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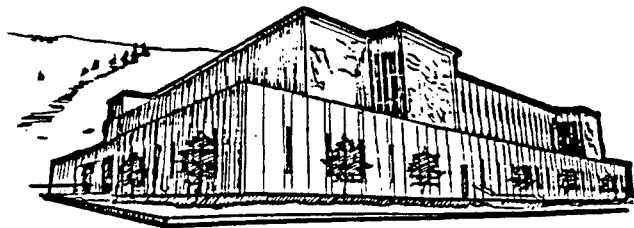
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University of  
**Montana**



ACCOUNTING FOR THE ENVIRONMENT

by

Barbara J. Yahvah

B. A. Carroll College--Helena, Montana, 1981

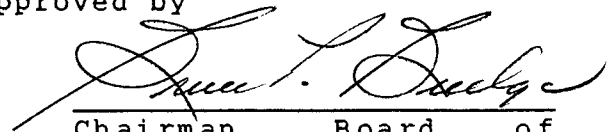
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Master of Business Administration

University of Montana

1993

Approved by



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Environmental accounting is a subject that is underdeveloped by the accounting profession in general. Representing a non-traditional view in identifying, measuring, and reporting transactions, environmental accounting offers a broader scope of aspects and users (beyond shareholder and creditor) than traditional accounting. The focus of this paper is directed toward the complexities of accounting for the environment.

The information presented has been researched in libraries, provided by professors, reviewed and categorized into chapters to describe accounting for the environment: The Coming of the Green, the when of the historical aspect; Justifications and Viewpoints, the varying opinions as to why this issue should be studied; Identification, Measurement and Valuation, the challenges facing the how to in accounting for the environment; and Future, the where do we go from here considerations.

Chapter I traces the erratic history of accounting for the environment from its past to the present, comparing the United States with Western Europe and the United Kingdom.

Chapter II presents justifications of the issue including social accountability, benefits to shareholders, social contract, and moral person view. Organizational legitimacy and sustainable development viewpoints are also applied to accounting for the environment.

Chapter III informs the reader of the complexity surrounding the aspects of identification, measurement and valuation. Level I-III Measurements, Cost-Benefit Analysis, Categories of Assets, and Valuation and Disclosure Models offer suggested approaches. An opposing viewpoint of a problem not existing at all is also presented. Finally, initiating environmental audits is regarded.

Chapter IV projects the future facing accounting for the environment. Aspects of corporate responsibility, accountability, sustainability, governmental influence, cooperation, and challenges are proposed.

Chapter V represents the author's suggestions for future research of accounting for the environment. A combination of the present reporting practices and continued market studies is considered. Recommendations include developing non-traditional techniques for identification, measurement and valuation and encouraging auditing methods to ensure reliability of the information presented.

## Preface

Picture a river, with origins in a lake high on the slopes of a mountainous plateau, which stretches out over 200 kilometers to the sea. On its journey to the sea the river undergoes several costume changes. Rock gardens create exciting and turbulent rapids. Trout poke and dart about in deep pools with beds of boulders and shingle. Long peaceful gorges unwind serenely. Large tracts of unmodified lowland forest, filled with the sounds of native birdsong, skirt the river over much of its length. Many parts of the river and its surrounding wilderness are inaccessible by road providing numerous opportunities for undiminished natural experiences. From the exhilarating and challenging excitement of canoeing the rapids to the tranquil pastime of fishing the pools or simply just enjoying the scenic splendor, the river is, for many, a scenic and recreational resource of significant value.

Alas the picture may soon no longer exist as described. An upstream hydro-electric development project threatens to divert a significant volume of water away from the river and into penstocks to generate electricity. The physical effects of this development are clear, a drop in water levels, possibly some deterioration in water quality and the consequent damage to the recreational resource; coupled with an increase in kilowatts of electricity. But how are we to choose between extra electricity and the unspoiled recreational resource?...How are we to put a value on scenic and recreational resources which are not traded in any market? How do we value a canoeing experience or the aesthetic pleasure gained from a free flowing river view?

Source: [Milne, 1990, pp.4-5]

Environmental accounting is a subject that is underdeveloped by the accounting profession in general. Representing a non-traditional view in identifying, measuring, and reporting transactions, environmental accounting offers a broader scope of issues and users (beyond shareholder and creditor) than traditional accounting. The accounting profession is faced with unconventional situations that do not conveniently "fit" into the accustomed practices.

Society's interest in the environment and business (i.e. social responsibility) has become an additional incentive for the accounting profession to research further into this subject. Indeed, some "deep green" activists believe that the environment may not wait until the accounting profession decides that the time is right; its resources will perish unless appropriate steps are performed.

Therein lies the purpose for this paper: to inform the reader of the authors' opinions on this complex issue. Beyond that simple premise, it now becomes the responsibility of the reader to utilize this information to have his/her perspectives challenged, to make better decisions, to persuade others--the prerequisites to adopting change.

The information presented has been researched in the 'archives' of libraries, provided by professors, reviewed and categorized. The results of this procedure have been the selection of four main chapters to describe accounting for the environment. These are:

- I. THE COMING OF THE GREEN, the when of the historical aspect;
- II. JUSTIFICATIONS AND VIEWPOINTS, the varying opinions as to why this issue should be studied;
- III. IDENTIFICATION, MEASUREMENT AND VALUATION, the challenges facing the how to in accounting for the environment;
- IV. FUTURE, the where do we go from here considerations.



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## Chapter I

### I. THE COMING OF THE GREEN

"In 1988, one would probably have been hardpressed to have found anyone to whom the adjective "green" meant much beyond the colour you get when yellow and blue are mixed..."

[Gray, 1990, p.7].

#### A. Introduction

The history of accounting for the environment is relatively short as compared with financial accounting. Record keeping may be traced over 6,000 years from the clay tablets of the Mesopotamians through government-centered accounting systems of the Chinese, temple and estate records of the Greeks and Romans. The present accounting practices were further influenced by the industrial revolution, the development of railways, legislative changes, the imposition of taxes, and events of the depression years [Mathews, 1993, forthcoming].

Accounting for the environment surfaced briefly during the 1900's. Stuart Chase, a noted economist (and CPA) of the 1920's was a pioneer of social accounting. The notion of stewardship was expanded from safeguarding resources to including terms of the output produced and the quality of resource utilization [Bloom, 1981].

A resurgence of interest in accounting for the

environment emerged during the 1970's and 1980's, both internationally and domestically.

#### B. International Aspects.

1. Western Europe. In general, the European accounting profession has shown little inclination towards assuming a leading role in the development of accounting for the environment, as evidenced by corporate reporting practices [Gray et al,1987]. Though in the area of environmental standards, Western Europe was surpassing other countries, it was not taking the initiative in developing accounting transactions to meet those requirements.

2. The United Kingdom. Legislation and studies in the UK have greatly influenced accounting for the environment. The Control of Pollution Act (1974) gave local authorities the right (but not the duty) to obtain and publish information about pollution emissions [Gray et al,1987].

The Corporate Report, published in 1975, was a discussion paper viewed as radical by some, which suggested additional disclosures for corporations such as the statement of corporate objectives. This statement comprised;

- a) a statement of general philosophy or policy,
- b) information concerning medium term strategic targets, as steps towards implementing

management philosophy or policy, in areas such as sales, profitability, investment, and employment together with consumer and environmental issues [Gray et al, 1987, p.48].

Gray et al [1987] analyzed 300 corporate reports and presented their findings regarding the frequency of publication of corporate social reporting information:

The picture emerging from consideration of both legislative developments and practice in relation to CSR [Corporate Social Reporting] in the UK is one of a gradual build up to what appears to have been a peak of activity and influence at the beginning of the 1980's, followed by some decline more recently [Gray et al, 1987, p.61].

By the end of 1989, however, an apparent escalation in green consciousness emerged [Gray, 1990]. Four key manifestations of a genuine change in awareness occurred;

FIRST: worldwide concern about environmental issues had been growing for over thirty years. (i.e., Limits to Growth study in 1968, the UN Conference on the Human Environment in 1972, the 1987 European Year of the Environment, the Brundtland Report of 1987.) At a more subtle level it seems that the increasing scale of environmental disasters

(i.e., Bhopal, Chernobyl, Exxon Valdez) had been slowly raising a general awareness of the scale of man's impact on the environment and the inter-related nature of environmental incursions.

