reveals that the purpose of the investigation was divided between two goals. The chapter then goes on to discuss the socio-demographic variables incorporated in the survey and then deals with sampling and the response rate. Finally, there is a discussion on factor analysis as the method employed to analyze the data.

5.1 Rationale for selecting a survey

There were several reasons why a questionnaire survey was selected as the data collection method for this investigation. The first reason emerges from the fundamental purpose of the study which was to investigate the extent to which the ecocentric and technocentric belief systems occur within the population. Implicit in this goal was the need to sample and explore beliefs on a scale large enough to ensure that any findings could be advanced as reasonably representative of the population from which the sample was drawn. A standardized mail-out survey helps make this possible. Furthermore, a survey was essential for the employment of Kerlinger's (1984) Criterial Referent Theory, which necessitated the development of a questionnaire for the scale measurement technique.

The second reason for choosing a survey was to incorporate a partial replication of a British survey on environmental opinions. Cotgrove (1982) developed a questionnaire incorporating several scales which translated into measures of ecocentric and technocentric views. Therefore, in accord with the goal of developing a reliable and valid measurement device, it made sense to employ Cotgrove's work. There are two reasons. First of all, the indicators developed for his questionnaire appeared to be valid measures (of some) of the concepts that this investigation was concerned with, and secondly their

value as measures could be examined and thus provide a validity check for this investigation.

The third reason for using a survey simply relates to it being an economical form of gathering information. Considering the limited scale of research appropriate for a Masters thesis and the limited time and resources available to the researcher, a self administered questionnaire, mailed out to the sample, was a most feasible option.

Finally, a survey was chosen was because the method provides an efficient and standardized mechanism for data collection. Not only do questionnaires provide a relatively quick means of obtaining information but they also provide a uniform presentation of concepts and thus reduce the possibility of distortion or bias often associated with open ended or more interactive data collection techniques (see Babbie, 1986, de Vaus, 1985).

5.1.1 Survey criticisms

One of the main criticisms of surveys is that they are superficial. That is, it is argued that surveys measure only those features that are at least minimally appropriate to most members without going on to achieve the detailed understanding that the more indepth or subjective studies of individual attitudes and beliefs may reveal.

Qualitative research methods are often seen as a means to overcome the presumed superficiality. The basic objective of qualitative research is that in order to gain understanding it is necessary to gain access to the "life-world" of the subjects. Researchers need to put themselves in the subject's shoes in order to see the world from their point of view, whether this be through participant observation, the life history or some other form of interpretive methodology. However, it is questionable as to whether it is appropriate to view qualitative sociology as an alternative that can overcome the shortcomings of quantitative methods. The two perspectives have different objectives. In general quantitative methods are concerned with uncovering empirical structures such as patterns, laws or relationships by using precise definitions of concepts and mechanisms which can be used to measure concepts repeatedly. Surveys observe and measure those facts that are external to the individual yet influential and constraining on social behavior, attempting to describe the world that is commonly believed to be out there. According to Jacobs and Schwartz (1979:7) qualitative sociology has a different goal:

"Instead of trying to discover things about a social world that those within it do not know, the reverse is sought. We want to know what the actors know, see what they see, understand what they understand. As a result our data attempt to describe their vocabularies, their ways of looking, their sense of the important and unimportant, and so on."

It can be said then, that quantitative and qualitative methodologies attempt to do different things. Although they can be concerned with the same subject, they investigate the subject in alternative ways.³

This investigation attempts to measure the nature and structure of attitudes towards the environment. It is an attempt to build up and validate a broad structural picture, describing something that little is known about. It is an exploratory investigation that attempts to outline, in a precise manner, the relationship between two alternative perspectives. At this stage it seems appropriate to build up an understanding that can be discussed in general terms. An analysis of this type is all that is required at this stage and a survey will help achieve this. At some later time it may be more appropriate to do qualitative research.

A second criticism of survey research is that it can sometimes appear to have an artificial quality. It can be argued that the measurement device may restrict the emergence of fuller and more realistic impressions of the concepts under investigation. Artificiality may also emerge because surveys do not measure social action. That is, the answers that people can give to a questionnaire may not necessarily indicate the way that those people behave in relation to the subject of concern.

Questionnaire surveys can also be criticized for having little or no capacity to monitor the quality of the responses supplied by the participants. However, in this study measures were taken in the construction of the self administered questionnaire to address these problems. Attempts were made to inspire motivation by noting the topical nature of the area under study. The length of the questionnaire was restricted to help motivate responses and to make its completion less time consuming. Sensitive topics were desensitized through careful phrasing or by the promise of confidentiality. Finally, complex topics were broken down into manageable parts which could be more easily understood by a larger section of the population.

³ In other words this can be reduced to the old reliability versus validity argument. Qualitative methodologies are good on validity whereas quantitative methods can have advantages in terms of reliability (see Goode and Hatt:1952).

5.2 Design of survey instrument

As said before the development of the specific questionnaire (see Appendix A) for the purpose of measuring the nature and structure of ecocentric and technocentric attitudes towards the environment was based on Kerlinger's (1984) Criterial Referent Theory of attitude measurement. The employment of Kerlinger's work demands an attitude measurement technique that is different to the usual method of attitude measurement. According to Kerlinger (1984:50) the usual way of measuring attitudes is to ask people to respond to a number of statements about one particular referent (such as New Zealand's anti-nuclear policies). The statements are designed to assess the respondent's beliefs and feelings about that attitude object. Collecting and scoring responses, is usually done by getting a sample of individuals to respond to a scale, such as a summated-rating scale of agreement-disagreement or approval-disapproval and the responses of each respondent are then scored. These scores represent the respondent's attitude towards the object of interest.

Criterial Referent Theory on the other hand requires respondents to react to many different aspects of the social attitude of interest. In this investigation they are those referents to which attitudes about the environment are believed to be targeted, such as river pollution or industrial society. However, as with the conventional method, scores for each response are collected via a summated-rating scale of agreement-disagreement or approval-disapproval. Then, the degree of correlation between the scores is obtained to ascertain the structure of the social attitude domain. Positive correlations between attitude items indicate that they measure a common construct. In this case, the shared beliefs may combine to construct a particular attitude towards the environment. No (or low) correlations between items suggests that they do not measure the same construct and may be orthogonal. Negative correlations indicate that the referents are criterial to the respondent but are opposing beliefs. Through factor analysis we can develop such correlations to reveal a more meaningful pattern of attitudes. In this case the ecocentric/technocentric attitude domain.

5.2.1 Cotgrove items

The questionnaire scale developed for the utilization of Kerlinger's Criterial Referent Theory was a seven point summated-rating (Likert) scale of agreement-disagreement made up of forty three statements, each representing an attitude object (referent) towards

which either a technocentric or an ecocentric attitude could be directed. The respondent's responses to this scale could then be interpreted as scores, and the scores factor analyzed to provide a description of the number and nature of the referents that underlie the technocentric and ecocentric attitudes.

The items included in the questionnaire were derived from the outlines advanced in Chapter Two, wherein the basic features that combine to form the technocentric and ecocentric perspectives were summarized. The first stage in developing the questionnaire was to list those features (dimensions) from each perspective, and then to develop statements which would act as representative indicators for them. These were then to be developed into a scale to provide a composite measure of the two perspectives. However, a significant problem was evident. Although the original objective was to construct a questionnaire that covered the complete range of characteristics advanced in Chapter Two so that a comprehensive measure of each belief system could be obtained, it soon became apparent that it was beyond the scope of this investigation to measure them all, especially when each dimension could be represented by various indicators. Therefore, it was decided that only a portion of those features outlined would be included in the measurement device. This was seen to be acceptable as those features chosen could clearly indicate the nature and structure of the attitudes of interest. That is, it was believed that not only could they provide a general outline of the content of ecocentrism and technocentrism, but they would also be able to indicate the nature of the relationship between the two perspectives.

It had been decided, however, that this investigation would also be a partial replication of the study conducted by Cotgrove (1982). Cotgrove (1982:13) constructed a survey to "explore the nature and extent of support for environmental issues in Britain". Inherent within the scales developed for the Cotgrove survey was the measure of technocentric and ecocentric attitudes. It was obvious, that these scales should be repeated in this investigation; first, to employ measures which appear to be valid indicators of the referents of interest; second, to determine whether the Cotgrove findings are applicable to the New Zealand context; and third, to assess the validity of the Cotgrove indicators.

5.2.2 Origin of Cotgrove scales

Many of the items (statements) that Cotgrove developed to indicate ecocentric and technocentric attitudes were formulated out of a series of interviews with environmentalists in England between November 1977 and January 1978. From those

interviews Cotgrove established that the environmentalist attitudes fell into three main categories which he (Cotgrove 1982:124) outlined as:

1. environmental concern (pollution, resource and energy shortages, population growth, extinction of animals and plants, soil erosion, etc);
2. anti-industrialism (domination of nature, unpleasant work, economic indicators of well-being, materialism, lack of community, lack of participation, short-sighted government, etc);
3. anti-science (reliance on experts, feeling that technology is out of control).

The broad nature of these attitudes stems from the understanding that utopian environmentalists, or those who fall deep within the ecocentric camp, are concerned not only with the environment per se but are also concerned about the type of society in which we live. The scales Cotgrove derived from the above attitude categories were an environmental concern scale, an anti-industrial attitude scale and an anti-science attitude scale.

In order to obtain a deeper understanding of the differences between the views held by modern environmentalists (ecocentrics) and others, Cotgrove also developed scales to measure post-material and anti-economic values. The measures of post-material values came from an adaptation of Inglehart's (1977) post-material values scale. The anti-economic values scale was based on various environmentalist literature and the overt criticisms of environmentalists as advanced by industrialists or those sympathetic to the industrialist position.

Cotgrove (1982:127-128) revealed that after factor analysis it was determined that his environmental concern scale measured three dimensions: environmental damage, environmental shortages and concern for the destruction of nature. Cotgrove (1982:126) notes that this scale had a relatively high degree of reliability. Its validity was also tested by comparing scale scores against independent attitudinal and self-reported behavioral parameters. Cotgrove (1982:126) further noted that after pilot investigations had been conducted he believed that the environmental concern scale was a reasonable measure of the intended attitude dimension.

According to Cotgrove the other scales he developed for his survey (the anti-industrialism scale, the anti-science scale, the post-material values scale and the anti-economic scale) were all piloted and tested for reliability and validity in much the same way as the environmental concern scale. Overall, at least according to Cotgrove

(1982:125-128), these scales presented relatively good measures of those particular ecocentric and technocentric dimensions.

5.2.3 A double barrelled investigation

It can be said then, that this investigation is double-barrelled. There are clearly two parts. The first, attempts to measure the nature and structure of ecocentrism and technocentrism via an application of Kerlinger's Criterial Referent Theory. The second is a partial replication of Cotgrove's survey on the nature and extent of environmental support. This second part of the study, unlike the first part, seeks to explore the nature of attitudes in line with the conventional methods of attitude measurement.

In the Cotgrove investigation five scales were developed to represent five particular referents (attitude objects). Environmental concern, anti-industrialism, anti-science, post-material values and anti-economic values. Each scale had a number of statements developed to assess the respondents beliefs and feelings about the attitude object with which it was concerned. The objective was to establish an understanding of the respondents attitude towards each particular referent. However, the degree of acceptance of each attitude object was done independently. There was no attempt to establish whether ecocentric or technocentric attitude sets emerge from the acceptance of multiple aspects of either ecocentric or technocentric belief systems. There was no attempt to obtain a structural understanding of how the referents combine to form an attitude domain.

This thesis's application of Criterial Referent Theory on the other hand does attempt to explore the nature and structure of the ecocentric and technocentric attitude domain. As noted earlier, the scale developed for this is partly made up of items developed for the Cotgrove investigation. But, unlike Cotgrove, the Criterial Referent scale measures the statements as independent referents, each representing a particular social object towards which an attitude can be directed. It measures each statement as a separate and independent aspect of one of the two belief systems.

5.2.4 Modifications to the Cotgrove scales

Two of the Cotgrove scales were not incorporated into the questionnaire in their complete forms. The environmental concern scale (Cotgrove, 1982:127) and the Post-material values scale (Cotgrove 1982:130) were reduced to half their original size (any

less than half size and it would be difficult to classify the modified scales as replications). This retrenchment was necessary to keep the questionnaire as short as possible in order to (1) keep the scale of the investigation to a size that was manageable and appropriate for an M.A thesis and (2) keep expenses to a minimum.

The most significant changes made were as follows. First, Cotgrove's environmental concern scale (items 1-11 in the questionnaire, see appendix A) had nine items removed from its original form. The items omitted were those statements which appeared least appropriate to the New Zealand situation. Second Cotgrove's Post-material values scale (items 27-30 in the questionnaire) was reduced from a list of eight statements to a section that included only four items. There were two basic criteria on which these omissions were based; once again those items least appropriate to the New Zealand situation were dropped, and those items similar to other items in other scales were also removed.

Cotgrove's short version of the Anti-science scale (Cotgrove 1982,129) (items 23-26 in the questionnaire) was included in its complete form. The Anti-industrialism scale (Cotgrove 1982,129) was also included in its entirety, even though it was made up of eight statements. The reason for including the complete Anti-industrialism scale (items 12-20 in the questionnaire) was that it had within it statements which covered a wide range of the issues on which ecocentrism and technocentrism differ. This realization emerged out of the original attempt to develop the questionnaire scale. As noted earlier the initial step in developing this questionnaire was to list those features that characterized the two perspectives. These features were then to be developed into the scale. However, the number of possible referents would have led to a questionnaire that was too large for the scale of this investigation. The development of statements designed to act as indicators for referents such as: anthropocentrism, non-violence, patriarchal opposition, the value of economic indicators, views towards civilization, the value of cities, opposition to hierarchies and bureaucracy, the significance placed on management and expertise and the acceptance of the free-market ideology had to be left aside. Cotgrove's Anti-industrialism scale, on the other hand, was a measure that provided referents that touched on some of these subjects. It had within it statements that addressed issues such as expertise, the market, and cities. Although Cotgrove's anti-industrialism scale was reasonably broad two further statements (numbers 21 and 22) were added. This was done to help make the overall measure more comprehensive and because it was believed that these two statements addressed important aspects of the technocentric/ecocentric debate. First, it dealt with an acceptance of the underlying proposition on which the arguments of radical modern environmentalism were based and

second, it incorporated differences in opinion about the importance of scientific expertise in management and decision making.

5.2.5 Original items

In addition to the statements derived from the Cotgrove scales, further statements were developed to construct a scale to which Criterial Referent Theory could be applied. There were two reasons for this, namely to increase the number of attitude objects or referents available, thus, enhancing the descriptive capacity of the scale (methodology), and to ensure that three significant areas of difference between the two perspectives would be measured.

The first set of items (numbers 31-35 in the questionnaire) were developed to measure some of the different beliefs ecocentrics and technocentrics may have around the area of development and growth. It was expected that technocentrics would be pro-development and growth while ecocentrics would be in favour of environmental protection. Five statements were developed for this section, with items 32, 33 and 34 acting as indicators of the technocentric perspective and items 31 and 35 measuring ecocentric views. It was believed that at least two referents should be used to represent each perspective. As pointed out earlier many of the features that characterize each view have multiple dimensions. Two referents covering the same referential area were therefore deemed necessary to provide a degree of validity to the measurement of those features. Greater validity, or understanding could have been obtained if more indicators had been used. Unfortunately, the restricted scale of the investigation prevented this. Finally, an important point to note is that item 35, "New Zealand's 'Green' image must be protected to earn overseas income from tourism and trade", could possibly be a technocentric referent as opposed to an ecocentric referent. It was hoped that this item would become an explicit indicator of the difficulty people may have in separating out the two perspectives.

The second set of original items (36-39 in the questionnaire, see Appendix A) was developed to measure the degree to which people held either a technocentric or an ecocentric perspective in relation to the human-nature relationship. The basic argument that this set of referents attempts to explore is that the technocentric view sees humanity as outside of and dominant over nature, while on the other hand, the deep ecocentric would believe that the environment should at least be protected for its own sake and that humanity is just one part of nature.

The third set of items developed specifically for this questionnaire (items 40-43, see Appendix A) were designed to indicate the way that ecocentrics and technocentrics regard the environment in relation to their spiritual beliefs. The two technocentric items attempt to explore the suggestion that the basic spiritual orientation of technocentrics is one that insists that people have the right to dominate nature and that the environment can be freely exploited as a resource to satisfy human needs. On the other hand, the two ecocentric statements attempt to explore the suggestion that the environment must be protected because it contains within it the essence of the human spirit and/or that it was intended for people to be responsible stewards of the environment.

5.2.6 The reasons for separate sections

As noted earlier the reason why the scale was divided into different sections was to ensure that important areas of interest were covered, and to set out the referents so that their validity as indicators of either the technocentric or ecocentric perspectives could be compared and checked. However, there were two further reasons why the scale was divided into separate sections. It was believed that the scale should be divided into parts in order to present a less intimidating questionnaire and thus encourage a higher response rate. Several smaller scales would not appear to be as formidable as one scale of forty three items. Secondly, the replication of the Cotgrove scales required that the introductory statements developed for those scales be incorporated into the questionnaire.

5.2.7 Minimal influence for introductory statements

The statements introducing the various sections of the scale outlined in very general terms the area of interest with which each section was concerned. It then asked the respondents to indicate their opinions about the referents listed in each section. However, both the statements replicating Cotgrove's work and the statements developed specifically for this investigation were altered or designed to be as vague and as neutral as possible. The reason for this was to assist the autonomy of the scale items (referents). That is, the objective was to ensure that each item would represent an attitude object in its own right without having the respondents attitude towards that referent directed or contaminated by the statement introducing it. Because of the use of Kerlinger's Criterial Referent Theory, the questionnaire was meant to be developed as one scale of autonomous referents. Therefore, the various statements used to break up the size of the scale were devised so that they would have minimal influence in terms of grouping the items and/or in directing the subjects responses (attitudes).

5.3 Socio-demographic and behavioral variables

The second part of the questionnaire measures a series of demographic and behavioral variables. These variables were developed as independent variables against which the information about the nature and structure of the technocentric and ecocentric attitudes could be analyzed. Because this investigation is a partial replication of Cotgrove's (1982) study many of the demographic and behavioral questions are derived from that source.

The first three demographic variables were age, gender and ethnicity. The respondents ethnic identification was determined by asking the respondents to indicate whether they were Pakeha/European or of European descent, New Zealand Maori, or whether they were of some "other" ethnic identification. It was decided that only these three categories were needed to measure ethnicity as knowledge of the ethnic composition of the Palmerston North/ Manawatu area suggested that most respondents would identify with the first two categories.

The Pakeha/European or of European decent category was developed to cater for the understanding that the term Pakeha is a contested label in New Zealand society (see Spoonley 1988:63). It was assumed that many people would not identify themselves as being Pakeha. On the other hand, others would not identify themselves as being of European descent. The Pakeha/European or of European descent category was developed to cater for both of these views. This category does have shortcomings however. There are probably people who are not Maori, or who are not members of another ethnic group, who refuse to identify themselves as either European/Pakeha or of European decent. For example some may prefer to be identified as a "New Zealander" or as a "Kiwi". Further, there is no doubt that there are also people who wish to identify themselves as Pakeha/Maori.

Level of education was measured on a nine point scale. The categories for this scale were extracted from the measure of education developed for the New Zealand Study of Values (Webster and Perry, unpublished). Political preference was also measured on a scale developed from the New Zealand Study of Values. The political preference scale asked respondents to indicate (from a list of eight prominent political parties) which political party they would vote for if there was an election tomorrow. Religiosity was measured on a five point scale extracted from the Manawatu Family Growth Study (Trlin and Perry, 1981). Questions 50-59 in the demographic section of the questionnaire were incorporated to establish a simple class profile of the respondents. The establishment of a class profile was done in order to investigate the idea that the ecocentric/technocentric

debate could possibly be reduced to a class issue. Questions 50-59 were developed from The New Zealand Class Structure, (Wilkes et al 1985).

5.3.1 Practice of ecocentric behavior

The last part of the demographic section was made up of questions 60 and 61. These two questions were developed to measure the extent to which the respondents practiced ecocentrically orientated behavior. The first of these questions sought to establish if the respondents were a member of any voluntary association primarily concerned with the protection of the natural environment or some aspect of it. It was believed that such membership would indicate, quite strongly, that the respondent was an environmentalist or leaning towards an ecocentric orientation. The other question asked respondents to reveal if they used the Palmerston North recycling depot. The reasons for this question involved the popularization of the recycling of waste as one way of addressing environmental problems, and the fact that the recycling centre was a readily accessible means by which people could directly engage in environmentally concerned behavior.

