

Fostering the Adoption of Environmental Management with the Help of Accounting: An Integrated Framework

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1 Introduction

Corporate social accountability has been widely discussed in the recent past though it can be traced back to several centuries (Carroll & Shabana, 2010; Valor, 2005). The evident escalation of corporate power and influence together with recent corporate scandals call for more corporate accountability in regard to the social and environmental impact of organizations (Benn & Bolton, 2011). As a means of being accountable to a wider set of stakeholders, organizations pursue many environmental management strategies in addition to other strategies. The increasing attention of corporations to the environment has been triggered by many factors. Disastrous industrial accidents such as the Fukushima nuclear disaster caused by the recent Tsunami, the Bhopal gas leak, the reactor meltdown at the Chernobyl nuclear plant, the Exxon Valdez oil spill, among many others, have drawn increased media attention and public concern over their harmful impact on the environment as well on society. Climate change, nuclear waste, erosion, routine pollutants, and deforestation have become commonplace concerns while the scope and scale of environmental problems has expanded considerably over the past decades (Colby, 1991; Freeman, 2002; Xiaomei, 2004). This expansion has coincided with unprecedented growth in the scope and scale of human activities. Due to the changing business conditions that demand better environmental performance, corporations have employed many environmental management practices (Banerjee, 2001; Soonawalla, 2006; Sroufe, Montabon, Narasimhan, & Wang, 2003).

In parallel with these developments, there has been growing research on companies' environmental management practices (Delmas & Toffel, 2004). The extant literature has mostly focused on drivers of environmental management practices, development stages of environmental management strategies and the role of

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(environmental) accounting in managing information, etc. Yet, there is limited guidance on and analysis of how accounting can be integrated with the environmental development stages when pursuing environmental management strategies. This chapter aims to provide an integrated framework that would facilitate the adoption of environmental management with the help of accounting in pursuit of corporate social accountability.

With a view to postulating this integrated framework, the rest of this chapter is organized as follows: The chapter begins with an explanation of the broad drivers of the corporate environmental management agenda in the context of corporate greening. The next section discusses various environmental management strategies and their development. The chapter next moves on to discuss the importance of stakeholder management and engagement in these actions while emphasizing the need for better information management. This is followed by a discussion of the practical approaches available for environmental management. Then the role of accounting, as a means of facilitating and sustaining these practices, is discussed in detail. The integrated framework for the adoption of environmental management with the help of accounting is presented in the next section. The chapter concludes with a practical case study that demonstrates some of aspects of the framework.

2 Greening of Corporations

In the long historical development of corporate greening, the 1980s mark a period that attempted to integrate economic and environmental objectives of corporations (Robbins, 2001). The firms that pursued proactive green markets saw environment as an opportunity while others embraced environmental and social concerns in their business operations. These phenomena collectively gave rise to the greening of corporations. Atmosphere, chemicals and waste, freshwater, land, oceans, biotechnology and bio diversity have been recognized as the key environmental challenges faced by the corporations when greening the organizations. In recent years, firms have increasingly recognized the strategic advantage of superior environmental performance when dealing with environmental challenges (Gouldson & Murphy, 1998; Mross & Rothenberg, 2006; Robbins, 2001). Many organizations now devote substantial time and resources to environmental management practices with the aim of ecologically contributing to sustainable development (Buysse & Verbeke, 2003). In this context, environmental management practices are defined as formal systems that integrate environmental procedures and processes for the training of personnel, for monitoring and controlling environmental impacts and for summarizing, integrating and reporting environmental performance (Sroufe et al., 2003, p. 24). The adoption of these environmental management practices can be identified in relation to specific drivers. The next section describes these drivers.

Various internal and external forces create pressure on corporations to pursue environmental practices (Delmas & Toffel, 2004; Mross & Rothenberg, 2006). Taking this view, researchers have grouped the drivers of environmental

management practices broadly into external and internal. External factors include regulations, competitive forces and other stakeholder influences while internal factors include organizational context, design, learning, individual or managerial level, leadership values and managerial attitudes (Berry & Rondinelli, 1998; Mross & Rothenberg, 2006; Qi, Zeng, Tam, Yin, & Zou, 2013; Sroufe et al., 2003). As a crucial external driver of environmental management, environmental-related regulations have received much attention (Henriques & Sadorsky, 1996; Newton & Harte, 1997; Porter & van der Linde, 1995). According to Porter and van der Linde (1995), stringent environmental regulations are needed to introduce better environmental management practices. They suggest that (properly crafted) environmental regulations can direct attention to resource inefficiencies and potential technological improvements, improve corporate awareness through information gathering, reduce the uncertainty in investments, motivate innovation and progress, etc. Highlighting the limitations of volunteerism, Newton and Harte (1997) put forward a similar argument calling for state intervention. Similarly, Henriques and Sadorsky (1996) have empirically identified that government regulation is the single most important source of pressure on firms to consider environmental issues among other forces such as customer pressure, shareholder pressure, community pressure, etc.

The aforementioned forces create a need for corporations to respond to the environmental challenge (or opportunity) in different ways. According to Benn and Bolton (2011), early corporate environmental practices addressed the regulatory requirements, which fall into the command and control category. However, environmental management practices later shifted away from command and control laws to more market-based and voluntary approaches. Driven by these internal and external factors, organizations follow various environmental management practices. In an organization these practices evolve/develop over time. The next section of this chapter describes the models that can be used to analyze the development stages of corporate environmental management practices.

