Corporate Reporting for Sustainable Development: Accounting for Sustainability in 2000AD[1]

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ABSTRACT: The paper is principally concerned with (a) outlining the range of possibilities that exist for organisations which wish to undertake environmental and sustainability reporting and (b) suggesting particular approaches as the more desirable. But the paper also attempts to show that there is an important difference between environmental reporting and reporting for sustainability, and that, so far, efforts to encourage organisations to voluntarily undertake either have not been successful. Environmental reporting is business-centred and there are a number of practicable ways in which it can be undertaken. The most notable of these are the UN CTC approach to financial environmental reporting plus the Compliance-with-Standard Report. Reporting for sustainability is life-centred and, whatever method we adopt it is likely to show that western organisations are *not* currently sustainable. The concept of sustainability is widely underestimated and misused in business and political circles. This is explored and the real meaning of sustainability operationalised. Environmental reporting and sustainability reporting are shown to be essential and practicable. It is argued, however, that there is little or no prospect of widespread, systematic reporting by corporations without a major regulatory initiative.

KEYWORDS: Accounting, environmental accounting and reporting, social reporting, sustainability

1. INTRODUCTION

The concept of 'sustainability' rose to prominence following the Brundtland report in 1987[2]. It has rapidly become the core concept in discussion of mankind's interaction with the physical environment. Further, on the face of it, it is a concept that is universally accepted as a desirable, even essential, yardstick by which to assess mankind's actions. However, there is considerable disagreement over the actual operationalisation of the concept and over its implications for the way in which mankind orders its life. Any serious discussion about sustainability must first expose this disagreement and then attempt to resolve it.

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The general definition of sustainability is *not* in dispute, namely that humanity must:

> "... ensure that [development] meets the needs of the present without compromising the ability of future generations to meet their own needs." (World Commission on Environment and Development, 1987, p.8)

How this might be achieved at national and international levels is widely discussed. There is, however, an increasing recognition that the pursuit of sustainability must be continued at community, household and organisational levels as well. Corporations are crucial in any progress towards sustainability. They account for a large proportion of the world's economic activity and (in the case of the major multi-national corporations) hold much of the international power, they control much of the world's resources, technology and innovation and they have considerable influence over much of mankind's choices.

If corporations are to contribute fully to humanity's attempts to seek a sustainable existence then a strong case can be made for the development of accounting and reporting systems which will support this process. In broad terms this will require the monitoring and recording of data that relates to the extent to which an organisation is acting (un)sustainably. This data will form the basis of information for both management and the external participants of the organisation who should then be in a position to monitor and assess the organisation's progress towards sustainability (or away from un-sustainability) and make judgements and take steps, in the light of the information, as they see fit.

This broad outline, whilst perhaps having an overall plausibility, is far too general to be of any practicable value. In this paper I shall attempt to examine each of these stages and to turn each of them into more practical options so that any organisation could adopt and apply a reporting system for sustainability. What this should do, is enable, in so far as current knowledge permits, each organisation and organisational participant to obtain a clearer idea of the nature of the relationship between the organisation, its environment and the pursuit of sustainability.

Throughout this paper I will be approaching the problems as an accountant who sees accounting and reporting as two sides of the information systems coin. The two sides are mutually dependent – it is impossible to report until one has something to report, to give an account until something is accounted for. Both depend upon and are themselves information systems. I will not, however, be restricting 'accounting' to 'financial accounting' – the demands of sustainability are too critical to be restricted to plausible financial measurement techniques (or to await the derivation of such).

The paper is structured as follows. Section 2 reviews 'light green' environmental accounting and reporting initiatives and relates these to the corporate social reporting experiments of the last two decades. Section 3 reviews the

current environmental accounting and reporting options available to any organisation. However, sustainability is not about being light green – it is a far more profound concept. Section 4 then attempts to review what is meant by sustainability and some of the ways in which the concept can be operationalised. In section 5, a critical review of our current reporting institutions and frameworks will be attempted. The purpose of this is to highlight the necessary tension between (i) conventional conceptions of current reporting, (ii) the actuality of current reporting and (iii) the sort of frameworks – notably stewardship, accountability and transparency – we will need if we are to report for sustainability. Section 6 of the paper proposes some practicable ways of approaching accounting and reporting for sustainability.

2. THE STATE OF THE ART IN SOCIAL AND ENVIRONMENTAL REPORTING

At its simplest, the current accounting and reporting activity depends upon four factors.[3]

(i) ORGANISATIONS**:** the organisations that are accounted for (the 'accounting entities') are defined in space and time. Events which do not fall within the defined organisation are ignored.

(ii) ECONOMIC EVENTS: the only events which accounting recognises are the 'economic events' which are tautologically defined as those events which have *financial* effects on the organisation.

(iii) FINANCIAL DESCRIPTION: the events that accounting recognises are further limited to those economic events which can be described in financial terms – or, more particularly, those which have generated in the past, do generate now or will generate in the future cash receipts or cash payments.

(iv) THE USERS OF INFORMATION: the way in which the events are recognised and then processed is (largely) determined by sets of assumptions about the eventual users to whom this information will be communicated and by whom it will be used. The users are predominantly assumed to be management, investors and lenders and their interest is assumed to be of a predominantly financial nature.

Thus, at a simple level, we can envisage the accounting activity as recognising and recording the financial attributes of a particular set of economic events as they flow across the imagined boundaries of the organisation for which we are accounting. This recorded data is then processed, re-arranged, summarised and manipulated and adjusted to put it into a form that management can use (e.g. cost

data, budgetary data, activity centre performance data, etc.) or that external financial stakeholders can use (e.g. profit and loss, costs and revenues, assets and liabilities etc.).

The relatively short history of social and environmental accounting and reporting has been, at its simplest, about questioning each of these characteristics. That is:

- How do we define organisations? to what extent can we include externalities?
- Why account for only economic events? how might we account and report on social and environmental events as well?
- What are the consequences of restricting our accounting and reporting to only financial description? how might we account in other ways?
- Why do we restrict our reporting to a selected set of participants? how might we set about accounting and reporting to society, other countries, employees, communities or future generations?

In the early 1970s there was considerable debate, speculation and actual experimentation with the elements of this framework – principally in North America.[4] Corporations tried many forms of reporting: within the annual report or within a separate booklet; in financial numbers, in non-financial quantities, in words and pictures; the reports were for employees or management or society-at-large; some were audited, some not; they covered one or more of: plans, policies, interactions with communities, charitable giving, levels of pollution and emissions, energy usage, employment data, health and safety at work, etc.; and so on. There was virtually no regulatory back-up to these experiments and by the mid- to late-1970s the experiments had all but disappeared and interest in the field had waned to a vestigial level all over the world.[5]

In the current growth of excitement and interest in environmental reporting it might be well to recall that we could learn a great deal from this earlier experience.