5.4 Sampling

The main objective of this investigation required the administration of a questionnaire to a sample of the "general population" in the Palmerston North and Manawatu areas so that the populations attitudes towards environmental referents could be measured. It was decided to employ a probability (random) sample to facilitate representativeness and generalizability.

The sampling unit used was the individual. This follows from the fact that an "attitude" is at its simplest level a psychological concept. However, for an attitude to exist as a social attitude it must be shared, and as Kerlinger (1984:9) states, "attitude structure is ascertained from the responses of many individuals to attitude measurement instruments". It is this structural understanding that raises the sociological interest. The question is whether these structures, as belief systems or ideologies, influence or constrain the way people behave.

The size of the general sample was set to be a minimum of 500. This was determined by several factors. The first and over-riding consideration was, the limited

time and resources available to the research. Secondly, working within these limitations, the size of the sample was determined by deciding what level of accuracy (i.e. margin of error) would be appropriate for the investigation and then selecting the sample size to achieve this goal. At the 95 percent confidence level a sample size of 500, with a binomial percentage distribution of 50/50, can be estimated to have a sampling error of plus or minus 4.5 percentage points (see Babbie, 1986:496). Such a margin of error strikes a reasonable balance between error levels and the costs of a larger sample.

5.4.1 Sampling frames

In order to sample the general population it was decided to use the Palmerston North and Manawatu electoral rolls as a sampling frame. The use of these electoral rolls was deemed to be appropriate because they provided fairly comprehensive lists of the individuals in the target population and they were less likely to incorporate the biases of some other available listings (like telephone directories).

The use of the local telephone directory as a sampling frame has several possible problems. It excludes people without a telephone or with unlisted numbers and typically list names that represent a household phone, rather than all of the individual household members. There are also problems with the use of electoral rolls. One problem is missing elements. That is, those individuals that should have been included in the population but were not (see Moser and Kalton 1971:154). In this case the missing elements include those individuals not old enough to vote at the time of the 1990 general election and those people who were eligible but who were not, for one reason or another, registered on the electoral rolls at that time.

In addition to missing elements there was also the problem of individuals who were supposed to receive the survey, according to the sampling frame, but who could not be contacted. The reasons for this include, infirmity, death and address error. Questionnaires were sent to wrong addresses because the electoral rolls were over a year old and thus some addresses were out of date, the sample frame included university, polytechnic and other students - people who tend to change address at the end of their respective academic years; finally, the addresses listed in the electoral roll were residential addresses and not necessarily postal addresses.

Two measures were taken to deal with these problems. The first, was to compensate by extracting a sample larger than the number initially sought. In order to increase the chances of obtaining a return of around 500 the general population survey was sent out to

a sample of just under 700. The second step was to re-contact those who did not respond to the initial mailing, and remind them to complete the questionnaire and to return it as soon as possible. In order to save costs the second contact was done by telephone. However, if any subject was unable to be contacted by telephone then they were sent a reminder letter (see Appendix C). A second questionnaire was sent to those who requested another.

5.4.2 Subgroups

In addition to the general population, samples were taken of three sub-groups. These groups included: environmental interest groups within the region, a local industrial manufacturing group, and professionals in the region who's occupation required them to make expert decisions about the legal requirements and technical problems of environmental management and control (decision makers).

Once again the limitations constraining the scale of this investigation helped to determine the size of these samples (the samples were restricted to a size of about 20 to 30 elements). Other factors also influenced size, such as the objective to intrude as little as possible, or to help increase the likely participation of each group.⁴ In addition, for at least one of these groups (the decision makers), the entire population of the group was very small. Twenty names fairly well have exhausted that population within the region.

These samples were obtained by getting each group to supply a list of their members so that a random sample of about 20 names could be drawn from each list. To represent the industrial manufacturing group it was decided that a sample would be drawn from the membership list of the Wellington Manufacturers Association. In response to a request this association supplied a list of members located in Palmerston North and the Manawatu. From this list, after excluding those members located outside the electoral boundaries, twenty subjects were selected for the sample.

In order to obtain a sample of those people who were members of environmental interest groups a number of local groups were contacted and asked to supply a small list of their members⁵. The number of environmental organizations used to build up the

⁴ Participation involved the supply of a membership list from each group to help build up the sampling frame. In order to obtain these lists it was decided that the request be kept small so that the chances of their participation would be increased.

⁵ Any member who resided outside the Palmerston North and Manawatu electoral boundaries was excluded from the sampling frame.

sampling frame was restricted to three: the Green Party, the Maruia Society and the Royal Forest & Bird Protection Society of New Zealand. Smaller groups such as the Manawatu Tree Fund and the Manawatu Fresh Water Anglers Club were left out for two reasons. First, the small groups were seen as too parochial and second, the groups that were selected had national identities and "branches" throughout New Zealand. This national status meant that at least some generalizations about this group could be made to the rest of New Zealand. A sample of about ten names was selected from each of the membership lists (no distinction was made between the various group members, i.e., as subjects they were not identified by organization) and these were combined to form a single sample. A sample of 33 was formulated to allow for failure to contact and non-response.

To represent those professionals in the region whose occupation required them to make expert decisions about the legal requirements and technical problems of environmental management and control it was decided to build up a sample by contacting an informant within the Palmerston North City Council. This informant was one of the decision makers and he had considerable knowledge of which people within the region were suitable for the sample, (based on the criteria set out by the definition of this interest group). The informant was asked to select and to formulate a record of such people so that a list of twenty respondents could be compiled.

The selection of the decision makers may be described as a judgement sample. That is, the subjects were chosen by virtue of the fact that they were a member of a small group whose occupation placed them within the population of interest. However, as Honigmann (1982:81) states, "Non-probability judgement sampling demands a clear cut definition of the universe about which the sample is intended to provide information."

It was questionable as to whether the definition of the decision makers was specific enough to set the guide lines for a precise judgement sample. Therefore, the concept of opportunistic sampling may also be used to describe the way the decision makers were selected. With reference to opportunistic sampling Honigmann (1982:81) states, "...the researcher resourcefully seizes any handy chunk of the universe that promises to reward him (sic) with relevant information..." It is arguable that in the case of the decision makers the sample was selected via a combination of judgmental and opportunistic method. Due to the realization that there were few people within the region who could be described as decision makers anyone who seemed to fit the criteria of the definition was selected for the sample.

The possible subjects on the list that the informant supplied were employees of the Manawatu-Wanganui Regional Council, the Manawatu District Council, and the Palmerston North City Council. The informant described subjects as "...local people who exercise environmental judgements in their work." All the subjects were administrative employees of the respective organizations. From the job descriptions provided they could be described as middle to top level executives and managers. Twenty three names were supplied, only three more than the desired sample size. All the subjects on the list were sent a questionnaire.

Altogether 772 questionnaires were sent out (see Table 1 for a summary of the sample size). The first mailing was posted on 4-2-92. However, due to limited funding only 327 (42%) were actually sent out through the mail. The remaining 445 (58%) were delivered by hand on the third, fourth and fifth of February 1992. The second contact (both for the general sample and for the subgroups) began approximately two weeks after the first mailing. Approximately half of the subjects had to be contacted the second time. The subjects that were able to be contacted by telephone were contacted in the evenings from the 19-2-92 through to the 4-3-92.

Table 1 Summary of Sample Size

Sample Name	Original Sample Size	Not contacted	Final sample size
General	698	139	559
Environmentalists	33	3	30
Decision makers	21	0	21
Manufacturers	20	0	20
Total=	772	142	630

One hundred and forty subjects, approximately 38% of those who had to be contacted the second time, were unable to be contacted by telephone. These people were sent the second reminder letter on 20-2-92. Once again 34% of these were delivered by hand.

5.5 Response rate

Of the 630 questionnaires included in the overall survey 347 were returned. This amounted to a overall response rate of 55%. However, when the survey is broken down in line with the various subgroups the response rate varies between 52% and 86% (see Table 2).

Table 2 Survey Response Rate.

Sample Name	Sample Size	Response	Response Rate (%)
General Sample	559	291	52%
Manufacturers	20	13	65%
Environmentalists	30	25	83%
Decision Makers	21	18	86%

5.5.1 The general population sample response rate

There are a number of possible reasons why the general sample had a response rate of 52%. First, the response may have been reduced because of the questionnaire serial numbers. The questionnaires were numbered to keep track of who had responded. This meant that the responses were not anonymous and even though confidentiality was promised response may have been higher if an explanation for the serial numbers had been included.

Second, for some people the demographic questions were unrelated to the topic of interest. It was possible that they perceived some type of ulterior motive and thus refused to respond. Additionally others may have thought that some of demographic questions were too personal. The political preference question (Question 48) and the income question (Question 59) were identified as being particularly sensitive. Had these two questions not been included in the questionnaire (or an explanation for them provided) the response rate may well have been higher.)

Third, the second contact wasn't done until two weeks after the initial mailing. In hindsight, and in line with a more conventional approach, it may have been more appropriate to have done the follow up a week earlier, while the survey was still "hot". However, because of lack of finance the follow up was delayed. The delay was

lengthened to get as many responses as possible so that the cost of the second contact would be kept to a minimum.

Fourth, the lack of money and resources was probably the most important reason for the level of response. The cost of producing the questionnaire had to be kept to a minimum and because of this a number of issues arose that may have restricted the response rate. (1) The constricted size of the introductory letter may have been a factor. The section of the letter that was designed to reveal the topical nature of the research area and to inspire motivation was relatively small. This section was not accompanied by illustrations or examples and no local issue of interest was outlined. It was not made clear how the research would benefit the respondents, and no explicit appeal was made to altruistic inclinations. (2) The lack of sophisticated presentation, such as the reliance on photocopied reproduction and no color or ingratiating design could have been another reason for the response level. (3) Lack of money for postage could have been another factor for the response rate. The fact that respondents received questionnaires (or a second letter) that had been delivered by hand may have detracted from their status as a legitimate survey. (4) The inability to employ people to assist with the telephoning of the respondents may also be relevant. The telephoning was done over a period of about two weeks and if it had been done at an early stage the response rate might have been higher. (5) The lack of money to pay postage for the second letter could also have played apart. If all the non-respondents had received a second letter, or if all of the follow up letters had been sent out through the mail, the response rate may have been higher. Additionally there was no money for a second follow up. Compounding this, telephoning the respondents was only done once because the telephoning procedure took about fourteen days to complete, and it was believed that an additional second contact would have been too intrusive.

The fifth, reason why the response rate was at the level that it was may have been related to the fact that the cover letter sent to the general sample was not personalized. If the cover letter had included a personal greeting to the respondent (possibly in hand writing) and if the letters had all been personally signed then the response may have been higher.

The sixth reason for the response rate could have been related to the fact that Palmerston North and the Manawatu are areas that are frequently surveyed. It is not unrealistic to argue that response rates are lowered by excessive surveying in one area

5.6 Factor analysis

Because factor analysis is a statistical tool that is used commonly in the social sciences, but is at the same time a complex conceptualization, the following discussion will be brief. It outlines factor analysis in general terms, only relating it to the purpose of this investigation. It is assumed that readers will have some understanding of the procedure.

"Factor analysis is a procedure by which the number and nature of the constructs underlying a set of measures is determined." (Hinkle, Wiersma & Jurs, 1979:432)

In this investigation factor analysis was employed to determine the nature and the structure of the environmental attitude domain. That is, factor analysis was used to assess the possible structure of environmental attitudes in terms of the technocentric and ecocentric perspectives.

The structural nature of an attitude domain can be described as the "...systematic relations among the elements and sets of elements under study" (see Kerlinger 1984,61). In this investigation the attitudinal structure examined was the configuration of the relationships between various technocentric and ecocentric referents. The objective was to use factor analysis to specify the relationships between the various opinions, or beliefs expressed towards the items (referents) in the questionnaire, in the hope that this would give some indication of the organization of (the structure of) the domain of environmental attitudes. In other words, the determination of the nature of and the relationship between the constructs of ecocentrism and technocentrism (as outlined in Chapter Two) was sought.

The first point that must be noted about factor analysis is that it is a statistical method of determining the number and nature of the constructs that underlie a set of variables. In this investigation the variables of interest were the responses to the statement items on the summated rating scales. In line with this idea then, if two or more variables correlate highly they are assumed to share the measure of a common construct. In other words, as Garson (1971:201) states:

"Given a table of correlations showing the correlation of each variable with every other variable, what is the minimum number of common factors needed to account for the relationships? Or, more simply, what variables share a common underlying factor with what other variables?"

The first step in factor analysis therefore, is to formulate a correlation matrix containing the variables of interest; in this case the forty three referents which represented either the ecocentric or technocentric perspectives.

Rummel (1970:13), outlined three important considerations in the understanding of factor analysis. The first of these considerations was that the "value of a factor analysis is dependent on the meaningfulness of the variability in the data." Factor analysis requires data with variation. If the data has little variation then only one factor can be extracted. If the data has only random chance variations then the factor analysis will only depict random patterns. For factor analysis to be meaningful it depends on the concept of patterned variation within the data under analysis.

The concepts of vector and vector space comprise the second key to understanding factor analysis (see Rummel 1970:15). If one can visualize the table (matrix) under consideration in spatial or graphical terms then each column from the table can be thought to represent a vector. Together all the vectors form the vector space. That is, the three dimensional space that the vectors occupy. The location of the vectors in this space is fixed by the coordinates set by the values in each row of the matrix. Within this space vectors that are correlated or interdependent will cluster together. The higher the correlations the more they will cluster. These clusters define distinct pattern of regularity in the data. In graphical terms therefore the objective of factor analysis is to plot as few axes as possible through the vector space to account for as much variation in the position of the vectors as possible. These axes represent factors or dimensions. That is, the constructs that underlie the set of measures (vectors). The concept of dimensions makes up the third consideration in the understanding of factor analysis. Rummel (1970:16) states:

"As many dimensions will be needed to reflect the variation in vectors as there are unrelated clusters of interdependent vectors. These dimensions then delineate the order, the uniformities, the regularities, the patterns in the data."

Rummel (1970:16) has also put this another way. What factor analysis attempts to do is to see:

"...whether the same amount of variation in the data can be represented equally well by dimensions smaller in number than the columns necessary to tabulate the data."

The number of factors to be extracted in a factor analysis is an arbitrary decision. It usually depends on the requirements of the particular investigation. However, Garson

(1971:208) states, that "A rule of thumb for most social science data is that factors extracted after the third are unlikely to account for much additional variance." For example the fourth and fifth factors may only account for two or three percent of the total variance. Their "value" as separate factors or identifiable dimensions may therefore be minimal.

In his analysis of Conservative and liberal attitudes Kerlinger (1984:72) used the following method to determine the number of factors to be extracted. He extracted a large number of factors and then applied four criteria for the final set: (1) an eigenvalue of 1. or greater associated with a factor made it a candidate for inclusion. (2) Two or more factor loadings greater than .35 recommended consideration of a factor. (3) A relatively sharp break in the magnitudes of the eigenvalues indicated a possible stopping point of factor extraction. Finally (4), the rotated solutions were checked against the correlation matrix. This could determine whether the factors accurately reflected the correlations. If the rotated factor and the correlations did not correspond then the factor would be treated with suspicion.

Because this investigation was an attempt to apply Kerlinger's Criterial Referent Theory, it was decided that this investigation could possibly use these same criteria for selecting the number of factors to extract. However, in a more general sense, and for the same general reason as Kerlinger (1984:73) put forward, the goal of selecting the "right" number of factors and for rotating the factors was to find the simplest possible factor structure.

5.6.1 Factor rotation

Kerlinger used both oblique and orthogonal rotations in his analysis. The need to rotate factors stems from the notion that although unrotated factors define the minimum dimensionality of the domain and the vector space, they are often uninteresting (see Rummel, 1970). That is, the first factor fitted to the data only accounts for the maximum variance. Each factor fitted thereafter is maximally fitted to the residual variance. On top of this, in an unrotated factor analysis, there is no means to implement control over the first location of the factor axes in the configuration of vectors. This means that the factors are frequently located between independent clusters of interrelated variables. It is impossible therefore to distinguish these clusters in terms of their loadings on the first factor. In terms of the second factor however, because it is at right angles to the first, the clusters do take on different signs; either positive or negative, and thus produce the bipolar effect.

The rotation of factors for simple structure moves away from the single restrictive delineation of maximum variance. The shift is from factors maximizing total variance to factors delineating the separate groups of highly intercorrelated variables. (Assuming that there are such groups. One of the essential characteristics for the operation of factor analysis is that the elements of interest must vary in some systematic way. Variation should not be left to chance). Factor rotation makes it possible to distinguish the nature and structure of the relationship between, at one level the variables of interest, and at another level the groups of variables (clusters) of interest. Rotation can reveal that clusters of highly interrelated variables (which would be distinguished as the factors of interest) could be independent of each other (orthogonal - or at right angles) or related (oblique angles).

The variables of interest in this investigation are the ecocentric and technocentric items advanced through the questionnaire. The question is the character of the cluster(s) of the related variables and whether these are related or independent or whether any such distinction can be made between them. This thus indicates the nature and structure of the environmental attitude domain.

Chapter Six

The nature and structure of the attitude Domains

This chapter is the first analytical chapter and uses Criterial Referent Theory to provide a descriptive outline of the various attitude domains derived from the factor analysis of the first forty three items in the questionnaire. These descriptions will only describe how the attitudes towards the environment are structured. Criterial Referent Theory does not have the ability to communicate why the attitude domains are structured in the way that they are. As Kerlinger (1984:185) states:

"...criterial referent theory is deficient. A theory should give explanations of how and why things are so and so and such and such. The criterial referent theory, however, only tells how social attitudes are structured. It does not tell why they are so structured."

The structure of the attitude domains is based on the variation of the responses in relation to the technocentric and ecocentric belief systems. That is, the meaningfulness of the structural analysis is dependent on the distinction between those items in the questionnaire which represent aspects of the technocentric belief system and those that represent aspects of ecocentrism (a list detailing which items were technocentric and ecocentric is provided in Appendix D). It must also be noted that the responses supplied by each group are independent of each other. Therefore, any variation in the nature and content of each attitude domain must be thought of as indicative of each individual groups perception of the relationship between the ecocentric and the technocentric belief systems.

The following attitude descriptions are in two parts. A table that provides a summarized factor profile of each attitude domain, and a brief description summarizing the content of each dimension. Factors were deemed to be of substantive interest if they accounted for more than 5 percent of the total response variation. A factor must explain a relatively large proportion of the total variance found in the study variables in order to be considered relevant or meaningful, hence the more variance explained by a factor the stronger (or more substantial) the factor is in the minds of the respondents. All factor

analyses were orthogonally rotated. That is, the factors were rotated to delineate separate groups of highly intercorrelated variables. The variable clusters can thus be seen as independent dimensions that combine to formulate the environmental attitude domain of the general population sample.

6.1 General population sample's attitude domain

The first pattern of environmental attitudes to be profiled is the domain that emerged from the responses obtained from the general population sample. Four factors were of interest (see Table 3). These factors accounted for 40.4 percent of the total response variation.

6.1.1 Environmental concern

The strongest factor (dimension) to emerge was one that could be described as an environmental concern dimension. It contained 13 items with a loading over .35 and explained 19.8 percent of the response variation. The first 11 heaviest loading items in this factor were all items that appeared in Cotgrove's (1982:127) environmental concern scale. As a dimension, this suggests that an important and significant part of the general population's environmental attitudes is an explicit concern about environmental degradation. This is a concern that covers a wide variety of issues, from a belief that global weather patterns are being upset to an acceptance of the notion that our countryside is being spoilt.

The last two items in this first dimension (Question 21 Radical .41 and Question 18 Toowaste .36) are anti-industrialism referents (variables). They link environmental concern with two fundamental criticisms of industrial society. First, that in order to avoid a future environmental catastrophe, radical changes must be made to the values and institutions of industrial societies (this item is a central proposition underlying many of the ideas advanced by radical modern environmentalists and could be described as a deeply ecocentric sentiment). Second, that industrial society is too wasteful of resources. Therefore, in brief, it can be said that the first dimension in the general population's attitude towards the environment is more than just a concern for the environment; it is a concern that is linked to a fundamental criticism of industrial society.

**Table 3 Factor Profile of the General Population
Attitude Domain**

Asterisk (*) = Technocentric item. No asterisk = Ecocentric item.

