

***A suggested paradigm for environmental  
accounting in New Zealand***

*Brendon John Orr*

The purpose of this Working Paper series is to stimulate discussion and comment.  
This work may be cited as: Orr, B.J. *A Suggested Paradigm for Environmental Accounting in New Zealand*. The Open Polytechnic of New Zealand, Working Paper, July 2000.

Comments on this paper and requests for further copies should be addressed to

Jane Clendon  
Coordinator, Working Papers Advisory Panel  
The Open Polytechnic of New Zealand  
Private Bag 31 914  
Lower Hutt  
Email: WorkingPapers@Mail.topnz.ac.nz

This paper is also available on The Open Polytechnic of New Zealand website:  
<http://www.topnz.ac.nz/>

Printed and published by The Open Polytechnic of New Zealand, Lower Hutt.

Copyright © 2000 The Open Polytechnic of New Zealand.

All rights reserved. No part of this work may be reproduced in any form by any means without the written permission of the CE of The Open Polytechnic.

ISSN — 1174-4103

ISBN — 0-909009-26-0

Working Paper No: 4/00

Manuscript submitted for publication in July 2000.

A list of Working Papers published by The Open Polytechnic is enclosed with this document.

## *Abstract*

---

In this paper the author examines important aspects of environmentalism and suggests a paradigm for environmental accounting in New Zealand. There are different aspects of environmentalism that can be considered, and the author explores some of these aspects. The author argues that the suggested paradigm provides a basis for assessing any attempted accounting and also promotes consideration of environmental aspects that a traditional accounting approach might not include. The paradigm is an attempt to include, and also go beyond, the interpretation of the environment in a physical and limited sense.

# *Contents*

---

<b>Introduction</b>	<b>1</b>
<b>A suggested environmental accounting paradigm</b>	<b>2</b>
Background	2
Sustainable development	4
The global commons	6
The precautionary principle	7
Eco-efficiency	8
Environmental ethics	9
New Zealand environmental legislation	11
Stakeholder opinion	13
<b>Accounting for the environment and the paradigm</b>	<b>15</b>
Problems of implementation	15
How to account for the environment	16
Practitioner efforts to account for the environment	16
<b>Conclusion</b>	<b>18</b>
<b>References</b>	<b>19</b>

# ***A Suggested Paradigm for Environmental Accounting in New Zealand***

## ***Introduction***

---

This paper aims to raise awareness of the environmental aspects of business activity and their potential linkages to accounting. It identifies a range of environmental concepts and suggests accounting connections. It does not provide a blueprint for a particular form of environmental accounting, rather, it presents suggestions for the inclusion of a range of environmental issues into business accounting practices in order for businesses to assess the extent of their own practices in this area. This paper suggests that accounting needs to consider identifying environmental issues beyond those of the immediate business impacts such as air emissions or water pollution. The wider environmental aspects discussed in this paper include the concepts of sustainable development and global commons, the precautionary principle, the concept of eco-efficiency, environmental ethics, New Zealand environmental legislation, and stakeholder opinion. These concepts provide a global perspective that forms a suggested environmental accounting paradigm.

Generally, a paradigm is a central way of regarding phenomena. The paradigm may dictate what type of explanation will be found acceptable. Present-day usage of the word *paradigm* is often vague and ambiguous. For the purposes of this paper, *paradigm* is used as an overall way of naming a perspective that arises when more global environmental concepts are considered in relation to accounting. This perspective can provide businesses with a viewpoint against which they can assess the degree to which environmental considerations are or could be incorporated into their accounting principles and practices.

