

Environmental Management Accounting Practices for the Sustainable Development Change: A Case Study from a Sri Lankan Rubber Manufacturing Company

Navodya Sandamini, Kalani Dissanayake*

Department of Accounting, University of Colombo, Sri Lanka

Info Articles

Keywords:

Environmental Management Accounting, Sustainable Development, Rubber Manufacturing, Sustainability Management, Environmental Costs and Earnings

Abstract

Every business has a responsibility beyond its basic responsibility to its shareholders. At present, people are more towards the environment, and accounting plays a crucial role by acting as a language of business. When referring to the environmental sensitive industries in Sri Lanka, the industrial processes connected to rubber manufacturing are harmful which can have negative environmental impacts. Accordingly, the discussion's critical part is based on the major environmental-related areas and their applicable environmental management practices. A qualitative approach was adopted in this study, occupying semi-structured interviews as the primary method of data collection. The study revealed a strict link between environment performance and the financial results of the case study organization. The study will provide businesses and managers the useful insights for implementing EMA practices and EMS applications as in the Sri Lankan context, well-established EMA related initiatives are rarely observable.

*Address Correspondence:

E-mail: kalani@dac.cmb.ac.lk

p-ISSN 2550-0368

e-ISSN 2549-0303

INTRODUCTION

Over the past era, industrial evolution has brought immeasurable wealth and affluence while also causing unintended ecological degradation such as deforestation, global warming, declining biodiversity, and toxic waste. As a result, a growth of public awareness has led to a massive demand by the stakeholders for organizations to adopt cleaner and safer environmental practices (Burritt, Hahn, & Schaltegger, 2002). Nevertheless, industrialization and large-scale production that aims to fulfill human needs have also resulted in both consumption and adverse outcomes, such as reducing natural and environmental resources and damaging human health. Similarly, environmental protection activities limited to household and community in the past has now become a compulsion on commerce. Investors and shareholders take pride in being associated with such activity. Accordingly, environmentally friendly practices have given rise to a body of accounting practices referred to as Environmental Management Accounting (EMA). Despite a fairly common understanding of EMA for the past two decades, EMA provides physical and monetary information on the use and flow of energy, water, materials, and monetary information on environment-related cost, earnings, and savings (Burritt et al., 2002).

Much research on EMA has focused on developed countries, and research on developing countries has started to appear. A focus on environmental performance was developed initially to meet compliance requirements and societal interests. Subsequently, improved performance was demonstrated by using physical measures alone, limiting the analysis of benefits and associated financial implications (Frost & Adam, 2008). Generally, EMA might focus on plans, monitoring performance targets, sharing acceptable practices throughout the organization, and integrating with financial reporting processes to enable performance improvement. Also, the term “sustainable development” currently has a high profile within corporate activities. As a body of rules regarding companies' responsibilities toward the environment, accounting plays a significant role in EMA and sustainable development. This role is further strengthened by the fact that accounting information forms the basis of management decisions.

Similarly, Environmental performance is a concern of managers due to regulations, contractual compliance, public perception, and competitive advantage. The environmental protection activities will result in a new and different environmental profile, resulting in cost savings and improved market opportunities. The foundation of the EMA relies on the extent of the adoption of EMS within that company. The majority of potential investors require a more cost-efficient strategy. They demand improved product quality by implementing ISO 14001, which guarantees environmental friendliness to compete on price and quality of products. An Environmental Management System (EMS) can be a certification such as ISO 14001 or a different reporting framework such as Global Reporting Initiatives (GRI). Hence, EMS (ISO 14001) provides an organization with a framework to recognize and assess how its business activities affect society. A strategy should be developed to ensure that the company takes appropriate measures in managing its environmental impacts (Govender, 2016). Furthermore, Environmental Management System (EMS) can be applied to provide a systematic approach to managing the company's environmental activities and reflecting the company vision, mission, policy, strategies, and actions (Gunaratne & Lee, 2015).

This study attempts to reveal how Environmental Management Accounting practices may drive an organization toward attaining sustainable development goals and how an organization may keep track of its environmental performance. A rubber manufacturing (rubber gloves) company has been selected for the case study, which represents a higher percentage as an export-based crop according to the annual report of Central Bank, Sri Lanka (CBSL). Scholars have identified the rubber manufacturing industry as one of the highly environmentally sensitive industries (Fuzi, Habidin, Janudin & Ong, 2019). According to the published records by the Central Environment authority (CEA) of Sri Lanka, Rubber processing is categorized as one of the major polluting industries. The rubber manufacturing process is heavily dependent on heating, and it uses heavy energy and water consumption while disposing of carbon emissions through heating. Some chemicals such as sodium sulphite, formic acid, and acetic acid are also added in the processing, which cause environmental degradation.