FACTOR 1		FACTOR 2		FACTOR 3		FACTOR 4	
Environmental concern (Eco)		Industrial strength (Tech)		Environmental control and growth (Tech)		Green compromise (Tech/Eco)	
Country	.81016	IOhealth*	.69403	Dominate*	.71488	Stabeco*	.71492
Nathab	.73961	Business*	.68031	Apart*	.70369	Humane	.64328
Waterpol	.73505	Market*	.67127	Costbene*	.57662	Ideas	.52734
Soildam	.69957	Ecogrow*	.59248	Nuclear*	.53400	Image	.50383
Herbpest	.69216	Adcities*	.47680	Mining*	.52272	Isocgood*	.35910
Consump	.68808	Techsolve*	.41261	Uscall*	.45718		
Polrise	.68769	Scitech*	.39460	Domover*	.44317		
RMshort	.67684						
Weather	.61561						
Popgrow	.57757						
PAextinc	.57191						
Radical	.41855						
Toowaste	.36351						

Pct of Var = 19.8 Pct of Var = 9.9 Pct of Var = 5.5 Pct of Var = 5.2

(For a complete outline of each item see appendix D)

6.1.2 Industrial strength

The second strongest factor for the general population accounts for 9.9 percent of the variation and is a dimension that is made up of seven items. These items are technocentric referents and reflect a general "industrial strength" position. There are three parts to the dimension. The heaviest loading variable (Q14 IOhealth .69), the idea that industrial output is the mark of a healthy society, fits well with the referent that indicates the notion that the advantages of cities outweigh their disadvantages (Q19 Adcities .47). The relationship between industry and cities extends from the earliest years of the industrial revolution and together these items indicate a favorable position towards industrialization. The idea that the business community works for the good of the nation

(Q16 Business .68), the idea that the market (Q17 Market .67) is the best way to distribute resources, and the idea that there is a need to maintain a high rate of economic growth (Q27 Ecogrow .59) are all related to the economic sphere and clearly capture the significance that economics has within industrial society. The third part of this dimension is a pro-science stance. Here science and technology (Q25 Techsolve .41) are perceived to be capable of solving all problems by finding new sources of energy and materials, finding ways of increasing food production, as well as science and technology (Q23 Scitech .39) being perceived to provide humanity with its best hope for the future. These items go hand in hand with industrialization and the economic perspective in characterizing a favorable acceptance of technocentric "industrial strength".

6.1.3 Control of nature and growth

The third factor produced by the general population's response is another technocentric dimension. It explains 5.5 percent of the variation and is a dimension that conflicts with environmental concern. Unlike the general nature of the second factor this dimension is more specific. It reveals a position that indicates a need to control the environment. The first two items (Q36 Dominate .71, Q37 Apart .70) set humanity apart from nature and into a position that is dominant over it. Incorporated in this also is the idea that, in a spiritual sense, it was intended that we use all of nature's assets to satisfy our needs (Q43 Useall .45).

A second feature of this dimension is support for economic growth. The support for growth is revealed by the backing for such ideas as the cost of protecting the environment comes second to benefits gained from economic growth (Q32 Costbene .57), that the benefits of allowing nuclear powered warships to visit this country outweigh the environmental concerns such visits may impose (Q34 Nuclear .53), and that mining of the Coromandel region is worthwhile (Q33 Mining .52) if economic benefits can be obtained. Together the items in this dimension set forth a position that suggests a need to control nature and a need or desire for growth.

6.1.4 Green compromise

The fourth factor accounts for 5.2 percent of the response variation and can be described as a mixed dimension. Initially this dimension has a materialistic orientation which is revealed by the heaviest item, to aim for a stable economy (Q30 Stabeco .71). However, this materialistic stance is contradicted by the inclusion of two items which are

indicators of post-material values; namely the aim to move towards a less impersonal more humane society (Q28 Humane .64) and the aim to progress to a society where ideas are more important than money (Q29 ideas .52). This mixture of technocentrism and ecocentrism is also indicated by the positive response to the idea that New Zealand's green image should be protected to earn overseas income (Q35 Image .50). This suggests that people want the best of both worlds. A clean green environment and materialistic gain.

Additionally, within the context of this dimension, the aim for a stable economy (Q30 Stabeco .71) suggests that support for a conventional technocentric position may be softened. Environmentalists do not deny the importance of economic momentum. However, the technocentric aim for economic growth is not supported. Therefore, the aim for a stable economy may be a transgression from the hard line technocentric orientation and be a suitable representation of a practical ecocentric view.

As stated above, although this fourth factor is on the one hand materialistic it also indicates a post-material view. Cotgrove (1982:28) suggested that the commitment to material or non-material values is an important component in the acceptance or rejection of the dominant social paradigm. The fourth factor suggests that within the general population's environmental attitude there is a view that may accommodate post-material tendencies and ecocentric ideas if it proves feasible and practical hence the mixed attitude structure. Perhaps, a clean green image is seen as a means to economic gain.

6.1.5 General population summary

To summarize the structure of the general population's environmental attitudes it can be said that it is an attitude system that incorporates a strong environmental concern dimension and that this indicates an ecocentric tendency. However, two of the remaining factors were technocentric dimensions and accounted for 15.4 percent of the total variance.

In line with critical referent theory, the response of the general population reveals that ecocentrism and technocentrism, as belief systems, appear to exist in a dualistic relationship. That is, rather than being bipolar the two belief systems operate relatively independently of each other. This duality is a product of the positivity principle, where the attitude domain was constructed by the sharing of positive perceptions and reactions to the attitude referents. As the positivity principle sets out, positive reactions by people

to certain referents do not necessarily mean that those people will have negative predispositions towards other referents.

For the general population the three strongest attitude dimensions were made up entirely of positive reactions to one or the other type of referent. This indicates that both belief systems were contributing to the attitude domain as independent networks. The belief systems, in a referential sense, appear to be orthogonal to each other. Therefore, the views of the general population sample can best be described as an attitude domain that involves both technocentric and ecocentric dimensions.

The "Green compromise" position was the one factor in the general population's environmental attitude domain that did have both ecocentric and technocentric referents. The ecocentric referents were items extracted from Cotgrove's (1982:130) post-material values scale. However, whether post-material indicators can be classified as ecocentric indicators is questionable. Steger et al (1989) studied the relationship between post-material values and the New Environmental Paradigm. Their conclusion was that the two dimensions are separate. They state (Steger et al, 1989:248):

Rather than reflecting a single larger dimension of value orientation...it is clear that post-material values and environmentalism are separate constructs in the thinking of both the Canadians and Americans surveyed.

Whether this is necessarily the case for everyone and whether it can be generalized to the New Zealand situation in particular is also questionable.

The content of the general population's attitude domain indicates that overall their orientation would seem to be ecocentric. Most of the response variation (19.8 percent) was explained by the environmental concern factor and as mentioned earlier (see Chapter 5) environmental concern is seen to be indicative of an ecocentric orientation. Still, this interpretation may be inaccurate. Does environmental concern actually represent an ecocentric position? Recall that technocentrism and ecocentrism were advanced as alternative belief networks which shape perceptions of environmental problems. Therefore, there can be both technocentric and ecocentric environmentalists and both types can be concerned about the environment. It must be kept in mind that when the dimensions are clearly orthogonal to one another, there is no reason to doubt the independence of environmental concern from technocentrism and to accept the Cotgrove (1982) position that environmental concern is indicative of an ecocentric view. The "Green compromise" position (factor 4) also suggests an ecocentric perspective. It would

be erroneous to classify this dimension as technocentric as most of the items within it do not support a technocentric orientation.

6.2 The environmentalist's attitude domain

The second sphere of environmental attitudes to be examined are those of the environmentalist subgroup. Six factors emerged that were of interest (see Table 4), which together accounted for 61.7 percent of the total response variation.

Table 4 Factor Profile of the Environmentalist Attitude Domain

Asterisk (*) = Technocentric item. No asterisk = Ecocentric item.

FACTOR 1 Environmental Concern and Democracy (Eco)	FACTOR 2 Natural Science (Eco)	FACTOR 3 Industrial Strength (Tech)	FACTOR 4 Peace and Stability (Eco)	FACTOR 5 Non-economic Management (Eco)
Experts .87458	Nathab .82412	IOhealth* .84258	Nuclear* -.83470	Emeasure .82086
Waterpol .77777	PAextinc .73437	Isocgood* .80943	Image .65209	Manage* .54542
Polrise .74840	Scitech* .70237	Business* .78337	Stabeco* .54364	Toowaste .53645
Herbpest .73585	Domover* -.62025	Ecogrow* .71129	Abandon .50475	Owsake -.49433
Ideas .68340	Useall* -.57293	Market* .69675	Techrun* .49595	Radical .46344
Techrun .60508	Dominat* -.50495	Apart* .54889	Humane .45958	Apart* -.43377
Soildam .57742	Country .50287	Abandon -.40766	Popgrow* -.44555	Weather .40759
Badtech .55883	Stabeco* .38407	Scitech* .36924	Weather* -.42072	Badtech -.38790
Country .54245	Consump .36514		Owsake .36802	Abandon .36560
Consump .50576				
Weather .46476				
Abandon .39543				
Spirit .38979				
Pct of Var = 19.6	Pct of Var = 11.3	Ptc of Var = 9.9	Pct of Var = 9.0	Ptc of Var = 6.4

FACTOR 6 Spiritual Stewardship (Eco)

Spirit .72793
Rescare .69148
RMshort .65879
Costbene -.54630
Useall* .39790

Ptc of Var = 5.5

(For a complete outline of each item see appendix D)

6.2.1 Environmental concern and democracy

The first factor for the environmentalists was very similar to the first dimension for the general population. It reflected a strong concern for the environment and accounted for 19.6 percent of the total variance. Concern about pollution levels and the damage caused by chemical sprays had particularly high loadings. However, unlike the general population the first factor in the environmentalist attitude domain included various referents that seem to qualify the environmental concern. The most substantial of these was the item stating that too many issues are now decided by experts without sufficient consultation by those affected (Q20 Experts .87). The loading on this statement, indicates that although environmental concern is significant as an objective problem itself, it also appears to be a concern accentuated by a perceived relationship between the problem, the experts, and the environmentalists. This dimension suggests that for environmentalists environmental concern is also an issue of ownership (see Chapter 2). It can be argued from an environmentalist perspective that experts (owners), because of their apparent adherence to the dominant social paradigm, do not consult with, or take advice from, environmental groups and are not seen to be resolving the environmental problem. In other words environmental concern for environmentalists also involves contesting the ownership of the issue.

The referent (Q29 Ideas .68) indicating that an aim for New Zealand over the next ten years should be to progress towards a society where ideas are more important than money also reinforces the ownership concern. Because of their perceived technocentric approach, experts are often seen as placing economic considerations before all others, including the wishes of those people on whose behalf they are meant to administrate⁶. A move to a society where ideas are important is a move away from economic reductionism. The importance of ideas is also significant in that the ideas that environmentalists have are competing for acceptance. To move towards a society where ideas are more important than money, may well be more than a move away from undemocratic control, it may also be a move to a society where ecocentric ideas find more acceptance. It can be said then that environmental concern of the environmentalists has evolved to include concern over how the issue is addressed.

⁶ Assuming the experts are "elected experts" or experts appointed to positions of action in the public interest

6.2.2 Natural Science

Factor 2 is another ecocentric dimension, and it accounts for 11.3 percent of the total variance. Like the first dimension it is concerned with environmental degradation (Q10 Nathab .82) but it also seems to indicate that environmentalists accept the use of science and technology (Q23 Scitech .70). Although it is suggested that science and technology provide humanity with its best hope for the future, support for a harmonious relationship with the environment is revealed by negative reactions to the ideas that humankind has not been given dominion over nature (Q40 Domover -.62), that there is no need for society to dominate the environment (Q36 Dominate -.50), and that it was not intended that we use all of nature's assets to satisfy our needs (Q43 Useall -.57). Another feature of this dimension is that the items concerned with the human/nature relationship are expressed as negative loadings on technocentric referents. This indicates that this view, or at least this part of the dimension is directly oppositional to the perceived technocentric perspective.

6.2.3 Industrial strength

The third factor in the environmental attitude domain expressed by the environmentalists is the only technocentric dimension in the domain. It accounts for 9.9 percent of the response variation and can be regarded as an "industrial strength" dimension, very similar to the industrial strength dimension evident in the general population's attitude domain, and accounting for the same amount of variation.

This factor contains five of the seven referents that were included in the general populations "industrial strength" dimension. It indicates a general acceptance of industrial society (Q14 IOhealth .84, Q12 Isocgood .80, Q16 Business .78, Q27 Ecogrow .71) and incorporates a favorable position towards the features that broadly characterize the technocentric perspective. As a substantive dimension it would appear that an industrial strength concern exists at a similar level for both environmentalists and the general population.

6.2.4 Peace and stability

The fourth factor for the Environmentalists explains 9.0 percent of the response variation and is a "peace and stability" dimension. The first item, disagreement with idea that nuclear powered warship visits would be of benefit to this country (Q34 Nuclear -.83) appears to be, in the context of this factor, indicative of the connection between

environmentalism and the peace movement. The remaining items, particularly items two and three, provide a context that is suggestive of stability. Item two, the idea that New Zealand's green image must be protected to earn overseas income from tourism and trade, indicates environmental concern for utilitarian reasons rather than environmental concern associated with any need for radical change. The third item, an aim for a stable economy (Q30 Stabeco .54), explicitly supports the stability component. Altogether the items in the dimension are predominantly suggestive of an ecocentric orientation, the negative response to the threat of population increase (Q2 Popgrow -.44) and changing weather patterns (Q6 Weather -.42) may imply a certain level of comfort with respect to these issues.

6.2.5 Non-economic management

Factor 5 indicates an anti-economic dimension and accounts for 6.4 percent of the response variation. The highest loading sentiment (Q15 Emeasure .82), the idea that too much importance is attached to economic measures of well-being in our society, contradicts a fundamental aspect of the technocentric belief system. On the other hand, this dimension also indicates that environmentalists accept the view that sound management decisions should always be based on scientific expertise (Q22 Manage .54). This suggests that environmentalists believe that scientific expertise is useful if it moves away from economic reductionism.

6.2.6 Spiritual stewardship

The sixth dimension in the environmentalist attitude domain explains 5.5 percent of the response variation and reveals a spiritual aspect in the environmentalist's response. The acceptance of the notion that the environment contains the essence of the human spirit (Q41 Spirit .72) bonds the people/earth relationship together in a sacred sense. Further, agreement with the view that humanity has been charged with the responsible care and protection of the earth's resources (Q42 Rescare .69), and that there are likely to be serious and disruptive shortages of essential raw materials if things go on as they are (Q4 RMshort .65), seems to indicate that the environmentalists accept a stewardship role. Stewardship necessitated by the belief that the earth's resources are unavoidably required to satisfy human needs.

6.2.7 The environmentalists summary

In summary, the description of the environmentalist's attitude domain reveals that only one dimension is technocentric and suggests that overall their attitude domain is ecocentrically orientated. The technocentric dimension accounts for only 9.9 percent of the response variation, while 51.8 percent is accounted for by the five ecocentric dimensions. This result was expected, for as noted in Chapter 5 the environmental group was selected as an "ideal type" whose attitudes, it was assumed, would be consistent with the ecocentric perspective.

Like the general population the largest amount of response variation for the environmentalists is accounted for by the environmental concern dimension. The items that characterize this dimension are all positive responses to ecocentric referents. Unlike the general population, however, the remaining ecocentric dimensions (ecocentric in that they were described best by the ecocentric referents within them) in the domain are made up of both technocentric and ecocentric referents. Thus classifying the dimensions and understanding what made a technocentric item and an ecocentric item is less clear. For the environmentalists, it appears that certain technocentric variables fit well with the ecocentric perspective and this suggests that for the environmentalists the distinction between the two perspectives is not definitive.

Furthermore, unlike the general population some dimensions involved negative loading referents. This implies that parts of the environmentalists attitude domain was comprised of notions that were oppositional to one or the other belief systems. It can be concluded that for this group ecocentrism and technocentrism did not appear to operate conceptually as completely autonomous or dualistic systems, but were related and at least partly antagonistic networks.

An additional point of difference between the general population and the environmentalist group is that in the latter's domain some variables had substantial loadings in more than one dimension⁷. Although the factors were rotated to delineate orthogonal dimensions this sharing of variables would seem to indicate that there was some relationship between them.

In the environmentalist's attitude domain, the technocentric dimension is very similar to the general population's "industrial strength" dimension and is substantial in that it

⁷ For example, Q9 'Consump' and Q7 'Country' had substantial loadings in both the first and second factors and Q31 'Abandon' had substantial loadings in the first, third and fourth factors.

accounts for 9.9 percent of the variation. The emergence of this dimension indicates that, although the environmentalists are ecocentrically orientated, there is also a favorable position towards some of the features that broadly characterize the technocentric perspective. It is, perhaps, of interest that the industrial strength dimension is a view that accounts for more variation than the "peace and stability" and "spiritual stewardship" dimensions, also present in the environmentalist's attitude domain.

6.3 The decision maker's attitude domain

The attitude domain based on the responses of the decision makers featured five factors (see Table 5) which together explained 66.5 percent of the total variance.

6.3.1 Maintain nature, constrain industry

The first factor to emerge for the decision makers explains 31.0 percent of the response variation and reveals a position that embraces the maintaining of nature and the constraining of industry. The highest loading item within this dimension is one that indicates acceptance of the idea that too much importance is attached to economic measures of social well being. However, the most prominent feature of this first dimension is the relative absence of items directed specifically at environmental degradation. Unlike the environmentalists or the general population the first dimension in this domain had only two items that appeared in Cotgrove's(1982) environmental concern scale. Environmental concern is present within this dimension but it is a concern that is associated with industry and growth. The factor appears to provide a context that suggests constraint on industry and economics as a necessity in order to address environmental issues. A third feature of this dimension is provided by items concerned with the people/nature relationship. It is not accepted that societies have a need to dominate nature (Q36 Dominate -.84) nor is it believed that people are apart from nature (Q37 Apart -.78), but rather there is also belief that people are in fact connected to nature in the web of life (Q39 Weblife .68).

Another interesting feature of this factor, unlike the first dimensions for the general population or the environmentalists, is that there is a high proportion of negatively loaded technocentric variables. This structural feature indicates that factor one for the decision makers incorporates a strong oppositional stance against the technocentric perspective and also suggests that the ecocentric items incorporated in the dimension are antipodean to

technocentric views. Altogether the items combine to set out a general orientation that can be described as one that seeks to maintain nature and constrain industry.

Table 5 Factor Profile of the Decision Makers Attitude Domain

Asterisk (*) = Technocentric item. No asterisk = Ecocentric item.

FACTOR 1 Maintain nature, constrain business (Eco)	FACTOR 2 Post-material environ- mentalism (Eco)	FACTOR 3 Holistic management (Eco)	FACTOR 4 Constraining the market (Eco)	FACTOR 5 Environmental mediation (Eco)
Emeasure .86571	Stabeco* .80503	Manage* -.87398	Market* -.81048	Experts .76469
Dominate* -.84066	RMshort .77641	Nathab .75786	Herbpest .72154	Isocgood* -.76261
Image .82544	Ideas .67120	Country .70956	Mining* -.70178	Toowaste .48485
Apart* -.77636	Humane .64283	Abandon .69361	Badtech .63793	Humane .45404
Costbene* -.73732	Domover* -.59007	Waterpol .63568	Adcities* -.45410	Spirit -.44245
Techsolv* -.72668	Useall* -.54500	Business* -.58810	Scitech* -.44304	Weather .42149
Weblife .68316	Consump .53564	Spirit -.55773	Nuclear* -.41285	Soildam .36338
Weather .63365	Ownsake .53039		Costbene* -.40166	
Nuclear* -.61691	Country .50704		Spirit .36065	
Artwants .59356	Ecogrow* .47324			
Useall* -.56263	Adcities* -.44726			
IOhealth* -.55221	Weblife .44221			
Business* -.49277	Nathab .42813			
Radical .48462	Waterpol .37918			
Ecogrow* -.47686	Radical .37705			
Toowaste .47050	Nuclear* -.37134			
Domover* -.45867	Techrun .35203			
Mining* -.42727				
PAextinc .40445				
Badtech -.37792				
Techrun .37679				

Pct of Var = 31.0

Pct of Var = 11.9

Pct of Var = 9.4

Pct of Var = 8.2

Pct of Var = 6.0

(For a complete outline of each item see appendix D)

6.3.2 Post-material environmentalism

Factor 2 accounts for 11.9 percent of the total response variation. Unlike the first factor the dimension is predominantly made up of positive responses to ecocentric referents. However, there are four items with loadings which stand as opposites to technocentric views, the most significant being opposition to the idea that humanity has been given dominion over nature (Q40 Domover -.59) and the notion that it was intended that we use all of nature's assets to satisfy our needs (Q43 Useall -.55). The dominant feature of this factor is the post-material position that appears amongst the heaviest loading items. The item with the most weight, the aim for a stable economy, is in the context of this factor, a post-material and a non-technocentric item, especially given the

harsh contemporary economic conditions and the importance of economic growth espoused by government and the business community in New Zealand. The next two variables, the aim to progress towards a society where ideas are more important than money (Q29 Ideas .67) and the aim to move towards a less impersonal, more humane society (Q28 Humane .64) are also indicators of post-material values. A second feature of this dimension is that it involves more items which are directed at environmental concern; for example, concern over shortages of essential raw materials (Q4 RMshort .78) and the destruction of the countryside (Q7 Country .50). Generally this factor can be described as a post-material dimension qualified by concern about the over consumption of raw materials, damage to the environment and the idea that people have not been given dominion over the nature.