SECOND: Britain was to join the single European market in 1992. The EC [European Community] in general and many of the member nations in particular had established much higher environmental standards than was the case in the UK.

THIRD: The UK government had appointed a Minister of State (Chris Patten) at the Department of the Environment (DoE) who was publicly committed to an improvement in the UK's Environmental position and who had appointed as economic advisor, Professor David Pearce, a man long committed to the cause of environmental protection and enhancement.

FOURTH: In addition to the vast increase in words expended in the media and elsewhere on all matters green, there were many substantive additions to the UK's green landscape (i.e., New Consumer, Green Magazine, Green Alliance, John Elkington's Sustainability) [Gray, 1990, pp.8,9].

The Department of the Environment commissioned David Pearce to report on environmental economics with suggestions as to the direction for the future. The UK's policy aims



included suggestions on sustainable development, raising awareness, institutional framework, climate change, tropical forests, ozone layer, waste management, energy, industrial development, transport, agriculture, the North Sea, countryside and wildlife conservation, water resources, global population, international debt and international conservation of species and their habitats as shown in Exhibits 1, 2, and 3.

---

Exhibit 1

---

**UK GOVERNMENT'S ENVIRONMENTAL POLICY AIMS**

**Sustainable Development:**

- To give practical effect to policies on sustainable development.

**Raising Awareness:**

- To continue to encourage rising levels of awareness, especially on the need for policies of sustainable development--in an informed and balanced way--throughout all sections of society, both domestically and internationally.

**Institutional Framework:**

- To take steps to ensure that environmental considerations are fully reflected in economic policy-making across the range of UK government policies as well as internationally.
- To support the urgent strengthening of the UN Environmental Programme and the on-going work of the Intergovernmental Panel on Climate Change and other environmental activities within the UN.

**Climate Change:**

- To support efforts to reduce uncertainty about the nature and consequences of climate change.
- To promote efforts to introduce effective internationally-agreed response measures to constrain climate change, in the light of emerging scientific and other data.

**Tropical Forests:**

- To support efforts to arrest the destruction of rainforests.
- To direct more UK overseas aid to encourage the wise and sustainable use of forest resources in developing countries.
- To support the Tropical Forestry Action Plan and the International Tropical Timber Organisation.
- To encourage additional forestry research.

**Ozone Layer:**

- To support efforts to phase out the production and consumption of CFCs and carbon tetrachloride by the end of the century and of halons by the year 2005, and to limit the production and consumption of methyl chloroform.

---

Exhibit 2

---

UK GOVERNMENT'S ENVIRONMENTAL POLICY AIMS (Cont'd)

**Waste Management:**

- To promote efforts by industry, commerce and individual householders to conserve valuable raw materials, reduce damage to the environment and save money, by minimising or preventing wastes, especially at source.
- To encourage UK companies to adopt an environmental strategy which by use of appropriate techniques and technology minimises waste and pollution before, during and after the manufacturing process and which encourages recycling of process or product residues and ensures safe disposal of waste.
- To encourage industrialised countries to become self-sufficient in disposing of toxic and other wastes.

**Energy:**

- To minimise the environmental impacts of energy production by:
  - \*seeking world-wide, consumer prices which reflect the full cost of energy production and use and the removal of artificial barriers (including subsidies and other distortions) to energy trade;
  - \*promoting energy efficiency, especially through the use of new technology and better energy management;
  - \*stimulating research and development of clean combustion technology and the development and use of non-fossil fuel and low-carbon energy sources, particularly renewable and nuclear energy.

**Industrial Development:**

- To stimulate enterprise and promote continuing growth consistent with the principles of sustainable development.
- To raise the level of awareness of environmental issues within business.
- To encourage firms, where appropriate, to include environmental considerations in their corporate strategy and management decision-making.
- To ensure that new environmental controls strike a fair balance between environmental benefit and economic cost, and that regulation works with the grain of market forces and good business practice.
- To promote waste minimisation and efficient disposal of waste.
- To encourage business to adopt an integrated environmental strategy for waste management, clean and low waste technology and pollution control.
- To encourage the development of technologies and techniques enabling the cost effective implementation of internationally agreed standards of environmental controls; improvements in those controls; and the development of safe substitutes for known pollutants.

---

Exhibit 3

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UK GOVERNMENT'S ENVIRONMENTAL POLICY AIMS (Cont'd)

**Transport:**

- To support international efforts to mitigate the effects of transport on the environment, particularly with regard to the reduction of vehicle emissions, especially of CO<sub>2</sub>, to mitigate pollution and the "greenhouse effect".
- To minimise adverse environmental impacts in considering the choice of basic location and detailed alignment of road schemes.

**Agriculture:**

- To seek to achieve a reasonable balance between the interests of agriculture, the economic and social interest of rural areas, the conservation of the countryside and the promotion of its enjoyment by the public.

**North Sea:**

- To cooperate with the other seven North Sea states to protect and improve the condition of the North Sea and to use it sustainably.

**Countryside and Wildlife Conservation:**

- To assist in safeguarding and enhancing the British landscape particularly in National Parks, National Scenic Areas and Areas of Outstanding Natural Beauty.
- To promote the conservation of the variety of British wildlife.

**Water Resources:**

- To secure the continuing provision of wholesome and sufficient water supplies, to protect water resources and to improve the quality of drinking water.
- To maintain and improve the quality of fresh water, estuaries and coastal bathing waters.

**Global Population:**

- Helping countries identify ways to tackle population issues;
- Encouraging the work of multilateral agencies on the links between environmental degradation and population pressure;
- Promoting open international discussion of the role of population issues in development policies.

**International Debt:**

- Support for the internationally agreed debt strategy to encourage solid commitment to adjustment policies that will bring economic growth and restore debtor countries to creditworthiness.

**International Conservation of Species and their Habitats:**

Supporting international efforts to secure the sustainable management of threatened species of fauna and flora and their habitats.

3. The United States. Accounting for the environment in the US has had a much higher profile (i.e. publicity) than in the UK. This is due in part to the US practice of directing issues and concerns towards the general public rather than towards employees, as in the UK [Gray et al, 1987].

Research and publications have been sponsored by the American Institute of Certified Public Accountants, National Association of Accountants, and the American Accounting Association dealing with social accounting issues such as environmental effects of organizational behavior, the measurement of social costs and social performance [Mathews, 1993, forthcoming; Gray et al, 1987]. The accounting firm of Ernst and Ernst surveyed the Fortune 500 industrials and presented their yearly findings (1972-1978) regarding social responsibility disclosures. Exhibit 4 shows the frequency of publication of Corporate Social Responsibility information as compared between the United States and the United Kingdom. In the U.S., disclosures on environmental (i.e., pollution) and energy (i.e., conservation) matters were widely reported.

## Exhibit 4

## FREQUENCY OF PUBLICATION OF CSR INFORMATION

	UK (1982-83)	US (1978)
A. Environment		
1. Pollution	10	133
2. Prevention or repair of environmental damage	7	15
3. Conservation of natural resources	--	39
4. Other environmental disclosures	--	46
B. Energy		
5. Conservation	16	126
6. Energy efficiency of products	10	45
7. Other energy related disclosures	2	29
C. Fair Business Practices		
8. Employment of minorities	1	52
9. Advancement of minorities	26	47
10. Employment of women	6	49
11. Advancement of women	--	142
12. Employment of other special interest groups	11	18
13. Support for minority businesses	--	18
14. Socially responsible practices abroad	15	43
15. Other statements on fair business practices	1	104
D. Human Resources		
16. Employee health and safety	46	69
17. Employee training	53	80
18. Other human resource disclosures	75	32
E. Community involvement		
19. Community activities	13	56
20. Health and related activities	5	35
21. Education and the arts	11	70
22. Other community activity disclosures	7	56
F. Products		
23. Safety	11	42
24. Reducing pollution from product use	--	22
25. Other product related disclosures	14	46
G. Other social responsibilities disclosed		
26. Other disclosures	11	56
27. Additional information	49	16

Source: [UK data-analysis of sample of 300 reports used for Financial Reporting 1983-84; Gray et al, 1987, p.60. US data-Ernst & Ernst (1978) adjusted from sample size of 500 pro rata to 300 to provide comparison with UK.]