Similarly, harmful solid and liquid wastes are generated from the rubber products manufacturing process (Dubey & Ali, 2014). Sri Lanka owns a wide range of premium quality rubber products in the market, including ribbed smoked sheets, latex crepe, scrape crepe, retreated rubber tires, and tubes. However, it is observable that lesser attention is given to the household, industrial, and surgical rubber gloves manufacturing section in Sri

Lanka. Further Gunawardana (2018) stated that rubber processing's physical and social impacts had reached a crucial juncture that can no longer be neglected.

Accordingly, this study facilitates the achievement of the following two objectives:

- To describe major environmental-related areas affected and the applicable environmental management practices in the rubber manufacturing company.
- To explain how the environmental cost and earnings (both physical and monetary) are captured by the company's sustainability management and reporting system.

REVIEW OF LITERATURE

Motivations for adopting Environmental Management Accounting (EMA) practices

Environmental issues have been a severe problem to be monitored and need precautionary action from stakeholders (Basuki & Irwanda, 2018). Therefore, an increasing number of organizations face a considerable problem: how to respond to the growing institutional pressure for accounting and reporting environmental aspects of their business. In addition, there are many compelling reasons why organizations should consider the environment in accounting, as environmental pressures come from various parties such as legislators, customers, green groups, and shareholders (Monterio & Guzman, 2012). On the other hand, Petcharat and Mula (2012) argue that some common benefits could motivate organizations to respond to stakeholder influences and achieve competitive advantage in the industry. Companies were able to gain competitive advantages via improved energy efficiency, reduced waste, increased recycling, improved quality, better environmental credentials, greater customer satisfaction, new business opportunities, local support, increased staff commitment, positive pressure group relations and improved media coverage, or through a combination of these benefits (Dayaratne, Wickremathilake & Gunawardana, 2015).

In a similar study, Jalaludin, Sulaiman, and Ahmad (2011) found that, age of facilities, size, stakeholder environmental pressure, the written environmental policy, and the use of operations management techniques influence the degree of implementation of environmental management practices by the firm. Several reasons prompt organizations to consider environmental issues such as the improvement of image, profitability, and level of customer satisfaction (Lansiluoto, 2010). For instance, according to Henri and Journeault (2010), environmental impact and corporate image refer to the company's overall reputation and the degree to which an organization meets or exceeds standards required by law and regulations related to emission dischargers. Moreover, According to Petcharat and Mula (2012), any action that an organization undertakes will affect not just yourself but also the external environment. The concept of a sound EMA system is characterized by firstly, being able to exhaust the financial and economic benefits and cost saving of environmental protection measures and secondly, by identifying the optimal amount of environmental protection to realize the maximum financial and economic success. Such environmental management initiatives may increase a company's shareholder value (Schaltegger & Synnestvedt, 2002). Although organizations play a significant role in causing and potentially controlling ecological problems, they could also benefit from cost reductions through ecological efficiencies, green markets, first-mover advantage, better community relations, and improved image (Henri & Journeault, 2010).

Additionally, different studies also note that EMA's use typically benefits organizations by providing them with different information for decision-making (Bebbington & Unerman, 2018). Ferreira, Moulang and Hendro (2010) identified that related information might reveal hidden opportunities, such as better waste management processes, reduced energy, and material consumption, or opportunities for material recycling. From an environmental outlook, this information may also be used to develop more systematic processes and thus guide to innovation.

Sustainable development change through environmental management strategy

The term "sustainable development" has become prominent in descriptions of corporate activity and objectives since there is an increasing trend and demand for organizations to demonstrate transparency and accountability beyond financial performance domains (Egan, 2017). The concept of corporate or business sustainability has grown gradually in recognition and importance. Bebbington and Larrinaga (2014) emphasized that corporate sustainability constitutes a business approach that creates long-term shareholder value by embracing opportunities and managing risk deriving from economic, environmental, and social development. It