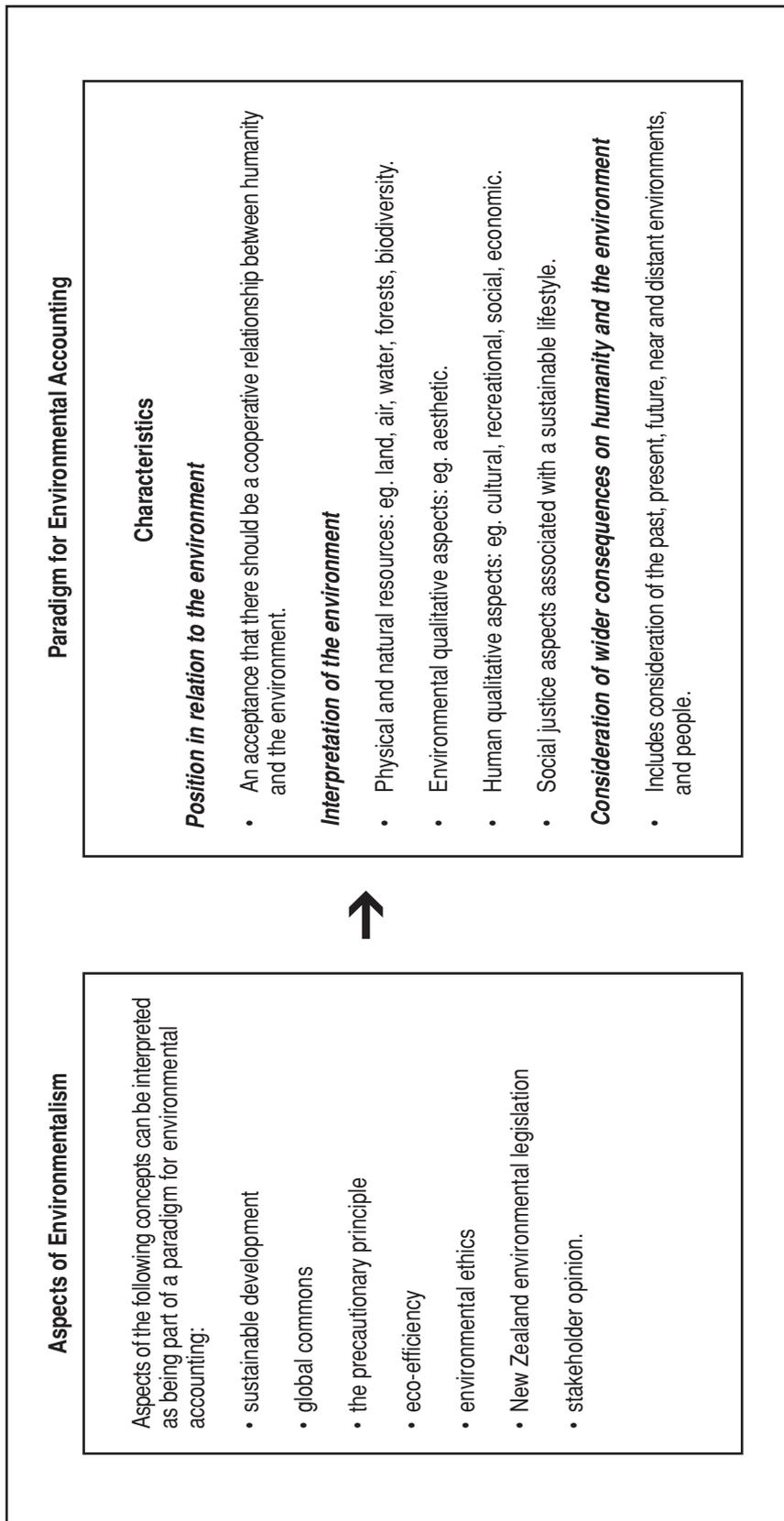
# *A suggested environmental accounting paradigm*

---

## ***Background***

Pepper (1993) notes that there is no clear-cut definition of environmentalism but that it broadly consists of ideas and practices that seek to address environmental concerns. There is support for environmentalism from the environmental movement, which has been described as 'both predatory and transforming' (O'Riordan & Jordan, 1995, p. 191). This description is reflective of the many ways that environmentalism is affecting different aspects in our lives.

Environmentatism is seen to have a strong influence on legislation. In New Zealand, there are 93 pieces of environmental legislation (Taylor et al., 1997). Corporate reporting has also been affected by environmentalism. Some company management now accept that the views of different types of stakeholders have importance in areas such as the environment (Deloitte Touche Tohmatsu International, 1993; Moore, 1994; Association of Certified Chartered Accountants, 1997). This paper explores aspects of environmentalism that may form one perspective for assessing environmental accounting efforts. See Fig. 1.



**Fig. 1** *Aspects of environmentalism and characteristics of an environmental accounting paradigm*

Proponents of social accounting and reporting (Gray et al., 1996) provide various examples of possible forms that might apply to environmental accounting. The paradigm set out in Fig. 1 should be interpreted via the corporate social accounting approach that has less stress on economic interests of an enterprise (Jones, 1995).

The paradigm described in Fig. 1 focuses on the

- relationship between humanity and the environment
- meaning of 'environment'
- interpretation placed on the consequences of human activity on the environment.

The three parts of the paradigm can be used as broad categories against which to assess attempts at environmental accounting and to generate further questions. The characteristics of the paradigm are discussed below.

### ***Sustainable development***

Sustainable development is a controversial concept that emerged during the 1980s. It promotes a reconciliation of tension between the environment and economy in a local and planetary sense (Conca et al., 1995). This resulted from an examination of our planet's critical and social problems by the United Nations (Wahl and Shrudu, 1994). The Brundtland Report 1987 is most commonly quoted as the origin of the concept of sustainable development and set the benchmark for all future discussions on sustainable development. Sustainable development is defined in that report as 'development that meets the needs of the present without compromising the ability of future generations to meet their needs' (cited in Mannion & Bowlby, 1992, p.24). Discussion of sustainable development centres around

- balanced economic growth that protects the environment
- the needs of present and future generations
- social justice associated with a sustainable lifestyle.

(Dixon and Fallon, 1989; Soussan, 1992; Ramphal, 1994; Conca et al., 1995; O'Riordan, 1995).