FIRST, the examples of significant environmental reporting[6] which we are now beginning to see (especially in Europe) echo those earlier (predominantly North American) experiments.[7]

SECOND, the short-lived but energetic enthusiasm for 'social accounting' made little in the way of long-term impact. Perhaps corporate reporting now emphasises social issues a little more, but if so, it is marginal. With virtually no exceptions, it is only the regulated changes in reporting that actually bring about widespread change in behaviour or reporting practice. There is much talk currently of leaving developments in environmental reporting "to the market". As far as I can see the market will largely ignore the development of environmental reporting (for more detail see below) and I would have

thought the 'market case' rather than the 'regulation case' was the one that had to be made.

THIRD, a considerable body of research evidence has been accumulated over the last twenty years on (a) whether social and environmental reporting could be associated with profitable or unprofitable organisations, and (b) whether bankers, investors and stock markets in general (i.e. the financial participants) reacted to social and environmental disclosure. The results are largely inconclusive.[8] It is possible to conclude, as does Mintzberg, "that it pays to be good, but not too good". Or, more brutally, one can conclude that financial participants in organisations do not currently express anything other than the very mildest concern for the social and environmental effects of the organisation that they own or to which they lend unless it is likely to directly or indirectly (through public image, regulation or whatever) influence financial returns. (Even the current experience with ethical funds does not run counter to this conclusion).[9]

FOURTH, the social reporting agenda of the 1970s was predominantly controlled by the companies. This is not meant to impugn the corporate integrity but to emphasise that throughout the debate the interests of 'business', of the companies, came first. Thus the examples of organisational social and environmental reporting that we have to draw from are largely self-congratulatory.[10] One need not be surprised by this but a very clear message is that one must be clear as to why one is pursuing a development in reporting. If the development is to achieve social change of some sort then there is no evidence to support the idea of leaving it to the companies. If the purpose is to smooth over a simple but troublesome issue without causing business any great worries then a voluntary approach will work perfectly well.

This is a critical dilemma and I shall return to it later. In the meantime we can now turn to look at the way things in the corporate sector are currently moving with regard to environmental accounting and reporting.

3. ENVIRONMENTAL ACCOUNTING AND REPORTING

Accounting and reporting cannot act in isolation. Organisational change is necessary to enable and/or encourage the internal information and reporting systems to be both developed and used whilst institutional, regulatory and market changes are necessary to encourage organisations to report and for financial participants to respond positively. The regulatory changes will be considered later. For the moment, in order to give some indication of the sort of organisational change that is needed, John Elkington's 'Ten Steps to Environmental Excellence' are shown in Figure 1.

1. Develop and publish an environmental policy.
2. Prepare an action programme.
3. Arrange organisation and staffing including Board representation.
4. Allocate adequate resources.
5. Invest in environmental science and technology.
6. Educate and train.
7. Monitor, audit and report.
8. Monitor the evolution of the green agenda.
9. Contribute to environmental programmes.
10. Help build bridges between the various interests.

FIGURE 1
The Ten Steps to Environmental Excellence

Source: Elkington 1989

In such an organisational climate, then the following suggestions of ways in which accounting might take greater cognisance of environmental issues become realistic possibilities (see Figure 2).

Whilst these suggestions *are* largely experimental, most of them are in current use somewhere in the world. So, for example:

- many organisations are finding considerable direct, financial, short-term benefits arising from energy accounting;
- Rhone Poulenc, one of the world's major chemical companies, is famous for its pioneering work in introducing accounting systems for its wastes and effluent;
- environmental impact assessment is becoming increasingly a regular fact of organisational life;
- the costs incurred by the chemical industry in investing in new, cleaner technology received considerable press coverage throughout the early 1990s; and, most visibly,
- environmental reporting has taken on a new lease of life.[11]

The suggestions and initiatives in Figure 2 relate principally to internal environmental management by corporations and, whilst information systems such as these are pre-requisites for developments in environmental reporting, they do not *in themselves* progress the reporting issues. Items 7 and 8 in Figure 2 are concerned with reporting issues.

1. Compliance and Ethical Audits: Reviews of the organisation's performance against legal and consent requirements and its own code of conduct.
2. Waste and Energy Audits & Accounting Systems: Reviews of organisational energy use and waste outputs. Development of information systems which record waste and energy, communicate it to line managers and, as appropriate, charge to activity centres.
3. Environmental Costs: separate identification of costs and potential liabilities that are environmentally related.
4. Emissions Information Recording and Communication Systems: Establishment of monitoring systems recording emissions to water, air and land (including noise). Regular reporting of this information to line managers.
5. Environmental Budget & Performance Appraisal Systems: Establishment of environmental criteria as part of management performance appraisal. Identification of environmental targets, environmental allowances and environmental spend as part of the organisational budgetary control system.
6. Environmental Impact Assessment, Environmental Hurdle Rates, Best Practicable Environmental Option (BPEO), Best Available Technique Not Entailing Excessive Cost (BATNEEC), Environmental Risk Assessment etc.: Bring environmental criteria into investment and project choice and post-audit in order to establish whether the organisation's investment policy is environmentally sensitive.
7. Financial Environmental and Social Reporting: Introduction of separate items in financial reports that identify, for example, environmental expenditures (separating compliance and other costs), environmental investments (actual, proposed and committed - and again identifying compliance-related costs) and potential environmental liabilities (such as reparation, fines for consent over-run or contingent, 'Superfund', clean-up liabilities).
8. Non-financial Environmental and Social Reporting: Establishment of wider reporting of environmental interactions including, for example, compliance with legal and consent standards, environmental policy and plans, environmental activities undertaken etc..
9. Accounting for Accountability and Transparency
10. Accounting for Sustainability

FIGURE 2
Some Possibilities for Environmental Accounting and Information Systems

Source: Adapted from Gray 1990e and from current research funded by ACCA as the second stage to the *Greening of Accountancy* project, the first fruits of which were published as Gray et al. 1993.