3 Corporate Environmental Management Development Stages

Sroufe et al. (2003), in an attempt to provide a framework for environmental management practices, categorize them into operational, tactical and strategic levels of a firm. In addition to this hierarchy level categorization, there are various models or frameworks which attempt to explain the corporate environmental management practices and their development stages. Among them, the environmental typology of Roome (1992) has received much attention (Buysse and Verbeke, 2003).

Roome (1992) suggests five strategic options available to business in shaping their response to the environmental challenge. These options are non-compliance, compliance, compliance-plus, leading edge, and excellence. The first three of these

options are set against the standards of compliance with legal requirements and social pressures. Non-compliance is an option arising from excessive cost, existing liabilities or even management inertia when faced with environmental challenges. However, it characterizes the lack of long term vision for a company and will not be sustainable due to the demands placed by legislation or social pressures. Organizations in the compliance stage will follow environmental management programs in a reactive response to environmental legislation. Hence it is a legislation-push strategy. However, the organizations in the compliance stage will face problems as legislation is more often reactive and deal with one problem at a time. Thus, legislation lags significantly behind the contemporary environmental agenda. These organizations will not therefore achieve any competitive advantage through their environmental management programs. The compliance strategies are based on management techniques and technologies required by legislation. These areas may include waste, pollutants, health and safety and waste water. However, the environmental impact of many organizations is not subject to environmental legislation and, even if it is, legislation will not demand changes in organizational structures and systems. When organizations move to a compliance-plus strategy the organizational response to environmental demand also transforms from reactive to proactive. The compliance-plus organizations will go beyond the current legal requirements and adopt environmental management programs based on a management-pull strategy. Unlike the compliance strategy, the compliance-plus strategy will demand changes in the organizational structures and systems.

The organizations in the next stage of development, i.e., the excellent companies, believe that environmental management is good management. These companies will follow core corporate and managerial values to achieve quality by managing their environmental impact and changing their conventional business concerns. This strategy also highlights a management-pull strategy. Excellent organizations will adopt clean technology techniques while changing their organizational structures and systems. When organizations move beyond excellence and reach leading edge status, they will set the standard for other businesses. Thus, leading edge represents a variant of excellent companies. According to Bhargava and Welford (1996), when organizations pursue/adopt excellent and leading edge strategies they could gain competitive advantage. When one carefully and broadly analyzes Roome's environmental management typologies, these strategies finally boil down to three typologies, i.e., compliance, compliance-plus and excellence.

Providing a somewhat similar analysis, Sakai (2007) suggests three sustainable environmental management views: (a) environmental correspondence, (b) environmental conservation and (c) sustainable environmental management. Organizations in the environmental correspondence stage passively correspond to external environmental pressures while those in the environmental conservation stage attempt to reduce the environmental impact of business activities with noble intent. The organizations in the sustainable environmental management stage actively reduce the environmental impact of a business while creating economic value as a business entity.

Corporate environmental management strategies have also been analyzed according to the natural resource-based view. Accordingly, Rugman and Verbeke (1998) and Buisse and Verbeke (2003) suggest that if the corporate strategy is supported by firm-level competencies (such as physical assets, employee skills, and organizational processes) sustainable competitive advantage can be gained. Taking this view, Hart (1995) suggests three types of resource-based environmental approaches: (1) pollution prevention, (2) product stewardship, and (3) sustainable development. Further, Buisse and Verbeke (2003) suggest a similar classification building upon Hart's (1995) resource-based framework. They suggest three dominant environmental management strategies: (a) reactive, (b) pollution prevention, and (c) environmental leadership. Buisse and Verbeke identify that many firms have already shifted from a reactive to a pollution prevention strategy while only a minority have adopted an environmental leadership strategy, of which many are MNE affiliates.

4 Support and Involvement of Stakeholders and Information Management

Irrespective of the level—early or advanced—of environmental management development, it is necessary to get the commitment of various stakeholders. Buisse and Verbeke (2003) are of the view that effective environmental management requires the identification of important stakeholders. It is therefore necessary to discuss briefly the stakeholder analysis of a firm. It was Freeman's (1984) landmark work that provided a solid and lasting foundation for many models, frameworks, and theories based on stakeholders although older references to the same concept have been found (Clarkson, 1995; Phillips, Berman, Elms, & Johnson-Cramer, 2010; Preston, 1990; Valor, 2005). In this regard, Clarkson (1995) distinguishes between primary and secondary stakeholders. Primary stakeholders are those without whose continuing participation the corporation cannot survive as a going concern. Thus there is a high level of interdependence between an organization and its primary stakeholders. Primary stakeholders include shareholders and investors, employees, customers, and suppliers *and* public stakeholders such as governments and communities. Secondary stakeholders are the stakeholders who influence or affect, or are influenced or affected by, the corporation, but are not engaged in transactions with the corporation. Therefore secondary stakeholders are not essential for the survival of an organization. They include the media and a wide range of special interest groups. However, they have the capacity to mobilize public opinion in favor of or against a corporation. Linking stakeholder analysis to environmental management strategies, Buisse and Verbeke (2003) identify that many companies attach the highest importance to regulators, especially firms with a pollution

prevention strategy. Also, they highlight the importance of environmental stakeholder management to the development of green competencies. The green competencies should be focused on making investments in green products and manufacturing technologies, employees, organizational competencies, management systems and procedures.