*Balanced economic growth that protects the environment:* This feature of sustainable development emphasises the wise use of physical and natural resources on planetary and local levels (Conca et al., 1995; Reid, 1995; Prugh, 1995). There is, however, a more important position behind sustainable development. It is the recognition that economic growth and environmental protection are inextricably linked (Schmidheiny, 1992). The link is sometimes described as a quality of economic growth (Soussan, 1992) as distinct from emphasising the maximising of wealth. Some critics, however, see the concept of sustainable development as surrounded by weak rhetoric that results in confused meanings and allows the traditional view of maximised growth to prosper (Redclift, 1991; Lele, 1991). Other commentators see that sustainable development has begun to displace the unqualified maximization of economic growth as the preferred aim of economic policy (Ramphal, 1994).

Consideration of sustainable development would result in emphasising accounting as a cooperative approach between human activity and the environment. This would not be consistent with the individual economic approach of more traditional accounting interpretations.

*The needs of present and future generations:* This emphasis expands on the joint human-environment approach of sustainable development. It is not just economic consequences on the present but also economic effects on future humans and on future environments (and accounting for them). Some business writers measure the future in terms of seven generations out (Rubenstein, 1994).

*Social justice associated with a sustainable lifestyle:* This aspect of sustainable development was originally inspired by issues such as the elimination of poverty, providing employment, and generally providing opportunities for a quality of life at a certain level (Soussan, 1992). This is still the case, although the interpretation of a quality of life has spread into many social movements and taken different forms (O’Riordan and Jordan, 1995). Sustainable development emphasises the need for quality social justice values.

New Zealand governments to date continue to not accept the concept of sustainable development but instead promote the term *sustainable management*. This is because of sustainable development’s relationship with social justice. New Zealand’s previous National Government argued that social justice should be pursued elsewhere (Taylor et al., 1997). Yet sustainable development has continuing importance, according to some influential overseas entities. Deloitte Touche Tohmatsu International (1993) issued an analysis dedicated to business acceptance of the concept of sustainable development, to be included in reporting. In July 1998, the Society of Management Accountants of Canada

published an exposure draft entitled 'Writing and Evaluating Sustainable Development and Environmental Reports' (*International News*, 1998). These reports link sustainable development to environmental reporting.

Sustainable development can contribute to a basis for environmental accounting by providing an accounting focus on

- promotion of a cooperative relationship between human activity and the environment
- the wise use of physical and natural resources
- social justice associated with a sustainable lifestyle
- consideration of the wider consequences of human activity (for example, future generations, distant places).

### ***The global commons***

This concept has both a physical and a social organisational perspective. On a physical level, it is interpreted as natural resources that we think should belong to the entire human race. 'The global commons includes the earth's atmosphere, its oceans, frozen poles, forests, and the entire genetic reserve' (Goodwin, 1991, p.323). The basic premise is that humankind did not make these structures but inherited them. O'Riordan (1995) goes beyond the description of the global commons as an amalgam of collectively owned resources. He sees it as a communal form of existence between the people of the Earth and the Earth that supports them. All depend on each other.

The New Zealand Government has endorsed a number of international agreements that reflect the global commons perspective, for example, the convention on climate change and the convention on biodiversity (Taylor et al., 1997). Other examples of issues that would reflect the global commons concept are global warming, ozone depletion, and overfishing. Efforts to curb some of these problems have become a part of some company reporting (for example, The New Zealand Refining Co., 1996).

The global commons concept can be interpreted and incorporated as part of a paradigm for environmental accounting as in Fig.1. This emphasises the importance of the greater human and ecological population. Our well-being (both practical and qualitative) can be determined by the consequences of economic activity on the global commons. Accounting for the impact of this is a

challenge.

The concept of global commons provides further important meaning for our understanding of the effects of economic activity on physical and natural resources and society. These effects are not confined to a limited geographical area. Therefore, economic activity on physical and natural resources and the extent of its consequences on the global commons, including distant communities who are a part of the global commons, need to be considered. The global commons concept contributes to the characteristics of a paradigm for environmental accounting by recognising

- that there should be a cooperative relationship between humanity and the environment
- the importance of physical and natural resources as a part of the environment
- the wider consequences of economic activity (for example, on distant places and people).

### ***The precautionary principle***

The use of this principle advocates a cautious approach to possible future consequences of human activity and may be translated into the characteristics of the environmental accounting paradigm in Fig. 1. This principle was introduced in 1992 at the United Nations Conference on Environment and Development in Rio De Janeiro:

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

(United Nations Conference on Environment and Development, cited in Ministry for External Relations and Trade, and Ministry for the Environment, 1992, p.5).

Perrings (1991) describes the precautionary principle as involving the commitment of today's resources in such a way as to safeguard against distant and potentially catastrophic outcomes in the future. Another interpretation is that the essence of the precautionary principle is one of risk avoidance and proactive response. This would be the case where there is reasonable uncertainty over a proposed action that might result in environmental damage or social deprivation (O'Riordan and Jordan, 1995). The precautionary principle

has no official standing in New Zealand. There was a judgment, however, in a New Zealand court case, that held that the precautionary principle would not be disregarded if evidence could be produced to support it (*McIntyre v Christchurch City Council A15/96*, Hassan and Sargisson, 1996).