Recent developments[12] in both voluntary environmental disclosure by companies and the intentions of regulatory bodies can be considered as falling into three categories of reporting:

- GENERAL NARRATIVE REPORTS: perhaps including statements of policy[13] and selected elements of 'hard' quantitative data, these are the most popular forms of environmental reporting.[14]
- NON-FINANCIAL QUANTITATIVE AND QUALITATIVE DATA: might include such things as emission statements and/or reports on environmental audits for example – this is form taken by the British company Norsk Hydro and a version of this approach is discussed below.[15]
- FINANCIAL DISCLOSURE OF ENVIRONMENTAL INFORMATION**:** is not yet widespread outside the influence of the USA's 'Superfund' Act. Whilst a number of companies may give selected items of financial data[16] and, at the other end of the spectrum, the Dutch company BSO/Origin have made attempts to report 'complete environmental accounts' it is only a matter of time before other parts of the globe follow suit.[17]

A degree of synthesis of these three approaches to reporting is provided by the United Nations Centre for Transnational Corporations' recent initiative in environmental accounting and reporting. Their proposals are summarised in Figure 3.

FINANCIAL INFORMATION

- disclosure of amount spent on environmental matters (possibly enabling capitalisation due to spend impact on EPS), will possibly be split between regulated and voluntary costs
- disclosure of environmental contingent liabilities - most especially those arising from remediation costs under 'Superfund' type legislation
- disclosure of anticipated pattern of future environmental expenditure (possibly split between regulated and voluntary costs)

NON-FINANCIAL INFORMATION

- disclosure of environmental policy for the organisation
- disclosure of organisational activity in the environmental field, including such matters as emissions statements

FIGURE 3
The United Nations Proposals on Environmental Accounting

Thus, if the UN is successful in getting nations to adopt their proposals, all companies can be expected to increase their financial disclosure within the current financial statements whilst *also* being required to provide statements of environmental policy and statements of environmental performance. This last would almost certainly follow the general sort of direction suggested for the statement of compliance-with-standard.

The *Compliance-with-Standard* approach to social and environmental reporting is derived from the concept of the accountability of the corporation to society (see below). At its simplest, the organisation would include a report (probably with the Annual Report) of the extent to which it had met the performance standards required of it. The standards would relate to (*inter alia*) emissions, spills, accidents, dumping, species habitat etc., and they would be derived from federal, national or supra-national law, regulatory body consents and standards set by trade associations.[18]

This approach to reporting is not only theoretically sound but there have been a number of experiments in this direction. The most notable of these in the 1970s was the Philips Screw Report in the USA, although in the UK the Social Audit Ltd used the concept to great effect in their social audit reports. Environmental reporting initiatives in the early 1990s are certainly headed in this direction.[19] In practical terms it seems that a compliance-with-standard (CWS) report must consist of a summary report plus more detailed data available to serious enquirers.[20] An idea of how a CWS Report might look is given in Figure 4.

The United Nations proposals taken together with the CWS Report represent current best estimates of the way in which environmental reporting could develop in ways commensurate with both the practical constraints on corporations and the demands of environmental accountability.[21] However, it is essential to note that this *is* only environmental reporting, it is not reporting for sustainability. Whilst such reporting (and the other suggestions in Figure 2) could most usefully guide corporations and external participants towards more environmentally sensitive – and, thus, less un-sustainable – activity, there is no element of such reporting which will link the concepts and demands of sustainability with corporate activity. For that, it is necessary to take further, more intrusive – or even radical – steps.

This is what suggestions 9 and 10 in Figure 2 are directed towards. That is, reporting for sustainability requires two major elements. First, it must be explicitly directed towards sustainability – the connection between activity and sustainability cannot be assumed. Second, the *actual* sustainability of actions cannot be known.[22] Sustainability involves trade-offs and personal valuations. Corporations cannot be expected to either know the ultimate sustainability of their actions or, necessarily, to act sustainably on behalf of future generations. Therefore any reporting for sustainability must involve transparency and accountability. That is, it must be society in the widest sense that makes the choices – not just management and financial participants.

AREA OF STANDARD	1990 LEVEL	1990 STD	1991 LEVEL	1991 STD	SOURCE OF STANDARD	DESCRIPTION
Ground Water:					NRA Consent levels	(e.g.) X dies when BOD exceeds Y
Discharge 1						
Character a:	w	a	y	c		
Character b:	x	b	z	d		
Discharge 2						
Discharges to Mains: etc....						
Discharges to Air: etc....						
Disposal of Wastes: etc....						
Discharges to Sea: etc....						

FIGURE 4
An example of an Environmental Compliance-with-standard Report Summary

In order to develop these notions it is necessary to first examine the concept of sustainability before moving on to consider the reporting framework for corporate reporting and the implications of accountability and transparency. Only then, can we consider what reporting for sustainability might actually look like.

4. THE NATURE OF SUSTAINABILITY

> … a large selection of quotations from recent writing on sustainability shows that there is no general agreement on exactly what sustainability means. This fuzziness is useful in forging a consensus to promote sustainable development but it also obscures

> the political, philosophical and technical issues that still remain unresolved from the "environment versus growth" debate of the early 1970s. (Pezzey, 1989, p1)

Pezzey goes on to show where the agreements and disagreements lie. The essence of the problem is the extent to which one believes (or is willing to believe):

(i) that what (western, business) man conventionally considers to be success – growth, profits, economic activity, conventional material well-being etc. – derives ultimately, not just from man's activities, but from the physical environment; and,

(ii) the extent to which that physical environment can continue to support the activities which have generated these things.[23]

At one extreme we have conventional economic theory which assumes that all wealth derives from man and the use of (generally) unlimited resources. This theory is embedded in our ways of thinking about business and economies and leads to the assumption that continued economic growth is an inalienable right and duty which must not be challenged on any grounds. This extreme position is further bolstered by a touching faith in the ability of markets and technology to solve problems. Thus the current panoply of environmental concerns are seen as neither systemic nor critical. Under this view, humanity can carry on doing exactly what it is doing although there is some necessity for sticking-plaster solutions to mitigate the worst of the immediate environmental concerns. This is the 'business-centred' or 'economics-centred' view and it is widely disseminated through political, economic and business writing. It needs no further illustration here.

At the other extreme, and working from exactly the same data, is the view that humanity is likely to be extinct within current lifetimes and that the planet the race leaves behind will be a badly-wounded cess-pit. That is, the environmental concerns *are* systemic and critical. The issues listed in Figure 5, for example, are connected, worsening and critical. Furthermore, despite an apparently growing concern with environmental management they are continuing to get worse and will do so for the foreseeable future. This extreme view sees the current activities of mankind as profoundly *unsustainable*.