Some of the extant literature also highlights the importance of information management to improve corporate accountability when dealing with a wide array of stakeholders. Applications such as eco-control have highlighted the importance of information management for better stakeholder management (Schaltegger & Burritt, 2000) when carrying out a corporate environmental strategy. As a specific application of management control systems, eco-control helps organizations to measure, control and disclose their environmental performance by supplying information for decision-making to ensure the attainment of environmental objectives and to provide persuasive evidence in support of the benefits of such actions (Henri & Journeault, 2010). It is a function of the management information system to provide relevant and reliable environmental information for key decision-makers to make better decisions (Ilinitch, Soderstrom, & Thomas, 1998; Wilmschurst & Frost, 2001).

5 Pragmatic Guidelines for Corporate Environmental Management

Along with the growth of literature on the development stages of corporate environmental management and stakeholder management, there is a growing body of guidelines and standards to help managers. These guidelines have taken a pragmatic perspective in improving corporate social and environmental responsibilities and performance (Epstein & Roy, 2003). The guidelines vary widely both in terms of focus and aim. Having analyzed these wide sets of guidelines, Epstein and Roy (2003) suggested nine principles of sustainability which also include protection of the environment. Yet, most these guidelines do not provide a comprehensive and step-by-step approach to the implementation of environmental management strategies. The guidelines offered by Doody (2010) and Certified Management Accountant (CMA) (1995) attempts to fill this need by providing a comprehensive approach to the implementation of environmental management.

Implementing Corporate Environmental Strategies, issued by CMA (1995), provides practical operating principles to implement a corporate environmental strategy. Hence these guiding principles are used to improve environmental performance and to integrate environmental considerations into management decisions as highlighted by Roome (1992). It should also be noted that CMA, being an international management accounting body, attempts to give prominence to the

role of the management accountant through these guidelines. Accordingly, CMA emphasizes that the role of a management accountant is integral to planning (development of environmental strategy, policy, objectives and environmental measurements), analysis, and control. Understanding the interdisciplinary nature of environmental management strategies, CMA also stresses the role that a management accountant should be closely associated with other multi-disciplinary groups. CMA also suggests several essential elements to be included when designing an effective environmental strategy. These elements are grouped into three stages, stage one: managing regulatory compliance, stage two: achieving competitive advantage, and stage three: completing environmental integration. According to CMA, companies will move from one stage to the next but in many instances organizations will straddle the boundaries between these stages.

The organizations in stage one develop environmental management measures by acknowledging the financial implications of environmental matters and realizing the risks associated with current practices. Showcasing a similar pattern to what was discussed in the previous models, at this stage the development of environmental management practices is a reactive response to both external and internal pressures. These organizations will adopt measures such as obtaining top management commitment, *and* developing an environmental policy, action program, management system and audit program. In stage two, the focus of environmental management extends beyond simply complying with regulations to improving resource efficiency and profits. These organizations realize that implementing proactive environmental programs can enhance their corporate image, which will in turn increase their market share. In order to derive competitive advantage, organizations should develop an external environmental reporting strategy, design environmentally sensitive products/processes and integrate environmental information into the decision-making process. Thus, these organizations move from cost minimization to cost avoidance through life-cycle management and design for the environment. When the organizations further develop these practices, they will fully integrate the environmental strategy throughout the organization and into all management decisions. The stage three organizations will often introduce performance evaluation systems based on environmental impact considerations, generate revenue generation through environmentally oriented products and services, and follow the principles of sustainable development. These organizations have fully integrated environmental issues into everyone's day-to-day decision-making process since they recognize that long-term economic growth is that of environmental sustainability.

As highlighted in this section and the previous sections, information management is important in implementing environmental management strategies. The next section attempts to provide an overview of information management with the use of accounting in pursuing environmental management strategies.

6 Supporting Tools and Techniques for Environmental Management

As the stakeholders pay a high level of attention to the environmental performance of corporations, environmental information and measurement issues are becoming increasingly important (Ilinitch et al., 1998). Therefore organizations should use effective tools and techniques to support environmental strategies (Sroufe et al., 2003). Further, without greener accounting tools and techniques many environmental initiatives will not succeed (Gray, Bebbington, & Walters, 1993). Hence, in parallel to the increasing interest on the environment, the interest in accounting for the environment has increased (Burnett & Hansen, 2008). Wilmshurst and Frost (2001) suggest that accounting and the accountants can play a significant role in effectively implementing environmental management practices. In order to successfully implement the environmental management strategies it is necessary to bring the traditional functions of accounting to the environmental management process. Hence accounting skills such as measuring, recording, monitoring and verifying data become increasingly important (Gibson & Martin, 2004; Wilmshurst & Frost, 2001). In this context, environmental management accounting (EMA), an accountant's response to environmental challenges, can play a significant role in facilitating the sustenance of an integrated approach to environmental management.