The precautionary principle can be translated into the paradigm in Fig. 1. The concern with possible outcomes could be translated as awareness of possible consequences for future humans and environments. This should not be confined to local neighbourhoods but should also take account of environments worldwide. Such possible consequences could affect the well-being of individuals and communities. If the principle is interpreted as a requirement for risk averse and proactive behaviour towards the environment, then accountants can contribute towards risk assessment programmes. The precautionary principle contributes to the characteristics of an environmental accounting paradigm through

- acceptance of the need for a cooperative relationship between humanity and the environment
- consideration of wider economic consequences on humanity and the environment (for example, effects on the environment and communities of people in near and distant places).

### ***Eco-efficiency***

The traditional understanding of efficiency is that it is increased when desired outputs increase relative to required inputs. People will be served best by being allowed to maximise their outputs from limited inputs of resources (Wenz, 1988). Eco-efficiency is interpreted in a similar manner to that of the traditional concept of efficiency, except that conservation of the physical environment is factored into the formula (Fayers, 1998). In general, eco-efficiency promotes careful conserving of physical and natural resources for future use. It prevents or minimises pollution or wastage and its consequences for the surrounding environment and people (Association of Certified Chartered Accountants, 1997).

Outcomes of eco-efficiency could take different forms that, with the aid of accounting, can be included in company reports. Such forms could be, for example, the use of a new fuel that has less pollution output, or the promotion of environmental management systems to enable wastage prevention or pollution reduction. Interpretation of eco-efficiency contributes to the characteristics of an environmental accounting paradigm through

- acceptance of the need for a cooperative relationship between humanity and the environment
- the importance of wise use of physical and natural resources
- consideration of wider consequences of economic activity, both physically and qualitatively.

## ***Environmental ethics***

Features of environmental ethics can be seen in the paradigm in Fig. 1. Gunn and Walker (1993) note that the term *environmental ethics* is relatively recent. Some comments on its purpose are:

Environmental ethics is a specialized study that focuses on moral questions generated by human interactions with the natural world.

(Drengson, 1989, p.7).

Environmental ethics in the *primary*, naturalistic sense is reached only when humans ask questions not merely of prudential use but of appropriate respect and duty.

(Rolston, 1988, p.1)

These definitions indicate the sort of morality that can be influential behind various aspects of environmentalism, including those discussed in this paper. Environmental ethics provide added insight into the importance of the environment. There are two features of environmental ethics that provide some background understanding to the characteristics of the paradigm in Fig. 1. These features are an emphasis on non-anthropocentrism and on intrinsic values.

Desjardins (1993) notes that the Western philosophical tradition has denied that any direct moral relationship exists between humans and the natural environment. This is the anthropocentric position. He describes how the recognition of environmental values in environmental ethics is a radical shift from anthropocentric to non-anthropocentric theories of value. An important part of this shift is the emphasis on intrinsic values by many proponents of environmental ethics (Norton, 1987; Rolston, 1988; Katz & Oechsli, 1993; Westra, 1994; Sylvan and Bennett, 1994;). The paradigm in Fig. 1 allows for the qualitative side of well-being in different forms. This is found in the non-anthropocentric and intrinsic value positions.

*Non-anthropocentric position:* The emphasis of environmental ethics on this position has highlighted the vexing question as to whether humans act only out of self-interest or can act selflessly. The emphasis of environmental ethics on different kinds of environmental qualitative values allows further understanding of this important question. Some of these environmental qualitative values have been identified as aesthetic, cultural, recreational, historical, symbolic, and religious (Rolston, 1988; Fox, 1990). The paradigm in Fig. 1 allows for the qualitative side of well-being in different forms. As an example of an expression in qualitative values, company management might decide to beautify a landscape that has been affected by company activity. This could be for self-interested or selfless reasons. This would be an example of an expression of aesthetic values to which accounting could contribute, even if it is just to identify expenditure associated with such a project.

Some companies promote such qualitative environmental policies. For example, a reader of the 1996 company report of Santos Ltd. (Santos Ltd., 1996) would learn that management have provided, for their staff, environmental education programmes based on environmental qualitative values. These values include beautifying of landscapes, and concern for aboriginal cultural issues as a part of the environment. It might be argued that such reporting is for self-interested anthropocentric reasons. This might be the case, and it also could be an example of 'weak anthropocentrism' (Norton, 1987, p.12) that includes a wide range of environmental values. Other examples of this reporting are evident in the annual reports of Boral Ltd. (Boral Ltd., 1996), CDL Investments Ltd. (CDL Investments Ltd., 1996), and The New Zealand Refining Co. Ltd. (The New Zealand Refining Co. Ltd., 1996). Whatever the reasons, these reports provide evidence that some managers have expressed a need to engage in this qualitative expression of environmental behaviour.

*Intrinsic values:* 'An object has intrinsic value when it is valued for itself and not simply valued for its uses' (Desjardins, 1993, p. 144). This concept of intrinsic value causes some difficulty for philosophies with more anthropocentric interpretations, such as Utilitarianism, which finds favour with accountants (Galhoffer and Haslam, 1995). Western philosophical tradition has more potential for an anthropocentric bias than the intrinsic value view that has a kinship with phenomenological philosophies (Polk, 1994). These philosophies encourage acceptance of phenomena because of what they are in themselves, and not necessarily for their usefulness (Hare, 1989). Consequently, ascribing an intrinsic value to phenomena may be philosophically difficult for some accountants in New Zealand to incorporate into their accounting practices. Others will prefer certain environmental values regardless of any intrinsic or anthropocentric label that may or may not be placed on any feature of the

environment. This should not necessarily prevent any aspect of the environment being included in company reports.