### C. Current Trends

1. Western Europe. Roberts [1992] reviewed annual reports of Western European corporations. Generally increasing levels of disclosure were found, although the amount of information provided and specific topics covered varied considerably. The level of disclosure of Germany was generally far higher than in any other country. Roberts [1992] concludes;

However, many corporations from all over Europe are clearly aware of increasing public and governmental concerns about the environment. Many have responded by producing clearly defined environment information sections in the annual report. It is especially noteworthy that disclosures of both the level of expenditure and some quantification of the outputs achieved are becoming increasingly common [Roberts, 1992, p.165].

2. The United Kingdom. Recent surveys have been conducted regarding green reporting (Touche Ross in 1990, Institute of Business Ethics in 1990, Coopers & Lybrand Deloitte in 1990, Harte, Lewis and Owen in 1991). The surveys showed the trend towards a greater coverage of green issues while at the same time they illustrated the diversity of reporting practice. Harte and Owen [1992] conclude;

At least a few companies are beginning to tackle

green reporting issues with some degree of rigour. Within an overall trend on the part of these companies towards a greater coverage of green issues perhaps particularly noteworthy developments relate to the publication of statements of objectives, the increased use of specific narrative and some move toward introducing external reference points in reporting on social performance [Harte and Owen, 1992, pp.198-199].

3. The United States. Governmental initiatives have been launched designed to promote greater industry participation in environmental matters (i.e., the President's Environment and Conservation Challenge Awards, President's Commission on Environmental Quality) [Bowles, 1992].

However, the accounting profession has been reluctant to delve too deeply into the problems that have arisen. Environmental and resource accounting has so far been limited to the collection of data on pollution abatement expenditures [Lutz and Munasinghe, 1991] and loss contingency [Surma and Vondra, 1992]:

The most important accounting pronouncements directly addressing the recognition and measurement of environmental cleanup liabilities are Financial Accounting Standards Board Statement no.5, Accounting for Contingencies, and the limited focus



of Emerging Issues Task Force Issue no. 90-9, Capitalization of Costs to Treat Environmental Contamination. Also, FASB Interpretation no. 14, "Reasonable Estimation of the Amount of a Loss" provides guidance on recording a liability when a range of probable loss can be estimated [Surma and Vondra, 1992, p.52].

Another facet of environmental issues, that of financial statement presentation, is discussed by Zuber and Berry [1992]. The accounting treatment recommended is:

If a production process generates hazardous wastes that must eventually be remediated, a reserve should be accrued as units are produced to reflect, in current earnings, expected cleanup costs. In addition, while consumption of a productive asset is certain to occur eventually, that asset's useful life may be shortened by environmental regulations requiring replacement by more environmentally friendly equipment by a specified future date. Also, the carrying value of property held for sale might need to be reduced to reflect environmental cleanup costs required before transfer but not recoverable from the buyer [Zuber and Berry, 1992, p.45].

Though there is a shortfall in corporate environmental accounting (i.e., quality, consistency, comparability, transparency), there has been a notable increase in the number of US companies issuing environmental reports [VanBuren, 1991]. These reports feature two types of shortfalls in current corporate environmental accounting;

- 1) The first type has to do with limitations in generally accepted accounting principles, and consequent refinements to better reflect environmental aspects of a company's operations,
- 2) The second type of shortfall is with financial accounting itself, as a tool too restricted to fully portray the effect of a company's operations upon the physical environment and the categories of people affected [VanBuren, 1991, pp.5-6].

Corporate accounts provide only partial assessment of the full costs: they reflect only monetary costs and costs already accrued. They do not include costs that are not or not yet monetarily measured, or ones which have not yet accrued [VanBuren, 1991].

#### D. Summary

The history of accounting for the environment is more recent than that of traditional accounting. Discussion on the topic emerged, only to be submerged during the 1920's, 1970's, and the 1980's.

Current trends of accounting for the environment include an increase in disclosures in annual reports (due in part to public sentiment). However, the type of information being reported varies among corporations and countries.

Present limiting and restricting accounting practices may have to change to completely present the impact of corporations' operations on the environment. In addition, legal requirements associated with environmental issues (i.e., cleanup liabilities) are becoming entangled with accounting practices causing the accounting profession to consider an accounting for the environment.

## Chapter II

### II. JUSTIFICATIONS AND VIEWPOINTS

What then for the role of accounting in the present world and its emancipatory possibilities to enable change towards "utopia"- wherever, or whatever that might be?

Source: [Gray, 1991b, p.25]

#### A. Introduction

The need for the development of accounting techniques and recognition is the basis of much of the literature on the issue of the environment. Several viewpoints are presented for review.

Vinten [1991] generalizes that the reasons for corporate involvement "may" be:

- a) Commercial self-interest,
- b) Company image,
- c) The extent of regulation,
- d) The use of their industry-specific knowledge to reduce environmental uncertainty,
- e) The need to identify environmental costs and expenditure,
- f) The necessity to keep pace with changing societal values,
- g) Government itself is beginning to take a green

stance, and this will influence the corporate sector [Vinten, 1991, pp.6-8].

Vinten [1991] concludes that the environment is a major and growing concern to organizations. Corporations would benefit from a proactive stance or at least a recognition of the impact of the environment on corporate affairs.

Mathews [1993, forthcoming] presents views of corporate involvement by examining three broad groups of arguments to justify the use of scarce resources in making additional disclosures: market-related, socially related and radically related.

## B. Market-Related Justifications

Market-related arguments are based on the premise that shareholders and creditors will benefit from changes in the market influenced by the information content of the disclosures [Mathews, 1993, forthcoming].

1. Social Accountability. Accountability is concerned with the right to receive information and the duty to supply it [Gray, 1991b]. The development of accountability increases the transparency of organizations:

That is, it increases (or, in the green vision,

should increase) the number of things which are made visible, increases the number of ways in which things are made visible and, in doing so encourages an increasing openness [Gray, 1991, pp.35-36].

Some justifications further supporting social responsibility by corporations are:

- i) a free market will be more efficient if more information is available to participants,
- ii) empirical research has demonstrated that a measure of social responsibility by management may correlate with higher corporate income, and
- iii) there is some evidence that share prices may be influenced by the social responsibility disclosures of corporations [Mathews, 1993, forthcoming, pp.14-15].

More information would become available to society serving to improve market efficiency. Another component of market efficiency relates to externalities. Externalities (private costs allowed to cross into the public domain, i.e., pollution caused by the organization escaping into the atmosphere which is being breathed by the community (at their expense) are not currently included in the total cost of goods or services. Including the externality would influence the

cost/selling price which in turn affects the market demand. As Mathews [1993, forthcoming] states:

Consequently, a failure to capture all of the manufacturing costs results in a lower total cost and may lead to a lower price and greater quantity sold in the market place. This may not matter, but on the other hand, if the externality which leads to the lower costs (because it is not counted) is going to cause environmental damage, then the consumer is gaining a lower priced product at the expense of the whole of society (both consumers and non-consumers) [Mathews, 1993, forthcoming, p.16].

Zinger [1990] expands on the corporate responsibility theme by including a listing of strategies which set out a plan for companies to fulfill their obligations through:

- a) the ongoing assessment of the stakeholders' expectations;
- b) the development of policies and their implementation through specific programs;
- c) the integration of these activities into day to day operations; and
- d) the structuring of feedback mechanisms to monitor "social performance" [Zinger, 1990, p.50].

In addition, Zinger [1990] recommends that accounting professionals develop their "social awareness" through formal education and practical experience.

The viewpoint expressed by Gray et al [1987] regarding the role of the accounting profession and the environment is:

In the end, the simplest explanation for the phenomena of accountants concerning themselves with such a contentious and complex area, when there is no certainty of professional pay-off, is that accounting is about discharging accountability. Financial accounts discharge only a small proportion of an organization's accountability--some new form of accounting is necessary. Put in this way it should come as no surprise that accountants are seeking to develop such a new accounting [Gray et al, 1987, p.17].

2. Benefits to Shareholders. Several studies have been conducted examining the relationship between market performance and additional disclosures presented in financial statements. Although the results from the studies appear to be conflicting, the overall views lean toward the opinion that disclosures of non-traditional information content have utility for shareholders and the security market. Further, a positive relationship between the subjective rating of the social responsibility performance of the corporation and



generally accepted market measures is suggested [Mathews, 1993, forthcoming]. Exhibit 5 summarizes the methods employed in the market studies research and the outcome of those studies.