necessitates corporations to compete in the areas of image, power, and speed and the reduction of environmental damages related to consumption, energy usage, soil erosion and air pollution (Caliskan, 2014). Additionally, business sustainability refers to incorporating sustainable development objectives and converting them into company's operational practices. However, current global economic activities are perceived as a threat due to the damage to the capacity required to satisfy the needs of future generations. From this overview, it is clear that sustainable development secures their position as crucial concepts that characterize the twenty-first-century dilemma, which also presents a growing awareness about the impending ecological crisis (Caliskan, 2014). Besides, EMA constitutes an integral part of sustainable development. It is an important instrument for organizations that aim to minimize the total costs or environmental costs and mitigate the environmental impact of their activities, products and services (Burritt et al., 2002). Gray (2010) suggests that defining what a sustainable organization would like is impossible. The necessary accounting as the basis for sustainability reporting must also be unrevealed and indirectly fraught with the possibilities of managers' hidden actions using the uncertainty generated by self-seeking actions. Similarly, companies must provide sustainable development reporting while disclosing economic, social, and environmental performance in a triple-bottom-line form. The inclusion of data on environmental, social, and economic information into decision-making processes is a significant progression for an organization.

The critical theorists argued companies' ability to reflect actual sustainability performance that could contribute to a sustainable society. On the other hand, the managerial perspective recognizes sustainability reporting as an essential tool that helps managers make effective decisions. They believe that both external and internal stakeholders drive managers to ensure quality sustainability measures and actions are implemented. Non-financial reporting was established to gain awareness in the early 1990s, and with the expanded community concerns about environmental information, the reports started to be monitored with interest by a large section of stakeholders (Aras & Crowther, 2009). The reports imply the commitment of the company management in managing environmental resources with a sense of responsibility.

Applicability of EMA practices for manufacturing companies

Most of the studies on EMA have focused on the manufacturing sector owing to its significant environmental impacts. However, the manufacturing industry is one of the strategic industries in a developing country context. Companies that operate in environmentally sensitive sectors, like industrial manufacturing, construction, and energy sectors, have higher environmental attributes than other sectors (Dayaratne et al., 2016). In a similar point of view, Mosene, Burritt and Sanagustin (2013) found that environmentally sensitive sectors such as chemicals, electricity generation, and manufacturing have received specific attention from the public and policymakers as greater accountability is sought. Moreover, companies in environmentally sensitive industries such as manufacturing and resources industries are affected by the legislation due to their business operations' inherent nature that have a significant impact on the environment (Ong, Tireksani & Djajadikerta, 2016). However, Fuzi et al. (2019) believe that manufacturing companies has not received much attention about environmental management accounting practices by research, particularly for developing country context.

There was an institutional view of environmental reporting in the Spanish wind power energy generating sector based on a content analysis tool. It was found that the disclosure has been minimal and is not conducive to the notion of increasing transparency in the wind-generated clean energy electricity sector. As a result, the credibility of relying on a voluntary sustainability standard, such as Global Reporting Initiatives (GRI) as an incentive for informative environmental reporting is challenged. It was found that the government in south-east Asia has little impact on corporate environmental responsibility due to weak law enforcement, inconsistent regulations, and lack of political and corporate involvements (Setthasakko, 2010).

Sustainable development and EMA concerns in Sri Lanka

Sri Lanka faces several environmental difficulties, including loss of bio-diversity, land degradation, pollution, inadequate water resources management, coastal erosion, and weak industrial waste management (Dissanayake, Tilt & Lobo, 2016). Hence, sustainable development and EMA have become a growing concern among public and private entities collectively and individual citizens. Also, Swaranapali (2019) stated that organizations have recognized the potential monetary rewards of improved environmental performance in Sri Lanka. They have discovered necessary actions for enhancing efficiency in energy usage, water, and other raw

materials, which could bring environmental improvements and significant monetary savings as the costs of material purchases and waste treatments will be decreased. Gunarathne and Lee (2015) studied the applicability of EMA for organizational change using the evidence from the hotel industry. The study noticed that the hotel had regenerated some environmental management and EMA practices in a crucial, cost-saving bid when faced with a financial crisis. The development stages of EMA reflect how the hotel moved from the survival phase to an integration phase. Gunawardana (2018) has done a quantitative analysis of how EMA practices may affect the financial performance of the Sri Lankan tea manufacturing industry.