Non-anthropocentric and intrinsic value interpretations within environmental ethics provide background understanding to the aspects of the paradigm in Fig. 1. In the above discussion, however, the author identifies two aspects:

1. an acceptance that there should be a cooperative relationship between human activity and the environment
2. the importance of environmental qualitative values.

### ***New Zealand environmental legislation***

New Zealand does not yet have any environmental reporting legislation. However, much legislation does contain environmental content that covers many aspects of the environment in terms of it being a physical, natural resource, and having a qualitative value (Taylor et al., 1997). Physical and natural resources span a range of land, air, and water resources. Qualitative values in the legislation are included in such matters as preservation of heritage sites and unique species. There are two pieces of legislation, however, that are very relevant to the paradigm in Fig. 1: the Environment Act (1986) and the Resource Management Act (1991). Important aspects in these Acts that contribute to the paradigm include

- the meaning of 'environment'
- Māori values
- future generations
- past, present, and future consequences on the environment.

*The meaning of the environment:* The Environment Act (1986) defines 'environment' as including

- (a) Ecosystems and their constituent parts (including people and communities); and
- (b) All natural and physical resources; and
- (c) Those physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes; and
- (d) The social, economic, aesthetic, and cultural conditions which affect the matters stated in paragraphs (a) to (c) of this definition or which are affected by those matters.

(Environment Act, section 2).

The Resource Management Act (1991) uses a similar definition, except that paragraph (c) is replaced by the words 'amenity values'. An analysis of the New Zealand legal position in terms of the characteristics of the paradigm focuses on the following aspects of the meaning of 'environment'

- the physical, natural environment and people
- human qualitative values (for example, social, recreational, economic, cultural)
- environmental qualitative values, such as aesthetic values.

The legal position provides a legal basis for a relationship between human activity and the environment and for the importance of human and environmental qualitative values. These features can be translated into the paradigm. The environment can be a part of the characteristics in Fig. 1 in both a physical and human community sense.

*The importance of Māori values:* The Resource Management Act (1991) promotes the importance of human qualitative values (which are allowed for in the paradigm) and focuses particularly on Māori culture. This includes respect for Māori traditions relating to ancestral lands, water, sacred sites, and taonga (treasures).

*Future generations:* In the Resource Management Act (1991), the reasonably foreseeable needs of future generations have importance and are a part of the paradigm.

*Past, present, and future consequences on the environment:* The paradigm, like the Resource Management Act (1991), also promotes the importance of considering past, present, and future consequences of human activity on the environment.

Interpretations of the New Zealand legal position in the paradigm contribute to the features of environmental accounting by focusing on

- an acceptance that there should be a cooperative relationship between human activity and the environment
- the importance of physical and natural resources as a part of the environment
- the importance of human qualitative values (for example recreation, social, economic, cultural) as a part of the environment
- the importance of environmental qualitative values (for example, aesthetic values)
- consideration of wider consequences of human activity (future generations, past, present, and future effects).

### ***Stakeholder opinion***

The stakeholder concept promotes wider audiences for company reports (Nasi, 1994). Stakeholders can include such diverse groups as investors, activists, the media, community groups, regulators, and the general community. According to Moore (1994), this diversification of stakeholders would have a wide range of concerns and would expect information in company reports to match these concerns.

In a number of analyses, there is application of the stakeholder approach to environmental reporting (Deloitte Touche Tohmatsu International, 1993; Moore, 1994; Association of Certified Chartered Accountants, 1997; Adams, et al., 1999) These analyses identify a range of stakeholders with varying interests in environmental issues. The reports include such matters as information relating to the global commons concept, sustainable development, legislation, physical and qualitative properties of the environment (Moore, 1994).

Interpretations from the literature of stakeholder opinion that contribute to features of an environmental accounting paradigm include

- an acceptance that there should be a cooperative relationship between human activity and the environment
- the importance of physical and natural resources as a part of the environment
- the importance of human and environmental qualitative values
- consideration of wider consequences.

# *Accounting for the environment and the paradigm*

---

## ***Problems of implementation***

While this paper focuses primarily on raising awareness and promoting discussion, it recognises that there are both real and potential problems associated with the implementation of the paradigm. Firstly, there has been little enthusiasm for environmental accounting from accountants worldwide and in New Zealand (Coombes and Davey, 1996; Bebbington, et al., 1994). There is also some evidence that unless environmental accounting is compulsory, then low interest would bring minimal disclosure (Deegan, et al., 1995). However, the accounting profession is generally reluctant to recommend any substantive interventionist regulation that would increase disclosure (Gallhofer and Haslam, 1997). Accounting researchers provide other evidence of factors that might beset the implementation of the paradigm. Some examples are

- The chances of accountants taking part in voluntary disclosure in New Zealand would only be enhanced if the company had an official environmental policy (Goodwin and Goodwin, 1996).
- The extent of environmental accounting of a company in New Zealand seems to be dependent on whether the company is a subsidiary of an overseas company (Coombes and Davey, 1996).
- Size and industry are significant factors associated with environmental and social disclosure in New Zealand (Hackston and Milne, 1996).
- An experiment on environmental accounting in New Zealand has shown that, in the last analysis, a company management can be more concerned with economic health than environmental health (Bebbington and Tan, 1997).
- The environmental accounting of companies in New Zealand is traditional accounting interpreted around waste, energy use, and legal requirements and is therefore limited (Coombes and Davey, 1996).