6.3.3 Holistic management

Factor 3 in the decision maker's domain explains 9.4 percent of the total variance and is another ecocentric dimension which has environmental concern as a notable feature. Interestingly the environmental concern variables already appear in Factor 2. This suggests that for decision makers environmental concern leans towards specific areas of focus such as water pollution, natural habitat destruction and the deterioration of the countryside. However, the main feature of this third dimension is opposition to the technocentric notion that sound management decisions should always be based on scientific expertise (Q22 Manage -.87). Associated with this is a negative response directed at the idea that the business community works for the good of the nation (Q16 Business -.59). Combined with the idea that if industries that are unable to eliminate environmental pollution they must be abandoned (Q31 Abandon .69) these responses appear to set this factor up as a dimension that disassociates the environmental decision making procedure from centralized authoritarian type processes and economic rationality.

6.3.4 Constraining the market

The fourth factor in the decision maker's environmental attitude domain accounts for 8.2 percent of the response variance and is another dimension that is oppositional to technocentric beliefs. The heavy negative loading on the idea that the market is the best way to supply people with the things that they want (Q17 Market -.81) is an anti-free market position. This position is supported by opposition to mining (Q33 Mining -.70) and to nuclear warship visits (Q34 Nuclear -.41). It would appear that economic rationality, that is the desire for increased income or profit, would not be enough to

justify such activities. Overall, it appears that this factor best represents a reinforcement of the general anti-technocentric orientation and desire for industrial constraint set out in the first factor.

6.3.5 Environmental mediation

Factor 5 accounts for 6.0 percent of the response variation, and has as its main feature the decision maker's apparent desire to increase the participation of ordinary people in decision making processes (Q20 Experts .764). Associated with this is a high negative response to the idea that industrial societies are good societies in that they provide a high level of well being for most of the people who live in them (Q12 Isocgood -.76). This suggests that some decision makers associate lack of consultation in decision making to lack of well being provided by industrial societies.

6.3.6 The decision makers summary

To summarize the description of the decision maker's environmental attitude domain it can be said that this group's response was, in a structural sense, similar to that of the environmentalists. Like the environmentalists the decision makers produced an attitude domain that incorporated dimensions that had both technocentric and ecocentric variables, both positive and negatively loaded variables and variables that were significant in more than one factor. However, unlike the environmentalists the decision makers produced attitude dimensions that were uniformly positive about ecocentrism and negative about technocentrism. The decision maker's attitude domain can therefore be described as one which fits totally within the bounds of ecocentric belief system.

The most noteworthy aspect of the decision maker's environmental attitude domain was the proportion of variables with negative loadings in each dimension. Factors 1,3 and 4 could all be described as anti-technocentric dimensions. This suggests that the ecocentric perspective of decision makers involved a considerable antagonism or opposition to technocentric views.

The content of the decision maker's attitudes was also significant in another way. In general, the concerns revealed by the decision makers were not so much concerns about the environment, although environmental concerns were there, as about aspects to do with the decision making process. Maintaining nature and constraining business, Post-material environmentalism, holistic management, market constraint, and mediation, are all

notions that can be directly related to decision making activity. It is not unexpected that such a result should occur as such a concern would be highly important to these people. The value of this finding is that it indicates that aspects of the decision makers attitudes are in line with the ecocentric perspective. It could be assumed, therefore, that these attitudes would to some degree have an influence on the decision making processes related to environmental issues, and it could be argued that the decision maker's environmental concern would influence the decisions made.

6.4 The manufacturer's attitude domain

Six factors emerged from the analysis of manufacturers (see Table 6). Together, they accounted for 82.7 percent of the total response variation.

6.4.1 Environmental concern

The manufacturers expressed an attitude domain which, like the general population and the environmentalists, had an environmental concern factor for the first dimension (see Table 6). This factor explained 34.5 percent of the total variance and can therefore be considered a very strong dimension within the manufacture's perspective. In this dimension six of the eight heaviest loading items appear in Cotgrove's environmental concern scale. Among the other two items was agreement with the notion that a future environmental catastrophe can only be avoided by making radical changes in the values and institutions of industrial societies (Q21 Radical .77), and agreement with the idea that industries that are unable to eliminate environmental pollution must be abandoned (Q31 Abandon .63). Altogether this dimension points to concern about environmental degradation as a very strong part of the manufacturer's environmental attitude domain.

6.4.2 Respect nature for own sake (naturalism)

The second factor in the manufacturer's domain explains 14.5 percent of the total variance. This dimension has two noticeable characteristics. The environment is perceived as being separate from humanity (Q37 Apart .82) but at the same time worthy of protection for its own sake (Q38 Ownsake .85), with the responsibility for care and protection is in the hands of humanity (Q42 Rescare .63). This appears to be a combination of technocentric and ecocentric understanding. According to the discussion in Chapter Two viewing humanity as separate from nature was thought to be a

technocentric belief, while protection of the environment for its own sake was put forward as an ecocentric belief. In the context of this factor the separation of people from nature does not mean the environment is disqualified from protection or free for exploitation. This indicates that in the minds of the manufacturers possible technocentric and ecocentric variables do not separate out into different belief networks. On the contrary they can be united to produce alternative understandings.

Table 6 Factor Profile of the Manufacturers Attitude Domain

Asterisk (*) = Technocentric item. No asterisk = Ecocentric item.

FACTOR 1 Environmental Concern (Eco)	FACTOR 2 Respect nature for ownsake (Naturalism) (Eco)	FACTOR 3 Industrial resource depletion (Eco)	FACTOR 4 Environmental harmony (Eco)	FACTOR 5 Stable industrial growth (Tech)
Waterpol .90240	Ownsake .84608	Consump .94473	Spirit .93763	Ecogrow* .86365
Herbpest .89609	Scitech* -.84165	RMshort .87590	Domover* -.93752	Stabeco* .80294
Polrise .89609	Techsolv* -.82732	Toowaste .67194	Useall* -.79801	Costbene* .78674
Radical .76872	Apart* .82732	IOhealth* -.63669	Ideas .64173	Isocgood* .73472
Country .68296	Badtech .69097	Nathab .61596	Dominate* -.56921	Mining* .70190
Abandon .63383	Rescare .63090	Business* -.56738	Market* -.53048	Adcities* .63128
Weather .63047	Market* -.53637	Techrun .53693	Toowaste .44035	PAextinc .46651
Nathab .57175	Artwants .41532	Soildam .49786	Badtech .43727	Nathab .43122
Experts .51303	Toowaste .39913	PAextinc .43012	Radical .42120	Market* -.41950
Weblife .50804		Weblife .42342	Abandon .40924	RMshort .36171
Market* -.46439		Nuclear .42104	Mining* .39904	Ownsake -.35076
Manage* .43132		Techsolv* -.40465	IOhealth* -.37375	
Badtech .40062		Scitech* -.39848	Humane .35724	
Business* -.39648		Emeasure .36841		
Adcities* .38210		Herbpest .36256		

Pct of Var = 34.5

Pct of Var = 14.5

Ptc of Var = 10.7

Pct of Var = 9.2

Ptc of Var = 8.2

**FACTOR 6
General
Technocentrism
(Tech)**

Manage* .74208
Nuclear* .73018
Ideas .55976
Emeasure .52316
Isocgood* .49454
Dominate* .44477
Iohealth* .39675

Ptc of Var = 5.6

(For a complete outline of each item see appendix D)

The second prominent feature in this dimension is an anti-science and technology position. The high negative loadings on statements such as science and technology provide humanity with its best hope for the future (Q23 Scitech -.84), science and technology can solve all problems by finding new sources of energy and materials, and ways of increasing food production (Q25 Techsolve -.83) and support for the idea that the bad effects of technology outweigh its advantages, are all highly antagonistic to the technocentric position. Overall, this factor suggests that for the manufacturers there is a dimension that maintains that the environment is worthy of protection and that this environmental concern is associated with a disbelief in the "technological fix" perspective.

6.4.3 Industrial resource depletion

Factor 3 accounts for 10.7 percent of the total variance and can be described as an ecocentric dimension concerned with industrial resource depletion. The heaviest loading item indicates that this dimension focuses primarily on the danger that we will be unable to sustain our present rate of consumption of natural resources (Q9 Consump .94). The second referent (Q4 RMshort .88) suggests that there are likely to be serious and disruptive shortages of essential raw materials if things go on as they are, while the third item (Q18 Toowaste .67) is agreement with the statement that our present way of life is much too wasteful of resources. These three referents are then reinforced to a degree by disagreement with the idea that vigorous industrial output is the mark of a healthy society (Q14 IOhealth -.64). Resource depletion therefore, is linked to industry. Altogether these variables combine to form a dimension concerned with resource depletion. Although it appears to be ecocentric, it is also a dimension that reflects a utilitarian concern, and may therefore, be technocentric as a concern related to the production process.

6.4 4 Environmental harmony

Factor 4, accounting for 9.2 percent of total variance, is a spiritual dimension centered around the understanding that because the environment contains the essence of the human spirit it must be protected (Q41 Spirit .94). Other spiritual features of this dimension include an acceptance of the understanding that humanity has not been given dominion over nature (Q40 Domover -.94) or has the right to use all of natures assets to satisfy its needs (Q43 Useall -.80).

6.4.5 Stable industrial growth

Factor 5 can be described as a technocentric dimension explaining 8.2 percent of the total variation. It is an acceptance of the technocentric growth orientation (Q27 Ecogrow .86, Q32 Costbene .79, Q33 Mining .70) and incorporates the belief that industrial societies are good societies (Q12 Isocgood .73). The growth perspective is qualified to a degree by the presence of environmental concern referents (e.g. Q3 PAextinc .47 and Q10 Nathab .43) and the high loading on the desire for a stable economy (Q30 Stabeco .80).

6.4.6 General technocentrism

Factor 6 is also technocentric in character, indicating a generally favorable acceptance of technocentrism (Q22 Manage .74, Q34 Nuclear .73, Q12 Isocgood .49, Q36 Dominate .44, Q14 IOhealth .40) and accounts for 5.6 percent of the total variance. It also indicates that manufacturers accept that too much importance is placed on economic measures of well-being (Q15 Emeasure .52). Finally some Manufacturers believe that there is room to progress towards a society where ideas are more important than money (Q29 Ideas .56).

6.4.7 Anti free market/business

Another feature of the responses supplied by Manufacturers was not a factor but a trend that showed up in the first five dimensions, namely an anti-free market/anti-business orientation. The idea that the market is the best way to supply people with the things that they want and the idea that the business community works for the good of the nation consistently received substantial negative loadings. This trend is contrary to the expected response from this group. This indicates that the manufacturers have a lack of faith in the capacities of the free market to account for environmental issues and of businesses to work for the good of the nation.

6.4.8 The manufacturers summary

In summary the manufacturers produced an environmental attitude domain that was, in terms of the ecocentric/technocentric debate, structurally similar to the domains produced by the other two subgroups. Like the environmentalists this group was selected as an "ideal type" group. Its attitudes, it was assumed, would be consistent with the

technocentric perspective. However, the manufacturers produced a predominantly ecocentric orientation; four of the six dimensions were ecocentric dimensions and together this accounted for 68.9 percent of the variation. The first dimension alone, a strong, clear concern for the environment accounted for 34.5 percent of the total variance. These findings may reflect the fact that in this study the sample of manufacturers involved relatively small entities rather than large corporations. It may be that large scale industrialists would be more in line with the technocentric position.

6.5 Comparison of factor domains

Table 7 provides a brief and simple comparative outline of the various attitude dimensions derived from the general population and the various subgroups. As this table shows, the factor analytic descriptions indicate that the decision makers were the only group where all factors were advance a clearly ecocentric perspective. The general population, the environmentalists, and the manufacturers revealed both technocentric and ecocentric dimensions in their attitude domains.

Table 7 Summarized outline of the Ecocentric and Technocentric Dimensions in each Attitude Domain

General Population	Environmentalists	Decision Makers	Manufacturers
Environmental concern <i>Ecocentric</i>	Environmental concern and democracy <i>Ecocentric</i>	Maintain nature, constrain industry <i>Ecocentric</i>	Environmental concern <i>Ecocentric</i>
Industrial strength <i>Technocentric</i>	Natural science <i>Ecocentric</i>	Post-material environmentalism <i>Ecocentric</i>	Nature for own sake (Naturalism) <i>Ecocentric</i>
Environmental control and growth <i>Technocentric</i>	Industrial Strength <i>Technocentric</i>	Holistic management <i>Ecocentric</i>	Industrial resource depletion <i>Ecocentric</i>
Green compromise <i>Ecocentric/Technocentric</i>	Peace and stability <i>Ecocentric</i>	Constraining the market <i>Ecocentric</i>	Environmental Harmony <i>Ecocentric</i>
	Non-economic management <i>Ecocentric</i>	Environmental consultation <i>Ecocentric</i>	Stable industrial growth <i>Technocentric</i>
	Spiritual stewardship <i>Ecocentric</i>		General technocentrism <i>Technocentric</i>

Comparing across the different groups there are noticeable similarities and differences between the dimensions:

- (1) The general population, the environmentalists and the manufacturers all have an environmental concern dimension as their strongest factor.
- (2) Both the general population and the environmentalists have an "industrial strength" dimension.
- (3) Both the general population and the manufacturers have a dimension that has a growth orientation.
- (4) The environmentalists and the manufacturers both have dimensions revealing a spiritual concern for the environment .
- (5) Although not evident in Table 7 both the decision makers and the manufacturers have an anti-free market position.

6.6 Attitude domain conclusion

The objective of this chapter was to describe the nature and content of the environmental attitudes revealed by the various groups investigated. These descriptions only outline how the attitudes towards the environment are structured. Little or no attempt was made to explain why they are structured so.

On the basis of these descriptions three points can be made in response to the questions set out in Chapter 1. These points concern the conception of attitude domains, dualistic and oppositional belief systems and the significance of the cross sharing of variables. First, what is the nature and structure of attitudes towards the environment? According to the above findings this varies depending on the group investigated. However, all of the groups incorporate both technocentric and ecocentric items in their attitude dimensions. Therefore their attitudes can best be described as attitude domains, incorporating influence from both technocentric and ecocentric belief systems.

An application of the positivity principle to the general population reveals that the two belief networks operate in a dualistic manner. On the other hand, the various subgroups showed that their ecocentric and technocentric perspectives were not

completely dualistic, they involved conceptions that were opposed or antagonistic to one or the other perspective. This pattern usually occurs when the issues are of extreme importance to the subjects.

The subgroups also revealed that some of their dimensions involved a mutual incorporation of certain technocentric and ecocentric referents. This cross sharing of variables not only indicated that the dimensions were related in some way but it also challenged the conception of ecocentrism and technocentrism as dualistic or orthogonal belief networks. This suggests that for these groups the distinction between the two perspectives is not always clear. To think of the two systems as separate or even in mutually exclusive ecocentric and technocentric terms may, as Pepper (1984) and O'Riordan (1981) both suggest, be misleading. However having said that, the above responses to the attitude variables do seem, in a general sense, to provide a pattern of association that does distinguish the two distinct perspectives.

Overall, factor analysis has provided a general picture of the various dimensions underlying group responses. It provides some idea of the content of the attitude domains and depicts the way that the ecocentric and technocentric belief systems are related in the construction of those domains. It can be said that for the general population, the manufacturers and the environmentalists the most important dimension was a concern for the environment, with all of these groups having an ecocentrically orientated attitude domain. For the decision makers the focus of concern for their domain was an orientation towards the decision making process.

Finally, before any further questions about the nature and structure of attitudes towards the environment can be answered the analysis has to move on to a new stage. That is, in order to explain why the attitudes are structured in the way that they are, it is necessary to look at how they are related to the characteristics (demographics) of the people surveyed.

Chapter Seven

Environmental Attitudes and Demographics: a "snapshot"

This chapter provides a brief "snapshot" of how characteristics of the general population are associated with the attitudinal dimensions that emerged from the factor analysis. In other words, it looks at how the respondents environmental attitude dimensions relate to their demographic traits. Because of the small sample size of the various subgroups this "snapshot" has been restricted to the general population.

In order to examine the associations responses were converted into factor scores (see Rummel, 1970:150-154, 433-445). This involves the subjects responses to the technocentric and ecocentric variables being transformed into a smaller number of composite variables based on the loadings the original variables had on each factor. These factor scores, therefore, became numeric values for each respondent on each of the various factors (attitudinal dimensions). The factors, in effect, become weighted composite variables which can be related to other traits.

The first step in the process of interpreting the relationship between the attitudinal dimensions and the demographic influences involved establishing the correlations between the factors and the background characteristics. *Eta* correlations (see Table 8)⁸ were calculated to reveal which demographic variables had a substantial association with the dimensions produced by the factor analysis⁹. Table 8 reveals that for the general population sample there were five demographic variables that had reasonably substantial correlations with the factor scores.

⁸ *Eta* correlation measures the strength of an association between a nominal level variable and an interval level variable (Garson, 1971:178). Note that it does not take into account any ranking on the independent variable.

⁹ For the general population a pragmatic decision was made to treat *Eta* correlations over 0.2400 as substantial.

Table 8 Eta Correlations between Demographic Variables and the Factor Scores on the Attitudinal Dimensions.

General Population				
	Environmental Concern	Industrial Strength	Environmental Control and Growth	Green Compromise
Gender	.1473	.0032	.0672	.0875
Age	.1891	.2220	.1761	.1017
Ethnicity	.0955	.1146	.1547	.0942
Political Affiliation	<u>.2769</u>	<u>.2464</u>	.1701	.1555
Religiosity	.1688	.1690	.2050	.1112
Employment status	.0391	.1004	.1903	.0386
Not in paid employment	.0791	<u>.2496</u>	.1508	<u>.2400</u>
Socio economic status	<u>.3425</u>	<u>.2448</u>	<u>.3359</u>	<u>.2525</u>
Education	.1519	<u>.2498</u>	<u>.3504</u>	.1665
Sector (public/private)	.0785	.1497	.0443	.0891
Income	.1823	.1538	<u>.2695</u>	.1353
Member of Envirntal Org	.0490	.1315	.0996	.0902
Use recycling depot	.0829	.0470	.0722	.1688

The second step in the process of interpreting the relationship between the attitudinal dimensions and the demographic variables involved producing a summary of the mean factor scores associated with the various attitude dimensions. For example, in Table 9 the mean factor score associated with the first dimension when broken down by political preference revealed that those who would have voted for the Alliance had a mean factor score of -.2803 and those who would have voted National had a mean factor score of .3305. The variation of these means provides a picture of how the different political orientations are related to that dimension. Hence the political orientations with negative means tend to lean one way on this factor while positive means indicate leaning in the

other direction. This sort of analysis is equivalent to a crosstabulation, but takes advantage of the interval level measurement of the factor scores.

7.1 Political affiliation

The first demographic (independent) variable which had substantial Eta scores was political preference. This item had relatively large correlations with the environmental concern and industrial strength dimensions of the general population (see Table 8). Table 9 shows how the mean factor scores for the environmental concern and industrial strength dimensions vary across the categories of political preference.

Table 9 Summary of the Mean Breakdown of Factor Scores
for Environmental Concern and the Industrial
Strength Dimensions by levels of Political
Preference.