6.1 *Environmental Management Accounting*

EMA is the identification, collection, analysis and use of physical information on the use, flows and destinies of energy, water and materials (including wastes) and monetary information on environment-related costs, earnings and savings for decision makers (United Nations Division for Sustainable Development (UNSD), 2001; Burritt, Hahn, & Schaltegger, 2002). It provides physical and monetary information regarding various environmental aspects for internal as well as external decision-makers. This leads to two types of EMA systems: physical EMA (PEMA) and monetary EMA (MEMA) systems. The EMA information provided by these two types of systems may cover three dimensions, i.e., time frame (past, current or future), length of time (short-term vs. long-term) and frequency (ad hoc vs. routine). Accordingly, Burritt et al. (2002) have suggested a comprehensive framework for EMA (refer Burritt et al. (2002) for more details on the framework). According to the framework, EMA encapsulates a wide array of accounting tools and techniques used for internal decision making such as accounting for energy, material flow cost accounting (MFCA), environmental capital budgeting, life cycle analysis, etc. Therefore, EMA is not an environmental management tool among others, but a broad set of principles and approaches that provide information for the successful implementation of environmental strategies (International Federation of Accountants (IFAC), 2005). It acts as an interface

between inward focused management accounting and environmental management strategies (Bennett, Bouma, & Walters, 2002). It should also be noted that the same information can be used to report to external stakeholders as well (Schaltegger & Burritt, 2006). Hence, EMA has an external information supply potential to facilitate corporate accountability towards a wider set of stakeholders. As described previously, EMA information is used for internal as well as for external reporting purposes (Deegan, 2003; IFAC, 2005). Due to the importance of the environment in every management activity, EMA is also becoming important for all types of management activities (Gibson & Martin, 2004).

6.2 *EMA Techniques*

There are many EMA tools and techniques that are continuously developing. Some of them are extensions to or adaptations of conventional management accounting tools and techniques while others are newly developed. In terms of sophistication, these tools and techniques range from simple to advanced. In this chapter, some, yet important, techniques are presented briefly. They are:

- Accounting for energy, materials, water and waste
- Material flow cost accounting
- Environmental capital budgeting
- Life cycle accounting
- Environmental activity-based costing
- Sustainability balanced scorecard

Please refer Appendix for more details on these techniques.

6.3 *EMA Benefits and Challenges*

When an organization follows EMA, there can be numerous uses and benefits, but they can be identified in relation to three broad areas. They are: ensuring compliance, supporting eco-efficiency and strengthening strategic position (Federal Environmental Agency (UBA), 2003; IFAC, 2005; Doody, 2010). These broad benefits are not mutually exclusive but interdependent. For example, suppose that a hotel installs a waste water treatment plant mainly to comply with environmental law. This is because it cannot simply discharge the waste water to the drainage system or to the nearby environment as per the law. The hotel uses the treated water of the plant for gardening purposes. Re-use of treated water saves water purchased from the municipal council giving economic benefits too. Further, the hotel can use its water purification plant and processes as a marketing tool to generate a favorable public image. It can be portrayed as a green hotel in the eyes of its stakeholders

which could strengthen the strategic position. (Refer the practical case study in this chapter for more details).

However, there are many challenges that could reduce the benefits of EMA. The available literature highlights the limitations of conventional management accounting practices as the main impediment to better adoption of EMA (Burritt, 2004; Gray et al., 1993; IFAC, 2005). The assumption of immateriality of environmental costs, lumping of environmental costs with general overheads, too narrow and short term performance appraisal techniques, exclusion of external considerations in investment appraisal, lack of focus on articulation of flow and stock, absence of accounting for externalities and social issues and dominance of financial accounting are some of the problems with conventional management accounting (Burritt, 2004; Fonseka, Manawaduge, & Senarathne, 2005; IFAC, 2005). In addition, underdeveloped communication links between accounting and other functions that collect environmental related information have also been suggested as another barrier (IFAC, 2005).

Having considered the EMA challenges and development stages of environmental management, the next section of this chapter provides the integrated framework that attempts to combine EMA and environmental management.

7 Integrated Framework for the Adoption of Environmental Management

7.1 The Need for an Integrated Framework

The existing literature on development stages of environmental management has so far failed to recognize the importance of environmental information management in propelling an organization to higher levels of development. On the other hand, the challenges to EMA are mainly caused and compounded by the lack of attention paid to the development stages of environmental management. EMA, the so called supporting tool for environmental management, has been developed and discussed in isolation without positioning it within the broad context of different conditions and requirements of environmental management development stages. Therefore the need for an integrated framework for the adoption of environmental management can be emphasized for two reasons: (a) the failure of the existing literature on the development of environmental management stages to recognize the role of accounting in the broader context of information management, and (b) the failure of the existing body of knowledge on EMA to develop EMA along with the environmental management stages. The repercussions of the lack of integration of these two aspects are evident. Many researchers around the world have revealed that the existing corporate environmental management programs and EMA practices have not been systematically and comprehensively implemented internally (Bartolomeo et al., 2000; Gunarathne & Lee, 2015; Lee, 2011). Thus, these existing practices are

largely fragmented and have been developed from time to time as a response to various internal and external factors. It is necessary for an organization to follow a structured approach to environmental management to generate competitive advantage. This requires an integrated adoption of EMA to support the environmental strategy of the firm (Godschalk, 2010). However, a systematic and comprehensive adoption of environmental management that fully integrates EMA has to evolve from its own experience after passing some of the early stages of implementation. This chapter aims to postulate a framework that guides companies to continuously develop and systematically adopt environmental strategies with the support of EMA practices over time to generate competitive advantage. The suggested framework is described in below.