## ***How to account for the environment***

Apart from limiting factors, there is also the consideration of how to account and report on environmental issues referred to in the paradigm. There is already a range of suggestions as to how to do this. Some examples include the use of quantitative measures (particularly ratios); measurement pertinent to the enterprise and measurement of present and future financial effects; making use of statements made by experts; estimates when precise measurement is not possible; and new accounting standards that could apply at a national and international level (Adams, 1992; Ing, 1992; Moore, 1993; Owen, 1994; Carey, 1992.; Buck, 1992; Gray, 1994).

Ways of reporting on environmental issues include tables, input-output statements, graphs, statistics, measurement, pie charts, environmental indicators, use of pictures, and narrative. Narrative is an important way of providing further explanation for the content of environmental reports.

These different ways of reporting can be applied to the three characteristics of the paradigm for environmental accounting. A company's position in relation to the environment can be expressed in a company policy statement. The nature of that statement should essentially advise readers how the company executive understands the meaning of environment and to what extent they see themselves responsible for the consequences of their actions. Measurement in different guises (such as graphs or indicators) can be used to explain company policy. Narrative and pictures can be further used to illustrate the effects of company environmental policy.

## ***Practitioner efforts to account for the environment***

Practitioners are encouraged to contribute environmental initiatives to the development of management information systems (Owen, 1992; Phillips, 1992; Coopers and Lybrand, 1994; Parker, 1996). In New Zealand, the Institute of Chartered Accountants (ICANZ) provides guidelines to accountants from the International Audit Practice's Committee (ICANZ, 1998). While this advice is voluntary, it promotes the philosophy that environmental matters are only accounted for if they have financial effects on a company. This is in contradistinction to the philosophy of the paradigm, which promotes the philosophy that environmental effects of company activity are accounted for, regardless of their financial effects on the company.

Despite the difficulties identified earlier, the European Union report on environmental accounting and reporting published in October 1999 (International News, 1999) takes a stakeholder approach to environmental accounting and reporting. A basic philosophy of this report is that environmental issues should exist alongside financial issues, and that financial issues alone should not determine what is reported. The report has twenty recommendations that cover such matters as the inclusion of an environmental policy in company reports, environmental indicators, environmental targets and objectives, and quantification of information where possible. The European Union report does not specifically refer to social justice, which is allowed for in the paradigm, but in allowing a company to define what it means by environmental expenditure it is possible for a company to include social justice in some form.

## *Conclusion*

---

The paradigm has the potential to assist in assessing accounting for environmental issues. It comprises aspects of environmentalism with a set of threefold characteristics. The type of environmental accounting that might result from applying this paradigm depends on the

- type of relationship that is perceived between human activity and the environment
- meaning attributed to the definition of the environment
- extent of interpretation placed on consequences of human activity on the environment.

Further questions about company activity and the environment can be interpreted from the outline of characteristics in Fig. 1. For example, such questions could relate to company management exporting pollution to a distant country; it could be in relation to some rarity of nature that might be harmed by company activity or it could be a question of social justice relating to use of cheap foreign labour. How such questions might be answered and accounted for ultimately depends on the importance that accountants give to the characteristics of the paradigm.

The theoretical structure of the paradigm has potential for different managerial commitments. Some examples cited in this paper indicate managerial commitment that is prepared to include economic effects on the aesthetic or special human groupings within the community.

Roth and Keller (1997) argue that there are two types of corporate commitment — ‘light green’ and ‘dark green’. The latter is more committed. Dion (1998) has also analysed varying extents of commitment among corporate environmental policies. Such varying commitments can be interpreted in different ways, such as a tension between anthropocentric and non-anthropocentric views. They can also be interpreted as different managerial understandings of ‘well-being’. Such managerial choices are some indication of the paradigm’s applicability and potential for environmental accounting.