As a recent development regarding sustainability concerns within the country, most of the business entities and government of Sri Lanka have aligned their strategies and operations in line with United Nations 17 sustainability development goals for 2030. Under that, the government of Sri Lanka has taken a number of initiatives. One such procedure is the government's "Vision 2025", which provides the overall vision about the public investment programme. Similarly, the National Budget 2018 has focused on a Blue-Green Economy in creating an eco-friendly environment where all can co-exist harmoniously (Swaranapali, 2019).

METHODOLOGY

Research site and collection of data

Sri Lanka's natural rubber has an excessive demand in the world market due to its unique features. The case study organization is one of the leading rubber hand protection products (gloves) manufacturing company (a PLC) in Sri Lanka, referred to as Beta PLC. Beta PLC is one of the global leaders in protective hand-wear (gloves), serving high demand not only in the local but also in the global market (mainly, it is an exports-based manufacturing company) which was established in 1976. With manufacturing facilities in Sri Lanka and Thailand, their products are sold in over 70 countries across five regions. In Sri Lanka, there are four huge factories and head office located in the western province. Beta PLC is also one of the world's leading manufacturers of ethical gloves, offering a holistic value proposition to all its partners across the value chain. Beta PLC's production process mainly consumes latex (rubber milk), cotton liner, and chemicals. Despite its challenging environment, Beta PLC has mainly focused on several key strategic priorities aimed at securing a competitive edge and ensuring long-term value creation.

This study adopts a qualitative approach followed by a single case study. The qualitative method is suitable for examining a phenomenon in a particular context and makes possible the answering of questions of how and why in relation to what is happening with that organization at a particular time (Giacomo & Guthrie, 2017). Several prior studies in environment and social reporting research exploring managerial perceptions have been informed by this qualitative approach because of its suitability (Alam & Islam, 2015). According to Setthasakko (2010), the single case study method enables researchers to better understand corporate culture and a holistic perspective on a complex management system that controlled the development of environmental management accounting in organizations. The data were mainly gathered through semi-structured interviews under two main stages. Initially, a pilot study was carried out, followed by a main study, which was more informative than the pilot study. The interviews took place at the participant's workplace. Firstly, the pilot study was conducted in October 2019 with two interviewees; the sustainable development and energy manager and the finance manager. Both the interviews varied from 40 minutes to one hour per person. Besides, the main study was carried out in February 2020. The empirical data were collected via semi-structured interviews held with sustainable development and energy manager, quality manager, finance manager, executive in raw material storage, and executive in environmental management. A standard questionnaire was distributed except for finance manager and quality manager. A stand-alone questionnaire was given to the finance manager and the quality manager. The reason is, the finance manager has an in-depth understanding of environmental management accounting and relevant reporting practices, where the quality manager has thorough knowledge about the ISO 14001 series of standards backed by environmental and sustainability management practices. The average interview time was around 45 minutes to one hour per person representing the top and middle-level managers and 20 – 30 minutes for lower-level managers. The interviews were recorded on audio recording tape and transcribed onto paper. All the interviews were conducted within the company premises except the last few interviews (due to government-imposed Covid 19 restrictions, last two interviews were held over the phone) and, in the interviewees' native language (Sinhala), which were translated into English later.

THEORETICAL FRAMEWORK

The institutional theory seems to be a widely accepted framework for actor-centered studies dealing with organizations, state and society. The institutional theory explores how organizational structure and actions are shaped by institutional forces such as the government, profession, and society surrounding organizations. This theory can be applied to explain how changes in social values, technical advancements, and regulations affect decisions concerning green sustainable events and environmental management (Ball & Craig, 2010). For example, Institutional theory can be drawn on to examine how different organizational strategies lead to adopting environmental management practices such as green changes in rules, including a core company within a supply chain and government regulations (Rivera, 2004). Luis, Medina and Pichardo (2018) identified that environmental concern is a factor that can explain why businesses are heterogeneous in their green practices and stances in the institutional environment. In sustainability, the significance of the institutional theory in describing organizational responsiveness to environmental issues is identified both conceptually and empirically. Accordingly, this study is theoretically backed by 'institutional theory', which aids in describing the environmental management and sustainability aspects of Beta Plc.

THE CASE STUDY EVIDENCE

Environmental management practices of Beta PLC

Energy management

The energy and sustainable development manager of Beta PLC commented on their fossil fuel consumption as follows:

"We have placed strategic emphasis on reducing dependence on fossil fuels by increasing the use of renewable energy. We have replaced two of our fossil fuel heaters with biomass boilers, which are more energy intensive. As a result, the composition of renewable energy sources accounts for 90% of the total production, and reduction in carbon footprint amounts to 07%."