7.2 *The Integrated Framework*

The various analytical models suggested by Roome (1992), Hart (1995), Buysse and Verbeke (2003), Sakai (2007) and practical implementation guidelines such as CMA (1995) finally hold similar views regarding the development stages of environmental management practices. Drawing from the available rich literature this framework also adopts a similar viewpoint suggesting three development stages of environmental management -compliance, conservation, and leading edge. All organizations will be initially compelled to be more environmentally sensitive by an internal or external force/s (compliance stage). Then these organizations will soon realize the conservation (cost saving) potential of these compelling actions and become more active in furthering these initiatives (conservation stage). They are finally propelled into a stage in which these practices become a part of their business through which they enjoy superior environmental and economic performance (leading edge stage).

The integrated framework is intended to be used at the organization level as it provides a micro level analysis of the main environmental management development strategies. The framework captures the development/movement of three key aspects of environmental management according to the development stages to demonstrate corporate social accountability (refer Fig. 1). These three aspects are:

- *Coverage of environmental domains/challenges*

The environmental domains reflect the subject matter of the environmental management action programs. Electricity, water, solid waste, waste water, emissions, pollution, bio diversity, etc are some of the environmental domains which can also be regarded as areas from which environmental challenges stem.

- *Support and involvement of stakeholders*

Stakeholder support represents a key success driver of environmental management strategies. Irrespective of whether the stakeholders are internal or external their support or sometimes active involvement will decide the degree of success of environmental management actions.

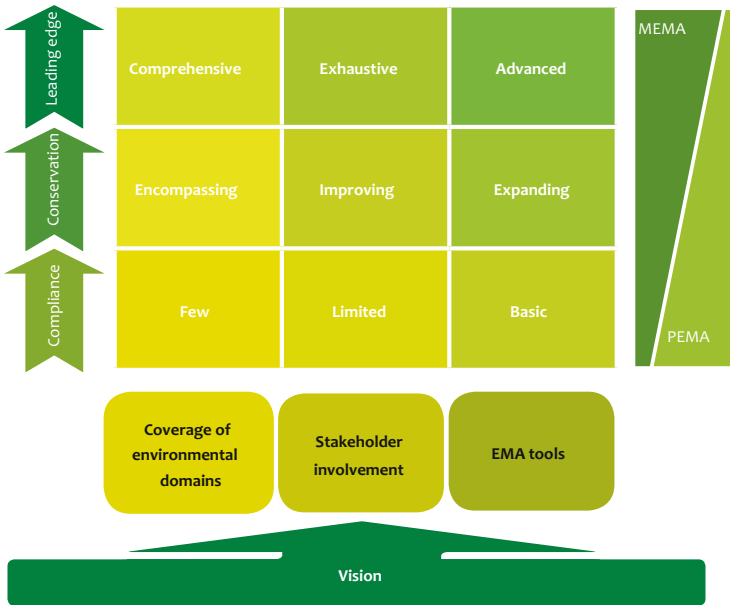


Fig. 1 An integrated framework for the adoption of environmental management

- *EMA techniques being used*

EMA techniques reflect information provision and management to a wider set of stakeholders. As mentioned previously EMA will be the thread that connects environmental strategies with stakeholders during the different stages of environmental management development.

The current framework is however not limited to the existing three-stage development models of environmental management. The arrow at the leading edge stage implies the potential for further development as and when the environmental challenges change. Crane and Matten (2007) also emphasize the need for continuous improvement in environmental management, referring specifically to broader sustainability as “the long-term maintenance of systems according to environmental, economic and social considerations (page, 23)”. Hence, it should be noted that the leading edge stage is not the most desired ultimate stage of development of environmental management but a desirable status in the current context. However, when the external and internal environment factors change, these practices will have to be adjusted and/or improved to withstand such challenges on an ongoing basis.

The framework provides an analytical tool for the three key aspects of the adoption of EMA along with the development stages. During the compliance stage, the coverage of environmental domains will be very few and limited to a single, but most important, domain such as energy, waste or even materials. These domains will be determined by the internal or external factor that triggered the

compliance stage. Since the environmental domains covered are few and environmental awareness is lacking, an organization will seek the support of key primary stakeholders initially. These key stakeholders can be, mostly, the employees. During this stage, organizations will adopt simple EMA tools such as accounting for energy, water or waste in order to facilitate its limited coverage of environmental strategies. During this stage, EMA system will often provide PEMA information and some monetary values as well.

In the next stage of the development of environmental management, i.e., the conservation stage, an organization will gradually expand its coverage to more environmental domains. For example, if the initial focus has been on energy now the focus will be expanded to incorporate materials, waste or emissions. However, to successfully implement these strategies with an encompassing coverage it is necessary to get the support of a range of stakeholders such as suppliers, distributors, etc. As the coverage of environmental domains is wider, it is necessary to experiment to adopt sophisticated and advanced EMA tools such as ABC, environmental capital budgeting, etc. In this stage, most of the PEMA information will be assigned monetary values. It is through this assignment of monetary values that an organization realizes the resource saving and cost saving potential of environmental strategies pursued. When an organization successfully implements this stage and derives benefits therefrom, it will move on to the next level, i.e., the integration stage. Hence, this stage is only transitional until the next stage is reached, provided the actions taken are fruitful.