## Exhibit 5

## CHOICE OF SOCIAL RESPONSIBILITY MEASURE

<u>METHOD</u>	<u>OUTCOME OF STUDIES</u>
1. Subjective ratings of corporation performance	Greater median values on all dimensions; best and honorable mentions have higher growth in EPS than worst rated corporations.
2. Quasi-objective ratings based on annual report content or structural analysis	Mean, median ROE higher for firms with some discussion; average ratings of both groups negatively correlated with stock market performance; no significant relationships; information content of social responsibility disclosures conditional upon market segment.
3. Pollution measures as reported by companies themselves	Substantial but temporary positive effect on stock market prices for companies disclosing pollution data.
4. Pollution measures as reported by parties other than the companies	Pollution control expenditures and high profitability not positively associated; expenditures for pollution control do not automatically lead to higher market returns.

Source: [Mathews, 1993, forthcoming, pp.18-25; Mathews and Perera, 1991, pp.336-341]

Finally, market-related justifications must establish that the additional information provided would allow shareholders to make better decisions and benefit in the long term [Mathews, 1993, forthcoming].

### C. Socially Related Justifications

Socially related justifications are based on the corporation's interaction with society. The justifications presented include: the social contract view, moral person view, and organizational legitimacy view.

1. Social Contract. Wider accountability of environmental accounting is based on an implied contract between business and society (i.e., social contract). Donaldson [1982] describes the social contract in the form:

We (the members of society) agree to do X, and you (the productive organizations) agree to do Y. It is relatively easy in this context to specify X, because what productive organizations need from society is:

- 1) Recognition as a single agent, especially in the eyes of the law.
- 2) The authority: (a) to own or use land and natural resources, and (b) to hire employees.

Defining the Y side of the contract is as difficult as defining the X side is easy. It is obvious that productive organizations must be allowed to exist and act. But it is not obvious precisely why societies should allow them to exist, that is, what specific benefits society should hope to gain from the bargain [Donaldson, 1982, pp.42-43].

The social contract requires that productive organizations maximize goods and minimize evils to enhance overall welfare. This view represents a departure from the profit motive belief, the usual outlook of corporations. As Donaldson [1982] points out:

It is the conviction expressed by the inventor of the Model T, the grandfather of Henry Ford II, when he said: "For a long time people believed that the only purpose of industry is to make a profit. They were wrong. Its purpose is to serve the general welfare" [quoted in Donaldson, 1982, p.57].

The performance of productive organizations should be capable of assessment if the social contract view is applied by such a technique as social responsibility accounting disclosures [Mathews, 1993, forthcoming].

2. Moral Person View. The moral person view argues that corporations are moral agents and, therefore, morally responsible for their actions. Corporations have an obligation to act in a moral manner with employees, society, and all those that associate with the corporation.

Direct obligations of corporations (specified by legal requirements) are identifiable. If breached, they may be settled through legal actions. However, the indirect obligations (i.e. externalities) are not as easily identified. As Mathews [1993, forthcoming] explains:

It is the indirect obligations that cause problems, because they are not readily identifiable, may not be agreed between the parties to disputes and frequently give rise to measurement and valuation problems, even where their existence can be agreed upon. The indirect obligations give rise to the notion of a social contract between business and society. These issues underlie many of the problems of accounting for externalities [Mathews, 1993, forthcoming, p.34].

3. Organizational Legitimacy. Mathews [1993, forthcoming] summarizes an alternative view of the relationship between society and corporations as put forward by Lindblom [1984]:

- a). Legitimacy is not synonymous with economic success or legality.

- b). Legitimacy is determined to exist when the organization goals, output, and methods of operations are in conformance with societal norms and values.
- c). Legitimacy challenges are related to the size of the organizations and to the amount of social and political support it receives with the more visible being most likely to be challenged.
- d). Legitimacy challenges may involve legal, political or social sanctions [in Mathews, 1993, forthcoming, p.43].

Organizational legitimacy presents a confrontation between the public and a corporation. The avoidance of the changes of societal norms (i.e., allowing products to become outdated) could damage the legitimacy of the organization as a dynamic system [Mathews, 1993, forthcoming].

#### D. Radical View.

The radical view criticizes many aspects of current society and seeks to change it by eliminating the use of the market mechanism. It seems to be a long way from persuading the majority of the population to join in any popular movement

for change. Environmentalists would probably argue that as our environment becomes progressively degraded changes will be forced upon society [Mathews, 1993, forthcoming, p.86].

#### E. Sustainable Development.

An economic viewpoint of the environment and sustainable development, is presented by Sarokin and Schulkin [1991] and Pearce et al [1989]. The concept of sustainable development refers to:

the need to develop our global society in a manner which provides for the current generation, without robbing future generations of their right to a livable environment [Sarokin and Schulkin, 1991, p.18].

Environmental and economic concerns overlap as achieving sustainable development requires financing, creating tension between the opposing views [Sarokin and Schulkin, 1991].

Pearce et al [1989] argue that sustainable development does not fit in either the growth versus environment or the complementarity of growth and environment categories. The issue is how growth is attained. The nature of sustainable development is:

i) Sustainable development tells us that

environmental quality frequently improves economic growth. It can do this by: improving the health of the workforce; creating jobs in the "environmental sector" (recreation, tourism); creating jobs in the "pollution abatement sector" (air and water pollution control equipment, clean-up campaigns).

- ii) Sustainable development shifts the focus from economic growth as narrowly construed in traditional attitudes to economic policy. It speaks of development rather than growth, of the quality of life rather than real incomes alone.
- iii) Sustainable development accepts that there must be some "trade-offs" between narrowly construed economic growth and environmental quality.
- iv) Sustainable development accepts what many economists have been arguing for a long time, namely that what we have been calling "economic growth" in the past has been measured by some very misleading indicators [Pearce et al, 1989, pp.21-22].

Pearce et al [1989] adopt the view that a market based system of regulation is more efficient than one based on command and control. Further, proper pricing of products and



services can be achieved by the polluter pays principle. The basic mechanisms for making the polluter pay are:

- i) by setting standards, the cost of achieving which is initially borne by the producer;
- ii) by setting charges or taxes on the polluting product or input;
- iii) by setting a standard, issuing pollution permits in amounts consistent with the standard, and allowing those permits to be traded [Pearce et al, 1989, p.158].

Market-based incentive (i.e., pollution charges or taxes) systems operate, generally, by establishing prices for environmental services through a market [Pearce et al, 1989].

#### F. Summary

The public awareness surrounding the concern for the environment, governmental influence, and company image (i.e., social responsibility) are reasons for corporate involvement with the matter.

The accounting profession (mainly social accountants) present several justifications for accounting for the environment including those which are market-related, socially related and radically related. As Mathews [1993, forthcoming]

states, the justifications are an evolutionary approach, not a revolutionary approach.

Sustainable development, an economist-related concept, implies "lasting" satisfaction for present and future generations. Sustainable development emphasizes a wider view of development and quality of life rather than a focus on growth and real incomes.

The public interest will be best served when the accounting profession fully undertakes the environmental issue. The viewpoints presented agree that the need exists to explore the facets of accounting for the environment.

## Chapter III

### III. IDENTIFICATION, MEASUREMENT AND VALUATION

#### A. Introduction

Green issues (or concerns for the future of the planet) have enjoyed a resurgence in public sentiment and thus the political arena in a "big way" [Owen, 1992, p.xi].

In a poll frequently conducted by the New York Times/CBS, the public was asked if "protecting the environment is so important that requirements and standards cannot be too high, and continuing environmental improvements must be made regardless of cost." Between September 1981 and June 1989, the respondents agreeing with the question posed, rose from 45% to 79%, respectively [Kirkpatrick, 1990, p.46].

U.S. managers, in a recent Conference Board study, ranked the following issues as "important": 1) worker health and safety, 2) clean air (pollution from stationary sources), 3) hazardous and toxic chemical waste disposal, 4) acid rain, and 5) toxic solid waste disposal [Deloitte & Touche, 1991].

Accounting for these issues of the environment is an ongoing philosophical debate among members of the accounting profession. The differing viewpoints center around the issue of recording for the total cost of running an organization. Mathews [1985] refers to the total cost of running an

organization as Total Impact Accounting. Total Impact Accounting is subdivided into private and public costs. As explained by Mathews [1985]:

The total cost of running an organization may be divided between private and public costs. Private costs, also called internal costs, are already recorded and measured by the accounting system, as the individual costs of material, labor and overheads...Public costs, also called external costs or externalities, occur as a result of the existence of an organization, and currently must be born by the community as a whole [Mathews, 1993, forthcoming, pp.219-220].