The problem is that neither extreme view is provable – except *in extremis*. Therefore, if we are concerned with practicable action as a way forward we must try and find some realistic middle-ground that can be articulated in ways that enable real-world policy to be derived from it. There are a group of environmental economists – including Daly, Pearce and Turner – who have sought to do just this and whose work is widely recognised as occupying a 'reasonable middle ground'.[24] It is their views of sustainability which will be used here to enable us to move forward.[25]

Pearce *et al.* have produced what is probably the most widely quoted and

Most environmental pressures are increasing exponentially. Thus mankind is faced with an accelerating:

- rate of ozone depletion;
- rate of species extinction;
- rate of habitat depletion;
- rate of increase in technological catastrophe and scientific ignorance;
- desertification;
- deforestation;
- incidence of acid rain;
- depletion of fishing stocks;
- decline in the planet's waste-sink-absorption capacity; erosion of soil;
- pressure on water resources;
- rates of poverty and starvation;
- rate of usage of non-renewable resources;

etc., etc.

FIGURE 5
Some examples of Curent Environmental Pressures

accepted principle of sustainable development:

> … the necessary conditions as 'constancy of natural capital stock'. More strictly, the requirement as for non-negative changes in the stock of natural resources such as soil and soil quality, ground surface waters and their quality, land biomass, water biomass, and the waste assimilation capacity of receiving environment. (Pearce *et al.*, 1988; quoted in Pearce *et al.*, 1989)

Pearce *et al.* and then Turner further developed this by employing the concepts of 'capital' and we can relate this to Daly's work using the concept of 'income'.

The 'capital' available to humanity can be thought of as falling into three categories:[26]

- 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.

The general point is that man-made capital (which is largely covered by priced transactions and thus is dealt with and measured in conventional economics and accounting) is created and expanded at the expense of the natural capitals. It is man-made capitals that are measured by GNP and by profit, and which western capitalism has been excessively successful at creating and expanding. But, as man-made capital expands so it becomes almost inevitable that the natural capital *must* decline – unless some way of managing sustainably can be found. 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.[27] Under current economics and accounting that cannot happen. Further, Daly's point (which can be added to this analysis) is the commonly accepted notion in economics, business and accounting that prudent behaviour suggests we only take as income that which is left over after maintaining our capital intact – capital maintenance. What we currently measure as 'income' does *not* leave our *natural* capital intact – it leaves it depleted. It must follow, therefore, that our measure of income is wrong and the level of consumption that we have enjoyed has been paid out of capital. Sustainability requires that we maintain our capital and only spend the income that allows us to do so.[28]

The operationalisation of a concept as complex as sustainability is bound to over-simplify the concept and, perhaps, lose some of the essential ingredients in the process. As societies show no inclination to revert to a level of peasant existence where sustainability is much easier to achieve, it is necessary to devise some method that can be seen to approximate the concept of sustainability in a practical way within our current institutional and structural arrangements. This is what Pearce, Turner and Daly achieve. The concepts can then be translated to a corporate level. This is where *accounting and reporting for sustainability* can perhaps help and to which the last section of this paper is directed.

But before suggesting some ways in which organisations might account for and report their (non-) sustainability, it seems essential to consider the actual

institutional arrangements for reporting. Without a serious appraisal of these arrangements there is the very real danger that there may be no actual change in reporting practice or else that matters will simply become so trivialised as to be irrelevant. A major reason for this is that systematic environmental reporting for sustainability cannot sit easily and comfortably within current reporting arrangements and practices.

5. THE CURRENT FRAMEWORK OF CORPORATE REPORTING

Current reporting by corporations is, in the main, a highly regulated activity governed by law and professional pronouncements. In the majority of large corporations, the regulated, and principally, financial data is augmented by voluntary reporting. This voluntary reporting consists, again in the main, of information that it would appear the corporate management wish the readers of the report to know about. This is dominated by general operational information, explanations of downturns, fanfares for successes and general image-related data on products and processes. (Of course, there is also social and environmental data but, beyond legally required disclosure this tends to vary between corporations, vary over time and to be, on average, less than half a page of the annual report.[29]) The dominant audiences for the annual report are presumed to be the financial constituents – mainly the investors but also, it would appear, investment analysts, prospective investors, bankers and other financial (and to an extent, trade) creditors.

As I have already stated above, there is no evidence to suggest that corporations as a whole will systematically report data which is difficult and which has a potentiality to reflect negatively on the reporting entity. Furthermore, as also mentioned above, there is no evidence to suggest that the financial community has any interest in environmental data except insofar as that data reflects a potential financial gain or loss that the corporation might suffer in the future. Therefore, I can see very little evidence that would suggest that corporations would voluntarily undertake (or that the 'market' would encourage them to undertake) significant, systematic reporting that might reflect badly on the organisation and/or have negative financial consequences. This may seem pessimistic with respect to the potential for voluntary reporting for sustainability but the current reporting framework is generally assumed to be related exclusively to financial gains and losses. This has become more and more the case as the older concepts of 'stewardship' have been pushed out by talk of 'efficient capital markets' and 'the information needs of investors'.

There would, therefore appear to be a series of conundrums. First of all, *if* we assume that 'markets' are efficient and that they will respond to new information and thus allocate funds to those companies with the best prospects, then reporting by corporations about their environmental activities and the extent to which they

are acting sustainably *might* influence the way in which capital is allocated in markets. *But*, we are in no position to assess, absolutely, how sustainable organisations are, *and* there is no evidence to suggest that corporations will supply the information voluntarily. How then could the markets react? And, critically, why should they act? There is obviously a need for the ball to be set rolling and all the evidence suggests that this has to be done through regulations.

Secondly, and equally critically (if perhaps more theoretically) the evidence suggests that (a) assumptions of market efficiency are overstated and are, in fact, acts of faith; and (b) that the purportedly efficient allocation of scarce resources through capital markets cannot be shown to be either allocatively efficient in particular or in society's interest in general – whether self-interest, short-term interest, long-term interest or anything.[30] Therefore, if we cannot show that financial information helps financial markets to allocate financial funds in a suitable way for the purpose of financial self interest we have little or no justification for the current rationale for accounting reporting by corporations.[31] There is certainly no evidence to suggest that markets *per se* will allocate environmental resources successfully.

Therefore, it seems to me that the current framework of corporate reporting cannot and will not accommodate the essential changes in reporting that are needed – whether we continue to talk of environmental reporting or talk of reporting for sustainability. For this reason, I believe that any reporting framework must take on board the concepts of stewardship and accountability – but not just to the financial community. This stewardship and accountability is owed to the financial community *and* to society, to communities and to future generations. Only a framework which acknowledges rights to information of a wider constituency can be assumed to encourage the new forms of reporting which are necessary. Furthermore, the very critical nature of the environmental problems that one is seeking to address plus the sheer complexity of the issues and the increasing level of ignorance of humanity's interaction with the biosphere do not lend themselves to the assumption of 'rational', allocative decision-making by selected groups of the privileged, (as is assumed by the traditional financial reporting model). Information and decision-making must be *democratic* in the widest sense of the term because it is society as a whole which must make the choices and trade-offs that are essential in the path to sustainability. The concept of accountability can acknowledge easily that all of society have rights to information about actions taken on their behalf. This is then developed as organisations become more *transparent***.** That is, information is used to reduce the distance between the organisation and external participants so that society can 'see into' the organisation, assess what it is doing with the resources that determine future options and react (or not react) accordingly.

