Environmental Management Maturity Stages and Environmental Management Accounting

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ABSTRACT

As of today, the environmental management maturity (EMM) and environmental management accounting (EMA) literature has established itself in its own right. Despite the obvious connection between these two fields of study, they have evolved along parallel paths with limited inter communication. This paper therefore aims to identify the use of EMA in different stages of EMM with a view to establishing a connection between these two fields. Data for this study was collected by identifying nine case organizations each from three different EMM stages. Accordingly, interviews, site visits and document analyses were used to collect data, which was analysed based on the environmental domain uses and functional applications of EMA in each EMM stage. The preliminary analyses of these selected organizations suggest that as the EMM level of increases, organizations depict a higher level of functional use of EMA for control and stewardship purposes despite the limited use of EMA for decision- making purposes. From the perspective of an environmental domain, the study finds that the use of integrative EMA tools is considerably low even in organizations with higher levels of EMM. These preliminary findings suggest that the use of EMA (or broadly, accounting) is still limited in the corporate environmental management. The study discusses some of the implications for theory and practice.

Key words: Corporate Sustainability, Environmental Management Accounting (EMA), Environmental Management Maturity (EMM), Sustainability accounting, and Sri Lanka.

1. INTRODUCTION

With the rise of corporate sustainable development activities, there have been, over the past three decades, a growing number of studies that provide taxonomical explanations of the development of corporate environmental management (Hunt and Auster, 1990, Jabbour and Santos, 2006, Shrivastava and Hart, 1995, Kolk and Mauser, 2002, Ormazabal and Sarriegi, 2012). Among these various explanations, the maturity (or development) perspective is dominant and has been the subject of many empirical studies (Gunarathne and Lee, 2018). It reflects a higher level of environmental management integration over time encompassing a wide range of organizational activities with substantial investments (Kolk and Mauser, 2002; Gunarathne and Lee, 2018). To reach higher levels of maturity by successfully implementing corporate environmental management practices, the support of many functions within an organization is essential. However, so far, only a few functional areas have been investigated empirically with respect to corporate environmental management maturity (EMM). This limited number of studies indicates that the contribution of many other vital functional disciplines has not yet been investigated with respect to corporate EMM. Among these functional areas that have been left unexplored is accounting. This is interesting since measurement systems and accounting are important for corporate sustainable development as they provide information for decision makers and stakeholders (Schaltegger et al., 2017). This paper therefore aims to discuss the uses of environmental-related accounting (also referred to as environmental management accounting, EMA) in different stages of corporate EMM.

2. LITERATURE REVIEW

2.1 Environmental Management Maturity (EMM)

There are different taxonomical explanations of how a company progresses in its environmental management activities/strategies. It is usually explained in terms of development/maturity stages (Jabbour and Santos, 2006; Kolk and Mauser, 2002; Gunarathne and Lee, 2018). There have been various explanations of how a company develops its environmental management strategies over time (see Hunt and Auster, 1990; Roome, 1992; Hart, 1995; Buysse and Verbeke, 2003; Jabbour and Santos, 2006, Ormazabal and Sarriegi, 2012). This study follows the taxonomy of Jabbour and Santos (2006), who suggest three stages of EMM: a) functional specialization (reactive), b) internal integration (preventive) and c) external integration (proactive) (see Table1).

Table 1: Salient features of EMM in companies

	Functional specialization stage	Internal integration stage	External integration Stage
Focus	Compliance	Better utilization of inputs	Improving competitiveness
Company perception of environmental management	Additional cost of compliance	Tool for improving eco-efficiency	Means of achieving competitive advantage
Role and support of top management	Limited	Linked to the improvement of eco-efficiency	Continuous

Source: Jabbour and Santos (2006)

2.2 Environmental Management Accounting (EMA)

Over the last two decades EMA has developed into corporate environmental (or sustainable) management (Lee and Schaltegger, 2018). It has often been suggested as the interface between management reporting and corporate environmental management strategies (Bennett et al., 2002). This paper suggests two lenses to understand EMA: a) looking at its focus areas, and b) analysing its functional uses.

2.2.1 Focus areas of EMA

The EMA tools and techniques, based on their focus area (or environmental domain they deal with), can be broadly divided into a) specific tools such as energy accounting, water management accounting and carbon accounting and b) integrative tools and techniques such as life cycle analysis, sustainability balanced scorecard (SBSC) and eco-control.

2.2.2 Functional roles of EMA

Another way to analyse EMA tools and techniques is to look at their various functional roles such as planning, decision making, controlling and performance evaluation (CIMA, 2005, Drury, 2009). Tillema (2005) broadly divided these functions into accountability (control or stewardship) such as budget preparation, variance analysis, managing risk and preparing sustainability reports and decision-making such as on cost and efficiency improvements, costvolume- profit, pricing and long-term capital investment. This study also follows these functional dimensions of EMA.

The literature suggests that EMA has developed in its own right irrespective of its corporate EMM stage resulting in static tools and techniques. Thus, the need arises to explore the use of EMA in different stages of corporate EMM.