Proponents of accounting for the environment believe these costs (albeit difficult to identify, measure or value) should be included in financial reporting. Traditional accountants, on the other hand, view these costs (owing to the difficulty to identify, measure or value) as beyond the scope of present financial statements and thus should be ignored by the accounting profession.

#### B. Identification, Measurement and Valuation

The identification of "potential social costs" may not

be the problem, but measurement and valuation may not be easily determined. As Mathews (1993) points out:

It is possible to see smoke or dust pollution leaving factory premises and to smell gaseous contaminants pollution the atmosphere, but how can a value be attached to the effects of these phenomena?

[Mathews, 1993, forthcoming, p.220].

Mathews continues noting that "valuation has the two aspects of occurrence and measurable effect" [p.220].

Suggested measurement and valuation approaches have emerged in the accounting literature addressing these environmental accounting issue.

1. Level I, Level II, Level III Measurements. The American Accounting Association (Committee on the Measurement of Social Costs, 1975) addressed the measurement aspect of accounting for the environment. Three levels of measurement were identified:

- Level I: Identified and described (or "inventoried");
- Level II: Measured in terms of nonfinancial measures of cost/benefit to the firm's owners and constituents;
- Level III: Measured in terms of financial

cost/benefit to the firm's owners and constituents [Belkaoui, 1984, p.127].

Mathews [1993, forthcoming] "illustrates" the levels, painting a picture:

If sulphur dioxide is discharged into the atmosphere it will soon be detected by its odour, and elementary analysis will confirm that the odour is caused by sulphur dioxide. This is a Level I measurement. The volume of discharge measured over a period of time in physical units, such as parts per million (ppm) will provide a Level II measurement. A Level III measurement is made when we convert the effect of the discharge into financial terms by measuring the financial effects of damage to property and health [pp.98-99].

Mathews acknowledges that valuation problems may be "difficult to overcome" and that the values will be "open to dispute." Further, time and distance (i.e., sulphur dioxide emissions over long periods of time or sulphur dioxide discharged in one country leading to acid rainfall in another many miles away) may complicate the issue of measurement. Mathews (1993, forthcoming) suggests an alternative approach

to traditional accounting methods by looking at costs and benefits of organizations over their entire life. The AAA committee suggested the development of "new measurement concepts" to allow management to "identify issues, recognize implications of current and planned actions, set priorities and select specific activities" [Belkaoui, 1984, p.125].

Next, the committee presented two views for the role of the accountant with environmental accounting. First, the accountant was to have "total involvement in the design and installation, administration and operation, and finally verification and attestation of detection and measurement systems" [Belkaoui, 1984, p.126]. This would give a more "inclusive" measurement of organizational performance than traditional accounting methods would. Performance measurements would expand to include "environmental contribution aspects of production operations, use of resources, or recycling operations" not normally considered business transactions [Belkaoui, 1984, p.126].

The second view addresses the underlying issue of measurement; because accountants should be concerned with "those costs which are imposed on the corporate (accounting) entity by law, public pressure or by choice of the corporation itself", no involvement should be made by the accountant in the area of environmental accounting. Further, because the necessary measurement technology does not exist for environmental accounting, accountants should not be involved

with accounting for the environment [Belkaoui, 1984, p.126].

2. Cost-Benefit Analysis. Evaluation of the effects of externalities over time will require a discounting approach to costs and benefits. The varied nature of externalities will require an assortment of procedures [Mathews, 1993, forthcoming].

Cost-Benefit Analysis (CBA) utilizes the Level III monetary quantification discussed previously. Currently used for specific governmental projects, it is adaptable to externalities. As Prest and Turvey (1965) explain:

Cost Benefit Analysis is a practical way of assessing the desirability of projects [or externalities] where it is important to take a long view (in the sense of looking at repercussions in the further, as well as the near future) and a wide view (in the sense of allowing for side effects of many kinds on many persons, industries, regions, etc. [p.682]).

The advantage of CBA is its record of data, both financial and non-financial. The "articulation" of an objective will assist subsequent measurement and decision-making [Mathews, 1993, forthcoming].

Churchman (1971) examines the cost/benefit approach from a problematic angle. The issue surrounded an historic church



(St. Michael's) setting in a proposed site for a new runway (for the London airport). The disagreements arose from the method of analysis; extant fire insurance policy was the base which upset antiquarians. Churchman states:

If you adopt either cost-benefit strategy, you automatically decide the issue. If you use the fire insurance approach, the church is virtually an irrelevant consideration in the decision of where to build the airport; whereas if you use the discount approach, the church is all that matters: it is inconceivable that one should build the runway there [1971, p.30].

Selection of the discount rate affects the outcome of the decision. It takes only a "modicum of plausibility ...to convince people that the numbers represent reality" [Churchman, 1972, p.31]. Further, a cautionary approach should be taken to "set down stipulations of the competent, disinterested observer.. to arrive at a basis for justifying the numbers" [Churchman, 1972, pp.31-34].

Alternative values of the discount rate include consumption rate of interest and opportunity cost of capital. The time preference underlying the consumption rate of interest is extended to include intergenerational equity [Pearce, 1990]. Intergenerational equity refers to the position where: "future generations should not be left worse

off by the actions of the present generation" [Mathews, 1993, forthcoming, p.255].

Pearce [1990] argues that discounting appears to discriminate against intergenerational equity. Adjusting the rate does not always result in "dealing with the problems of environmental risk, irreversible damage investment programs, or the interests of future generations" [p.38].

Mathews [1993, forthcoming] summarizes the shortcomings of the cost-benefit approach:

CBA can produce problematic decisions because of the combinations of present and future estimates of costs and benefits, the range of possible discount rates, and a need to force non-monetary measurement into the monetary form in order that cash flows may be discounted [p.279].

3. Man-made, Natural, Critical Capital. Gray [1990, 1991] approaches environmental accounting from a different perspective than presented thus far; He looks at the basis of identifying and categorizing assets (i.e. "capital"). He distinguishes three categories of capital:

Critical Natural Capital: those elements of the biosphere that are essential for life and which, for sustainability, must remain inviolate (examples include the ozone layer, a critical mass of trees etc);

Other (Sustainable, Substitutable or Renewable) Natural Capital: those elements of the biosphere which are renewable (e.g. non-extinct species, woodlands) or for which reasonable (however defined) substitutes can be found (perhaps, for example, energy from fossil fuels versus energy from renewable sources given the right capital investment);

Man-Made Capital: those elements created from the biosphere which are no longer part of the harmony of the natural ecology which includes such things as machines, buildings, roads, products, wastes, human know-how and so on [1991c, pp.21-22].

Gray's [1990] concern was for transfers between categories of assets and overall maintenance. "It then follows that for sustainability to be achieved, the critical capital MUST not be touched and all diminutions in other natural capital must be replaced, renewed or substituted for" [1991, p.22]. Reorientation of the accounting from ownership towards stewardship will result from a redefinition of assets and capital maintenance [Gray, 1990].

4. No Accounting Problem at All. Discussion has centered around the identification, measurement and valuation of

externalities. Mathews [1993, forthcoming] states that:

For some accountants the major difficulty with the valuation of externalities is not in knowing that they exist, or even in their identification and measurement, but in recognizing that there is an accounting problem at all [1993, forthcoming, pp.223-224].

The question, "to whom is the corporation responsible?" is answered by Benston [1982]. Three sectors (shareholders, stakeholders, society) are "affected by the assumption that corporation managers may misuse shareholders resources" [Benston, 1982, p.89]. Most of the costs of social responsibility is incurred by the shareholders and managers. Further, most social responsibility disclosures would not benefit shareholders; "if concern for shareholders is the motivating factor behind this accounting" it is not necessary as the internal and external monitoring systems of corporations prevents management misuse of shareholders funds [Benston, 1982, p.93].

Benston [1982] viewed externalities as being an internal cost by the fact that companies include those costs in their revenue and expense operations:

Thus if all of the area residents are associated with the factory (say as employees or suppliers), the disability from breathing polluted air is a cost

of dealing with the factory and will be reflected in the wages or prices for goods paid by the factory owners. Therefore, there is no externality [Benston, 1982, p.94].