Furthermore, the supervisor of the operations mentioned that,

"Our company follows safe and endemic working policies. All operational level employees should wear safety shoes produced by us before entering the premises. We ensure employee safety at work premises. There exists a high risk of falling liquids on to the legs and may cause accidents and injuries at operations. To increase the efficiency of operational level employees, they are advised not to use mobile phones while working. Also, mobile phones are not allowed to take into factory premises. However, for communication purposes, Beta PLC has established a common land phone system at each department."

Raw material management

Mainly, the production ingredients of gloves comprise latex/ natural rubber. The daily usage of rubber latex for production purposes amounts to 70,000-80,000 liters. The operations supervisor mentioned that:

"Other than natural rubber, chemicals such as Calcium (C), Sulphur (S), and Ammonium sulfate are used (160 of varieties) in the mixture; also varieties of color chemicals are added when manufacturing rubber gloves."

Beta PLC purchases raw materials from both internal and external suppliers. The raw material storage executive stated that:

"In terms of purchases, firstly, we forward a purchase request (PR) to the raw material purchasing unit. Then purchase order (PO) is issued, and we receive the goods. After that, as a requirement of ISO 140001 standard, the operational procedure will be implemented. For chemical compounds, raw material storage division issues a non-format report, Certificate of Analysis of Chemical (COA)."

Raw material storage (RMS) executive further stated that,

"We also work closely with our suppliers in getting quality inputs for high-quality natural latex through sustainable agricultural practices and tapping methods and thereby, contributing to the quality and sustainability of this valuable source."

Raw material storage (RMS) executive further mentioned that:

"We follow a safe chemical managing procedure, especially for the employees. In case of chemical leakages, chemicals are absorbed by that soil. Therefore, hazardous acids are kept under suitable storage conditions. Such safeguards are initiated to ensure the health and safety of all employees at the workplace. Finally, the chemical mixed sand is delivered to Holcim under safety instructions for incineration (burn) purposes. The cost of incineration is quite high."

There is a special training program on handling hazardous acids and guidelines are given on how to use them and how to handle safety equipment. They have labeled solid chemicals through a colour code board scoring, ranging from 0-4. (0- less harmful, 4- extremely harmful) For liquid chemical storage, the company has developed a drain system filled with sand.

Waste Management

In line with GRI framework, an unnecessary part of a material, substance or byproduct is eliminated or discarded as no longer useful or required after completing a process. This includes water dischargers, treatment and disposal of waste and spills of chemicals, oil, fuel and other substance. The environmental management and regulation department of Beta PLC is responsible for controlling the waste.

The senior management of Beta PLC is involved in the project evaluation stages of Total Production Maintenance (TPM), a concept in lean manufacturing. The environmental management and regulation executive mentioned that:

“The main aim of implementing TPM within the factory premises is to identify 15 areas of losses which impede labour and equipment effectiveness. These include breakdown losses, minor stop, idling losses, quality defect and rework losses, management losses, and logistic losses.”

Based on the organizational practices, the general idea of the environmental management and regulation executive about the sustainability concept was:

“The top management contribution and guidance is the most important factor in determining the adoption and success of the organizational sustainability policy /concept.”

Furthermore, he briefly explained the 3R concept:

“Under reuse, it is concerned with reusing barrels, tanks, baskets, and cans multiple times in the production process. In recycling, biological sludge (mud) is used as a compost fertilizer in gardening or sold to small scale compost manufacturing entrepreneurs. Under reclaim, scraped gloves are sold to employees or third parties at a low price for their household purposes. Some employees are doing small scale businesses by selling scraped gloves.”

The Finance manager explained the steps that they have taken in reducing paper usage:

“We advocate communication via electronic or digital media wherever possible and generate e- reports. Furthermore, the company is implementing an automated board meeting software that will reduce the paper consumption used to print board papers. Plans are also in place to move towards a paperless culture with the use of soft copies, and employees are strictly advised to use double-sided printing option.”

The environmental management and regulation executive further added:

“Our manufacturing facilities are fully in compliance with the CEA environmental protection license and waste management agreements. In addition, the CEA and BOI are bound to provide an independent assurance report on the factory’s environmental compliance monthly.”