Because there *will*, as Pezzey[32] concludes, be tradeoffs that have to be made if sustainability is to be pursued. Thus, it is surely absolute nonsense to argue that the West can carry on expecting the same continuing rise in our standard of

material well-being whilst profoundly reversing the direction of our impact on the biosphere. If it *can* be done, nobody has yet explained how. Not only do we need more knowledge about these things but society will have to be informed, through reporting, about the extent of the issues at stake.

It is not likely that corporations will find such a prospect attractive. However, if this accountability and transparency can be accepted, then the corporation will find itself (depending upon how you look at it) more closely in tune with its wider constituents or under considerable pressure from employees, consumers, communities and society through democratic processes. This, rather than the financial interests of investors will produce the forces that are necessary to help corporations move towards sustainability.

Much more could be said about these matters[33] but for now it seems that enough has been said to illustrate that there is some hard thinking and bargaining to be done and, perhaps most importantly from the position of this paper, there is at least some significant doubt as to whether the conventional accounting and reporting frameworks currently in operation have anything to offer.

If we can assume that there is at least a will to regulate in order to bring corporations more in line with concepts of accountability, then we can now turn to look at some ways in which we might account for and report upon an organisation's sustainability.

6. REPORTING FOR SUSTAINABILITY

Ultimately, reporting for sustainability must consist of statements about the extent to which corporations are reducing (or increasing) the options available to future generations. This is a profoundly complex, if not impossible, task. However, there do appear to be three major ways in which any organisation could try and approximate this in a fairly practicable and systematic way which would potentially lend itself to reporting. These are the Inventory Approach and the Sustainable Cost Approach – which are both based around the categorisation of man-made and natural capital discussed earlier – and the Resource Flow-through/Input-Output Approach, which is more general. (In a broad sense, one might bear in mind that the first two are attempts to report *about* sustainability whilst the last is an attempt to move towards reporting *for* sustainability.) These will be briefly examined in turn *but* it must be stressed that each is still very experimental.[34] Until corporations are willing to work alongside researchers with these exploratory models, it is inevitable that they will remain experimental. It should also be recalled that no reporting can take place until it has a related accounting/information system to back it up and supply the data. Finally, it should be recalled that the thinking behind the reporting I have discussed in this paper is related to providing information to which society has a right, which will enable society – in the broadest sense – to make judgements about the activities

of its organisations. It is, thus, an utterly *democratic* approach which sees accountability in general and sustainability reporting in particular as part of the dialogue between a society and its organisations.[35]

The Inventory Approach is concerned with identifying, recording, monitoring and then reporting, probably in non-financial quantities, the different categories of natural capital and their depletion and/or enhancement.[36] The different elements of: critical; non-renewable/non-substitutable; non-renewable/substitutable; and renewable natural capital which could be thought of as being under the control of the organisation would first be identified by the corporation. These, plus changes therein, likely impacts upon and steps to mitigate effects or replace/renew/substitute the elements involved, could then be reported. Figure 6 provides a tentative illustration of the way this might look.

As with the Compliance-with-Standards (CWS) Report discussed above, there may well be a need for some means of providing summaries but with detailed back-up data available to serious enquirers. Also, as with the CWS Report, there is a critical need for corporations to engage with researchers in experimenting about the feasibility of the approach and working out methodologies.

The second of the approaches to *accounting for sustainability* mentioned above is the Sustainable Cost Approach. This is easier to explain but may very well prove to be exceptionally difficult in practice. Its attractions though are that it can fit within current reporting practice, it *is* a simple concept and the accuracy of the actual sustainable cost is probably not important.

The notion of sustainable cost derives directly from accounting concepts of capital maintenance and the need, within all the definitions of sustainability, to maintain the natural capital for future generations. Translating the most basic concept of sustainability to the level of the organisation we could say that *a sustainable organisation is one which leaves the biosphere at the end of the accounting period no worse off than it was at the beginning of the accounting period.* It must be the case then that the vast majority, if not all, organisations do not comply with this. The extent of this 'failure' can be quantified. That is, it is theoretically possible to calculate the amount of money an organisation *would* have to spend at the end of an accounting period in order to place the biosphere back into the position it was at the start of the accounting period. We are, thus, dealing with a *notional* amount but one which is based on *costs* not *values.* The resultant number could be shown on the income statement as a notional reduction of profit or notional addition to operating expenditure. It is probable that the number would be very large and would wipe out any profit the organisation has earned in this (or any previous) year – dividends are, and have been, paid out of 'capital'. But broadly speaking, that is the 'right' answer. It is widely accepted that current organisational activity is *not* sustainable and the calculation of sustainable cost provides some broad 'ball-park' quantification of the degree to which this is the case.

CRITICAL NATURAL CAPITAL

OZONE DEPLETION: The level of CFC use/emission for 1991 was XXX (1990, YYY). The corporation is committed to total elimination of CFCs by 1995 and HCHCs by 1997.

TROPICAL HARDWOOD: The corporation has eliminated all use of tropical hardwood in its own processes (1990, YYY used). Supplier audits have established that all hardwood use by suppliers is from sustainably managed sources as accredited by ABC & Co.

GREENHOUSE GASES: **…** (See also Compliance-with-standards report on emissions)

CRITICAL HABITATS/SPECIES: **…**

etc.

NON-RENEWABLE/NON-SUBSTITUTABLE NATURAL CAPITAL

OIL AND PETROLEUM PRODUCTS:

Product 1 - use, comparative figures, plans for reduction or substitution, funds or efforts expended to provide substitutes;

Product 2 - ditto, etc.

OTHER MINERALS AND MINERAL PRODUCTS:

etc.

NON-RENEWABLE/SUBSTITUTABLE NATURAL CAPITAL

ENERGY USAGE: Use details, changes in usage, plans to change, efforts towards renewable sources.

DISPOSAL OF WASTES: Levels of wastes produced and types, changes and plans.

Efforts towards (a) discovery and access to new sources of resources – typically minerals) and (b) extending longevity of use, repairability and recycling might appear here.

etc.

RENEWABLE NATURAL CAPITAL

TIMBER PRODUCTS: use, harvesting, recycling, etc.

