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ENVIRONMENTAL MANAGEMENT ACCOUNTING IN UNIVERSITY: A CASE STUDY OF IIUM

BY

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ABSTRACT

Environmental management accounting (EMA) has become an important management accounting tool due to its ability to provide accurate and relevant information pertaining to the environmental impact of the various activities of organizations. Many studies have been performed on EMA to examine various aspects, for example, implementation, measurement of environmental costs, link with information system and factors contributing to its adoption. However, the majority of the studies were performed on business organizations. The study on EMA in the services industry, particularly institutions of higher learning, is still lacking. The institutions of higher learning, with a large population and various activities, can have a substantial impact on the environment. Therefore, it is equally important to study EMA in the institutions of higher learning. The ability of EMA to provide relevant information pertaining to the environmental impact can enable the impact to be managed more effectively and possibly lead to cost savings. The current study, therefore, attempts to fill the gap by looking into EMA adoption in IIUM, one of the public universities in Malaysia. There are four objectives to the study. These are to assess the level of awareness of the university staff on environmental management, environmental accounting (EA) and EMA, to assess the need for the environmental cost information, to assess the extent of EMA implementation by the university and the perception of how the university should move forward in relation to the issues of EA and EMA. The theory used is the social issue lifecycle theory. The study uses a case study as the research method. The results reveal that there is a moderate level of awareness among the staff on EA and EMA. Staff indicate that they need the environmental cost information, both currently and in the future. Only minimal adoption of EMA by the university and staff has high perception that the university should disclose environmental information to the internal users.

ملخص البحث

أصبحت محاسبة الإدارة البيئية (EMA) أداة محاسبة إدارية مهمة؛ وذلك لقدرتها على توفير معلومات دقيقة وذات صلة بالتأثير البيئي لأنشطة المنظمات المختلفة. ولقد أجريت العديد من الدراسات في مجال (EMA) لفحص الأغراض المختلفة ،مثل: التنفيذ، وقياس التكاليف البيئية، وربطها بنظام المعلومات والعوامل التي تسهم في تبنيها. ومهما يكن فإنّ غالبية الدراسات قد أجريت في منظمات الأعمال التجارية. أما دراسة محاسبة الإدارة البيئية (EMA) في صناعة الخدمات وبخاصة في مؤسسات التعليم العالي فلا زالت فقيرة. والمؤسسات التعليمية العليا ذات الكثافة العددية العالية والنشاطات المختلفة، يمكنها أن تؤثر تأثيرًا متينًا في البيئة. ولهذا من الأهمية والعدل دراسة محاسبة الإدارة البيئية (EMA) في مؤسسات التعليم العالي. إن قدرة محاسبة الإدارة البيئية (EMA) على توفير المعلومات ذات الصلة والتي تختص بالتأثير البيئي، يمكنها أن تجعل التأثير يدار بفعالية أكثر التحكم في التأثير أكثر فعالية ويحتمل أن يقود إلى تقليل التكلفة. والدراسة الحالية تحاول سد الفراغ وذلك بنظرتها لتبني محاسبة الإدارة البيئية (EMA) في الجامعة الإسلامية العالمية الماليزية وهي واحدة من الجامعات العامة في ماليزيا. هناك أربعة أهداف لهذه الدراسة ، وهي: تقييم مستوى الوعي لدى هيئة العاملين عن الإدارة البيئية، والمحاسبة البيئية (EA) و محاسبة الإدارة البيئة (EMA) ، وتقييم الحاجة إلى معلومات تكلفة البيئة، ثم تقييم مدى تنفيذ الجامعة الإسلامية العالمية بماليزيا لمحاسبة الإدارة البيئية (EMA) ومدى إدراكها لكيفية أن تخطو للأمام بصدد موضوع محاسبة البيئة(EA) و محاسبة الإدارة البيئية (EMA). تم استخدام نظرية (دورة حالة الحياة الاجتماعية) كما استخدمت الدراسة دراسة الحالة أداة للبحث. كشفت الدراسة أن هناك مستوى متوسطًا من الوعي وسط هيئة العاملين فيما يتعلق بـــالمحاسبة البيئية (EA) و محاسبة الإدارة البيئية (EMA). وأشارت هيئة العاملين إلى أنها تحتاج إلى معلومات تكلفة البيئة في الوقت الحاضر وفي المستقبل. أما كشف المعلومات البيئية عبر شبكة المعلومات الدولية فقد وجد تبنيا متدنيا وليس عاليًا من قبل الجامعة وهيئة العاملين.