In the final stage, the leading edge stage, an organization will have a comprehensive coverage of environmental domains. Hence, its coverage of environmental activities will usually include all aspects that are important for the organization such as pollutants, emissions, bio diversity, etc. which are contained in its environmental policy. In order to implement a wide array of environmental practices, an organization needs the support of all the stakeholders in its value chain such as community, shareholders, upstream suppliers and downstream distributors. Further, the organization will seek to receive the support of secondary stakeholders such as the media and environmental pressure groups. In order to foster the support of various stakeholders the organization will follow internal as well as external environmental reporting systems, which are facilitated through the provision of EMA information. Moreover, in order to foster these various environmental management strategies more advanced EMA tools such as lifecycle analysis and MFCA, will be adopted. When an organization reaches this stage, due to the advanced nature of its EMA system, most of the EMA information will be monetary.

The framework also shows that it is the vision that lays the foundation and drives the environmental management and EMA practices of an organization. Without a clear vision an organization will not progress to the leading edge stage. Lack of a clear vision may dilute the intensity of environmental management and EMA practices when the criticality of the trigger that caused the compliance stage is weakened.

7.3 Contribution of the Framework

The main contribution of the framework is the integration of the current fragmentary discussions on the development of environmental management and EMA. Lack of proper integration of these two strands has posed challenges regarding the practicability and sustainability of environmental management in a dynamic business environment. In addition to this main contribution, the framework mainly provides practical as well as theoretical benefits. From a pragmatic perspective the framework provides many benefits for a practitioner.

- The framework enables practitioners to map where their organization currently stands in terms of the development stages of EMA.

It should be kept in mind that identifying a perfect mapping of the three environmental aspects of an organization according to the development stages is highly unlikely. An organization may display some characteristics at different stages. For example, an organization may have an encompassing coverage of environmental domains but with still limited support from its stakeholders. Hence, the framework emphasizes that what is important is not a perfect mapping of an organization's current status but the identification of lags for future consideration.

- The framework also directs practitioners to understand what the future focus should be in the key aspects of environmental management. Consequently, an organization will be able to move fast to the leading edge stage to derive the full potential of its environmental management strategies.
- In the current dynamic business environment the internal and external factors may change fast posing new environmental challenges and opportunities for organizations. The framework provides insights for the practitioners to develop, or sometimes to retain, an integrated approach to environmental management adoption when environmental challenges change.

From a theoretical perspective, the framework provides a tool for a researcher to analyze the development stages of an organization's environmental management strategies along with the supportive accounting tools (i.e. EMA). Hence, the framework extends the current discussions on the development of environmental management by incorporating vital accounting aspects as a means of pursuing corporate accountability for a wider set of stakeholders.

8 Practical Case Study

Having explained the integrated framework for environmental management adoption, the last part of this chapter uses a case study to demonstrate how the elements described here can be found in a real life situation.

8.1 Scenic Hotel

8.1.1 Background and Drivers of Change

Scenic Hotel belongs to a large hotel chain in the Asian Pacific region. The hotel was performing reasonably well until it faced a critical situation in 2004, which was triggered by the Tsunami that devastated the coastal lines of most of the Asian Pacific countries. Although the hotel was not damaged by the Tsunami, tourist arrivals to the region fell drastically. The hotel experienced a very low level of occupancy amidst increasing operational expenditure. Depressed share prices and the inability to claim dividends frustrated the investors in the hotel. The parent company granted full autonomy for the management of Scenic Hotel to find avenues to reduce its operational costs. In an urgent cost-saving bid, the hotel's management with the help of the accountant carried out a detailed cost analysis. The analysis revealed that the highest cost was energy which accounted for nearly 40 % of the total cost of operations. The next major contributors to costs were materials costs (food, chemicals, etc) and the cost of water. Although the labor cost was significant nothing was possible as the management had promised the hotels' trade unions that no lay off would take place. Also the management did not want to demoralize its employees by reducing the head count.

8.1.2 Internal Compliance Driving Environmental Management

With the primary motive of saving costs to ensure survival, the hotel started devising strategies that were aimed at managing the significant costs identified in the cost analysis. Energy was initially targeted as it offered the greatest and most needed cost savings potential. With a view to saving energy, the hotel introduced solar water heating panels, installed card key switching of room air conditioning, scheduled light switching, colour coded all light switches, and replaced incandescent lights with compact fluorescent lamps (CFL). In order to successfully implement these energy conservation practices, Scenic Hotel sought the support of its key stakeholders -its employees. In this regard, the hotel conducted many awareness programme aimed at employees on the criticality and potential for energy savings. As job security was at risk these energy saving initiatives received overwhelming support from the employees in all departments. The accountant together with the engineer started calculating the energy savings, initially in physical units, which were shared with the employees at regular meetings. The energy savings were identified in terms of energy units by comparing the energy consumption data before and after the initiatives. These accounting aspects reflect the application of simple EMA techniques such as accounting for energy in physical terms. Most of these actions were simple and did not require any significant capital expenditure and represented a bottom-up approach in which most ideas came from the lower

level employees. In fact, the hotel was not in a position to make any capital intensive projects due to its financial crisis.

8.1.3 Realization of the Conservation Potential Driving Environmental Management

The cost savings realized by these simple, yet effective, actions were more than anticipated. Encouraged by these savings, the hotel then started to focus on other areas such as water and waste. Many water saving measures were taken such as a sewerage treatment plant, re-use of treated water for garden irrigation, introduction of water-saving cisterns and optional re-use of room linen. In order to minimize waste the hotel started grading garbage, recycling and reusing materials, composting of garden refuse, and reducing the use of environmentally damaging materials. These actions required the support of guests and suppliers in addition to the support already received from employees. To ensure the support of guests the hotel started putting up notices and conducting awareness programme. Most of the guests responded positively and contributed to these initiatives. Similarly, action was taken to educate the suppliers as well. Along with these initiatives, the hotel calculated the water savings and savings of waste. These accounting aspects such as accounting for water and accounting for waste were developed in order to support these initiatives. The accountant then gradually started to assign a monetary value to these savings to convince and encourage the employees and even the management. This expansion of focus of EMA information represents a movement from simple physical EMA tools to somewhat advanced EMA tools that incorporate physical as well as monetary aspects. Some of the savings information was shared with the guests also.