Species Exploitation: ditto.

Habitat destruction/remediation:

LEISURE AND VISUAL ENVIRONMENT, BUILT ENVIRONMENT, WATER, AIR, NOISE, etc.

FIGURE 6
Inventory of X Corporation's Sustainability Interactions

This will not be a simple matter. First, any use of 'critical natural capital' will, by definition, have to be included at infinite cost because it is irreplaceable. Although that might be an uncomfortable conclusion it strikes me as being morally correct (and, perhaps, practically correct in terms of the survival of humanity). Second, while there may be a very large number of ways of replacing a part of the biosphere, there may equally be no simple way. (What, for example, is the cost of replacing a net-full of cod?) Third, there is no simple agreement on the level at which resources can be sustainably harvested. Third, the system, rather like Life-Cycle Assessment, involves an infinite regress, as each element in the calculation is dependent upon a set of earlier, prior environmental interactions. These are major practical problems and there is a real need to explore them in corporations but until organisations are willing to work alongside researchers on matters of this sort, basically simple ideas like sustainable cost will remain academic pipe-dreams.

The third and final suggestion for approaching the problem of *reporting for sustainability* is the Resource Flow/Input-Output Approach. This is derived from both a method well-established in economics and an approach used in many environmental audits. It is based upon a systems conception of the organisation and attempting to report the resource flows of the organisation. *It does not directly report sustainability* but provides a transparency to the organisation which focuses upon resource use. This is done in a way that will enable participants to assess resource use – and, ultimately, therefore the sustainability of the organisation's activities.

What one is seeking here is a catalogue of the resources flowing into an organisation, those flowing out of the organisation and the 'losses' or leakages (wastes and emissions, for example) from the process. Such an 'account' would again be quantified – probably in both financial and non-financial numbers (including the profit and other distributions generated). The non-financial numbers would, in many ways be the most useful being the most easily accessible and understandable but the use of financial numbers may help in providing summary data. Figure 7 is a tentative outline illustration of how a summary of this might look for a small hotel.[37]

Such a summary would probably need to be backed up by detail which analysed each of the categories and each category would need quantification – in simple numbers, in weights and measures or in financial numbers. Whilst perhaps *the* major problems with this suggestion are (a) it is cumbersome, and (b) it would probably be wholly unacceptable to organisations on the grounds of confidentiality, it is a method which organisations could use for internal reporting and *it does fulfil the requirements of transparency and of allowing society to make choices about resource use.*

The Resource Flow/Input-Output Approach has been independently pursued by Paul Ekins and *New Consumer* Ltd. Their approach is much more sophisticated and is far more refined and developed than the approach described above.

INPUTS		LEAKAGES		OUTPUTS
Brought f/d	Loss/Theft Breakages	Emissions	Wastes	Carried f/d
Building				Building
Fixtures	Deterioration			Fixtures
Furniture				Furniture
Fittings				Fittings
Fumishings	Deterioration			Furnishings
Sheets				Sheets
Crockery	Breakages			Crockery
etc.				etc.
Additions to Non-consumables				
Repairs				
New sheets			packaging	
New crockery			packaging	
etc.				
Consumables				
Meat			scraps	2700
Groceries			packaging	BED-NIGHTS
Canned food			cans	
Canned drink			alu cans	
Milk			bottles	
Bottled drink			bottles	
Cleaning materials		sewage	plastics	
Electricity		heat		
Oil		gases, heat		
Gas		gases, heat		
Car miles		gases		
Laundry		water		
etc.				PROFIT/ LOSS
				TAXATION PAID

As far as possible all inputs, leakages and outputs would be described and/or quantified.

FIGURE 7
Resource Flow Statement for XYZ Lodge Ltd (Extract)

Under the *New Consumer* proposal, the resources used by an organisation/product and their flow is further separated into their source of origin, their function in the organisation and their ultimate destination. The idea is to produce product/organisation data sheets which can provide references for consumers and others wishing to assess the potential sustainability of an organisation or product they intend dealing with, (similar in intent to life-cycle assessment). Yet again, the idea is experimental, and the data shown in Figure 8 (taken from a 1990 New Consumer Ltd Research Proposal) has been collated from the public domain.[38]

In its concern with transparency, with informing the public and allowing society to decide, the New Consumer Approach is clearly not a reporting *of* sustainability but a move towards reporting *for* sustainability.

At the time of writing, these three broad suggestions represent the full extent of the methods for reporting for sustainability of which I am aware.[39] We are therefore in a period when experimentation and research are critical. Until organisations take that need more seriously than they appear to be doing at present we must, of necessity, continue to work for, buy from and own organisations which are blatantly un-sustainable. There is only one conclusion to such practice.

7. SOME WAYS FORWARD?

The foregoing has attempted to demonstrate that (*inter alia*):

- whilst *environmental reporting and reporting for sustainability* are clearly related concepts there is quantum difference in their scope, focus and impact;
- environmental reporting has been experimented with for many years (under the guise of 'social reporting') and, thus, there is a wide although patchy experience from which to learn;
- the current conventional reporting framework offers no likelihood of organisations voluntarily producing – on a widespread and systematic basis – environmental reporting of any seriousness.
- the proposals for reporting for sustainability are embryonic and research and experimentation is critically needed;
- no organisation, to my knowledge, has approached, or is likely to approach, reporting for sustainability in the foreseeable future; and
- if reporting for sustainability is to be any more than a rather comforting form of arm-waving, a substantial regulatory initiative will be necessary.

So the question arises – assuming that the pursuit of sustainability is a genuine

EMULSION PAINT DULUX, ICI		Raw materials/ Extraction	Processing/ Manufacture	Packaging	Use	Disposal
RESOURCES	Renewable	Water Brine Sulphur dioxide Hydrogen sulphate	Chlorine gas Sulphuric acid			
	Non-renewable	Titanium dioxide (ilmenite, rutile) Oil (Acrylates) Mercury	Oil (Acrylates) Gas Coal (coke)	Metal (tin) Oil (Plastic)		Chalk (to neutralise metal salts)
WASTES	Emissions		Acrylic acid Sulphuric acid Chlorine gas Sulphur dioxide			
	Pollution		Acrylic acid Sulphuric acid Chlorine gas Sulphur dioxide			Sulphuric acid Heavy metal salts
IMPACTS	Global services					
	Species/ Eco-systems	Mining (open cast & dredge)				Marine life Marshland
	Amenity	Mining (open cast & dredge)		Landfill sites		Landfill sites
POLICY	I		Tioxide to spend £220m over 5-10 years on environmental improvements. ICI spends 10% of the capital cost on safety and environmental protection			
	II		ICI's initiatives include developing alternatives to CFCs, Aquabase car paint and Biopol – a biodegradable plastic			

FIGURE 8
Example of Ekins/New Consumer Sustainability Report Proposal
(© *New Consumer Ltd*, 1990)

FIGURE 9 (opposite)
Steps in Environmental Accounting and Reporting

POLICY

- Statement of environmental policy (or steps being taken). The Valdez Principles are the current State of the Art.
- Steps taken to monitor compliance with policy statement.
- Statement of compliance with policy statement.