APPROVAL PAGE

I certify that I have supervised and read this study and that in my opinion, it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Master of Science in Accounting.

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DECLARATION

I hereby declare that this dissertation is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

Noredah Binti Abdul Rahman

Signature …… Date ……..

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LIST OF ABBREVIATIONS

EA	Environmental Accounting
EFA	Environmental Financial Accounting
EMA	Environmental Management Accounting
ENA	Environmental National Accounting
EMS	Environmental Management System
EPA	Environmental Protection Act
IFAC	International Federation of Accountants
IIUM	International Islamic University Malaysia
FA	Financial Accounting
FCA	Full Cost Accounting
MA	Management Accounting
MEMA	Monetary Environmental Management Accounting
MLC	Methodist Ladies College
NRA	National Resource accounting
PEMA	Physical Environmental Management Accounting
PO	Purchase Order
UNDSD	United Nations Division of Sustainable Development
US EPA	United States Environmental Protection Act

CHAPTER ONE

INTRODUCTION

1.1 ORGANISATION OF THE CHAPTER

This introductory chapter will provide the background of the current study including the problem statement in Section 1.2. Section 1.3 focuses on the motivation for the study while section 1.4 presents the objectives of the study. This is followed by the contribution of the study in Section 1.5. Section 1.6 presents the research questions generated from the objectives that the current research is trying to answer. Finally, Section 1.7 provides the organisation of the whole thesis.

1.2 BACKGROUND OF THE STUDY

Environmental Management Accounting (EMA) has been referred to as a management accounting tool that provides useful and relevant information pertaining to the impact of an organization's activities on the environment (IFAC, 2005). EMA, being part of the wider Environmental Accounting (EA), has emerged because of the limitation of conventional management accounting in providing complete information on the environmental impact of an organization's activities. Among the limitations are the failure to adequately account for the environmental costs and the misallocation of the environmental costs to products and services (IFAC, 2005). Generally, the information provided under EMA consists of two types, physical information on the use of energy, water and materials, and monetary information on environmental related costs and savings (IFAC, 2005). This information is important for the

organizations in their decision making and strategic planning. It can also lead to a competitive advantage in terms of cost savings.

Prior studies that examined EMA looked at various aspects of its implementation, including the measurement and calculation of the environmental costs, allocation of costs to products or services, the factors that contributed to the adoption of EMA and the links with management information systems and environmental reporting. The literature reveals that the majority of the studies were performed on business organizations such as, Ricoh in Japan (Kokubu & Kurasaka, 2002), Siemens in Germany (Thurm, 2002) and Post Denmark and DONG in Denmark (Rickardsson & Vedso, 2002). The purpose of these studies was to find the best practices for others to follow. However, there are few studies performed on the services industry, particularly on institutions of higher learning.

Environmental cost information is important to both the industrial and service sectors, regardless of whether they are public or private. Institutions of higher learning are no exception. Both public and private institutions have considerable impact on the environment due to the large population. The activities of the population of an institution such as a university and its facilities give rise to the use of energy, water, paper and the production of waste. The university, as an organization, is a consumer of natural resources and a producer of waste (Flint, 2001). Thus, it is important that environmental cost information is made visible to the management of the university so that the impact can be managed more effectively. As with business organizations, it is also vital to promote environmental management accounting practices to universities.

In addition, the literature on EMA shows that there are a number of benefits that can be obtained from its implementation, such as more informed decision making, uncovering opportunities, enhancing internal and external reporting, improved

reputation and public image and generation of social benefits (Deegan, 2003). Some of the benefits also apply to institutions of higher learning. Unfortunately, very few studies have actually examined the adoption of EMA in institutions of higher learning. The majority of the studies on institutions of higher learning were on environmental sustainability and environmental management, and such studies were done in the West (Shriberg, 2000, Venetoulis, 2001).

The current study, therefore, attempts to look into the adoption of EMA in institutions of higher learning in Malaysia. The study will examine the extent to which academic and administrative staff are aware of environmental management and environmental accounting. It further investigates to what extent EMA is adopted by the university and staff perception on how a university can be proactive in addressing such issues. It is hoped that this study will increase awareness on EMA and, subsequently, will promote EMA adoption by universities.

1.3 MOTIVATION FOR THE STUDY

There are three motivations to examine EMA adoption in institutions of higher learning. The main motivation is that activities of institutions of higher learning have a substantial impact on the environment. The use of natural resources by its population, namely, electricity, water and paper and the production of waste are some of the impacts. The ability to provide relevant information on the impact of such activities to the environment will enable management to manage these activities more effectively. Subsequently, this will lead to cost savings.