In order to reduce the cost of materials, especially food cost, the hotel started to cultivate vegetable and fruits in its own gardens. Scenic Hotel did not use any chemical fertilizer but used only the compost made from the sewerage treatment plant. In addition to reducing costs, these practices received a lot of attention and were much loved by the guests who started to pick their own vegetables and fruits during their stay.

8.1.4 Integration of Environmental Management to Move on to the Leading Edge Stage

By this time the tourism sector of the country was picking up and tourist arrivals were rising. The hotel was gradually recovering from its financial crisis. However, due to the increased investor confidence in the tourism sector, there were many hotels that were competing in the selected target markets of Scenic Hotel. The hotel, after realizing the potential of the actions, started to revisit these initiatives with a view to developing them. The management soon realized that all these areas relate to the environment and can be used as a competitive tool to generate a greener

image for the company. The hotel then devised a comprehensive environmental management policy that encompassed the already established areas such as water, energy and waste as well as new areas such as carbon footprint, pollution, bio diversity, etc. By this period the accounting team of the hotel had developed an advanced toolkit to support these initiatives. Most of these EMA tools had evolved through their own experiments with accounting tools that were developed in the latter two stages. However, in order to view the hotel as a “*mass balance*” and thereby to identify losses (non-product output as discussed in MFCA) it obtained the help of an external consultant. Moreover, it got his support to calculate the carbon footprint of its operations. Especially the advanced EMA tools such as MFCA and carbon footprint calculations enabled the hotel to take a comprehensive look at the site’s material flows and to focus attention on areas where carbon savings became possible.

In order to further reduce energy costs and reduce the carbon foot print, the hotel installed a bio mass boiler after carefully carrying out a comprehensive environmental capital budgeting exercise. The firewood for the boiler was purchased from the nearby villagers providing them with a stable livelihood. This initiative ensured their support for the hotel too. The hotel started to conduct awareness and training programs on how to grow and harvest the required firewood. In addition, the hotel maximized the use of indigenous flora in landscaping and eradicated invasive alien species. Most of the flora, fauna and vegetables were supplied by the villagers who became regular suppliers to the hotel. Along with these initiatives the least discussed accounting aspects such as accounting for bio diversity were developed and fully integrated into the corporate information management systems. Moreover, the hotel conducted awareness programs in schools and villages to educate the community about the importance of saving the environment. Some of the waste generated by the hotel was given away to the villagers or to the regular buyers who then use them to produce some ornamental items or for re-use responsibly. During this time the hotel started to use a strategic scorecard that encapsulates the performance of aspects such as financial, environmental, guests (customer), employee, social, etc. This reflects the application of a modified sustainability balanced scorecard to suit the context of the hotel.

Over the years, the green practices followed by the hotel have been recognized by many local and international institutes. Scenic Hotel won many local and international green awards which received a lot of local and foreign media attention. The hotel started sharing its successful green strategies with other industry partners while promoting them in many ways. The hotel started to promote its success story in the media and among environmental groups while reporting the cost savings in its sustainability report. All these actions improved its public image considerably in the local as well as international markets. Today many guests visit the hotel as they love these green practices. In effect, the environmental management practices adopted by the hotel have given it a competitive edge. These environmental management practices of the hotel have been well interwoven with EMA practices such as accounting for material, energy and waste, life cycle design, material flow cost accounting, environmental capital budgeting, etc. Despite the

financial recovery, the environmental management practices and supporting accounting tools have become routine and embedded into the daily decision-making process of the hotel. Moreover, all the practices have been implemented with consistent commitment and vision with the support of its stakeholders.

Conclusion

With a view to furthering the existing discussions on how organizations can meet the environmental challenge, the chapter provided an integrated framework for the adoption of environmental management. In doing so, the framework incorporated an accounting dimension (EMA) along with the development stages of environmental management while highlighting the changes in three key aspects. The framework demonstrates that the development of environmental management is gradual and is initially driven by internal or external compliance. Later, once the business case of environmental management is realized an organization will move forward to leading edge status by incorporating environmental consciousness into its daily decision making. To reach this stage, environmental management strategies, which encompass all the significant environmental domains, should be driven by a clear vision cascading from top to bottom. Furthermore, the continuous engagement of all the primary and secondary stakeholders on a regular basis is warranted. In this process, accounting for environmental management strategies (EMA) will act as the common thread that connects and sustains these practices while ensuring corporate accountability for its stakeholders. Hence, the integrated framework will provide useful insights for organizations to demonstrate corporate social accountability through sustained environmental management strategies with the help of accounting.

Appendix: EMA Techniques

Accounting for Energy, Materials, Water and Waste

According to Bennett and James (1998) accounting for energy and materials is the tracking and analysis of all flows of energy and substances into, through and out of an organization. When organizations realize the importance of energy costs, they can follow a piecemeal approach (in-house initiatives) or a comprehensive approach (top-down approach) or even a combination of them (Gray et al., 1993). Due to the wide range of approaches possible, there is no single hard and fast rule for accounting for energy, but any accounting system should attempt to separately identify different types of energies used, relate these costs to the causes of costs, highlight the energy costs in cost reports, etc. The same is applicable when accounting for materials, water and waste.