PLANS AND STRUCTURE

- Structural and responsibility changes undertaken in the organisation to develop environmental sensitivity (e.g. VP of environment; committees; performance appraisal of line managers).
- Plans for environmental activities – introduction of Environmental Impact Assessment; Environmental Audit; Projects; Investment Appraisal criteria; etc., etc.
- Talks with local green groups; plans to work with community etc., etc.

FINANCIAL (The best initiatives here are covered by UN papers 1991/5)

- Amount spent on environmental protection – capital/revenue; reaction to/ anticipation of legislation; voluntary/mandated; damage limitation/pro-active (enhancement) initiatives.
- Anticipated pattern of future environmental spend – to meet legislation, as voluntary; capital/revenue.
- Assessment of actual and contingent liabilities (e.g 'Superfund' type problems); impact on financial audit; impact on financial results.

ACTIVITY

- Compliance with standards audits, procedures for, results of and issuance of compliance with standards report.
- Environmental audit and issuance of summary/results.
- Physical units analysis on (e.g.) materials, waste and energy.
- Analysis of dealings with regulatory bodies/fines/complaints.
- Awards/commendations received.
- Analysis of investment/operating activity influenced by environmental considerations.
- Analysis/description of voluntary projects undertaken (e.g. tree planting; schools liaison).

SUSTAINABLE MANAGEMENT

- Identification of Critical, Natural Sustainable/Substitutable, and Man-Made Capital under the influence of (not necessarily'owned' by) the organisation.
- Statement of transfers between categories.
- Estimates of sustainable activities.
- Estimates of 'sustainable costs' which would have to be incurred to "return the organisation (and thus future generations) to same position as they were in before the activity".
- Assessment and statement of input/output resource-flows and changes therein.

An alternative or complementary reporting form might recognise the different dimensions of environmental impact – such as resources used; emissions; waste energy; products; transport; packaging; health and safety; toxic hazards; biosphere; built environment; visual environment; community interaction.

one – how might we move forward from here? Currently, to all intents and purposes, environmental reporting is little more than the slightest of murmurs worldwide and reporting for sustainability is non-existent. Therefore, any developments in environmental or sustainability reporting would be progress – if such developments did not prevent further development through a mis-placed sense of achievement and complacency.

A number of references have been made to current or past experiments which are in the public domain and, further, a number of specific suggestions have been outlined here. These are more than enough to provide ideas and guidance for any organisation looking to start the process towards sustainability reporting. It seems to me, that organisations might well find it easier if they took discrete steps towards the goal, passing through simple forms of light green reporting, through financial reporting and onto CWS reports, eventually coming to the challenge of reporting for sustainability. Figure 9 provides a minimal checklist that might aid an organisation embarking on this process.

It would be nice to believe that organisations and the 'market' will voluntarily move organisations towards much greater reporting and disclosure about their environmental impacts and about the degree of their sustainability. There is really no evidence to suggest that this will actually happen. Insofar as voluntary efforts are making progress (as, for example, with the ICC Business Charter for Sustainable Development) the progress is not leading to substantive reporting – at least not yet – and the initiatives themselves are remarkably cautious and timid in the face of the enormity of the issues. It would be very nice to be proved entirely wrong but it seems to me that the most crucial step forward, the pre-requisite for other steps, must be a major initiative by an influential (perhaps regulatory) body establishing the need, beyond question, for substantial, systematic reporting that approaches the question of whether or not an organisation is acting sustainably. Without this, the world's organisations will continue to be patently un-sustainable. There is no future in that.

NOTES

[1] In what follows, I acknowledge the considerable influence of Tony Clayton, The Centre for Human Ecology and The Institute for Policy and Development and their work on the operationalisation of the concept of sustainability. I also acknowledge the considerable support of the Chartered Association of Certified Accountants for the research into environmental accounting upon which much of the enclosed is based. An earlier version of this paper was commissioned by and presented to the International Institute for Sustainable Development.

[2] United Nations World Commission on Environment and Development 1987.

[3] The following is adapted from Laughlin and Gray 1988.

[4] For more detail see Gray, Owen and Maunders 1987, Estes 1976, Johnson 1979, Belkaoui 1984.

[5] The evidence suggests that the overall *average* level of social and environmental

accounting and reporting did not actually alter much – one simply saw an upsurge in 'outliers', one-offs who undertook major initiatives or particularly interesting experiments. For more detail see Gray 1990b.

[6] For more information on environmental reporting initiatives in the UK see Owen 1992 and Owen and Harte 1991.

[7] European companies like Norsk Hydro, BSO/Origin, The Body Shop, Rhone Poulenc etc. all have their counterparts in earlier experiments by North American companies like Philips Screw, Clark C. Abt, First National Bank of Minneapolis, Eastern Gas and Fuel Associates and so on. For more detail see Gray, Owen & Maunders 1987; Owen 1992, Gray *et al.* 1993.

[8] For more detail see, Gray *et al.* 1987; Owen *et al.* 1987; Mathews 1987; Mintzberg 1983.

[9] For more detail on ethical funds, and the green funds in particular, see Harte *et al.* 1991, Owen 1990, Burman 1990, Rockness and Williams 1988.

[10] There are exceptions to this, but explanations can usually be found. For example, the Atlantic Richfield social/environmental report, one of the best in the mid-1970s, contained data which did not necessarily show the organisation in a good light. The Atlantic Richfield company had recently experienced a major environmental disaster. This echoes the Norsk Hydro case – a company who have produced a most wide-ranging report that contains data detrimental to the company. The company had experienced a recent environmental disaster in Norway. Such negative explanations cannot always be found of course but it is noticeable that those more 'honest' social and environmental reports were rarely repeated for more than a year or two.

[11] For example, the USA experience with Superfund is being echoed in the European experience. Increasing numbers of organisations recognise that the EC moves towards freedom of information, environmental audit and corporate liability to clean up environmental damage will have a significant impact on the legislative framework of external reporting. Further, major reporting initiatives from companies such as Norsk Hydro, British Petroleum, Dow Chemicals and BSO/Origin have updated the standards in voluntary external reporting. More detail on these matters can be found in Gray 1990b, Gray *et al.* 1993 and Owen 1992.