The second motivation for the study is the fact that the study of EMA in institutions of higher learning is still a less explored area, particularly in Malaysia. Prior studies generally focused on profit making organizations. Accordingly, this

study will contribute to literature in the area of EMA implementation in institutions of higher learning.

The third motivation is to provide a practical example of how EMA can be implemented in the service sector, or to be more specific, a public university.

1.4 OBJECTIVES OF THE STUDY

The current study has four objectives:

i. To ascertain the level of awareness of the university staff (both academic and administrative) on issues pertaining to environmental management and environmental accounting.

ii. To examine the need for environmental information (both physical and monetary) by staff of the university. Environmental information refers to the usage of electricity, water, paper and waste management costs that are incurred by each individual department, division or faculty of the university.

iii. To determine the extent that EMA has been adopted by the university. This includes ascertaining how the environmental impact of the university's activities is accounted for within the current accounting system and how the information on environmental costs are disseminated and made use of by the users of the information within the university.

iv. To examine how the university can be more proactive in addressing environmental issues in general and EMA in particular. It includes assessing the perception of the staff on the actions to be taken.

Objectives one, two and four are to be achieved through the survey method, while objective three is through interview and perusal of relevant documents for example the chart of accounts, accounting information system flowchart and cost centre listings.

1.5 CONTRIBUTION OF THE STUDY

It is hoped that this study will add to the extant literature on EMA adoption, especially in institutions of higher learning. Additionally, the results of the study will enable one to determine how major environmental impacts have been accounted for within the current accounting system of a university and, subsequently, reveal the limitations of conventional management accounting in providing relevant information for management decision making, planning and control. Finally, the suggestions put forth by the researcher on how to integrate environmental issues in the existing system will help the university to address this increasingly important issue in a systematic way.

1.6 RESEARCH QUESTIONS

The research questions follow the objectives of the study. The current study has four research questions as follows:

RQ1: *What is the level of awareness of environmental management and EMA among the academic and administrative staff of IIUM?*

RQ2: *To what extent is environmental cost information useful in their decision making?*

RQ3: *To what extent is EMA being practiced by IIUM?*

RQ4: *What is the perception of the IIUM community on how the university should address the environmental issues with respect to environmental management and environmental management accounting?*

1.7 ORGANISATION OF THE THESIS

The thesis is organized into six chapters. Chapter 1, the introduction chapter provides the background of the current study, which includes the problem statement, motivation, objectives, contributions and the research questions. Chapter 2, the literature review will provide a review of the literature. It begins with the framework of environmental accounting and EMA. This is followed by a study of environmental management and environmental management accounting in institutions of higher learning. The chapter concludes by highlighting the gap in the literature. Chapter 3, the theoretical framework will discuss the theory that governs the current study. The theory used is the social issue lifecycle theory. Chapter 4 focuses on the methodology used. It includes the research design, research procedures, data collection methods and data analysis. The current study will primarily adopt the qualitative method of research using a case study. Chapter 5 on results and analysis will present the results of the study and its analysis. It also provides a discussion and possible interpretation of the results in light of the research questions. Finally, Chapter 6 on recommendations and conclusion will present the conclusion that can be drawn from the findings of the study and the recommendations to be made following the results. In addition, limitations of the study and suggestions for future research are also covered.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter presented the introduction for the study that includes the background information, research objectives, contribution of the study, the research questions and the organization of the thesis.

This chapter proceeds with a review of the literature pertaining to the current study. It covers the framework of environmental accounting and environmental management accounting and selected studies on environmental management and EMA in institutions of higher learning. The chapter is organized in the following manner. Section 2.2 describes the framework of conventional accounting, which includes the limitations of conventional accounting. Next is section 2.3, which discusses environmental accounting, followed by section 2.4 on EMA. Included in the section is the information provided by EMA, its uses and benefits and the link with the environmental management system. Section 2.5 discusses prior studies on environmental management and EMA performed in institutions of higher learning. Section 2.6 discusses the experience of EMA implementation by selected organizations. Finally, section 2.7 summarises the chapter.

2.2 CONVENTIONAL ACCOUNTING

Before further discussion is made on the framework of EA and EMA, it is beneficial to explain the framework of conventional accounting. This is because environmental accounting is rooted in conventional accounting. EA is an extended version of

conventional accounting, which includes the environmental aspects of company activities in its framework (Burritt, Hahn & Schaltegger, 2002).