Water Management

Beta PLC’s Energy and sustainable development unit is holding the responsibility of managing water. Two kinds of water categories are used in production. The first category is bleaching water that goes under biological treatment. The second one is chlorination water, and it comes under chemical treatment. Beta PLC has recently established an Osmosis plant. The energy manager commented:

“Osmosis plant was established recently in the organization. As a new unique tool for Beta PLC, it is more useful in purifying the chemical water discharged by the operational processes. In a normal purifier system, they mix 50% of chemical water and 50% of pure water. However, in this osmosis plant, water can be purified without mixing them with pure water. The initial cost was high, but through this process, 5% of recycled water can be reused for production purposes.”

Carbon emission management

Carbon is emitting from the boilers. These boilers are used in generating steams from the oven. After steams reach a particular temperature, gloves are cooled through them, which is the last step of the gloves manufacturing process. The supervisor in charge of operations stated that:

“To reduce the carbon emission volume at the factory premises, Beta PLC is heavily using firewood. Firewood is one of the renewable energy sources, and that is the least carbon-emitting energy source. Previously, furnace oil was highly used. However, later, furnace oil was recognized as one of the highest carbon-emitting sources.”

The sustainability management and reporting system of Beta PLC

The environmental management strategies of the company have been implemented with consistent commitment. The strategies are periodically evaluated and analyzed with the support of the EMA system. The adoption and maintenance of the environmental-related recording system within Beta PLC is backed by several reasons. With the emergence of the integrated reporting framework in 2013, Beta PLC has given much attention to environmental management accounting and reporting concerns.

Furthermore, the finance manager stated that:

“The integrated reporting framework requires “natural capital” to be specifically highlighted in the corporate reports. This year, we have implemented ISO 14001(EMS). The EMS provides a foundation in keeping records on the environmental management activities of the entity.”

In addition, the quality manager explained that:

“In 2013, we won the best innovative model for CSR projects award at JASTECA awards (Japan Sri Lanka Technical & Cultural Association). It was a great achievement, and Beta PLC wanted to deliberate that news to our valuable stakeholder groups and the general public. The basic format of our EMA recording system is based on management approach disclosures and topic-specific disclosures in GRI framework, UN global compacts standard and Environment Management System (ISO 14001).”

Before implementing sustainability software, Beta PLC recorded their energy usage and carbon emission details in spread (excel) sheets. The excel sheet comprises conversion factors and rupee values. In the sustainability software /portal, the cost and revenue categories are identified under Global Reporting Initiatives (GRI) code. The department employees enter data monthly into the system. At the end of the period, sustainability software generates a summary report relating to environmental costs and revenues.

All the waste categories of the company are divided into hazard waste and non- hazard waste. Under non – hazard waste: biological sludge (compost and mud sludge, waste food) recycle sludge; (cardboard, paper, cotton waste) and rubber waste (scraped gloves, wet forks). Conversely, chemical sludge (forks and machine-washing water, polythene) comes under hazard waste. Beta PLC keeps track of the total water consumption and wastewater generation, evaluation of water-saving projects, and calculation of water intensity ratio (KPI) representing both PEMA and MEMA practices in terms of accounting for water. The water bill is used as a source document to obtain physical details about the average consumption for the last 30 days and current consumption (M3). Also, for monetary details such as water charge and payment, charges for this month, dues of the previous month, and total due amount. The results of individual KPIs also provide valuable feedback for resource allocation decisions while signaling budgetary requirements for the next period. For carbon emission, they get the total amount using intensity factor and calculate for units such as kg & liters with the use of excel sheet. The sustainability software encompasses certain elements such as scope 1 (Direct GHG emission, Scope 2 (Indirect GHG emissions), and other GHG emissions. Beta PLC maintains an action plan regarding environmental objectives supported by a scoring system for different activities.

DISCUSSION AND CONCLUSION

EMA provides various financial and non-financial, quantifiable and non-quantifiable benefits such as compliance, supporting eco-efficiency behavior, and strengthening strategic position. However, EMS (Environmental Management System) is one of the foundations for EMA. Therefore, the establishment of an EMS is a crucial factor for any organization. According to Gunarathne and Lee (2015), the EMA approach is supported by some supplementary initiatives such as the existence of EMS systems or performance evaluation systems. Lansiluoto (2010) has recognized quality managers and accountants as the key actors in implementing EMS and EMA within an organization. The success of EMA's adoption is highly dependent on the support received from the employees at all levels (Gunarathne & Lee, 2015).