Reporting and valuing externalities is not a viable proposition due to: shareholders being well served by present voluntarily adopted accounting procedures, the need for additional regulations beyond self-regulation, and the difficulty of measuring externalities [Benston, 1982].

Critics of this approach argue that the analysis is limited because accounting is a social construct; to account only to shareholders ignores the basic philosophy of large sections of the changing population [Mathews, 1993, forthcoming].

5. Valuation and Disclosure Models. Traditional accounting prepares financial statements (i.e., balance sheet, income statement, statement of cash flows) as a performance indication. Models have been developed to account for externalities as well. Mathews [1993, forthcoming] exhibits several models which have been compiled in Exhibit 6.

Mathews (1993, forthcoming) concludes that a combination of the models designed by Estes and Dierkes, as shown in Exhibits 7, 8, 8A and Preston, as shown in Exhibits 9, 9A, would be the closest to calculate and present externalities.

## Exhibit 6

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**SUMMARY OF VALUATION AND DISCLOSURE MODELS**

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<u>DATE</u>	<u>AUTHOR</u>	<u>MODEL STRUCTURE</u>
1972	Linowes	Historical cost to indicate the costs and
1973	Dilley and Weygandt	benefits of externalities
1976	Ullman	Non-financial measurement Macro
1976, 1977	Estes	Current items-financial
1977	Dierkes and Preston	Imputed costs of unprevented externalities
1979	Eichorn	Conceptual
1987	Gray, Owen and Maunders	Conceptual

---

Source: [as compiled from Mathews, 1993, forthcoming, pp.246-247]

## Exhibit 7

**THE PROGRESSIVE COMPANY**  
**Social Impact Statement for the Year Ended December 31, 19x1**

<b>Social Benefits</b>		
Products and services provided		\$xxx
Payments to other elements of society		
Employment provided (salaries and wages)	\$xxx	
Payments for goods and other services	xxx	
Taxes paid	xxx	
Contributions	xxx	
Dividends and interest paid	xxx	
Loans and other payments	<u>xxx</u>	
		xxx
Additional direct employee benefits		xxx
Staff, equipment, and facility services donated		xxx
Environmental improvements		xxx
Other benefits		<u>xxx</u>
Total social benefits		\$xxx
<b>Social Costs</b>		
Goods and materials acquired		\$xxx
Buildings and equipment purchased		xxx
Labour and services used		xxx
Discrimination		
In hiring (external)	\$xxx	
In placement and promotion (internal)	<u>xxx</u>	
		xxx
Work-related injuries and illness		xxx
Public services and facilities used		xxx
Other resources used		xxx
Environmental damage		
Terrain damage	\$xxx	
Air pollution	xxx	
Water pollution	xxx	
Noise pollution	xxx	
Solid waste	xxx	
Visual and aesthetic pollution	xxx	
Other environmental damage	<u>xxx</u>	
		xxx
Payments from other elements of society		
Payments for goods and services provided	\$xxx	
Additional capital investment	xxx	
Loans	xxx	
Other payments received	<u>xxx</u>	
		xxx
Other costs		<u>xxx</u>
Total social costs		xxx
Social surplus (deficit) for the year		\$xxx
Accumulated surplus (deficit) December 31, 19x0		<u>xxx</u>
Accumulated surplus (deficit) December 31, 19x1		<u>\$xxx</u>

Source: [Estes, 1976, p.96]

Exhibit 8

XYZ CORPORATION  
 SOCIAL IMPACT STATEMENT FOR YEAR ENDED DECEMBER 31, 1980 (all amounts in \$ millions)

	C U S T O M E R S	E M P L O Y E S	H O M E L A D R E S S	S U P P L I E S	G O V E R N M E N T*	C O M M U N I T Y	A S T O R I E S	S I M P L I F I C A T I O N
<b>Social Benefits</b>								
Products and services provided . . . . .	\$1.80	\$0.10	\$0.10	\$ --	\$ --	\$ --	\$ --	\$2.00
Cash payments made (purchases, taxes salaries, dividends, etc.) . . . . .	--	0.40	0.10	0.60	0.15	0.05	0.10	1.40
Additional employee benefits . . . . .	--	0.10	--	--	--	--	--	0.10
Environmental improvements . . . . .	--	0.02	--	--	--	0.03	0.10	0.15
Staff services, facilities, and equipment services donated . . . . .	0.01	0.01	--	--	0.01	0.02	--	0.05
Other social benefits . . . . .	--	--	--	--	--	--	0.20	0.20
<b>Total Benefits . . . . .</b>	<b>\$1.81</b>	<b>\$0.63</b>	<b>\$0.20</b>	<b>\$0.60</b>	<b>\$0.60</b>	<b>\$0.60</b>	<b>\$0.40</b>	<b>\$3.90</b>

\* Separate columns could be added for different levels of government--federal, state, and municipal. Source: [Estes, 1977]



Exhibit 8A

XYZ CORPORATION  
 SOCIAL IMPACT STATEMENT FOR YEAR ENDED DECEMBER 31, 1980 (all amounts in \$ millions) (continued)

	C U S T O M E R S	E M P L O Y E S	H O L D E R S	S U P P L I E S	G O V E R N M E N T*	C O N S U M E R S	A S T O R I E S	S I M P L I F I E D
<b>Social Costs</b>								
Human services used . . . . .	\$ --	\$0.30	\$ --	\$0.04	\$ --	\$ --	\$ --	\$0.34
Materials acquired . . . . .	--	--	--	0.30	--	--	--	0.30
Structures and machinery acquired . . . . .	--	--	--	0.20	--	--	--	0.20
Discrimination in hiring, placement, and purchasing . . . . .	--	0.02	--	0.01	--	0.03	--	0.06
Cash payments received . . . . .	1.60	0.09	0.14	--	0.01	--	0.05	1.84
Environmental damage (air, water, noise, aesthetic pollution; solid waste; terrain damage). . . . .	--	0.10	0.14	--	0.01	0.15	--	0.30
Public services and facilities used . . . . .	--	--	--	--	--	--	--	0.25
Industrial injuries and illness . . . . .	--	0.10	--	--	--	0.02	--	0.10
Corporate crime (price-fixing, tax fraud, bribery, etc.) . . . . .	0.05	--	--	0.01	0.02	--	0.02	0.20
Other social costs . . . . .	--	--	--	--	--	--	0.20	0.20
<b>Total Costs . . . . .</b>	<b>\$1.65</b>	<b>\$0.61</b>	<b>\$0.14</b>	<b>\$0.56</b>	<b>\$0.28</b>	<b>\$0.20</b>	<b>\$0.27</b>	<b>\$3.71</b>
<b>SOCIAL SURPLUS (deficit) . . . . .</b>	<b>\$0.16</b>	<b>\$0.02</b>	<b>\$0.06</b>	<b>\$0.04</b>	<b>(\$0.12)</b>	<b>\$0.10</b>	<b>\$0.13</b>	<b>\$0.19</b>

\* Separate columns could be added for different levels of government--federal, state, and municipal. Source: [Estes, 1977]

## Exhibit 9

## ENVIRONMENT

FACTOR	INPUT (COMMITMENT)		
	DESCRIPTION	MEASURE	FURTHER INFORMATION
Energy	Research and development Savings Measures Policy, Goals	D.No.\$ D.\$ D.No. (\$ or \$)	
Air pollution	Policy and goals	D.No.	
Water pollution Solid waste Noise	Research and development (by pollutant or waste)  Control equipment Recycling equipment	D.No. \$  \$.D \$ of total investment \$ increase in production cost	
Despoliation of landscape	Policy and goals Rehabilitation (landscaping) Beautification	D.No. D.\$  D.\$ size area despoiled size area reclaimed	\$ production costs
Raw materials*	Policy and goals	D.No.	
	Research and development: substitution recycling	D.No. \$	
Packaging	Research & development	D.No.\$	
Transport	Model policy	D.	

\*Consideration may also be given to the use of scarce non-renewable resources and the use of renewable but long-term resources, e.g. trees.

Legend

No. : Absolute quality (could mean both staff and beneficiaries)  
 \$ : Cost in applicable currency  
 % : Proportion or percentage in terms of applicable denominator  
 D : Description of policy, measure, goal, activity  
 Fr : Frequency of activity                      T: Length of time applicable to activity  
 W : Weight                      S: Sales                      P: Product                      A: Assessment

Source: [Dierkes and Preston, 1977, p.15]



### C. Audits

Discussion of environmental accounting also includes the auditing of externalities. Environmental auditing has been defined by the International Chamber of Commerce as being:

A management tool comprising of a systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of helping to safeguard the environment by:

(i) facilitating management control of environmental practices;

(ii) assessing compliance with company policies, which would include meeting regulatory requirements [Owen, 1992, p.8].