Environmental Concern by levels of Political Preference				Industrial Strength by Levels of Political Preference			
	Mean	Std dev	Cases		Mean	Std dev	Cases
Ent Pop	-.0241	.9868	239	Ent Pop	-.0050	1.0235	239
Alliance	-.2803	.9424	24	Alliance	.1048	1.3257	24
Green	-.7326	.8946	9	Green	.4097	1.104	9
Labour	-.1141	1.008	47	Labour	.0497	1.016	47
Liberal	.5602	1.497	9	Liberal	.6675	1.031	9
National	.3305	.9820	29	National	-.4556	.6014	29
New				New			
labour	-.7655	.5285	6	labour	-.4155	.2342	6
Social				Social			
Credit	-.8766	.0000	1	Credit	-.0632	.0000	1
Other	-.0971	1.027	10	Other	.4462	.8124	10
Don't				Don't			
know	.0454	.9060	104	know	-.0427	1.040	104
Total cases= 291							
Missing cases= 52 or 17.9 pct							

It was apparent that those who would have voted Alliance, Green, Labour, New labour or Other have an average position that is supportive of environmental concern (a negative mean factor score was indicative of a positive disposition - simply a statistical artifact). Those who would have voted National, Liberal, or those who were Don't

Knows had mean scores which revealed a tendency to move away from environmental concern.

Political preference was also considered in relation to the factor scores associated with the industrial strength dimension. It appears that those who would have voted National, New Labour, Social Credit, or were Don't Knows, were the groups with a favorable position towards industrial strength.

It should be kept in mind that the overall the variability in mean factor scores for the political orientations was relatively modest. That is, they did not vary greatly, above or below, the average mean score for the entire population. Along with the Eta correlation, this shows that as a factor of differentiation, political preference can only be described as a modest influence on environmental concern and industrial strength dimensions. It must also be noted that the full variability of the means is much greater than that which is revealed in the following tables. The complete range of variability is about 6 points whereas the variability of the means in the following analysis is only about 1.5 points.

7.2 "Not in paid employment"

The "not in paid employment" variable was the second independent variable with substantial Eta correlations. This variable was correlated with the factors scores for the Industrial Strength dimension and the Green Compromise factor of the general population (see Table 10). It should be noted that out of the general population, only 33.3 percent were in the "not in paid employment" category.

Table 10 Summary of the Mean Breakdown of Factors Scores
for Industrial Strength and Green Compromise
Dimensions by levels Of "Not In Paid Employment".

Industrial Strength by levels of Not in Paid Employment				Green Compromise by levels of Not in Paid Employment			
	Mean	Std dev	Cases		Mean	Std dev	Cases
Ent Pop	.0765	1.008	97	Ent Pop	-.0776	1.156	97
Retired	-.0945	.9939	45	Retired	.0314	1.284	45
Student	.3569	1.072	16	Student	.0545	.8097	16
Homemak	-.0195	.9746	26	Homemak	-.0369	.9897	26
Unemploy	.6477	.8864	10	Unemploy	-.8857	1.246	10
Total cases= 291							
Missing cases= 194 or 66.7 pct							

Among those people who were not in paid employment, in relation to the Industrial Strength perspective, it was the students and the unemployed who were not supportive of this view. For the Green Compromise dimension the point of interest to emerge was that it was the unemployed who had a positive disposition toward the factor. Students, retired people and homemakers showed a very modest difference from the overall mean.

7.3 Socio-economic status

The variable "socio-economic status" was the only demographic item to be substantially correlated with all four dimensions of the general population's attitude domain. Note however, that only 46 percent of the general population was involved (see Table 11).

In relation to Environmental concern by socio-economic status it appears that it was only those people on levels two, three and six of Johnston's (1983) revised scale of socio-economic status (Johnston's scale) that had a positive orientation towards environmental concern. The people on levels one, four and five, were orientated in the opposite direction. This arrangement of dispositions makes it difficult to argue that there is a meaningful pattern in the relationship between levels of socio-economic status and orientation towards environmental concern. Environmental concern appears to be distributed arbitrarily amongst the different socio-economic categories.

With regards to Industrial Strength there was only one socio-economic group, those on level two of the Johnston scale, who indicated opposition towards the factor. As a proportion of the number of cases in this analysis, this group only accounted for 23.8 percent of the views expressed. The remaining 76.2 percent of the cases, the overall majority of the sample included in this analysis, had a positive frame of mind towards the industrial strength dimension.

The Environmental Control and Growth dimension was substantially correlated with socio-economic status. It is quite clear from the summary of the mean factor scores that only those in the "lower" socio-economic groups (levels five and six from Johnston's scale) had a positive propensity towards environmental control and growth (recall a negative mean factor score is indicative of a positive disposition). The majority of the cases, those with a higher level of socio-economic status, had an aversionary disposition

towards this view. In fact, the factor scores associated with the Environmental Control and Growth dimension suggests a pattern in the relationship. The higher the socio-economic level, the greater the tendency to orientate away from the idea of environmental control and growth. That is, there appears to be an inverse relationship between socio-economic status

Table 11 Summary of the Mean Breakdown of Factors Scores for Environmental Concern, Industrial Strength, Environmental Control and Growth, and Green Compromise Dimensions By levels of Socio-Economic Status.

**Environmental Concern
by levels of Socio-Economic
Status**

	Mean	Std dev	Cases
Ent Pop	-.0079	.9428	134
Socio eco status			
Level 1	.5062	1.0758	23
Level 2	-.2424	.78357	32
Level 3	-.2657	.84436	44
Level 4	.3142	.90801	19
Level 5	.2773	1.0235	9
Level 6	-.2461	.9981	7

**Environmental Control
and Growth by levels of Socio-
Economic Status**

	Mean	Std dev	cases
Ent Pop	.1117	.9371	134
Socio eco status			
Level 1	.5647	.7583	23
Level 2	.2486	.9580	32
Level 3	.0164	.9950	44
Level 4	.1119	.8746	19
Level 5	-.4059	.6219	9
Level 6	-.7374	.7165	7

Total cases= 291

Missing cases= 157 OR 54.0 pct

**Industrial Strength
by levels of Socio-Economic
Status**

	Mean	Std dev	Cases
Ent Pop	-.0308	1.030	134
Socio eco status			
Level 1	-.2811	.8665	23
Level 2	.3424	1.0191	32
Level 3	-.0405	.9164	44
Level 4	-.0161	1.3959	19
Level 5	-.5254	1.1580	9
Level 6	-.2577	.6110	7

**Green Compromise
by levels of Socio-Economic
Status**

	Mean	Std dev	cases
Ent Pop	.0065	.9270	134
Socio eco status			
Level 1	-.0208	1.112	23
Level 2	-.1598	.6938	32
Level 3	.1653	.9801	44
Level 4	-.1379	.7965	19
Level 5	.5912	.9080	9
Level 6	-.5007	.9608	7

and the environmental control and growth orientation. The group most averse to this position were those people on level one of Johnston's scale. Generally, as socio-

economic status lowered (except between levels 3 and 4) the position towards Environmental Control and Growth became more favorable.

Socio-economic status was also substantially correlated with the Green Compromise dimension, but there appears to be no pattern in the relationship between these two variables. People on levels one, two, four and six of Johnston's scale (60.5 percent of the cases incorporated in this analysis) had a favorable frame of mind towards this particular perspective. The people on levels three and five of the Johnston scale, (39.5 percent of the cases) had a negative orientation.

In a general sense, the variability in the mean factor scores associated with the socio-economic variable, like the mean factor scores associated with the Political Preference and Not In Paid Employment variables, was relatively modest. This suggests that as a factor of differentiation, socio-economic status can only be described as a moderate influence.

7.4 Education

Education was another variable with substantial correlations, but only with the Industrial Strength and the Environmental Control and Growth dimensions (see Table 12). With Level of Education taken into account, the breakdown of factor score means indicate, that those people with some secondary school education, school certificate, or those who went to teachers college or a polytechnic, were the respondents that had a positive leaning towards the industrial strength dimension. The group with the highest mean support were those with some secondary school education. On the other hand, those least inclined to support the industrial strength dimension were those with a university level of education. Followed by the "other" category, and those who's highest level of education was Form Six or Seven.

A point of interest is that those who went to teachers college held a positive view towards industrial strength while those groups with other tertiary education, including a university education, held an oppositional position. Why this should be the case is unclear. However, similar to the relationship between Socio-Economic Status and Environmental Concern, or the Green Compromise positions, the summary of the factor scores associated with Levels of Education does not reveal any systematic pattern in the relationship between it and the orientation towards Industrial strength.

For people who's highest level of education was no secondary school, some secondary school, higher school certificate or school certificate and technical certificate there was a positive orientation towards Environmental Control and Growth. Those people who's highest level of education was form 6 or 7, teachers college, a university qualification, or other, were those who held a view that was moving away from such a belief. The group most inclined to support the notion of Environmental Control and Growth were those with higher school certificate. In fact the mean factor score for this

Table 12 Summary of the Mean Breakdown of Factors Scores for Industrial Strength and the Environmental Control and Growth Dimensions by levels of Education.

Industrial Strength by levels of Education				Environmental Control and Growth by levels of Education			
	Mean	Std dev	cases		Mean	Std dev	cases
Ent Pop	.0035	1.016	242	Ent Pop	.0060	1.0103	242
No sec school	.1584	.8413	7	No sec school	-.2853	.5421	7
Some sec school	-.2736	1.0550	62	Some sec school	-.3636	.9852	62
school C	-.1621	.7161	32	school C	-.0190	.6994	32
Form 6-7	.2463	1.2625	13	Form 6-7	.1274	.9446	13
Higher school C	.1211	.8106	6	Higher school C	-1.010	.8596	6
Tech Cert	.0494	.9027	31	Tech Cert	-.0453	1.107	31
Teach Co	-.2101	1.1211	27	Teach Co	.6507	.9860	27
Uni	.3598	1.0655	55	Uni	.2519	1.0282	55
OTHER	.2584	.7470	9	OTHER	.1106	.8736	9
Total cases= 291							
Missing cases= 49 or 16.8 pct							

group indicates that they were by far the group most inclined to support the notion of Environmental Control and Growth. Note however, that the number of cases for this group was only six and thus, the meaningfulness of this finding is questionable. The group most inclined not to be supportive of Environmental Control and Growth were those who had teachers college training.

7.5 Income

The last independent variable to have a substantial correlation with the factor scores was Income. The Income variable was correlated with the environmental control and growth dimension (see Table 8).

Table 13 **Summary of the Mean Breakdown of Factors Scores for The Environmental Control And Growth Dimension by level of Income.**

	Mean	Std dev	Cases
Ent Pop	.0033	1.025	220
Income (per year)			
Loss	.4041	.6787	10
\$20,000 or less	-.2043	1.049	65
\$20,001 - 30,000	-.0781	1.100	46
\$30,001 - 40,000	-.0991	.8178	26
\$40,001 - 50,000	.4050	.9772	27
\$50,001 - 60,000	-.4576	.9434	10
\$60,001 - 70,000	.0432	1.078	15
\$70,001 - 80,000	.1967	.4418	8
\$80,001 - 90,000	.8896	1.521	4
\$90,001 or more	.4470	1.120	9
Total cases = 291			
missing cases = 71 or 24.4 pct			

Table 13 shows that there is a fairly clear pattern in the way the Environmental Control and Growth dimension is related to Level of Income. Respondents with an annual income of up to 40,000 dollars (other than a loss) had a positive disposition towards the Environmental Control and Growth dimension while those who had an income level of over 60,000 dollars had a negative orientation. Although these are clear groupings, some confusion emerges with the nil or loss category, and the 40-50,000 dollar group with both having a negative orientation towards the dimension.

7.6 "Snapshot" summary

This "snapshot" reveals that for the general population most of the demographic variables incorporated in this investigation are not substantially correlated with the various attitudinal dimensions. It appears that the four dimensions cut across most demographic indicators - that is there is no simple demographic profile of those who support or oppose ecocentric or technocentric dimensions. The few variables that appear to be moderately

associated with them are useful indicators, but they require further analysis and clarification. These demographic variables include political preference, not in paid employment, socio-economic status, education and income.

Although these variables provide some insight into the way the general population is orientated towards the various dimensions, the factor score summaries generally reveal that the variation in the mean factor scores is not that large. Therefore, the demographic traits have limited value in helping us understand the factor analysis results.

Socio-economic status was the only independent variable that had substantial Eta correlations with all four factors. Socio-economic status revealed a clear pattern in its association with two of the attitude dimensions. First, in relation to the idea of Industrial Strength only one socio-economic group was against this view. The majority of the general population had a positive propensity towards this dimension. Second, as an ordinal level variable socio-economic status reveals that there may be an inverse relationship between socio-economic status and orientation towards Environmental Control and Growth. The summary of the factor scores suggests that the higher the level of socio-economic status the less likely the respondent is to be supportive of the idea of environmental control and growth. However, only 46 percent of the general population sample was involved in the socio-economic status analysis.

Level of Education was correlated with the Industrial strength and the Environmental Control and Growth dimensions. However, there does not appear to be any simple pattern to the relationship between education and these two dimensions.

However, Level of Income does show a clearer positive association with the Environmental Control and Growth dimension. There are two main groupings: those who earn above 60,000 dollars a year are not supportive of the environmental control and growth dimension while those that fit in between making a loss and up to 40,000 dollars a year have a positive orientation to this dimension.

Finally, the most important feature of this "snapshot" is that there are only a few demographic variables that can be used to differentiate the general population in terms of how it is associated to the various attitude dimensions. Even in these cases the correlations are not high. This low capacity to differentiate suggests therefore, that the general population's environmental attitude domain is a view that is held by a broad cross section of the general population, and that additional analysis is required to further clarify and properly interpret these relationships.

Chapter Eight

Cotgrove Replication

This investigation was also partially designed to replicate Cotgrove's (1982) British survey. Unlike the previous sections which dealt with the measure of the nature and structure of ecocentric and technocentric attitudes via an application of Kerlinger's Criterial Referent Theory this section deals with Cotgrove's survey on the nature and extent of environmental support. This part of the study seeks to explore attitudes with more conventional methods of attitude measurement.

The purpose here is to outline those parts of Cotgrove's investigation which this study did replicate and to compare and discuss the findings. The features from Cotgrove's investigation that this chapter has addressed include: the perception of environmental concern, alternative beliefs and values, the idea of a new middle class and the effects of the "cognitive variables" on environmental concern.

In exploring the nature and extent of support for environmental issues in Britain Cotgrove targeted a number of different groups - the general public, industrialists, trade union officials, new environmentalists, and nature conservationists. These groups were chosen because Cotgrove believed that they would hold divergent views with regard to the environment and environmental issues.

The present study also targeted several groups; namely the general population (or Public), members of environmental organizations, members of a manufacturers association (in place of the industrialists), and bureaucratic decision makers. It was hoped that these groups would also furnish substantially different responses and therefore provide some insight into the extent of ecocentric and technocentric attitudes.

8.1 Perception of environmental dangers

Cotgrove developed an environmental concern scale in order to explore perceptions of environmental dangers. This scale was then factor analyzed to see whether environmental concern was multidimensional in nature. From this Cotgrove focused on three factors which together accounted for 52 percent of the total variance. The first factor (dimension) was an awareness of environmental damage; the second factor was concerned with the perception of environmental shortages; and the third dimension was focused on the destruction of natural habitats (see Table 14). Cotgrove (1982:15) drew three conclusions from his examination of the perceptions of environmental dangers. First, he argued that there was a fairly widespread recognition of the threats to the environment, particularly the threats to nature. Second, he concluded that there were

Table 14 Perceptions of Environmental Dangers (From Cotgrove 1982:15)

	Environ- mentalists	Nature conserva- tionists	Indust- rialists	Trade union officials	Public
Scales	%	%	%	%	%
Environmental damage					
Low	2.8	5.5	42.2	18.5	11.0
Medium	46.9	51.9	49.5	61.2	52.9
High	50.2	42.7	8.3	20.3	36.1
<i>N</i>	426	293	218	281	518
Environmental shortages					
Low	3.2	10.1	28.0	12.8	20.8
Medium	39.8	57.1	53.7	50.2	49.6
High	56.9	32.8	18.3	37.0	29.6
<i>N</i>	432	296	218	281	530
Nature protection					
Low	0.0	0.7	11.9	3.9	3.8
Medium	9.4	9.2	48.2	42.6	30.4
High	90.6	90.2	39.9	53.5	65.8
<i>N</i>	438	295	218	284	520

noticeable differences between the groups selected in relation to environmental concern and argued that the industrialists had consistently lower scores on all the environmental concern sub-scales. Third, the perception of environmental dangers for conservationists

and environmentalists were similar, except for concern over shortages where the conservationists responses were closer to those of the public and trade union officials.

In our investigation only eleven out of the twenty items from Cotgrove's original environmental concern scale were used, and only one general environmental concern factor (dimension) emerged after factor analysis (see Table 15).

Table 15 Perceptions of Environmental Concern

		Environ- mentalists	Manufacturers	Decision makers	General population
scales		%	%	%	%
Environmental concern					
	Low	4.0	15.4	11.1	11.6
	Medium	32.0	53.8	61.1	51.8
	High	64.0	30.8	27.8	36.6
	<i>N</i>	(25)	(13)	(18)	(284)

Missing cases = 7

The perception of environmental concern scale produced results similar to those in the Cotgrove study. First, it is interesting to note the similarity between the public's response in Cotgrove's strongest factor (environmental damage) and the general population's response to environmental concern in this study. It suggests that the environmental concern scale is a reliable measure, and that general environmental concern in New Zealand is at least similar to the level of environmental concern held by the public in Britain ten years ago. Secondly, environmental concern was recognized by all groups. Third, there were noticeable differences between the groups, though the manufacturers, the decision makers and the general population were relatively close when compared to the difference between these groups and the environmentalists. Fourth, the environmentalists were the group most inclined to have a high level of environmental concern. Fifth, the manufacturers were the group least likely to be concerned about the environment.

This study also produced an interesting difference, particularly with regard to the manufacturers as compared with Cotgrove's industrialists. In two of Cotgrove's subscales the majority of the industrialists exhibited a low level of concern. In this study however, the direction of concern, as revealed by the manufacturers, was opposite; there were more manufacturers who had a high rather than a low level of concern, with an

overall medium to high environmental concern orientation. A similar orientation was also revealed by the decision makers and the general population. Table 15 reveals that environmental concern seems to be prominent within all sectors of society, including the manufacturers who were expected to fit closest to the technocentric orientation. It would appear that these findings are in line with recent trends. Dunlap and Scarce (1991:654-657) maintain that the majority of people "...typically see environmental problems as serious...". Further, they argue that environmental problems are increasingly viewed as a threat and that "...public concern for environmental quality has reached an all time high."

8.2 Alternative beliefs and values

The major argument advanced in earlier chapters is that perceptions of the natural environment and environmental issues can vary across cultures, and according to alternative belief systems within a particular society. It has also been argued that within modern Western industrialized society there are two major belief systems of particular importance in relation to environmental perceptions - namely the politically dominant technocentric view and the emerging ecocentric perspective.

In his study Cotgrove found that the responses of the environmentalists and industrialists were different and suggested that the reason for this was to be found in their alternative patterns of beliefs and values. The view taken here is that these alternative beliefs and values, as Cotgrove outlines them, were essentially the ecocentric and technocentric perspectives. The former being exhibited by the environmentalists, whereas the industrialists were the latter.

Cotgrove argues that the variation between these two perspectives can explain the difference in the meaning and importance that certain environmental issues have for various groups. Cotgrove (1982:26) also argues that if these belief systems are cognised in paradigmatic terms then they can be thought of as the intellectual maps which guide the formulation of perception. That is, they provide the basis on which ideas about the environment are built¹⁰. Cotgrove (1982:28) further argued that these two "social paradigms" were oppositional on almost every issue. Not only basic issues such as production and wealth creation, but also other issues such as attitudes towards science and technology.

¹⁰ Dunlap and Van Liere (1984:1013) note that this paradigmatic conception has been described as the "...common values, beliefs and shared wisdom about the physical and social environments" which constitute a society's basic "world view"...

In order to address these ideas and to obtain a deeper understanding of the two paradigms and the support for them, Cotgrove included in his study several scales that addressed issues on which he believed ecocentrics and technocentrics would have divergent values and beliefs. These scales included: a modified version of Inglehart's (1977) post-material values scale; a scale to measure views towards economic individualism; a scale tapping the central features of industrial society; and a scale concerned with different attitudes towards science and technology. See Table 16 for a summary of Cotgrove's findings.

Cotgrove found that on the post-material values scale the environmentalists came out as more post-materialist, indicating high levels of support for non-material goals such as a less impersonal and more humane society. Industrialists emerged as strong 'materialists', revealing support for goals such as maintaining a stable economy, economic individualism, rewards for achievement and the operation of market forces. Alternatively, the environmentalists placed more emphasis on satisfying work, participation in decision making, and on a society in which the supremacy of the market is subjected to the public interest. With regard to the scale developed to measure attitudes toward some of the central features of industrial society Cotgrove (1982:31) found that the environmentalists stood out as having a high anti-industrial society score. Finally, for attitudes towards science and technology, Cotgrove (1982:31) found that the views of the industrialists and environmentalists differed considerably.