Similarly, at Beta PLC, top management was involved in policy development and initializing instructions for conducting procedures while middle level managers are involved in conducting awareness programmes and evaluating management reviews. The management reviews contain information about the last six months' progress and behavioral patterns. At Beta PLC, they practice the application of TPM throughout their production processes. Total Production Maintenance (TPM) is one of the key concepts of lean manufacturing philosophy.

The department's exclusive features are a Total Production Maintenance (TPM) related leader and member teams comprising five employees. The objectives are waste reduction and deduction of waste disposal cost.

All of the interviewees strongly emphasized the strict link between environment performance and financial result and the high importance of environmental management practices. This study shows the importance of institutional logic and collective identify in better understanding the concept of EMA. In addition, EMA is linked with their organization's ability to finance and gain benefits from sustainability practices. When the environmental measures become entered in the major reporting media, the connection between environment and profits become visualized by it. Mainly, EMA systems are used as a basic structure for achieving sustainable development and guiding decision making within the organization in order to gain legitimacy from broader society. There is a need for broader acceptance by senior management on the role of accountants should play in accounting for sustainable development. Some interviewees implied that engaging in sustainable development reporting was a burden with their existing roles within the organization and they were negotiating the use of Triple Bottom line Reporting and Global Reporting Initiatives. Beta PLC develops sustainability strategies, create sustainable products and operations, produce sustainability reports and appoint sustainable development department who assist sustainability to make their core mission. All the interviewees agreed that, EMA is a process of maintaining and reproducing the collective identify environmental targets and measures become extremely connected with cost saving and revenue but also continued to provide further similar concepts. Ultimately, this study contributes to the practicing managers to recognize opportunities for the use EMA concepts and create value addition for the organizations.

When referring to the limitations of the study, the researchers has experienced the difficulty in scheduling interviews and the total number of interviews were limited to seven as there were some difficulties in entering to the factory premises and contacting the interviewees during the covid-19 pandemic period. The other major limitation is that qualitative case study method's results will only be capable of being theoretically generalized in a contextual way. Future research on this topical area could also be extended to a bigger sample size perhaps incorporating a range of organizations from various institutional settings. As such a future avenue of research will be the extension of multiple case studies in Sri Lanka, especially for Small and Medium size Enterprises (SME) or survey data covering of different sector organizations such as conglomerates.

REFERENCES

- Alam, M. M., & Islam, M. A. (2015). Do Stakeholder or social obligations drive corporate environmental reporting? Managerial views from developing country, *Qualitative Research in Accounting & Management*, 12(3), 287-314.
- Aras, G., & Crowther, D. (2009). Making sustainable development sustainable, *Management Decision*, 47(6), 975-988.
- Ball, A., & Craig, R. (2010). Using neo- institutionalism to advance social and environmental accounting, *Critical Perspective in Accounting*, 21(4), 283-293.
- Basuki, B., & Irwanda, R.D. (2018). Environmental cost analysis and reporting to measure environmental performance in realizing eco- efficiency at PT Industri Kereta Api, *Asian Journal of Accounting Research*, 3(2), 169-180.
- Bebbington, J., & Larrinaga, C. (2014). Accounting and sustainable development: An exploration, *Accounting, Organization and Society*, 39(6), 395-413.
- Bebbington, J., & Unerman, J. (2018). Achieving the United Nations Sustainable Development Goals: An enabling role of accounting research, *Accounting, Auditing & Accountability Journal*, 31(1), 2-24. doi: 10.1108/AAAJ-05-2017-2929.
- Burritt, R., Hahn, T., & Schaltegger, S. (2002). Towards a comprehensive framework for environmental management accounting: links between business actors and environmental management accounting tools, *Australian Accounting Review* 12(2) 39-50.
- Caliskan, A.O. (2014). How accounting and accountants may contribute in sustainability? *Social Responsibility Journal*, 10(2), 246-267.
- Dayaratne, S.P., Wickremathilake, G.H., & Gunawardana, K.D. (2015). Impact of Green Reporting for business valuation: Study of Small and Medium sized Enterprises (SME) Rubber manufacturing in Sri Lanka, *Sri Lanka Journal of Real Estate*, 2(1), 31-53.
- Dissanayake, D., Tilt, C.A., & Lobo, M.X. (2016). Sustainability Reporting by Publicly Listed Companies in Sri Lanka, *Journal of Cleaner Production*, 9(4), 1-14.
- Dubey, R., & Ali, S. S. (2014). Green Supply Chain Practices and its impact on organizational performance: an insight from Indian rubber industry, *International Journal Logistics systems and Management*, 19(1), 20-42.
- Egan, M. (2017). Sense making resources efficiency through Sustainability Reports, *Journal of Business Ethics*, 10(20), 41-52.