Broadly, conventional accounting can be divided into two categories, namely:

- Financial accounting; and
- Management accounting

Financial accounting (FA) is concerned with the provision of information to satisfy the needs of various external stakeholders. The external stakeholders may include the shareholders, financial authorities and the government. Included in financial accounting is the financial reporting, which involves the dissemination of financial information to the external stakeholders. FA also focuses on several different types of information, for example, the revenues, expenditures, assets, liabilities and equities. Thus, the FA activities include the data collection, account balancing, auditing and external reporting of the financial information (IFAC, 2005).

Management accounting (MA), on the other hand, is concerned with the provision of the information to satisfy the needs of internal stakeholders. The internal stakeholders may include the management and employees of the companies. There is no single and exact definition for management accounting but, generally, it can be defined as the identification, collection, analysis and use of costs and other information for decision making within the organization (IFAC, 2005).

MA deals with both monetary and non-monetary (physical) information. Monetary information is concerned with the information measured in monetary terms, for example, the cost; while the physical information is concerned with the information measured in physical amount, for example, the production quantity. Both types of information are important for various internal management activities, for

example, variance analysis; where the variances are reported both in monetary amount and in quantity.

Apart from financial and management accounting, there is another category of conventional accounting, which is called National Accounting. This concerns the development of economic and other information to characterize national income and economic health (US EPA, 2005). National Accounting is not the focus of the study. Accordingly, this type of accounting will not be discussed.

2.2.1 Limitations of Conventional Accounting

This section discusses some of the limitations of conventional accounting that led to the development of EA and EMA. More specifically, there is a need for proper EMA as it can provide the relevant environmental information for managers to make decisions that are more informed.

The first limitation concerns communication or the link between accounting and other departments that are often not well developed (IFAC, 2005). The monetary information, for example, the information related to cost, normally lies within the accounting department, whereas the physical information, for example, material and energy flow, often lies within the production or environment department. The majority of companies often have poor communication between these departments. Moreover, these departments may have different information systems that are not checked for consistency. Therefore, the accounting persons may not have easy access to the physical information and vice-versa.

Second, environment-related cost information is often hidden in overhead accounts (IFAC, 2005; Burritt, 2004 and UNDSD, 2001). Much of the environmental related cost information, particularly the cost that bears a less clear relationship with

the product or process, is often placed under general overhead account. For many companies, even if they maintain a separate account for electricity and water expenses, these accounts are not categorized separately under an environmental cost category.

Third, is misallocation of environmental costs (Deegan, 2003). This problem is highly associated with the problems of having environmental cost information hidden in the general overhead account. The costs in the overhead account need to be reallocated to product, process or cost centre. Under conventional accounting, these costs are normally allocated using a single basis, for example, production unit or floor space area. An inappropriate allocation base will result in inaccurate calculation of costs to the cost centre, process or products. In the context of environmental cost allocation, 'cleaner' products may have to take a larger share of environmental costs than what they are supposed to absorb, compared to the 'dirtier' products.

Fourth, materials use, flow and cost information are not tracked adequately (IFAC, 2005; Burritt, 2004). Many large organizations or companies are able to produce extensive information on the use, flow and cost of the materials, energy and water but the information does not cater for the EMA information needs. The information may not be produced according to the category of product output and non-product output.

Fifth, many types of environment-related cost information are not found in the accounting records (IFAC, 2005). The information produced through the accounting records is normally past information. The information on the future environmental related costs is not generated by the normal accounting system. This situation also applies to the information relating to intangible costs, for example, loss due to poor environmental product design.

Sixth, investment decisions are often made with incomplete information (IFAC, 2005; Burritt, 2004). When making investment decisions, a company will normally exclude the environmental related information in its appraisal, for example, environmental costs and benefits. This is due to the unavailability of this information on an ad-hoc basis and inability of the current accounting system to generate such information.

Other limitations include a narrow focus on manufacturing, higher importance placed on financial accounting rules, motivational effects and absence of accounting for externalities (Burritt, 2004).

The above limitations are common problems in the current accounting system of organizations, regardless of whether they are a business or non-profit organization. The current study will also consider the above limitations in the current accounting system of IIUM to assess the extent of EMA implementation by the university.

2.3 ENVIRONMENTAL ACCOUNTING (EA)

EA is an extension of conventional accounting, which includes the environmental aspects of company activities in its scope. The environmental aspects can be categorized into two main groups (Burritt, Hahn & Schaltegger, 2002):

- Environmentally induced impact of companies on their economic system, which is reflected in the monetary environmental information measured in monetary units, for example, Ringgit Malaysia (RM); and
- Company-related impact on the environmental system, which reflects the physical environmental information expressed in physical units, for example, kilowatts.