This study's, replication of Cotgrove's inquiry produced some similar patterns (see Table 17). However, it must be remembered that the scales in this investigation were only partial replications of the instruments used by Cotgrove.

The environmentalists were the group most inclined to have post-material values while the industrialists were the group least inclined to be post-materialist. That is, a third (33.3 percent) of the environmentalists had a high post-material orientation and 62.5 percent had a medium post-material view. On the other hand 46.2 percent of the manufacturers had a low post-material orientation and only 38.5 percent held a medium view. Like Cotgrove's findings these results indicate that the environmentalists were strongly 'post-materialist' and the manufacturers more materially orientated. The anti-industrialism scale also produced some similar and interesting results. First, in the Cotgrove study environmentalists stood out as having a high anti-industrial score. In this investigation the environmentalist's also had a higher anti-industrial society orientation, but it was not as pronounced. Second, the anti-industrialism results produced by the manufacturers were fairly similar to those produced by Cotgrove's industrialists. Like the industrialists, the manufacturers were inclined to have a medium or low anti-industrial

orientation. Finally, unlike the public response in the Cotgrove study more than a quarter of the general population in this study had a low anti-industrial society orientation.

For science and technology this investigation found, like Cotgrove (with regard to environmentalists and the industrialists) that there was a difference between the views of

**Table 16 Alternative Beliefs and Values (From
Cotgrove 1982:29)**

	Environment alists %	Nature conserva tionist %	Industria lists %	Trade Unionists %	Public %
Post-Material Values					
Low	4.2	31.0	54.4	14.2	25.7
Medium	74.6	66.0	44.2	79.8	72.2
High	21.2	3.1	1.4	6.0	2.1
<i>N</i>	425	294	215	282	529
Anti-economic individualism					
Low	10.9	50.7	73.1	17.6	38.2
Medium	55.8	44.3	25.5	55.1	57.1
High	33.3	5.0	1.4	27.3	4.8
<i>N</i>	414	280	212	267	482
Anti-industrialism					
Low	1.9	10.8	31.3	9.7	13.3
Medium	57.9	79.6	65.4	74.3	81.0
High	41.0	9.7	3.3	16.0	5.7
<i>N</i>	414	280	212	267	482
Anti-science					
Low	22.1	42.6	78.5	69.4	68.0
Medium	60.9	53.7	20.5	29.6	29.4
High	17.0	3.7	0.9	1.1	2.6
<i>N</i>	430	296	219	284	531

the environmentalists and manufacturers. However, in this study (aside from the manufacturers) views towards science and technology seem to be more concentrated around a medium position.

Generally then, what this investigation has revealed - in relation to alternative beliefs and values - is that the variation between the different groups appears to be reasonably similar to those reported by Cotgrove. Environmentalists are more post-materialist in orientation while manufacturers are more materialist. Environmentalists have a higher anti-industrial society orientation than others while manufacturers tend to have a medium to low anti-industrial society orientation and in both studies the general population

Table 17 Alternative Beliefs and Values

	Environ mentalists	Manufacturers	Decision makers	General population
scales	%	%	%	%
Post-material values				
low	4.2	46.2	—	12.4
Medium	62.5	38.5	94.4	73.0
High	33.3	15.4	5.6	14.5
<i>N</i>	(24)	(13)	(18)	(282)
Anti industrialism				
Low	9.1	36.4	—	28.5
Medium	72.7	54.5	83.3	61.8
High.	18.2	9.1	16.7	9.7
<i>N</i>	(22)	(11)	(18)	(267)
Anti-science				
Low	16.0	25.0	11.1	20.1
Medium	80.0	58.3	77.8	73.7
High	4.0	16.7	11.1	6.1
<i>N</i>	(25)	(13)	(18)	(278)

tends to have a medium to low orientation towards anti-industrialism. Finally this study found, like Cotgrove's, that environmentalists and manufacturers also have different views towards science and technology. Although the difference is not great the manufacturers are both more anti and more pro-science and technology than the other groups. It cannot be said with any certainty why this is so. One could speculate that science and technology is more of a criterial referent for manufacturers due to its historic

relationship with industry. It is also possible that some of the manufacturers in our sample do while others do not identify themselves with industrialists.

8.3 A New middle class?

An important argument which has been a consistent feature of the debate about environmentalism is that support for environmental concern is elitist or located in the better off sections of society. Cotgrove (1982:18) suggests that there is little substance to this argument and claims, as this study has found, that there has been minimal success in locating the social bases of support for environmental concerns. In fact typical measures such as income, education and occupational status have little explanatory value, and, studies suggest: "...that the limited utility of demographic variables in explaining variation in environmental concern points to a widespread distribution of concern in our society" (Cotgrove, 1982:18).

Cotgrove's examination of the sources of support for environmental pressure groups did reveal that the membership of the radical modern environmentalist groups involved a strong bias towards particular occupational groups outside the market (private) sector. Cotgrove (1982:19) claims that many were located in the personal service professions and creative arts, such as teachers, doctors, social workers etc.

In other words Cotgrove said was that the majority of the environmentalists were located in the non-market sector and that this was a fundamental difference between the environmentalists and the other groups. Cotgrove (1982:19) found that 64.4 percent of environmentalists fitted into the non-market domain compared to only 41.7 percent of the public and 23.6 percent of the industrialists. This position according to Cotgrove (1982:95) tends to distance the environmentalists from the institutions and processes of industrial capitalist societies and thus contributes to their alternative values and political beliefs¹¹. As Cotgrove (1982:96) states:

"What we are suggesting then is that any understanding of the quite different values and beliefs of environmentalists and industrialists is to be found in part in their relations to the core economic institutions of society."

¹¹ In contemporary New Zealand however, it is questionable as to whether employment in the public sector actually does distance people from the full effects of technocentric processes. Since 1984 there has been a massive restructuring of the state sector along market lines.

According to Cotgrove (1982:20) the difference in their political beliefs and values was the second major distinction between the environmentalists and others groups.

In ideological terms the environmentalists differ in that they reject the ideology of market capitalism, and thus are similar to the arguments expressed by the working class left. On the other hand, their relative autonomy and positions of authority in employment tends to shift their focus away from the issues that the working class left seems to target. Another main difference is that environmentalists tend to have a commitment to non-material goals and values which Cotgrove (1982:95) states, "...can be seen as fundamentally related to their social role: an everyday occupational commitment to non-material goals and values."

Because of these differences Cotgrove suggests that it is possible that environmentalists have emerged as a distinct fraction of the middle class. Although environmentalists can be described as middle class, this fact alone may be misleading. Cotgrove (1982:19) notes that industrialists are also middle class and implies that there are many groups which can be described in this way. Therefore, the utility of the concept "middle class" as a distinguishing characteristic may be limited.¹² Cotgrove (1982:96) also suggests that if class were to be defined in a way that moves away from "...criteria such as relations to the means of production, or function..." and is based on "...observable behaviors and utterances of identifiable groups..." then it could be argued that environmentalists are a part of a new class or a distinct fraction of the middle class that has emerged from the 1960s onwards.

8.3.1 Middle class operationalization

In this investigation class was defined in accordance with the ideas of Erik Olin Wright (1979) as set out for New Zealand by Wilkes et al (1985). The middle class comprised those positions that were in contradictory locations. That is, managers and supervisors - people: "...who are both exploited by capital as wage earners, yet at the same time, dominate workers through the control of worker's labour" (Wilkes et al, 1985:9)¹³. The class distribution of the various sample groups identified is set out in Table 18.

¹² Although Cotgrove (1982:93-96) discusses the issue of the middle class he does not actually define the middle class as he uses it in his discussion.

¹³ A second contradictory location that can be considered middle class was the semi-autonomous employee, however, this group was not distinguished by the measurement device. Even question 57, "Describe your occupation or main work activity", was not precise enough to classify many of the

Table 18 Sample Group Class Structure compared to New Zealand Class Structure*

	Environ	Manu-	Decision	General	New Zealand Class Structure**
	mentalists	facturers	Makers	Population	
	%	%	%	%	%
Bourgeoisie	7.1	23.1	—	4.2	2.9
Small Employers	7.1	38.5	—	6.3	8.0
Petty Bourgeoisie	—	—	—	5.6	9.0
Managers & Supervisors	50.0	38.5	70.6	35.4	39.2
Semi-autonomous & Workers	35.7	—	29.4	48.6	40.9
Missing cases	11	0	1	147	
N =	14	13	17	144	

*= From Wilkes et al (1985).

**= The 'bourgeoisie' were defined as owners or part owners of businesses with at least 10 employees. 'Small employers' were owners or part owners of businesses but with only 2-9 employees. The 'petty bourgeoisie' were the self employed or the owners or part-owners of businesses with only one employee. The 'manager and supervisor' group included: (1) managers, who participate directly in making decisions and task supervise more than one employee and/or places him/herself as manager or supervisor in the formal hierarchy; (2) Advisor-managers, those people who provide advice to the decision makers in at least one type of decision and is at least task supervisor for more than one employee and/or places him/her self as manager or supervisor in the formal hierarchy; (3) Supervisors, those people who are at least task supervisor for more than one employee. Finally, the 'working class' incorporated the semi-autonomous employee, who has moderate or high work autonomy but no supervisory function, and the 'worker' who has no autonomy and no supervisory function. These are consistent with the criteria employed in the international comparison of class by Erik Olin Wright and associates (1979).

respondents as semi-autonomous with any certainty. Therefore, semi-autonomous employees were included in the working class (proletariat) category.

The assumption that the environmentalists are predominantly middle class seems to be supported by this table. It reveals that the majority of the environmentalists tend to be located in the manager/supervisor class category; that is, in the contradictory or "middle class" position.

8.3.2 Characteristics of environmentalists compared

Like Cotgrove (1982:19) this investigation compared various characteristics of the sample groups and although little explanatory value was expected some interesting findings did emerge (see table 19). First, the environmentalists and the general population had quite similar age distributions, although the environmentalists were more clumped together in the younger age categories. Second, a large percentage (80 percent) of the environmentalists had experienced some form of tertiary education (i.e. teachers college, university) whereas 23.0 percent of the industrialists and only 23.2 percent of the general population had experienced education at this level.¹⁴ Third, the environmentalists tended to have a medium to low level of income. That is, no environmentalist had an income of over \$70,000. However, the income distribution of the environmentalists was slightly higher than that of the general population, even though 9.6 percent of the general population had an income level greater than \$70,000.

Beyond age, education and income the characteristics that were of particular interest, in relation to Cotgrove's argument about class, were occupational location and political beliefs. In this study the distribution of environmentalists in the public and private sectors was very similar to the market/non-market distribution of Cotgrove's environmentalists. Cotgrove found 64.4 percent of the environmentalists were located in the non-market sector and in this study 62.5 percent of the environmentalists were in the public sector.

The examination of occupational location seems to support Cotgrove's argument that environmentalists could possibly be distinguished as a fraction of the middle class. Environmentalists do tend to be located in the public (non-market) sector far more than the general public.

Cotgrove also claimed that political beliefs were another distinguishing feature and in this study the political orientations of the environmentalists do seem to stand apart from

¹⁴ The fact that all of the decision makers had a post secondary qualification is an artifact of their position

those of other groups. First, 28.0 percent of the environmentalists would have voted Green compared to less than four percent of the general population and none of the other two sample groups. Second, 16.0 percent of the environmentalists would have voted Labour and only 4.0 percent would have voted National. Of the manufacturers, 50.0

Table 19 Characteristics of Sample Groups Compared

		Environ mentalists %	Manufac turers %	Decision Makers %	General Population %
Age (years)	19-29	28.0	7.7	22.2	21.1
	30-39	28.0	30.8	44.4	21.1
	40-49	20.0	23.1	33.3	19.7
	50-59	12.0	38.5	—	15.5
	60-69	8.0	—	—	14.1
	70-87	4.0	—	—	8.5
	<i>N</i>	(25)	(13)	(18)	(284)
Education	No secondary	—	—	—	3.2
	Some sec	4.0	23.1	—	25.3
	School Cert	—	7.7	—	12.6
	Form 6 or 7	—	—	—	5.6
	HSC	4.0	—	—	2.8
	Tech Cert	8.0	38.5	11.8	13.0
	Teach college	16.0	—	—	10.2
	University	64.0	23.1	88.2	23.2
	other	4.0	—	—	4.2
	<i>N</i>	(25)	(13)	(17)	(285)
Sector	Public	62.5	—	100.0	37.8
	Private	37.5	100.0	—	62.2
	<i>N</i>	(16)	(13)	(17)	(164)
Income (Thousands of Dollars)	Loss	—	—	—	3.9
	<20	33.3	—	—	28.2
	>20-30	8.3	—	6.7	21.2
	>30-40	25.0	25.0	26.7	13.5
	>40-50	8.3	16.7	6.7	11.6
	>50-60	12.5	8.3	26.7	5.4
	>60-70	12.5	8.3	6.7	6.6
	>70-80	—	—	—	3.5
	>80-90	—	8.3	6.7	1.9
	>90	—	33.3	20.0	4.2
	<i>N</i>	(24)	(12)	(15)	(259)
Politics	Alliance	8.0	—	6.7	9.6
	Green	28.0	—	—	3.6
	Labour	16.0	33.3	20.0	19.6
	Liberal	—	—	—	3.2
	National	4.0	50.0	—	12.5
	New Labour	—	—	—	2.1
	Social credit	—	—	—	0.4
	Other	4.0	—	—	5.0
	Don't Know	40.0	16.7	73.3	43.9
	<i>N</i>	(25)	(12)	(15)	(280)

percent would have voted National, 33.3 percent would have voted Labour and none would have voted Green. Of the general population 12.5 percent would have voted National, 19.6 percent would have voted Labour and only 3.6 percent would have voted Green. Among the decision makers 20.0 percent would have voted labour and 6.7 percent Alliance. The remainder of the decision makers were in the don't know category.

The decision makers were the group that was most undecided. A large majority (73.3 percent) did not know who they would vote for. In fact the dominant feature of political preference was finding that by far the largest percentage in any group, except for the manufacturers, was the "don't knows". The manufacturers support was largely for the main stream political parties.

Since the support for Labour is similar for decision makers, environmentalists and the general population, it can be said that what probably distinguishes the political orientation of the environmentalists is their bias towards voting Green and, their bias away from voting National.

This posture may be considered a political orientation that moves away from the right. However, to perceive the political tendencies of environmentalists in these terms may be a little erroneous. Modern environmentalists generally reject the traditional left/right debate. As Cotgrove (1982:90) states:

"One of the bases for the emergence of 'green' or ecology parties is the conviction that the traditional left/right dimension in politics has little relevance to environmental issues. Parties of the left are seen to be as committed to economic goals as are those of the right, differing mainly in their support for economic individualism versus varying degrees of collectivism."

It is difficult to say whether a rejection of the traditional left/right parties is the case here. In relation to political affiliations, Cotgrove argued that the large proportion of environmentalists who classified themselves as either "center" or of "no position" could have been an indication of such a rejection. Although a large proportion of the environmentalists in this study classified themselves as "don't knows" it is not possible to argue that this necessarily represents the same repudiation. The proportion of "don't knows" in the decision maker and general population categories are also high. It is more likely that the large percentage of "don't knows" indicates the public's general confusion about politics at the time of the survey. It is arguable that the public was having difficulty in recognizing any difference between the two major parties in terms of their overall policy direction. The Manawatu electorate also has had to contend with the resignation of

their member of parliament from the National Party and his self definition as a Liberal. Finally, at the national level, the public has been confronted with the emergence of the Alliance Party. Overall, it can be said that this study does support Cotgrove's claims. The environmentalists do tend to be located in the public sector and they do seem to stand apart in terms of their political orientation.

8.4 The effects of "cognitive variables" on environmental concern

Beyond political affiliation and occupational classification, Cotgrove argued that the identification of environmentalists as a fraction of the middle class was fundamentally associated with their ideological orientation. The basic features of this orientation were a rejection of the ideology of market capitalism and attitudes demonstrating a commitment to post-material and non-economic goals. The effects of such "cognitive variables" on environmental concern was examined by Cotgrove through a multiple regression analysis of the public's scores on his three environmental concern sub-scales using age, politics, income, market/non-market occupational classification, attitudes towards post material values, anti-industrial society, economic individualism, and science and technology as independent variables. Cotgrove found that a number of variables (politics, income, age, anti-economic values and anti-industrial beliefs) had a substantial effect on variation in environmental concern (see Table 20)¹⁵.

Awareness of environmental damage was substantially affected by politics, income, anti-economic values, and to a lesser degree by age and holding anti-industrial beliefs. Support for environmental shortages on the other hand was not affected by politics. It was moderately linked to anti-economic values and anti-science beliefs and was only very weakly linked to age and income¹⁶. Concern about nature was affected in much the same way as awareness of environmental damage, but with anti-industrialism and post-materialism having greater direct effects while age, politics, income and anti-economic values had lesser effects.

¹⁵ Table 20 gives standardized regression coefficients for each of the three environmental concern sub-scales regressed against the eight predictor variables. The value of R squared gives the proportion of total variance explained (Cotgrove, 1982:133).

¹⁶ Also note that the proportion of total variance explained by the environmental shortages dimension was much less than that explained by the other two dimensions.

Table 20 Multiple Regression of Environmental Concern Sub-Scales, Public Sample (From Cotgrove 1982:134)

Independent Variable	Dependent Variable		
	Damage	Shortage	Nature
Age	0.179	0.097	0.170
Politics	-0.234	0.004	-0.193
Market	-0.077	0.032	-0.002
Income	-0.245	-0.081	-0.187
Anti-industrialism	0.175	0.079	0.211
Anti-science	0.096	0.139	0.028
Post-materialism	0.104	-0.021	0.197
Anti-economic	0.230	0.139	0.173
R squared	0.212	0.065	0.208

Cotgrove drew two main conclusions from his regression analysis. First, in addition to socio-demographic variables, cognitive variables have substantial direct effects on environmental concern. Cotgrove argued that an understanding of a person's anti-economic, post-material, anti-industrial and perhaps anti-science attitudes was the key to understanding environmental concern, and that this was the only peculiarity that the various groups, all of which were environmentally concerned, had in common. This leads on to the second, and more general conclusion which was that there was no single constituency for environmental concern.

A similar multiple regression analysis of the public's scores on environmental concern was done in this study. Using the environmental concern scale Table 21 shows the standardized partial regression coefficients for the eight independent variables, and like Cotgrove's study the value for *R square* gives the proportion of total variance explained by the independent variables acting together.¹⁷

Only three variables had a substantial effect on variation in environmental concern. Support for anti-industrialism had the greatest effect, and reveals that an anti-industrial

¹⁷ Dummy variables were created for the political preference and the public/private sector independent predictors so that these nominal-scale variables could be inserted into the regression equation.

orientation was positively related to environmental concern. The propensities to vote Green or to vote National also had moderate effects. However, these effects were in opposite directions; those who would have voted Green were inclined to be environmentally concerned, whereas those who would have voted National were moving away from concern about the environment. This is an interesting point - the propensity to vote National was the only feature with a negative coefficient and thus indicative of a non environmental concern position.

Table 21 Multiple Regression Analysis of Environmental Concern Scale, General Population Sample.

Independent variables	Standardized Partial Regression Coefficients (Dependent Variable -environmental concern factor)
Age	.014495
Politics	
Alliance	.052273
Green	.100427
Labour	.024622
National	-.145592
Don't Know	.004302
Sector (Public/Private)	.072077
Income	.013130
Anti-industrial society	.297957
Anti-science & Tech	.039431
Post-material values	.014495
R squared	0.14424

The main conclusion that can be drawn from the regression analysis is that it would be difficult to distinguish any single environmental concern group on the basis of the characteristics included in the regression. There are two reasons for this. First, the proportion of the total variance explained by this set of predictor variables was only about 14 percent and second, only three of the variables in the analysis stand out as having a notable influence. At best, these findings provide only limited support for Cotgrove's argument that an understanding of a person's anti-economic, post-material, anti-industrial society and perhaps anti-science attitudes are a key to understanding environmental concern.

8.5 Ecocentric behavior

In addition to the Cotgrove replication this investigation also included two questions which were designed to indicate the way in which the respondents practiced ecocentrically orientated behavior. Question 60 asked whether the respondents were members of any voluntary association primarily concerned with the protection of the natural environment or some aspect of it. Question 61 asked the respondents to reveal if they used the Palmerston North recycling depot. The response distribution for the various sample groups are set out in Table 22 and Table 23.