## References

---

- Adams, R. (1992). Why is the environmental debate of interest to accountants and accountancy bodies? In D. Owen, (Ed.). *Green reporting: Accountancy and the challenge of the nineties*. London: Chapman & Hall.
- Adams, R., Houldin, M., & Slomp, S. (1999). A FEE approach to environmental accounting. *Accounting & Business*. May, 20–22.
- Association of Chartered Certified Accountants. (1997). *Guide to environment and energy reporting and accounting 1997*. London: Association of Chartered Certified Accountants.
- Bebbington, J., Gray, R., Thomson, T., & Walters, D. (1994). Accountants' attitudes and environmentally-sensitive accounting. *Accounting and Business Research*, 2(4), 109–120.
- Bebbington, J., & Tan, J. (1997). Accounting for sustainability. *Chartered Accountants Journal of New Zealand*. Feb. 38–41.
- Boral Ltd. (1996). *Boral 1996 annual report*. Sydney, Australia: Boral Ltd.
- Buck, J. (1992). Green awareness and the accounting function. In Owen, D. (ed.). *Green Reporting: Accountancy and the challenge of the nineties*. London: Chapman & Hall.
- Carey, A. (1992). A questioning approach to the environment. In D. Owen, (Ed.), *Green reporting: Accountancy and the challenge of the nineties*. London: Chapman & Hall.
- CDL Investments NZ Ltd. (1996). *Annual report of CDL Investments NZ Ltd*. Auckland. CDL Investments NZ Ltd.
- Conca, K., Albery, M., & Dableko, G. D. (1995). *Green planet blues*. Colorado: Westview Press.
- Coombes, R., & Davey, H. (1996). A review of accountant and corporate involvement in environmental accounting in New Zealand. *Asian Review of Accounting*, 4(2), 109–115.
- Coopers & Lybrand. (1994). *A DIY environmental review for companies*. United Kingdom: Sceptre Litho.

- Deegan, C., Geddes, S., & Staunton, J. (1995). A survey of Australian accountants' attitudes on environmental reporting. *Accounting Forum*, 2(3), 143–163.
- Deloitte Touche Tohmatsu International. (1993). *Coming clean: Corporate environmental reporting: Opening up for sustainable development*. London: Deloitte Touche Tohmatsu International.
- Desjardins, J. R. (1993). *Environmental ethics*. Belmont, California: Wadsworth Publishing Company.
- Dion, M. (1998). A typology of corporate environmental policies. *Environmental Ethics*, 20(2), 151–162.
- Dixon, J. A., & Fallon, L. A. (1989). The concept of sustainability: Origins, extensions, and usefulness for policy. In R. Krishnan., J. M. Harris., N. R. Goodwin (Eds.), *A survey of ecological economics* (pp. 93–96). Washington, DC: Island Press.
- Drengson, A. R. (1989). *Beyond environmental crisis: From technocrat to planetary person*. New York: Peter Lang.
- Environment Act 1986*. Wellington, New Zealand: GP Print.
- Fayers, C. (1998). Environmental reporting and changing corporate environmental performance. *Accounting Forum*, 22(1), 74–94.
- Fox, W. (1990). *Toward a transpersonal ecology: Developing new formulations for environmentalism*. Boston: Shambala Publications.
- Gallhofer, S. & Haslam, J. (1995). *Analysis of Bentham's chrestomathia: Or towards a critique of accounting education*. Hamilton: University of Waikato.
- Gallhofer, S., & Haslam, J. (1997). The direction of green accounting policy: Critical reflections. *Accounting Auditing & Accountability Journal*, 10(2), 144–152.
- Goodwin, N. (1991). Introduction — global commons: Site of peril, source of hope. In R. Krishnan, J. M. Harris, & N. R. Goodwin (Eds.), *A survey of ecological economics*. Washington, DC: Island Press.
- Gray, R. (1994). *Social and environmental accounting, accountability and reporting: New wine in old skins or silk purses from sow's ears*. (Working Paper No. 21). Melbourne: Royal Melbourne Institute of Technology, Department of Accountancy.

- Goodwin, D., & Goodwin, J. (1996). The voluntary disclosure of environmental information: A comparison of investor and company perceptions. *Accounting Research Journal*, 9(3), 36–40.
- Gray, R., Owen, D., & Adams, C. (1996). *Accounting and accountability*. United Kingdom: Prentice Hall.
- Gunn, A., & Walker, R. (1993). Christianity and environmental ethics. Hamilton, New Zealand: Department of Philosophy, University of Waikato.
- Hackston, D., & Milne, M. (1996). Some determinants of social and environmental disclosures in New Zealand companies. *Accounting Auditing and Accountability Journal* 9(1), 77–108.
- Hare, R. M. (1989). In J. O. Urmson and J. Ree (Eds.). *The concise encyclopedia of western philosophy and philosophers* (pp. 144–146). London: Unwin Hyman.
- Hassan, J., & Sargisson, H. (1996). *The Resource Management Act: An update*. Wellington, New Zealand: The New Zealand Law Society.
- Ing, B. (1992). Developing green reporting systems: Some practical implications. In D. Owen (Ed.), *Green reporting: Accountancy and the challenge of the nineties*. London: Chapman & Hall.
- Institute of Chartered Accountants of New Zealand. (1998). *Members' handbook*. (Vol. 4, pp. 16.431–16.453). Wellington: Institute of Chartered Accountants of New Zealand.
- International News. (1998, October). Guideline 'writing and evaluating sustainable development and environmental reports'. *Index actual news*. <wysiwyg://bottom.main.16http://home.wxs.nl/~folmolen/mjv\_n\_i\_contents.htm>
- International News. (1999, October). *EU study report published about environmental accounting and reporting*. <http://www.enviroreporting.com/news\_I\_66.htm.>
- Jones, T. C. (1995). *Accounting and the enterprise*. London: Routledge.
- Katz, E., & Oechsli, L. (1993). Moving beyond anthropocentrism: environmental ethics, development, and the Amazon. *Environmental Ethics*, 15(1), 49–48.
- Lele, S. M. (1991). Sustainable development: A critical review. In R. Krishnan., J. M. Harris., N. R. Goodwin (Eds.), *A survey of ecological economics* (pp. 83–86). Washington, DC: Island Press.