An environmental audit should not only serve as "an external check on the environmental statements, but also report on the adequacy of the company's environmental policy, and of systems to ensure the policy is pursued properly" [Cowe, 1992, p.136].

Proponents of environmental accounting argue that credibility is provided for the audience by the audit procedure [Ing, 1992].

Owen (1992) states that accountants "can make a considerable contribution in the environmental auditing

field...by virtue of their experience and expertise in the realm of information systems and control procedures generally" [Owen, 1992, p.8]. Further, Owen (1992) mentions the "possibility of annual environmental audits not only being given equal status to, but also being incorporated within, the financial audit" [Owen, 1992, p.17].

#### D. Summary

The accounting profession cannot accomplish the needed changes by themselves:

rather there is a pressing need for accountants to show a willingness to enter into debate with various groups in society having an interest in the development of green reporting. Concerns must be incorporated centrally within the accounting setting process [Owen, 1992, pp.xi, 24].

A listing of contributions for the accounting profession to the environmental debate is suggested by Adams (1992):

- a) Agreed definitions of what is to be measured and why;
- b) The technology to measure and capture the required data;

- c) Systems to record it and controls to ensure that corrective actions are taken when required;
- d) Reporting systems to convey performance measurement data to those requiring it;
- e) An audit which can attest to the reliability of the data reported;
- f) A willingness to accept estimates when precise cost apportionment is not possible [Adams, 1992, p.77].

Mathews (1993, forthcoming) attempts to reconcile the complex and conflicting developments of total impact accounting with social responsibility as presented in Exhibit 10.

Mathews concludes;

The future environment is unknown, in respect of both formal and less formal expectations, although it is reasonable to speculate that present constraints will not be reduced and that the expectations of the various constituencies are likely to increase over time [Mathews, 1993, forthcoming, p.357].

Exhibit 10

THE FIRM IN RELATION TO PRESENT AND FUTURE ACCOUNTING REQUIREMENTS

<u>Less Formal Expectations</u>				<u>Formal Expectations</u>			
E	C	E				A	C
X	O	N				C	O
P	N	P	<----->			C	C
E	S	R	I			A	O
C	T	E	R			S	U
T	I	S	O			E	T
A	T	E	N			I	Y
T	U	N	M			L	N
I	E	T	E			A	G
O	N	N	releases			W	E
N	C	T	<----->			S	G
S	I					T	I
E						A	S
O	S					N	L
F						D	A
						A	T
						R	I
						D	O
						S	N

	Financial	Social	Total Impact	
	Accounting	Responsibility	Acctg. Report	C
	Reports	Accounting	Measures of	U
F	Modified to	Reports*	Externalities	N
U	allow for:			K
T				N
U	i.New \$ Valuations	i.Energy	i.\$Costs	O
R	e.g. C.C.A.	ii.Pollution	ii.\$Benefits	W
E	ii.New \$ Inclusions	iii.Employment	negative	N
N	e.g.Capitalised	iv.R and D	positive	T
E	leases,	v.Productivity	net	S
N	executory	vi.Community		
T	contracts	Interaction		
		vii.Human Resource		
		Accounting		

\*Mixed monetary and non-monetary quantification.

Source: [Mathews, 1993, p.358, forthcoming]

Gray (1990) suggests "some possibilities for more environmentally sensitive internal, as shown in Exhibit 11, and external, as shown in Exhibit 12, accounting and reporting systems.

Accounting standards are set through discussion and analysis of situations. The situations (i.e., assets, liabilities, expenses, etc.) precede the methods arrived at for identification, measurement and valuation (i.e., recording assets at historical cost). These, through discussion and analysis, are adjusted as needed or as solutions to exceptions are applied (i.e., adjusting to lower of market or cost).

Accounting for externalities may not be any different than traditional accounting; first, recognize the situation (i.e., pollution); then, discuss and analyze the situation to arrive at a starting point; the system will refine itself as it is used. Simply ignoring the existence of externalities does not cause the situation to disappear. Only by facing the "problem" will any "solution(s)" be found.



## Exhibit 11

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**SOME POSSIBILITIES FOR MORE ENVIRONMENTALLY SENSITIVE  
INTERNAL ACCOUNTING AND INFORMATION SYSTEMS**

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- \* Development of an environmental department.
- \* Development, adoption and communication of a detailed environmental policy. The Valdez Principles represent a good first stage.
- \* Institution of regular monitoring, reporting and auditing of legal and quasi-legal compliance.
- \* Development of the compliance audit to encompass the ethical audit.
- \* Institution of regular and systematic identification, monitoring, reporting and audit of waste. Consider re-definition of waste as by-product for re-cycling.
- \* Develop the energy audit. Consider the possibility of a full energy accounting system.
- \* Monitor emerging issues.
- \* Develop a regular mechanism for conducting environmental impact analysis and incorporating the results into all board and senior management decisions.
- \* Consolidate the foregoing (plus other strategies) into a full environmental audit specific to each organisation.
- \* Establish the regular and systematic financial appraisal of environmental options that recognises the new and emerging price structure.
- \* Consider other possibilities related to: the third world; risk assessment; eco-labelling; response to ethical investment; etc., etc.
- \* Establish environmental budgets for activity centres.
- \* Introduce environmental hurdle rates for new investments. Recognise the reality of BPEO and BATNEEC.
- \* Develop a new classification of assets to recognise man-made, natural and critical capital. Develop environmental asset accounting and maintenance.
- \* Consolidate this all with the development of Resource-flow input-output analysis.

## Exhibit 12

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**SOME POSSIBILITIES FOR MORE ENVIRONMENTALLY SENSITIVE  
EXTERNAL ACCOUNTING AND REPORTING SYSTEMS**

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- \* Note that if one's own organisational reporting is not sufficient one may find oneself the subject of external social audits.
- \* There is a very wide range of previous experiments from which to learn and upon which to build further experiments.
- \* The current United Nations initiative offers a practicable and realistic policy option upon which external environmental reporting could be based. The initiative suggests that each organisation might include in its Annual Report:
  - # the organisation's environmental policy;
  - # the capitalisation of environmental expenditures;
  - # specific identification of environmental contingent liabilities relating to (a) bringing the organisation into line with current regulations and (b) future potential liabilities such as site clean-up costs;
  - # disclosure of current period expenditure on environmental protection;
  - # disclosure of anticipated environmental expenditures in excess of that classified as contingent liabilities--both voluntary expenditure and that designed to satisfy current and future regulations;
  - # disclosure of organisational activity and performance.
- \* A more specific approach to the disclosure of activity and performance would be the production and disclosure of a systematic **compliance-with-standard report** where standards would consist of (a) legal standards; (b) anticipated legal standards plus EC directives not yet incorporated into UK law; (c) industry best practice standards; (d) the organisation's own ethical/code of conduct standards where these are in excess of (a), (b) and (c).
- \* If reporting is to reflect the extent of the environmental issues and to fully operationalise the Pearce Report, then it will be necessary to re-define the nature of assets and to disclose (a) man-made, natural and critical capital assets; (b) transfers between categories of assets; and (c) data on the maintenance of critical and other nature capital assets.

## Chapter IV

### IV. FUTURE

As accounting comes to appreciate the fundamental nature of the questions raised by an environmental perspective, the questions needing answers and the research opportunities available will rise exponentially. The sooner we start the better

[Gray, 1990, p.136].

#### A. Introduction

The future of accounting for the environment rests with various factors including the perception of the seriousness of environmental issues and further research [Gray, 1990].

The levels of response regarding the seriousness of the concern for the environment fall into four categories:

- a) there is nothing to worry about ignore it all;
- b) there is a bit of a problem with one or two unpleasant manifestations but all it needs is some symptom-curing and everything will be basically alright (the light green response);
- c) the planet may soon cease to support life-the matter is critical (the deep green response);
- d) Western man's failure is a spiritual and social one of which environmental abuse and degradation is only a symptom (green politics response) [Gray, 1990, p.130].

The accounting profession should experiment with different approaches in methods to account for the environment. Further, Gray (1990) suggests that the sharing of ideas and experience would benefit in the development of the process.