Table 22 Membership of Voluntary Association primarily concerned with the Protection of the Natural Environment

	General Population	Environ mentalists	Decision Makers	Manufacturers
Yes	12.0	87.0	37.5	15.4
No	85.1	13.0	50.0	84.6
Other	2.8		12.5	
Total	100%	100%	100%	100%
N=	281	25	16	13

Table 23 Use of Palmerston North Recycling Depot.

	General Population	Environ mentalists	Decision Makers	Manufacturers
Yes	62.4	83.3	62.5	46.2
No	36.2	16.7	37.5	53.8
Total	100%	100%	100%	100%
N=	282	24	16	13

Although earlier findings indicate that concern for the environment is prominent across all the sample groups Table 22 reveals that only 12 percent of the general population and 15 percent of manufacturers are members of environmental groups. It is

interesting to note that the percentage of manufacturers in environmental organizations is slightly higher than that of the general population. The 37.5 percent of the decision makers who were members of environmentalist organizations might suggest a stronger commitment by this group to the ecocentric orientation revealed by their attitude domain.

Table 23 reveals that except for the manufacturers the majority of people in the groups investigated by this study use the the Palmerston North recycling depot. Over 62 percent of the general population, 62.5 percent of the decision makers and 83.3 percent of the environmentalists use the depot. Once again this might suggest behavior consistent with ecocentric beliefs. In contrast to this only 46.2 percent of the manufacturers use the recycling depot. This is still a reasonably high percentage and may suggest an ecocentric orientation, but it also consistent with the manufacturers behaving in line with a technocentric perspective.

Although a positive response to question 60 (Table 22) may indicate an orientation towards environmentalism it may not indicate an ecocentric orientation. There are many environmental groups which generally adhere to the dominant technocentric perspective and which do not acknowledge or seek to confront the underlying cause(s) of many environmental problems. This can also be said about question 61 (Table 23). A positive response to question 61 may indicate environmental concern, but it may not measure an ecocentric attitude. Use of the recycling centre could indicate an acceptance of the "technological fix" perspective inherent within the technocentric view. In fact, it may be that recycling is a form of technocentric environmentalism. Furthermore, question 61 did not ask the respondents how often they used the depot or how much material they delivered to the centre for recycling.

8.6 Cotgrove replication summary

In summary, environmental concern seems to be prominent within all the groups examined by this investigation. This chapter has also revealed that the pattern of variation between the different groups appears to be similar to those reported in Cotgrove's investigation. However, it must be noted that the magnitude of the differences between the groups in New Zealand is less. Therefore, although the manufacturers and the environmentalists appear to hold divergent views which seem to fit into respective technocentric and ecocentric camps, it would appear that in the New Zealand context there is more uniformity with respect to ideas about the environment. One could speculate, given the findings from the measure of the nature and structure of ecocentric and

technocentric attitudes in line with Criterial Referent Theory, that this uniformity suggests that in each of the groups investigated most members had an ecocentric attitude system.

In this chapter environmentalists appear to be predominantly middle class, tend to be located in the public sector, and seem to stand apart in terms of their political orientation. These points seem to support Cotgrove's argument that it may be possible to describe these people as a distinct fraction of the middle class (or even a new emerging middle class). In addition, environmentalists seem to be slightly younger, have a slightly higher level of income and have a higher level of education than the general population. Finally this chapter found only limited support for Cotgrove's argument that a person's position in relation to the cognitive variables such as anti-economic, post-material, anti-industrialism and perhaps anti-science attitudes was a key to understanding environmental concern.

Chapter Nine

Conclusion

9.1 The nature and structure of the ideological domain

This thesis argues that the way in which the environment and environmental problems are perceived can vary according to alternative value and belief systems that operate within any society. In modern Western industrialized societies, like New Zealand, it is assumed that the most influential environmental belief systems are the technocentric and ecocentric perspectives. It was also argued that our shared social psychological attitudes are the belief systems that have the most direct impact on our thoughts, perceptions and behaviors. Because of this argument, the main goals of the investigation were to explore the structure of those attitudes, and where feasible to shed some light on the social bases of those beliefs and values in New Zealand.

In order to achieve this objective this investigation employed Kerlinger's (1984) Criterial Referent Theory. This "theory" explains the structure of social attitudes in the factor analytic tradition and attempts to establish a descriptive outline of the structure and nature of attitudes towards specific social objects. The theory makes no presuppositions about the structure of attitudes and thus opens up the possibility for investigators to uncover the degree to which such beliefs are related to one another, such as when they are closely correlated, orthogonally independent or bipolarized. Attitudes are treated as a variable domain of shared ideas that can be influenced by shared ideologies as well as by changing social conditions and relations. In terms of the ecocentric/technocentric argument attitudes towards the environment could be conceived as a domain that draws upon both ecocentric and technocentric ideologies rather than as an area of dispute between polar opposites. It was believed that an application of Kerlinger's Criterial Referent Theory would allow for a more "realistic" understanding of the variability and structure of different sets of environmental attitudes.

The operationalization of this investigation involved the development and distribution of a self administered questionnaire. This particular methodology was chosen because a questionnaire was essential to the scale measurement of Kerlinger's Criterial Referent

Theory, and because this investigation incorporated a partial replication of Cotgrove's (1982) British survey on environmental opinions.

In the survey conducted for this thesis four sample groups were targeted. A general population sample plus three sub-groups: environmentalists, decision makers and manufacturers. All groups were sent the same questionnaire. Of the 559 questionnaires sent out to the general population 52% were returned. The sub-groups all had excellent response rates, although the size of the sub-group samples were relatively small, with 13 manufacturers, 25 environmentalists and 18 decision makers.

It would appear from the responses of the general population that ecocentrism and technocentrism do operate as distinguishable and independent belief systems within our society. However, it could not be said that for the general population there is an organized structure of social beliefs which could be described as a completely ecocentric or technocentric attitude. Rather, the environmental attitude is best described as a domain that is dualistic and draws from both ideologies. Rather than being bipolar, the three strongest dimensions of the general public's attitude domain operated relatively independently of each other, while a fourth dimension incorporated items presumed to be ideologically opposed.

The strongest dimension, accounting for most of the variation, was a concern focused on environmental degradation. Two of the other dimensions that made up the domain, however, were technocentric dimensions; an industrial strength dimension and a dimension that incorporated support for economic growth and control of the environment. The fourth dimension was a compromise factor. That is, it was primarily ecocentric, but was made up of both technocentric and ecocentric items, possibly indicative of an attempt to combine the best of both worlds. The general population showed a clear ecocentric bias. Most of the response variation was explained by the ecocentric dimensions; that is, by the environmental concern and the green compromise positions.

The attitudes of the environmentalists, decision makers and manufacturers showed a surprisingly similar ecocentric bias but also revealed characteristic differences. For example, in the environmentalist's attitude domain only one out of the six dimensions was technocentric while the majority of the factors were mostly made up of ecocentric items. Unlike the general population, the dimensions were not separate in the sense that each dimension was made up of only one type of referent. In five out of the six dimensions there were one or two items that were technocentric. The only other technocentric items included were negatively loaded and therefore consistent with the ecocentric character. The third factor, on the other hand, was completely technocentric

with one negatively loaded ecocentric item. Finally, the environmentalist's attitude domain involved notions that were oppositional to one or the other belief system. This suggests that for the environmentalist's not only were ecocentrism and technocentrism not operating conceptually as completely autonomous or dualistic systems but they were operating in a partly antagonistic or bipolar relationship. Therefore, it is not only possible for aspects of technocentrism and ecocentrism to operate together as elements of a unified belief system, but also in a way that is complimentary.

The observed tendency to bipolarity by the environmentalists is much stronger amongst the decision makers. Their responses were uniformly positive towards ecocentrism and negative to technocentrism. This pattern is one that fits totally within the bounds of the ecocentric camp. It indicates that technocentrism and ecocentrism were ideologically distinguishable networks that operated not as independent influences but as antagonistic contributors to the decision maker's environmental attitude.

Such an oppositional stance would seem to challenge the positivity principle set out by Kerlinger (1984). According to Kerlinger people generally share positive perceptions to attitude referents. This, he argued, contributes to the formation of orthogonal attitude systems. However, as Kerlinger recognized, two points incorporated within the positivity principle are important here. First, positive perceptions are generally shared amongst large groups of people and second, negative reactions do occur in times when the issue is controversial and important. Both of these factors could explain the emergence of negative responses in the environmentalist's and the decision maker's attitude domains. Note that the sample size of both groups were relatively small and that environmental concern and the arguments surrounding it are probably important reference points for the environmentalists and decision makers. In comparison to the general population, the environmentalists and the decision makers are more likely to be aware of any ideological contradictions and are more likely to hold a controversial or partisan position.

The manufacturers produced an attitude domain that was structurally similar to the other two sub groups. As with the environmentalists the dimensions were made up of both technocentric and ecocentric referents. Surprisingly there was considerably more opposition to technocentric variables than anticipated. Like that of the environmentalist's, their attitude domain was ecocentric but incorporated a minor technocentric orientation as well.

For the general population and the decision makers it would appear that technocentrism and ecocentrism do operate at an ideological level, although, they operate

differently for each group. For the general population they have a dualistic relationship while for the decision makers they stand as polar opposites. The most important point is that all of the groups showed an ecocentrically biased attitude domain. Most of the response variation was explained by ecocentric referents and to a lesser extent by negatively loaded technocentric referents. Furthermore, for three of the four groups the strongest dimension was environmental concern comprised of similar items but with different weightings.

The ecocentric bias of the manufacturers attitude domain was an unexpected finding. Although it was thought that the manufacturers would have an attitude domain that was generally technocentric, it would appear that the manufacturers were no exception to recent global trends. As indicated by studies such as the United Nations Environment Programme's environmental attitude survey (UNEP:1988), the New Zealand Study of Values (Gold and Webster,1990:42-44) and the work of Dunlap and Scarce (1991) a large majority of many populations are now concerned about the environment.

The question of whether ecological perspectives are becoming more mainstream has already been partially answered, since each of the above sample groups had an ecocentrically orientated attitude domain. However, the findings in Chapter 7 provide further elaboration with regard to this question. It was found that the environmental attitude domain of the general population was a fairly universal phenomenon, emerging in most sections of the sample. Only a few demographic variables were capable of differentiating between the various dimensions of the attitude domain, and the explanatory power of those variables that did differentiate was minimal. However, although the ecocentric orientation appears to be nearly universal in cutting across all sections of the general population, its political dominance is yet to be established.

9.2 The perception of environmental concerns

How do the nature and structure of these environmental attitude domains affect the perception of environmental concerns? If environmental concerns are regarded as problems that are subjectively constructed by these alternative ecocentric and technocentric belief systems, then it would be reasonable to argue that ecocentric orientations must be having the most influence, however, the nature and structure of each attitude domain was somewhat different, therefore the perceptions of particular problems must also be different. For example, the environmental concern dimension for the general population would indicate that degradation and pollution were the priority

problems whereas for the decision makers greater weight was be given to the problem of maintaining natural systems and constraining industrial and business practices.

The ownership of the problem must also effect the perception of environmental concerns. It would be fair to say that within our technocentric society the general population would have a marginal influence on decisions related to the perception of environmental problems. In a society where the institutional structures and patterns have been shaped by technocentric criteria, the political processes of management and decision making will be heavily influenced by authoritative experts who have compatible commitments. Amongst the sub-groups studied here, the decision makers might be seen as having the greatest influence on the way environmental problems are officially perceived.

The perception of environmental concerns must also be analyzed in a structural context, as this constrains the influence of the various belief systems. At one level the structural influence operates as institutionalized technocentrism - the way technocentric practices are actioned through organizational policies and procedures. That is, people who hold ecocentric views may behave in a manner which is in line with the technocentric perspective because the organizations in which they operate expect it. For example, a decision maker may have ecocentric ideals, but when it comes to the formation of policy it may be that for the organization in which that person works establishing jobs in the community has a higher priority than ecocentric concerns. Therefore, that person could be constrained to consider employment before considering issues such as factory run-off or the carbon dioxide emissions of industrial output.

This can also be understood in relation to the notion that ecocentrism and technocentrism can exist as a duality (i.e. in an orthogonal relationship). This dualism must be considered in relation to the structural context in which environmental attitudes are applied. If people direct attitudes towards things with various degrees of intensity (or criteriality), and if people are generally ambivalent about many of the attitudes they hold until a specific issue becomes criterially referent, then because much of the motivational context of society has been technocentricly defined and structured, those institutionalized practices will be actioned. Thus people may behave in a technocentric fashion because of the institutional structures which incorporate them and not because technocentric referents are criterial for them.

Nonetheless the attitude domains revealed by this investigation should not be ignored. Our scales measured the degree of acceptance of the attitude objects, so as to reveal the general structure of the relationship between the technocentric and ecocentric

perspectives. This led to the finding that the attitude domains were ecocentrically orientated in spite of the presence of technocentric referents. It could be argued therefore that ecocentric views are gaining prominence and that this is currently influencing the relations amongst the various groups and their environmental concerns. The question remains of how enduring are these attitude structures, even though they may be shared by large numbers of people at a given time. As noted above, belief systems can change when they are subject to variation according to the criteriality of the referents in question. That is, in a different context people can draw upon different values and beliefs to suit the various situations confronting them. Events may force people to reconsider their ecocentric priorities and less important technocentric beliefs in situations where industrial growth is needed to save jobs and homes. People may redefine the situations in terms of the criterial referents that meet the needs of the new situation.

This exploration has enabled us to see that for the various groups investigated, their attitudes towards the environment are in a general sense, ecocentric in orientation. There is a general concern about environmental conditions, and associated with this acceptance there is opposition to or less regard for many features of the technocentric perspective. This abstracted empirical look at the two perspectives would suggest that ideologically ecocentric views are gaining acceptance. It would also suggest that if people were not constrained by the technocentric structures which characterize contemporary society then behavior could change to be more in line with the ecocentric belief system. However, attitudes towards the environment are subject to the context of technocentric society and therefore, in order to get a realistic picture of how the ecocentric perspective is having an effect in a behavioral sense, it is important to measure concern for the environment relative to concern over other problems.

This study has provided an important stepping stone for further research. It suggests that ecocentric ideology is probably having a larger effect than technocentrism on the perception of problems in our society. It has also revealed the nature and structure of these attitude domains. The next step would be to investigate the extent to which this is reflected in behavior associated with specific issues. In other words, it is important to investigate the relationship between environmental problems and environmental attitudes. As Lowe and Wolfgang (1986:518) state:

"The relation between environmental problems and environmental attitudes is, in our view, one of the major research topics which has not been adequately addressed. What is needed, instead of large-scale, mass opinion surveys, are detailed studies of local responses (or non-responses) to specific problems, in order to elucidate the determinants of concern and action."

To discuss the resolution of environmental problems on a grand scale the above arguments lead to a dialogue which often can be reduced to a structure/agency debate. To rely on a change in values and attitudes towards the environment to solve our problems could be a big mistake. Although environmental attitudes may change, people will still be confronted with the technocentric structures in which they have to survive. In other words many people may continue to chase technocentric goals first because they are seen to be not only important but practical for survival in a technocentric society. This thesis has also taken the position that structures and institutions are a reflection of ideas. Ultimately, a change in attitudes or values could have an effect, especially if the change in attitudes and values is born from the realization that there are certain conditions within the environment that are objective environmental problems. The dilemma is that the environmental problems are compounded by time.

9.3 Some comparative issues

The second part of this investigation involved a partial replication of Cotgrove's (1982) British survey and addressed the perception of environmental concern, alternative beliefs and values, the idea of a new middle class and the effects of "cognitive variables" on environmental concern. Unlike the previous section this part of the study measured attitudes towards environmental concerns in line with the conventional approach to attitude measurement. That is, attitudes were seen to be torn between two opposite perspectives.¹⁸ This view incorporates the idea that the variation between these two perspectives could explain the difference in meaning and significance that certain environmental issues have for various groups.

With regard to the perception of environmental concern Cotgrove (1982:15) drew three conclusions. First, he argued that there was a fairly widespread recognition of the threats to the environment, particularly the threats to nature. Second, he concluded that there were noticeable differences between the groups selected in relation to environmental concern and argued that the industrialists had consistently lower scores on all the environmental concern sub-scales. Third, the perception of environmental dangers for conservationists and environmentalists were similar, except for concern over shortages where the conservationists responses were closer to those of the public and trade union officials.

¹⁸ This implies that there can only be one ideological/attitude domain. A domain that is spread along a continuum between polar opposites. Kerlinger's criterial referent theory on the other hand allows for alternative attitude domains to occur.

This study produced results that were similar to those found by Cotgrove. However, there was also an important difference. There were more manufacturers (expected to have a strong technocentric orientation) who had a high rather than a low level of environmental concern. This fits with the results produced by our investigation into attitude domains. We revealed that for the general population, the environmentalists, and the manufacturers the strongest dimensions were concern for the environment. This additional evidence supports the trend revealed by other studies, where a large majority of the population is today concerned about the environment.

Dunlap and Scarce (1991:654) outline several likely reasons to help explain why this trend has been occurring. First, in the U.S there has been a backlash against government environmental policies. Second, new environmental problems have continued to emerge leading to increased concern about environmental protection. Third, there has been the "discovery" of critical problems such as global warming and ozone depletion and also the continuous occurrence of specific disasters such as the Exxon Valdez oil spill and the contamination of water supplies. Fourth, the mass media has placed more attention on environmental problems and thus more people are more likely to be informed about environmental issues. Finally, they argue that the celebration of the twentieth Earth Day probably gave environmental concern a "boost".

Cotgrove investigated alternative values and beliefs in order to obtain a deeper understanding of, and an idea of the support for, the technocentric and ecocentric perspectives. Cotgrove found that on the post-material values scale the environmentalists came out as more "post-materialist" with high levels of support for non-material goals. On the other hand, industrialists emerged as strong "materialists", revealing support for goals such as maintaining a stable economy. Industrialists also indicated strong support for economic individualism. Alternatively, the environmentalists placed more emphasis on satisfying work, participation in decision making, and on a society in which the supremacy of the market is subjected to the public interest. With regard to attitudes toward some of the central features of industrial society Cotgrove (1982) found that the environmentalists stood out as having a high anti-industrial society score. Finally, in relation to attitudes towards science and technology, Cotgrove (1982) found that the views of the industrialists and environmentalists differed considerably.

In replicating Cotgrove's survey this study found that the environmentalists, who represented an ecocentric position, were strongly post-materialist while the manufacturers, who were meant to be representative of a technocentric position, were strongly materialist. The replication also found that, with regards to attitudes towards

some of the central features of industrial society, environmentalists had a high anti-industrial score and the manufacturers tended to have a medium to low anti-industrial orientation. It was found that post-materialism and anti-industrialism do appear to characterize the ecocentric perspective, while the technocentric position is characterized by material values and a pro-industrial position. However, if this is compared to the factor profile of the manufacturers attitude domain, as outlined in Chapter 6, there are noticeable differences. Generally speaking the factor profile revealed that the manufacturers had an ecocentric bias and expressed opposition to technocentrism. In the four strongest dimensions of their attitude system most of the referents which were indicative of materialist and pro-industrial positions had low weightings, negative loadings or did not feature.

In relation to attitudes towards science and technology this investigation found, like Cotgrove that there was a difference between the views of the environmentalists and manufacturers. However, our replication found that (aside from the manufacturers) these views seemed to merge towards a more medium orientation. This consolidation may suggest that science today is not as likely to be seen as the handmaid of industry. A scientific discipline like ecology for example, has often been used to critique the industrial process.

The investigation into the issue of class by this study revealed that not only were environmentalists predominantly middle class but, as Cotgrove (1982) found, environmentalists were also more likely to be employed in the public sector and to stand apart in terms of their political orientation. These findings tentatively support Cotgrove's argument that environmentalists may possibly be described as a distinct fraction of the middle class. This in turn supports the idea that the struggle between technocentrism and ecocentrism can be perceived in relation to the concepts of class and hegemony.

Our study found that environmentalists were slightly younger, had a slightly higher level of income and had a higher level of education than the general population. This is in line with the findings produced by Van Liere and Dunlap (1980 cited in Lowe and Rudig 1986:514). After examining 21 American studies they found that in addition to those people who were politically liberal it was those who were younger and well-educated that were more likely to be concerned about the environment.

In addition to socio-demographic variables Cotgrove argued that "cognitive variables" had a substantial effect on environmental concern. To investigate this claim Cotgrove examined the effect of several demographic variables and several cognitive variables on environmental concern in a multiple regression analysis. This investigation's

replication, however, found that only two political variables and support for anti-industrialism had substantial effects. Thus, there was only limited support for Cotgrove's claim that an understanding of a person's alternative beliefs and values was a key to understanding their environmental concern.