- Ferreira, A., Moulang, C., & Hendro B. (2010). Environmental management accounting and innovation: an exploratory analysis, *Accounting, Auditing & Accountability Journal*, 23(7), 920-948. doi: 10.1108/09513571011080180.
- Frost., G.R., & Adams, C.A. (2008). Integrating sustainability reporting into management practices, *Accounting Forum*, 32(1), 288-302.
- Fuzi, N. M., Habidin, N. F., Janudin, S. E., & Ong, S. Y. (2019). Critical success factors of environmental management practices: findings from Malaysian manufacturing industry, *Measuring Business Excellence*, 23(1) 1-14. doi: 10.1108/MBE-0332018-0015.
- Giacomo, N., & Guthrie, J. (2017). Environmental management Accounting system for carbon emissions, *PSU Research Review*, 1(1), 39-50.
- Gray, R. (2010). Is accounting for sustainability actually accounting for sustainability and how would we know? An exploration of narratives of organizations and the planet, *Accounting, Organizations and Society*, 35(1), 47-62.
- Govender, V. (2016). A case study on environmental management accounting practice at a South African manufacturing company, *Yunibesiti Ya Bokone-Bophirima*, 14(2), 68-80.
- Gunarathne, N., & Lee, K. H. (2015). Environmental Management Accounting (EMA) for environmental management and organizational change: An eco-control approach. *Journal of Accounting & Organizational Change*, 11(3), 362-383. doi: 10.1108/JAOC-10-2013-0078.
- Gunawardana, K. D. (2018). An analysis of Environmental Management Practices on Financial Performance of Tea Estate Industry, *Sri Lankan Journal of Real Estate*, 3(4), 31-53.
- Henri, J.F., & Journeault, M. (2010). Eco control: The influence of management control systems on environmental and economic performance, *Accounting, Organizations and Society*, 35(2), 63-80.
- Jalaludin, D., Sulaiman, M., & Ahmad, N. N. (2011). Understanding environmental management accounting adoption: A new institutional sociology perspective, *Social Responsibility Journal*, 7(4), 540-557. doi: 10.1108/17471111111175128.
- Lansiluoto, A. (2010). Collective action in the implementation of a greener environmental performance measurement system, *Journal of Accounting & Organizational Change*, 6(2), 200-227. doi: 10.1105/18259110111048763.
- Luis, G.J., Medina, P.S., & Pichardo, R.D. (2018). Institutional pressure and green practices in small agricultural business in Mexico, *Journal of Sustainability*, 10(3), 44-61.
- Monteiro, S.M., & Guzman, B. A. (2012). Organizational and Accounting change within the context of the environmental agenda: Evidence from Portugal, *Journal of Accounting & Organizational Change*, 6(4), 404-435. doi: 10.1108/1832591101191800.
- Mosene, J.A., Burritt, R. L., & Sanagustin (2013). Environmental reporting in the Spanish wind energy sector: an institutional view, *Journal of Cleaner Production*, 40(1), 199-211.
- Ong, T., Trireksani, T., & Djajadikerta, H.G. (2016). Hard and soft sustainability disclosures: Australian resources industry, *Accounting Research Journal*, 29(2), 198-217.
- Petcharat, N. N., & Mula, J. M. (2012). Towards a conceptual design for environmental and social cost: identification and measurement system, *Accounting, Auditing & Accountability Journal*, 10(1), 34-54.
- Rivera, J. (2004). Institutional pressure and voluntary environmental behaviour in developing countries: evidence from The Costa Rican hotel industry, *Journal of Social and Natural Resources*, 17(2), 779-797.
- Schaltegger, S., & Synnestvedt, T. (2002). Environmental management as the crucial trigger between environmental and economic performance, *Journal of Environmental Management*, 65(2), 339-346.
- Setthasakko, W., (2010). Barriers to the development of environmental management accounting: An exploratory study of pulp and paper companies in Thailand, *Journal of Organizational Change Management*, 5(3), 315-331.
- Swarnapali, N.C. (2019). Sustainability disclosure and earnings informativeness: evidence from Sri Lanka, *Asian Journal of Accounting Research*, 33(5), 2444-275.