1. Corporate Responsibility. Pearce et al (1989) suggest that the existing environmental database be expanded and the linkages between the environmental data and the economic demands be developed.

Corporate behavior can possibly be altered by

- a) shifting power among individuals;
- b) establishing internal corporate legislation and procedures;
- c) altering formal organizational structure

[Donaldson, 1982, p.179].

Stockholders, managers, the public, employees--all influence the corporation; the pressure applied by these individual groups will adjust the corporation's behavior to be in line with the interest of that class [Donaldson, 1982].

Concerned stakeholders will have to apply pressure and motivation to help bring about increased environmental accounting. In addition, tougher laws, higher standards or raised expectations on the part of influential investors will cause greater environmental disclosure [VanBuren, 1991].

Public pressure may spark initiatives which bring about the transformation of reporting:

In short, the future of CSR is closely linked to the way the environmental debate will develop into the 21st Century. That, and the degree of attachment to the idea that firms have an implicit contract with, and should therefore be accessible to, the wider society in which they operate [Hines, 1991 p.21].

2. Accountability and Sustainability. Gray (1991c) argues that accounting as a professional activity should return to the roots of stewardship and should develop the concepts of accountability and sustainability:

Accountability allows both company and non-company accounting to be viewed from the same set of principles and, more pertinently here, allows the issues of social & environmental accounting to be given an equal precedence with the matters more usually associated with conventional accounting. A simple social accountability could be discharged through the compliance-with standard report and, beyond that, accountability would be developed through increasing pressures arising from changes in public perceptions as well as through the changing mechanisms of accountability themselves. Matters related to the environment were clearly part

of this accountability framework [Gray, 1991a, p.46].

The notion of sustainability should be ensured as an important standard for organizational life. The actions of the accounting profession should re-examine the very foundations of its practice and develop a conceptual framework [Gray, 1991a].

3. Governmental Influence. A regulatory body should be a major initiative in determining if an organization is acting sustainably. An influential agency would establish the need for substantial and systematic reporting [Gray, 1991c].

Postel (1991) suggests the answer to the environmental accounting debate may also be found in government fiscal policy. By curtailing subsidies that encourage the misuse of resources and imposing taxes on environmentally damaging practices, fiscal policy could create incentives for ecologically beneficial activities.

4. Cooperation and Challenge. Selley (1991) suggests the accounting profession should become generally informed about environmental accounting, bring environmental and ethical thought to bear on their clients.

We're uniquely positioned to offer a major contribution to the debate, and reasonable and

ethical solutions to environmental problems. It's a formidable challenge, one that will lead us to change our way of thinking in a number of important respects. And there will be risks. But if we don't take up the challenge, I don't think the solutions will be as good [Selley, 1991, p.74].

Mathews, (1993, forthcoming) adopting an evolutionary approach, argues that social responsibility accounting may be justified and should be implemented. By including relationships (measurement and reporting) the present system can be improved. Social changes, ideological transformation of managers, and a shift from an individualistic attitude to a communication idea need to occur [Belkaoui, 1984].

As the spotlight on environmental issues becomes more focused, cleanup technology improves, and estimating cleanup costs becomes easier, earlier recognition of liabilities in financial statements may result [Surma, 1992].

Assessing the proper financial statement presentation and disclosure of environmental contingencies is a responsibility of accountants [Zuber, 1992].

## B. Summary

Ing (1992) summarizes the future of environmental accounting;

- \* Environmental reporting systems capable of providing significant quantitative data may be technically difficult to design;
- \* Presentation is, arguable, more important than any financial information, and effort and time must be expended on getting this presentation right;
- \* Each individual problem of reporting may be quite simple but it is the totality and the manner in which it is pulled together, and how this varies over time, that can produce the complexities for those designing a reporting system;
- \* There is a need to understand environmental issues as seen by those outside the organization as well as those inside;
- \* There is a need to be able to respond quickly as opinions and issues change;
- \* It is necessary to ensure that every effort has been expended to ensure that the data is right;
- \* Accountants through their training are ideally placed to play a leading role in environmental



reporting. Some, including the author of this chapter, would argue it is their duty to undertake this role [Ing ,1992, pp.293-294].

## Chapter V

### V. CONCLUSIONS

"Accounting can indeed make a contribution. The ball is in the accounting profession's court!"

[Owen, 1992, p.26]

A. The Coming of the Green. The history of environmental accounting literature can be described with one word--erratic. Even though the incentives are present to publish, such as the acceptance of social responsibility, environmentalism, increased legal regulations, and mass media attention, the accounting profession, as a whole, has avoided the issue. On the international scale, accounting for the environment has been as varied in disclosure as the diverse cultures. The United States has approached the subject with traditional viewpoints by reporting those environmental concerns that are both reliable and relevant. Transactions involving loss contingencies and pollution abatement are disclosed on financial statements. The European financial statements include specific environmental sections while the United Kingdom discloses narrative, qualitative information. A combination of the accounting practices currently being reported is recommended for future research to fully present

the transactions among the environment, corporations, and society.

B. Justifications and Viewpoints. Reasons for developing the accountant's role in environmental transactions center around the issue of accountability. Whether from a market-related more focused view to a wider perspective of socially related justifications, accepting responsibility toward complete, informative statement presentation for accountants and corporations can be viewed positively; accountability correlates with higher corporate image and profits.

Sustainable development and intergenerational equity viewpoints argue that accountability regarding quality of life is valued by society. Decisions are now made with a longer time horizon.

Further research of justifications and viewpoints could include further market studies to assist the accounting profession in determining proper statement presentation. Further detail of why traditional accounting methods should be changed is necessary to sufficiently understand the depth of accounting for the environment.

C. Identification, Measurement and Valuation. The complexities of identification, measurement and valuation are, perhaps, the most numerous of all of the aspects of environmental accounting. Prioritizing environmental

transactions into categories, such as critical natural capital (essential), natural capital (renewable) and man-made capital (unnatural), helps to identify overall wealth into "measurable" terms. Stewardship of these assets encourages protection of overall wealth and profits. Further research for the accounting profession can explore these trends of potential profits which are determined by different shifts between natural capital and man-made capital.

Another approach of identification, measurement and valuation concerns the total costs of accounting for the environment. Indirect costs need to be acknowledged to fully present the cost of products to the individual and society as a whole. The limitations of the present accounting system should be continuously reviewed to develop a new process or system which better accounts for environmental accounting.

Another complexity associated with identification, measurement and valuation is that of quantification. Accountants relate more to numbers than conceptualism (due in part to traditional accounting education) so it is only natural that they attempt to quantify environmental accounting. In reality, it may be that environmental accounting cannot be expressed in the terms of traditional accounting. Because of such issues as the vastness of the environment, potential social costs, and time and distance considerations quantification of environmental accounting may not be able to be captured on numerical financial statements.

The further challenge that is before the accounting profession is to develop auditing methods to ensure reliability of this information.

D. The Future. The future of accounting for the environment rests with the accountability issue. As long as society (in part or in total) has a concern for the environment, corporations will be expected to honor those concerns. And as those concerns continue to escalate, corporations will assume their responsibility toward legitimacy.

Acknowledging that accounting is dynamic and socially constructed (it reflects societal norms, lifestyles, views), it follows that the profession should react to the increase in interest in environmental accounting shown by the public. A responsibility is owed to the profession itself, in maintaining the integrity it so greatly cherishes. This means that the accounting profession should take the initiative in gathering information (such as forming a committee comprised of management, accountants, legal authorities, consumers), making decisions (instead of ignoring the situation) and carrying out the resolutions.

Above all, it should be stressed that this is indeed a process of change and growth; one cannot expect to have the answers that are "correct" today, be necessarily the "correct" answers for tomorrow. The accounting profession should encourage a flexible, organic strategy and discourage a

bureaucratic, stale approach in "challenging our perspectives"  
with accounting for the environment.

## Epilogue

"The position of accounting as a social construct means that changes in society should logically lead to developments in accounting and reporting."

[Mathews, 1993, forthcoming, p.9]

"If appropriate accounting systems do not evolve, other parties will organize themselves to fill the gap and thereby remedy the deficiency."

[Mathews, 1993, forthcoming, p.5]

"This is accounting's second opportunity to take an important innovative stand on a crucial issue. We may not get a third."

[Gray, 1990, p.1]

"The opportunities are there to be taken."

[DeWar, 1991, p.9]

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