To conclude, this study has examined the extent to which the technocentric and ecocentric ideologies might occur within our society. In doing so it has provided some understanding of the nature and structure of environmental attitudes. It can be said that technocentrism and ecocentrism do operate as belief networks and are drawn upon to formulate views towards the environment and environmental problems. However, this descriptive outline only provides a basis for further research. Questions such as the extent to which ecocentric and technocentric belief systems influence the decisions made by the bureaucrats who are concerned with addressing environmental problems, require detailed studies of local responses to specific problems. The research has to be placed in context to take into account factors such as structural influences, the unequal power that different groups have in influencing the "reality" of a problem and the critical choices made by people in those situations.

9.4 Suggestions for future research

One idea for further research is to study the fit between attitudes and behavior in relation to particular issues. It may be important to investigate the relationship between environmental attitudes and a particular environmental problem. For example, to investigate the way people perceive and address river pollution, created by domestic and industrial run-off, a researcher could participate in and observe the processes that different groups go through in addressing that type of problem. Such interactive research may allow for an empathic understanding of the situational factors that influence the way such problems are perceived and handled.

A second idea for research is to investigate how people think others perceive the environment and environmental problems. For example, it might be worthwhile to ask environmentalists how they believe manufacturers think about such issues and vice versa. Such research could assist in clearing up any misunderstandings between these groups when environmental problems become areas of dispute.

There is also room to do more in depth research on the sub-groups investigated by this thesis. For example consider the manufacturers. There are many different types of

manufacturers and it can be assumed that they are able to produce a variety of perceptions depending on their particular situations. It may be appropriate to compare say, large scale manufacturers to small manufacturers, or to compare white ware manufacturers to other types of producers such as farmers.

Other research could be focused at a structural level. For example, research could be done to investigate issues such as whether decision makers are able to put into place structures that allow problems to be solved from an ecocentric perspective, or how decision makers behave in relation to existing structures, such as the Resource Management Act, when confronted with specific issues?

These suggestions do not exhaust the possibilities, but they do provide some idea of the various directions that research on environmentalism and environmental issues can take. Such issues, I believe, are of primary interest to sociology. As Newby (1991:6) states:

"A consideration of the environment, and particularly of the concept of sustainable development, raises precisely the same kind of fundamental questions about the organization of society that faced the early founders of the discipline when they encountered the rise of industrialism, capitalism and liberal democracy."

Appendix A

Survey Questionnaire

Here are a number of statements about present or possible environmental dangers, problems or changes. What are your opinions?

Please indicate your response to each statement by selecting a number from one of the response categories provided. Write the number in the space supplied to the left of each statement.

1	2	3	4	5	6	7
<i>Agree very strongly</i>	<i>Agree strongly</i>	<i>Agree</i>	<i>Undecided</i>	<i>Disagree</i>	<i>Disagree strongly</i>	<i>Disagree very strongly</i>

- 1 ____ Pollution is rising to a dangerous level.
- 2 ____ Population levels are growing to beyond what the world can support.
- 3 ____ Some animals and plants are being threatened with extinction.
- 4 ____ There are likely to be serious and disruptive shortages of essential raw materials if things go on as they are.
- 5 ____ There is growing damage to the environment through the excessive use of chemical herbicides and pesticides.
- 6 ____ Global weather patterns are being upset.
- 7 ____ Our countryside is becoming more and more spoilt.
- 8 ____ The structure of the soil is being threatened by agricultural practices.
- 9 ____ There is a real danger that we will be unable to sustain our present rate of consumption of natural resources.
- 10 ____ There is too much destruction of natural habitats.
- 11 ____ Rivers and water ways are seriously threatened by pollution.

Below are a number of statements about the kind of society we live in. What are your opinions?

1	2	3	4	5	6	7
<i>Agree very strongly</i>	<i>Agree strongly</i>	<i>Agree</i>	<i>Undecided</i>	<i>Disagree</i>	<i>Disagree strongly</i>	<i>Disagree very strongly</i>

- 12 ____ Industrial societies are "good" societies in that they provide a high level of well-being for most people who live in them.
- 13 ____ There are forces at work in modern societies which stimulate a lot of artificial wants for things that we do not really need.
- 14 ____ Vigorous industrial output is the mark of a healthy society.
- 15 ____ We attach too much importance to economic measures of the level of well-being in our society.
- 16 ____ The business community works for the good of the nation.
- 17 ____ The market is the best way to supply people with the things that they want.
- 18 ____ Our present way of life is much too wasteful of resources.
- 19 ____ On balance, the advantages of cities outweigh their disadvantages.
- 20 ____ Too many issues are now decided by experts without sufficient consultation with those affected.
- 21 ____ A future environmental catastrophe can only be avoided by making radical changes in the values and institutions of industrial societies.
- 22 ____ Sound management decisions should always be based on scientific expertise.

Here are a number of statements about science and technology. What are your opinions ?

1	2	3	4	5	6	7
<i>Agree very strongly</i>	<i>Agree strongly</i>	<i>Agree</i>	<i>Undecided</i>	<i>Disagree</i>	<i>Disagree strongly</i>	<i>Disagree very strongly</i>

- 23 ___ Science and technology provide humanity with its best hope for the future.
 24 ___ The bad effects of technology outweigh its advantages.
 25 ___ Science and technology can solve all problems by finding new sources of energy and materials, and ways of increasing food production.
 26 ___ We are in danger of letting technology run away with us.

Below is a possible list of aims for New Zealand over the next ten years. What are your opinions?

1	2	3	4	5	6	7
<i>Agree very strongly</i>	<i>Agree strongly</i>	<i>Agree</i>	<i>Undecided</i>	<i>Disagree</i>	<i>Disagree strongly</i>	<i>Disagree very strongly</i>

- 27 ___ Maintaining a high rate of economic growth.
 28 ___ Progressing toward a less impersonal, more humane society.
 29 ___ Progressing towards a society where ideas are more important than money.
 30 ___ Maintaining a stable economy.

It appears that quite often people have to make a choice when confronting environmental issues. What are your opinions about each of the following statements?

Please indicate your response to each statement by selecting a number from one of the response categories provided. Write the number in the space supplied to the left of each statement.

1	2	3	4	5	6	7
<i>Agree very strongly</i>	<i>Agree strongly</i>	<i>Agree</i>	<i>Undecided</i>	<i>Disagree</i>	<i>Disagree strongly</i>	<i>Disagree very strongly</i>

- 31 ___ Industries that are unable to eliminate environmental pollution must be abandoned.
 32 ___ The cost of protecting the environment must not out weigh the benefits gained from economic growth
 33 ___ The possible benefits to the New Zealand economy make mining of the Coromandel region worthwhile
 34 ___ Allowing nuclear powered warships to visit New Zealand would be of benefit to this country.
 35 ___ New Zealand's "Green" image must be protected to earn overseas income from tourism and trade.

People have various views towards the environment. What do you think about each of the ideas below?

1	2	3	4	5	6	7
<i>Agree very strongly</i>	<i>Agree strongly</i>	<i>Agree</i>	<i>Undecided</i>	<i>Disagree</i>	<i>Disagree strongly</i>	<i>Disagree very strongly</i>

- 36 ___ An essential element of all human-societies is the need to dominate nature.
 37 ___ Unlike all other creatures people stand outside of and apart from nature.
 38 ___ Nature must be respected for its own sake beyond its usefulness to people.
 39 ___ All forms of life, including people, are connected in the web of life.

One's spiritual perspective may influence how one thinks about the environment. What do you think about each of the statements below?

1	2	3	4	5	6	7
<i>Agree very strongly</i>	<i>Agree strongly</i>	<i>Agree</i>	<i>Undecided</i>	<i>Disagree</i>	<i>Disagree strongly</i>	<i>Disagree very strongly</i>

- 40 ___ Humanity has been given dominion over nature.
 41 ___ Because the environment contains the essence of the human spirit it must be protected.
 42 ___ Humanity has been charged with the responsible care and protection of the earth's resources.
 43 ___ It was intended that we use all of nature's assets to satisfy our needs.

Now I would like some basic background information about yourself.
 Please answer each or the following questions.

- 44 You are? (Tick appropriate category) Male []
Female []

- 45 How old are you? (Enter number of completed years) _____
 Years

- 46 Which one of the following categories best describes your ancestry or ethnic identification? (Tick appropriate category)

Pakeha/European or of European descent []
 New Zealand Maori []
 Other []

If other please specify _____

47 What is your highest level of education? (Tick appropriate category)

- No secondary school education []
- Some secondary school education []
- School certificate []
- Form 6 or 7 []
- Higher school certificate []
- Technical or trade certificate []
- Teachers college/Polytechnic []
- University level []
- Other []

If other please specify _____

48 Which political party would you vote for if there was an election tomorrow? (Tick appropriate category)

- Alliance []
- Democrat []
- Green []
- Labour []
- Liberal []
- National []
- New Labour []
- Social Credit []
- Other []
- Don't know []

If other please specify _____

49 In guiding your life, would you say your religious beliefs were:
(Tick appropriate category)

- Very important, []
- Important, []
- Not Very important, []
- Not important at all? []
- Don't know/not applicable []

50 Which one of the following categories best describes you in terms of paid employment? (Tick appropriate category)

- Not in paid employment [] (Go to question 51)
- Employed part-time, under 35 hours per week [] (Go to question 55)
- Self employed [] (Go to question 52)
- Employed full-time, 35 hours per week or more [] (Go to question 55)

51 Which one of the following categories, if any, best describes you?

- Retired/pensioner ☐
Student ☐
Non-worker ☐
Homemaker ☐
Unemployed ☐
None of these describe me ☐

(Go to question 59)

52 Do you own your own business, company or farm?

- Yes ☐ (Go to question 53)
No ☐ (Go to question 55)

53 Do you have paid employees?

- Yes ☐ (Go to question 54)
No ☐ (Go to question 57)

54 Enter number of employees?

(Go to question 57)

55 If you work for wages or a salary, do you manage or supervise other people at work?

- Yes ☐ (Go to question 56)
No ☐ (Go to question 57)

56 Number of people supervised or managed?

57 Describe your occupation or main work activity.

58 In which sector do you work?

Private (Private Companies and Businesses) []
Public (Local or Central Govnt or Govnt funded Institutions) []

59 Considering all sources, what will be your annual income? If the household is a family type home please report the joint income for the husband and wife or partners. If the household is a solo parent or flatting arrangement, please report only your income.

Nil or loss []
\$20,000-or less per year []
\$20,001-30,000 per year []
\$30,001-40,000 per year []
\$40,001-50,000 per year []
\$50,001-60,000 per year []
\$60,001-70,000 per year []
\$70,001-80,000 per year []
\$80,001-90,000 per year []
\$90,000 or more per year []

60 Are you currently a member of a voluntary association (Club, Society, etc) that is primarily concerned with protection of the natural environment or some aspect of the environment?

Yes []
No []
Other []

(Yes or other please specify) _____

61 Do you make use of the Recycling Centre in Palmerston North?

Yes []
No []
Don't know/not sure []

**PLEASE COULD YOU RETURN THE QUESTIONNAIRE IN THE
ENCLOSED ENVELOPE AS SOON AS POSSIBLE**

THANKYOU FOR YOUR ASSISTANCE

Appendix B

Covering letters for questionnaire

General population sample

TO THE RESIDENT

Over recent years public concern and media attention to environmental issues has grown enormously. In this survey we are asking you for information which will help produce a better understanding of how people think and feel about the environment. This survey will go some way towards enabling us to answer such questions as:

- What attitudes towards the environment are commonly shared?
- Do environmental attitudes simply reflect specific interests?

The research is being performed by the under signed, post-graduate student from the **Department of Sociology at Massey University**, and is being supervised by three senior members of staff: Mr Paul Green, Dr Paul Perry and Dr Andrew Trlin. If you want more information please contact the supervisors by calling 3569099.

You were selected randomly to participate in this project, and the success of our survey depends on your co-operation. However, your participation is completely voluntary. Please help us by taking fifteen to twenty minutes of your time to complete the questionnaire and to seal it in the self addressed, stamped envelope provided. Please return the survey by mailing the return envelope to us.

The data being collected will be **strictly confidential**. Information from your questionnaire will be combined with the data from other responses and only aggregate results will be used in the final analysis. Once individual questionnaires have been received and processed they will be destroyed.

Information about the investigations findings will be made available at a public meeting to be held after the completion of the research.

Thank you, in advance, for your help.

Yours Faithfully

Dennis Morgan

**PLEASE RETURN AS
SOON AS POSSIBLE.**

Environmentalists

TO

Over recent years public concern and media attention to environmental issues has grown enormously. In this survey we are asking you for information which will help produce a better understanding of how people think and feel about the environment. This survey will go some way towards enabling us to answer such questions as:

- What attitudes towards the environment are commonly shared?
- Do environmental attitudes simply reflect specific interests?

The research is being performed by the under signed, post-graduate student from the **Department of Sociology at Massey University**, and is being supervised by three senior members of staff: Mr Paul Green, Dr Paul Perry and Dr Andrew Trlin. If you want more information please contact the supervisors by calling **3569099**.

You were selected for this survey as a member of an environmental group. Such groups often have a special relationship to environmental issues. Therefore your views are of special interest. The success of our survey depends on your co-operation. However, your participation is completely voluntary. Please help us by taking fifteen to twenty minutes of your time to complete the questionnaire and to seal it in the self addressed, stamped envelope provided. Please return the survey by mailing the return envelope to us.

The data being collected will be **strictly confidential**. Information from your questionnaire will be combined with the data from other responses and only aggregate results will be used in the final analysis. Once individual questionnaires have been received and processed they will be destroyed.

Information about the investigations findings will be made available at a public meeting to be held after the completion of the research.

Thank you, in advance, for your help.

Yours Faithfully

Dennis Morgan

**PLEASE RETURN AS
SOON AS POSSIBLE**

Manufacturers

TO

Over recent years public concern and media attention to environmental issues has grown enormously. In this survey we are asking you for information which will help produce a better understanding of how people think and feel about the environment. This survey will go some way towards enabling us to answer such questions as:

- What attitudes towards the environment are commonly shared?
- Do environmental attitudes simply reflect specific interests?

The research is being performed by the under signed, post-graduate student from the **Department of Sociology at Massey University**, and is being supervised by three senior members of staff: Mr Paul Green, Dr Paul Perry and Dr Andrew Trlin. If you want more information please contact the supervisors by calling 3569099.

You were selected for this survey as a member of the Wellington Manufacturers' Association. The interest in this group arises from the understanding that Manufacturers' may have specific views towards the environment. Therefore, your opinions as a member of this group are of special interest. The success of our survey depends on your co-operation. However, your participation is completely voluntary. Please help us by taking fifteen to twenty minutes of your time to complete the questionnaire and to seal it in the self addressed, stamped envelope provided. Please return the survey by mailing the return envelope to us.

The data being collected will be **strictly confidential**. Information from your questionnaire will be combined with the data from other responses and only aggregate results will be used in the final analysis. Once individual questionnaires have been received and processed they will be destroyed.

Information about the investigations findings will be made available at a public meeting to be held after the completion of the research.

Thank you, in advance, for your help.

Yours Faithfully

Dennis Morgan

**PLEASE RETURN AS
SOON AS POSSIBLE**

Decision makers

TO

Over recent years public concern and media attention to environmental issues has grown enormously. In this survey we are asking you for information which will help produce a better understanding of how people think and feel about the environment. This survey will go some way towards enabling us to answer such questions as:

- What attitudes towards the environment are commonly shared?
- Do environmental attitudes simply reflect specific interests?

The research is being performed by the under signed, post-graduate student from the **Department of Sociology at Massey University**, and is being supervised by three senior members of staff: Mr Paul Green, Dr Paul Perry and Dr Andrew Trlin. If you want more information please contact the supervisors by calling **3569099**.

You were selected for this survey as a professional who's occupation requires you to make expert decisions about the legal requirements and technical problems of environmental management and control. Therefore, your opinions as a member of this group are of special interest. The success of our survey depends on your co-operation. However, your participation is completely voluntary. Please help us by taking fifteen to twenty minutes of your time to complete the questionnaire and to seal it in the self addressed, stamped envelope provided. Please return the survey by mailing the return envelope to us.

The data being collected will be **strictly confidential**. Information from your questionnaire will be combined with the data from other responses and only aggregate results will be used in the final analysis. Once individual questionnaires have been received and processed they will be destroyed.

Information about the investigations findings will be made available at a public meeting to be held after the completion of the research.

Thank you, in advance, for your help.

Yours Faithfully

Dennis Morgan

**PLEASE RETURN AS
SOON AS POSSIBLE**

Appendix C

Follow up letter

19-2-92

DEAR RESIDENT

Between February 3 and February 7 this year a questionnaire investigating how people think and feel about the environment was mailed out to you. This letter is just a polite reminder for you to complete the questionnaire and to return it in the self addressed stamped envelope as soon as possible. Although many people have already responded to this survey it would be even more effective with your participation. Your help would be greatly appreciated. Thank you.

The research is being performed as a post-graduate study with the **Department of Sociology at Massey University**, and is being supervised by three senior members of staff: Mr Paul Green, Dr Paul Perry and Dr Andrew Trlin. If you want more information or another questionnaire please contact the supervisors by calling 3569099, or by calling me. 3584065. Thank you.

Yours Faithfully

Dennis Morgan

Appendix D

Technocentric / Ecocentric Items

Technocentric Items

Item Lable	Question Number	Item (Referent)
Adcities	19	On balance, the advantages of cities outweigh their disadvantages.
Apart	37	Unlike all other creatures people stand outside of and apart from nature.
Business	16	The business community works for the good of the nation.
Costbene	32	The cost of protecting the environment must not out weigh the benefits gained from economic growth.
Dominate	36	An essential element of all human societies is the need to dominate nature.
Domover	40	Humanity has been given dominion over nature.
Ecogrow	27	Maintaining a high rate of economic growth.
IOhealth	14	Vigorous industrial output is the mark of a healthy society.
Isocgood	12	Industrial societies are "good" societies in that they provide a high level of well-being for most people who live in them.
Manage	22	Sound management decisions should always be based on scientific expertise.
Market	17	The market is the best way to supply people with the things that they want.
Mining	33	The possible benefits to the New Zealand economy make mining of the Coromandel region worthwhile.
Nuclear	34	Allowing nuclear powered warships to visit New Zealand would be of benefit to this country.
Scitech	23	Science and technology provide humanity with its best hope for the future.
Stabeco	30	Maintaining a stable economy.
Techsolve	25	Science and technology can solve all problems by finding new sources of energy and materials, and ways of increasing food production.
Useall	43	It was intended that we use all of nature's assets to satisfy our needs.

Ecocentric Items

Item Lable	Question Number	Item (Referent)
Abandon	31	Industries that are unable to eliminate environmental pollution must be abandoned.
Artwants	13	There are forces at work in modern societies which stimulate a lot of artificial wants for things that we do not really need.
Badtech	24	The bad effects of technology outweigh its advantages.
Consump	9	There is a real danger that we will be unable to sustain our present rate of consumption of natural resources.
Country	7	Our countryside is becoming more and more spoilt.
Emeasure	15	We attach too much importance to economic measures of the level of well-being in our society.
Experts	20	Too many issues are now decided by experts without sufficient consultation with those affected.
Herbpest	5	There is growing damage to the environment through the excessive use of chemical herbicides and pesticides.
Humane	28	Progressing toward a less impersonal, more humane society.
Ideas	29	Progressing towards a society where ideas are more important than money.
Image	35	New Zealand's "Green" image must be protected to earn overseas income from tourism and trade.
Nathab	10	There is too much destruction of natural habitats.
Ownsake	38	Nature must be respected for its own sake beyond its usefulness to people.
PAextinc	3	Some animals and plants are being threatened with extinction.
Polrise	1	Pollution is rising to a dangerous level.
Popgrow	2	Population levels are growing to beyond what the world can support.
Radical	21	A future environmental catastrophe can only be avoided by making radical changes in the values and institutions of industrial societies.
Rescare	42	Humanity has been charged with the responsible care and protection of the earth's resources.
RMshort	4	There are likely to be serious and disruptive shortages of essential raw materials if things go on as they are.
Soildam	8	The structure of the soil is being threatened by agricultural practices.

Spirit	41	Because the environment contains the essence of the human spirit it must be protected.
Technun	26	We are in danger of letting technology run away with us.
Toowaste	18	Our present way of life is much too wasteful of resources.
Waterpol	11	Rivers and water ways are seriously threatened by pollution.
Weather	6	Global weather patterns are being up set.
Weblife	39	All forms of life, including people, are connected in the web of life.

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