3. RESEARCH METHODS

The data for this study was collected in two stages. In the first phase, the researchers used a survey to identify companies at different EMM stages, using the Jabbour and Santos (2006) instrument (see Annexure 1). The companies thus identified were asked to express their willingness to participate in the second phase. In the second phase, the researchers selected 18 companies from different industries and at different EMM stages, which also had useful information to share about EMM. However, this paper covers nine of the 18 companies selected as the study is still ongoing (see Annexure 2 for more details on the selected companies). In the second phase, various methods were deployed to gather data about these companies. Indepth data was collected through various EMA tools and techniques and data about the functional uses of EMA through interviews with various personnel responsible for sustainability and accounting. As a means of data collection triangulation, on-site observations and document analyses were carried out (Golafshani, 2003). This was supplemented with an analysis of company web sites, annual reports, and sustainability or integrated reports. All the interviews were recorded electronically and later transcribed. They were then thematically analysed based on the uses of EMA that were identified earlier.

4. FINDING AND RESULTS

The findings pertaining to the uses of EMA are presented under the three levels of EMM, i.e., a) functional specialization, b) internal integration and c) external integration stages.

4.1 Organizations in the functional specialization phase

The commonly observed environmental domains of EMA tools and techniques were energy, waste and waste water. Since the law and the certification stipulate the minimum requirements, the scope of the EMA tools is limited as the focus is more on physical and past-oriented information (Burritt et al., 2002). Since EMA is used to satisfy the prevailing standard from time to time as and when a need arises, there is no continuous application of these tools. This is clearly evident when considering the functional uses of the EMA. For instance, in terms of decision making, these EMA tools and techniques are hardly used to improve efficiency or to reduce costs. However, a clear exception was the use of energy which entailed a high overhead cost. Accordingly, energy accounting is regularly used in budget setting and variance analysis.

4.2 Organizations in the internal integration phase

The selected organizations in this stage of EMM commonly focus on environmental domains such as energy, waste, water and carbon, using domain-specific environmental tools; the use of integrative tools is not visible in these organizations. The analysis of the organizations suggests several functional uses of EMA. First, in terms of decision making, the primary use is for reducing

cost and increasing efficiency. As for control and stewardship, EMA is used in making budgets, setting KPIs, and analysing variances often on a monthly and quarterly basis mainly using physical information.

4.3 Organizations in the external integration stage

A notable feature of these organizations is that they had introduced environmental management and EMA practices a long time back in the interests of compliance or efficiency. Thus, these practices have matured over a considerable period of time through consistent application in these organizations (Gunarathne and Lee, 2015).

In terms of the focus areas of EMA, these organizations cover in the main energy, waste, carbon and waste water in addition chemical management depending on the industry. Although this coverage of the domains is largely similar to that of the organizations in the internal integration stage, a notable difference is in the use of integrative EMA tools. In terms of functional uses, these organizations use EMA information for control and stewardship purposes such as budgets, KPIs, performance targets, variance analyses, risk management and sustainability reports. This use of EMA is consistent and often linked to managerial performance evaluation.

5. DISCUSSION

The findings reveal that the use of EMA for various decision-making purposes is low regardless of the stage of EMM. An exception is the decisions on cost and efficiency improvements in cases where EMA information is used by organizations at every stage of EMM. The analysis of these selected organizations also suggests that as the EMM level of increases, organizations depict a higher level of use of EMA for control and stewardship purposes. These findings are summarized as follows (see Table 2).

Table 2: Functional uses of EMA in the organizations at different EMM stages

Functional role	Accounting task	Functional specialization	Internal integration	External integration
Decision making	Decisions on cost and efficiency improvements	✔	✔	✔
	Cost-volume-profit decisions			
	Pricing decisions			✔
	Decisions on special one-off orders			
	Make or buy decisions			
	Long-term capital investment decisio		✔	✔
Control and stewardship	Budget preparation	✔	✔	✔
	Variance analysis		✔	✔
	Setting performance targets and indicators		✔	✔
	Managing risk			✔
	Preparation of sustainability/integrate			✔

The findings also indicate that the use of integrative EMA tools is considerably low even in the organizations that are at higher levels of EMM. This suggests that the focus in these organizations on the use of EMA is still narrow (fragmented) (Bartolomeo et al., 2000). The findings pertaining to the domain uses of EMA tools are as follows (see Table 3).

Table 3: Domain-based uses of EMA tools in the organizations at different EMM stages

Focus area	Accounting task	Functional specialization	Internal integration	External integration
Specific tools	Energy accounting	✔	✔	✔
	Water accounting	✔	✔	✔
	Waste accounting	✔	✔	✔
	Carbon accounting		✔	✔
	Accounting for biodiversity	✔	✔	✔
Integrative tools	SBSC			✔
	Life cycle analysis			
	Capital budgeting		✔	✔
	Eco-control			
	Sustainability index			✔

6. CONCLUSIONS

This study on the uses of EMA at different stages of EMM suggests that the use of EMA (or accounting in a broad sense) is limited and fragmented in organizations at the initial stages of EMM. Even at the advanced levels of EMM, the use of EMA is mainly focused on control and stewardship with some use in decision making. The study therefore proposes that the selected organizations do not seem to use accounting to the benefit of their environmental management practices. The findings can however have several implications for theory and practice. For theory development, it is necessary to explore why EMA is used with limited focus by organizations in the first stages of EMM. For practice, it is necessary to enhance management awareness of the different tools of EMA and their use for decision making as well as control purposes of the environmental management strategies of organizations.

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