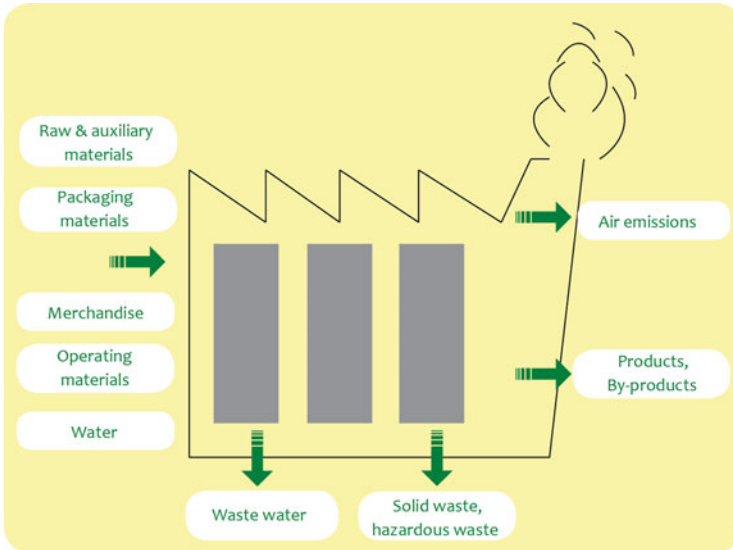


Fig. 2 Mass balance of an organization

Material Flow Cost Accounting

MFCA is a tool for quantifying the flows and stocks of materials in processes or production lines in both physical and monetary units (Kokubu & Kitada, 2012; Strobel & Redmann, 2002). MFCA has been developed based on the principles of mass balance. Accordingly, mass balance implies that the amount of inputs should be consistent with the sum of desirable and no-desirable output (refer Fig. 2). MFCA incorporates both PEMA and MEMA by quantifying material flows and stocks in a process or processes in terms of both physical and monetary units.

In MFCA waste is valued at the same rate as the good output, it thereby brings the cost of waste to the attention of the management immediately for requisite action. The benefits of MFCA are evident from both economic and environmental perspectives. From an economic perspective, MFCA identifies the material in both physical units and in monetary units along with their progress through an organization. From an environmental perspective, the reduction of the consumption of materials and energy reduces the undesirable waste outflows from an organization.

Environmental Capital Budgeting

Capital budgeting is the process of making long-term decisions that involve cash flows beyond the current year (Hilton, Ramesh, & Jaydev, 2008). When environmental considerations are taken into account explicitly in the long-term decision

making process, environmental oriented capital budgeting takes place. It is therefore necessary to fully consider environmental costs, cost savings, and revenues in evaluating a potential capital investment (Environmental Protection Agency (EPA), 1995). As Gray et al. (1993) suggest, as the world is becoming more environmentally sensitive, non-environmentally sensitive income streams will be difficult to obtain, leading to early abandonment of projects. Environmental capital budgeting offers financing as well as investment benefits to an organization. Financing benefits such as easy approval and soft financing terms for capital investment projects and investment benefits such as informed decision making are the results of such environmental capital budgeting techniques.

Life Cycle Accounting

Life-cycle costing estimates and accumulates costs over a product's entire life cycle (Drury, 2004). According to EPA (1995), life-cycle accounting assigns and analyzes the product or project-specific costs within a life-cycle framework including usual, hidden, liability, and less tangible costs. However, it will be difficult to conduct a comprehensive life cycle assessment of products or projects (Gray et al., 1993). Yet, accountants and other professionals can contribute to life cycle assessment by bringing in financial implications of existing activities and potential future options.

Environmental Activity Based Costing

Activity-based costing is a two-stage procedure used to assign overhead costs to various cost objects accurately (Hilton et al., 2008; Kaplan & Atkinson, 1998). Despite the fast diffusion of ABC, many companies around the world still use traditional volume-based overhead allocations systems (Fonseka et al., 2005). In a traditional overhead absorption costing system, environmental related costs can be hidden (Burritt, 2004; Gibson & Martin, 2004; IFAC, 2005). It is necessary to bring environmental costs to the attention of corporate stakeholders (EPA, 1995). This necessitates the allocation of environmental costs to the appropriate accounts by allocating them to those who generate them (Soonawalla, 2006).

Sustainability Balanced Scorecard (SBSC)

Balanced Score Card (BSC) has been promoted as a balanced performance measurement system that overcomes the limitations in conventional performance management. BSC has also been suggested as a strategic management tool as well

(Kaplan & Norton, 1992, 1993, Niven, 2002). BSC encompasses four perspectives, namely, financial, customer, internal business and learning and growth. As these perspectives act as only a template, BSC has been suggested as an effective tool to incorporate economic and environmental (and social) dimensions (Dias-Sardinha, Reijnders, & Antunes, 2002, Epstein & Wisner, 2001, Figge, Hahn, Schaltegger, & Wagner, 2002, Moller & Schaltegger, 2005). The environmental (and social) integration into a conventional BSC to make it a sustainable BSC can be achieved in different ways (refer Figge et al., 2002 for more information).

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