[12] See Roberts 1991 for a European view and, for a more global perspective, see UNCTC 1992.

[13] The most popular 'off the shelf' policy statements are the Valdez Principles and the ICC Business Charter for Sustainable Business.

[14] See, for example, recent Annual Reports or supplementary reports from Sainsbury's, Allied Lyons, Ciba-Geigy, Sandoz, British Steel, Hoechst, ICI, Rhone Poulenc, British Gas.

[15] This approach is less popular but British Nuclear Fuels Ltd and a number of the UK Water Companies have adopted an approach something along these lines. ICI is moving in this direction and the Chemical Industries Association is encouraging this form of reporting.

[16] Examples include ICI, RTZ and Glaxo in the UK.

[17] For example, the EC's investigation of and proposals for a 'European Superfund Act' force European companies to follow the USA lead in disclosure of environmental contingent liabilities.

[18] For an introduction to these ideas see Gray *et al.* 1986, 1987. The relationship with concepts of accountability is developed more fully in Gray *et al.* 1988 and 1991.

[19] See, for example, Gray *et al.* 1993.

[20] This seems necessary because of the sheer complexity of many organisations and the dangers that any accessible summary may over-simplify complex matters. Thus the British Nuclear Fuels Ltd report is really very complex for the lay-person whereas the summary data they report gives a much quicker impression.

[21] This is perhaps graphically illustrated by the high degree of agreement between recommendations for environmental reporting from groups as diverse as the UK 100 Group of Finance Directors, the UK's Advisory Committee on Business and the Environment, The Institute of Chartered Accountants in England and Wales, The Chartered Association of Certified Accountants Environmental Reporting Awards and the Society of Management Accountants of Canada.

[22] It is this which has led Ekins and Hueting to recommend attempting to calculate un-sustainability and to measure movements towards and away from un-sustainable activities. See Gray *et al.*, 1993, Ch.14.

[23] Two points should be emphasised here. *First* this analysis will, in common with much of the concern with environmental issues, be anthropocentric. That is, we look at the problem from the point of view of the environment's ability to continue to support human life and 'value' the environment in human terms. That is we do not give other life forms and the planet itself any rights or value independent of man's existence. This is a narrow view (for more detail see, for example, Maunders and Burritt 1991; Lovelock 1982; 1988). *Second*, this analysis is also very western-centred – also in common with most commentators on the subject. When the gross inequalities between peoples are considered and the role that environment plays in them, the subject becomes more complex still, see, for example, Angell *et al.*, 1990. I would suggest *any* allowance of these two factors must make the pursuit of sustainability more radical and threatening to western humans' ways of living.

[24] Examples of their work are included in the bibliography at the end of this paper. The political and intellectual dangers of seeking a 'middle ground' are well argued in Tinker *et al.* 1991.

[25] I should be honest here and mention that I personally subscribe to the second of the 'extreme views'. Furthermore, although the work of Daly, Pearce and Turner is excellent and very important in many ways I have profound doubts about some of its basis, see, for example, Gray 1990f, 1992.

[26] Sustainability is, of course, a concept rather wider than just the physical environment. It refers to ways of life, societies and communities and the general quality of life of humanity. Included in what follows there should also be, therefore, reference to 'social' capital – qualities of lives, education, culture, built environment etc. The analysis without these things is difficult enough and I, in following Turner and Daly, have also left them out. Most 'deep greens' see sustainability as embracing these wider social and it must be said, spiritual concepts, through a re-aligning of western values and the pursuit of smaller community levels of activity.

[27] One point of departure from the economists' approach would be the notion that one *can* substitute for natural capital. Whilst, for example, the energy use in coal non-renewable natural capital could be substituted by the energy use of solar panels man-made capital there is no way in which the total 'use-value' that future generations may derive from coal can be known. Until that is known, future generations cannot be compensated for our use of their coal. Other aspects of natural capital, species for example, cannot be substituted for. Attempts to put a financial value on all of the natural capital lead to arguments about how that valuation should be done, whether it is ethical and whether we really want to be

in a position to trade 'n' Mutant Ninja turtle toys for 'm' golden eagles. Finally, there is a critical problem of deciding what is really critical capital. For the 'deep green' observer,a considerable major proportion, if not all, of the biosphere is critical capital.

[28] For more detail see the references to Daly, Daly and Cobb, Pearce *et al.*, Turner, Turner and Pearce in the bibliography. See also Gray 1990e, 1990f, 1991 and 1992.

[29] This data is taken from Gray 1990b which is based upon a UK survey of annual reports over a ten year period. These results appear to be broadly consistent with practices in other countries. See also Owen 1992 and Gray 1993.

[30] This matter is expanded a little in Gray & Kouhy 1993 and Gray 1992.

[31] Gray & Kouhy 1993 develop this by referring to the many attempts by the accounting profession to develop a Conceptual Framework for accounting. They have all had two things in common – i they start from an assumption that the wants of investors are paramount in efficient capital markets, and ii they have been expensive but abject failures. Investors wants, governed by their own short-term financial self-interest, are not compatible with accountability, with stewardship, with any ethical argument or with any assumptions about the maximisation of social welfare. The current framework for accounting practice is therefore very hollow and no basis for the development of other forms of reporting. For more detail, see, Gray, Owen and Maunders, 1986, 1987, 1988, 1991, Gray 1991 and 1992.

[32] Pezzey 1989 is probably the authoritative study of definitions of sustainability.

[33] For more detail see, Gray, Owen & Maunders 1987, 1988, 1991 and Gray 1990d, 1990e, 1990g and 1991 .

[34] And there are other experiments going on in, for example, Canada and New Zealand, which have yet to produce anything that looks like a corporate reporting approach. These are yet early days though.

[35] This should not be confused with a development of the mid-1990s in which companies began to label sections of their Annual Reports 'sustainable development'. These varied between genuine attempts to acknowledge the frightening challenge of sustainability for most corporations through to trite misinterpretations of the term in order to capture and control the term.

[36] The only experiment in this area so far of which I am aware is that undertaken in New Zealand with regard to Local Authority reporting.

[37] The approach taken here has a very similar intellectual heritage to the German and Austrian attempts at Okobilanz. The hotel referred to in the text is an actual organisation and the example is used because it allowed access and a degree of experimentation with its resources and flows.

[38] I understand that funding and access are preventing the experiment from being further developed at this stage.

[39] There has also been a UN CTC funded experiment in Canada involved with a forestry company undertaken by Dan Rubenstein. To a large degree that experiment attempted to combine all three elements above. Its practical implications are still being worked out.

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