- Mannion, A. M., and Bowlby, S. R. (Eds.). (1992). *Environmental issues in the 1990s*. Chichester, New York: John Wiley & Sons.
- Ministry for External Relations and Trade, and Ministry for the Environment. (1992). *United Nations conference on environment and development: Outcomes of the conference*. Wellington, New Zealand: Ministry for External Relations and Trade, and Ministry for the Environment.
- Moore, D. J. (1993). *Environmental costs and liabilities: Accounting and financial reporting issues*. Toronto: Canadian Chartered Institute of Accountants.
- Moore, D. (1994). *Reporting on environmental performance*. Toronto: Canadian Chartered Institute of Accountants.
- Nasi, J. (1994). *Understanding stakeholder thinking*. Helsinki, Finland: LSR-Publications.
- Norton, B. G. (1987). *Why preserve natural variety?*. Princeton, New Jersey: Princeton University Press.
- New Zealand Refining Co. Ltd. (1996). *The New Zealand Refining Co. Ltd. annual report, 1996*. Whangarei, New Zealand: New Zealand Refining Co. Ltd.
- O’Riordan, T. (1995). The global environment debate. In T. O’Riordan (Ed.), *Environmental science for environmental management* (pp. 16–30). Essex, England: Longman House.
- O’Riordan, T., and Jordan, A. (1995). The precautionary principle in contemporary environmental politics. *Environmental Values*, 4(3), 191–211.
- Owen, D. (Ed.). (1992). *Green reporting: Accountancy and the challenge of the nineties*. London: Chapman & Hall.
- Owen, D. (1994). The need for environmental accounting standards. *Certified Accountant*, March, 65–69.
- Parker, L. D. (1996). Towards accounting for environmental management and performance. *Accountability and Performance*, 2(1), 44–50.
- Pepper, D. (1993). *The roots of modern environmentalism*. London: Routledge.
- Perrings, C. (1991). Reserved rationality and the precautionary principle: Technological change, time, and uncertainty in environmental decision making. In R. Krishnan., J. M. Harris., N. R. Goodwin (Eds.), *A survey of ecological economics* (pp. 158–162). Washington, DC: Island Press.

- Phillips, L. (1992). The contribution of management accounting to the environmental debate. In Owen, D. (Ed.). *Green reporting: Accountancy and the challenge of the nineties*. London: Chapman & Hall.
- Polk, D. W. (1994). Gabriel Marcel's kinship to ecosophy. *Environmental Ethics*, 16(2), 173–214.
- Prugh, T. (1995). Natural capital and human economic survival. Solomon Islands: International Society for Ecological Economics.
- Ramphal, S. (1994). Sustainable development. In R. A. Eblen and W. R. Eblen (Eds.), *The encyclopedia of the environment* (pp. 680–683). Boston, New York: Houghton Mifflin.
- Redclift, M. (1991). *Sustainable development: Exploring the contradictions*. New York: Routledge.
- Reid, D. (1995). *Sustainable development*. London: Earthscan.
- Resource Management Act. (1991). Wellington, New Zealand: GP Print.
- Rolston III, H. (1988). *Environmental ethics: Duties to and values in the natural world*. Philadelphia: Temple University Press.
- Roth, H. P., and Keller, J. R. (1997). Quality, profits, and the environment: Diverse goals or common objectives? *Management Accounting*, 79(1), 51–55.
- Rubenstein, D. (1994). *Environmental accounting for the sustainable corporation*. London: Quorum Books.
- Santos Ltd. (1996). *Santos 1996 annual report*. Adelaide, South Australia: Santos.
- Schmidheiny, S. (1992). *Changing course: A global business perspective on development and the environment*. MA: MIT Press.
- Soussan, J. G. (1992). Sustainable development. In A. M. Mannion., and S. R. Bowlby (Eds.), *Environmental issues in the 1990s* (pp. 21–37). Chichester, UK: John Wiley & Sons.
- Sylvan, R., and Bennett, D. (1994). *The greening of ethics*. Cambridge, UK: White Horse Press.
- Taylor, R., and Smith, I. (Eds.). (1997). *The state of New Zealand environment 1997*. Wellington, New Zealand: The Ministry for the Environment.

- Wahl, E. R., and Shrdlu, E. (1994). Sustainable development. In W. P. Cunningham., T. Ball., T. H. Cooper., E. Gorham., M. T. Hepworth., A. A. Marcus (Eds.), *Environmental encyclopedia*. (pp. 810–812). Detroit, Washington: Gale Research.
- Wenz, P. (1988). *Environmental justice*. New York: State University of New York.
- Westra, L. (1994). *An environmental proposal for ethics*. Maryland: Rowman & Littlefield.