THE PRACTICES, OBSTACLES AND BENEFITS OF VOLUNTARY ENVIRONMENT MANAGEMENT ACCOUNTING PRACTICE IN GREEN ADOPTED APPAREL MANUFACTURING ENTERPRISES IN SRI LANKA: A QUALITATIVE RESEARCH

WICKRAMA ARACHCHIGE DULAN PUBUDU GUNASEKARA

(14/MS/022)

B.Sc. (HONOURS) IN BUSINESS MANAGEMENT

SABARAGAMUWA UNIVERSITY OF SRI LANKA

2020

THE PRACTICES, OBSTACLES AND BENEFITS OF VOLUNTARY ENVIRONMENT MANAGEMENT ACCOUNTING PRACTICE IN GREEN ADOPTED APPAREL MANUFACTURING ENTERPRISES IN SRI LANKA: A QUALITATIVE RESEARCH

A Supervised Independent Studies Submitted to the Faculty of Management Studies, Sabaragamuwa University of Sri Lanka in Partial Fulfilment of the Requirement for the Degree of Bachelor of Science Honours in Business Management

WICKRAMA ARACHCHIGE DULAN PUBUDU GUNASEKARA

(14/MS/022)

© 2020 W.A.D.P GUNASEKARA

Faculty of Management Studies

Sabaragamuwa University of Sri Lanka

CERTIFICATION OF SUPERVISED INDEPENDENT STUDY

We, the undersigned, certify that

WICKRAMA ARACHCHIGE DULAN PUBUDU GUNASEKARA

Candidate for the Honour degree of

Bachelor of Science in Business Management

Has presented his supervised independent study entitled

THE PRACTICES, OBSTACLES AND BENEFITS OF VOLUNTARY ENVIRONMENT MANAGEMENT ACCOUNTING PRACTICE IN GREEN ADOPTED APPAREL MANUFACTURING ENTERPRISES IN SRI LANKA: A QUALITATIVE RESEARCH

As it appears on the title page and front cover of the thesis

That the said supervised independent study is acceptable in from and content and

Displays a satisfactory knowledge of the field of the study as demonstrated by the candidate through the oral examination held on

…….…….

Chairman for Viva …… Signature ……

Head of Department ……. Signature ……...….

First Examiner …… Signature ……...

Second Examiner …….. Signature……...……

PERMISSION TO USE

In presenting this supervised independent study in fulfillment of the requirement for a bachelor's degree from the Sabaragamuwa University of Sri Lanka, I agree that the university library may make it freely available for inspection. I further agree that permission for the copying of this supervised independent study in any manner, in whole or in part, for scholarly purposes may be granted by my supervisor or, in their absence, by the Dean of the Faculty of Management Studies. It is understood that any copying or publication or the use of this supervised independent study or parts therefore financial gains shall be given to me and to the Sabaragamuwa University of Sri Lanka for any scholarly use which may be made of any material from my supervised independent study.

Request for permission to copy or to make any other use of materials in this supervised independent study, in whole or in part, should be addressed to:

Dean

Faculty of Management Studies

Sabaragamuwa University of Sri Lanka

P.O. Box 02, Belihuloya – 70140

Sri Lanka

DECLARATION

I Wickrama Arachchige Dulan Pubudu Gunasekara declare that this supervised independent study and the works presented in it are my own and it has been generated by me as the result of my own original research.

Title of supervised independent study

THE PRACTICES, OBSTACLES AND BENEFITS OF VOLUNTARY ENVIRONMENT MANAGEMENT ACCOUNTING PRACTICE IN GREEN ADOPTED APPAREL MANUFACTURING ENTERPRISES IN SRI LANKA: A QUALITATIVE RESEARCH

I confirm that:

(1) This work was done wholly or mainly while in candidature for a research degree at this University; (2) where any part of this research report has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated; (3) where I have consulted the published work of others, this is always clearly attributed; (4) where I have quoted from the work of others, the source is always given. With the exception of such quotations, this research report is entirely my own work; (5) I have acknowledged all main sources of help; (6) where the research report is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself; (7) either none of this work has been published before submission.

Signature of Student: Dulan Date: 2020/12/20

Supervisor's Recommendation: …….

This is to certify that this research report has been prepared by W.A.D.P Gunasekara under my supervision.

Signature of Supervisor: ……

Name of Supervisor: …… Date ……

ABSTRACT

Environmental Management Accounting (EMA) has emerged as a new branch of accounting due to the heightened concern on environmental sustainability by business organizations during the past decade. However, the knowledge of EMA in the Sri Lankan context is scarce. Therefore, this research's primary purpose is to explore the voluntary EMA practices in green adopted apparel manufacturing enterprises in Sri Lanka. I designed this exploratory study as a qualitative multiple case-study and used an inductive reasoning approach to arrive at the findings. I purposefully selected five green implemented apparel factories in Sri Lanka to explore EMA practices. I interviewed Sustainability Managers and Executives of the selected organizations and analyzed the data by using thematic analysis. Organizations use different EMA practices for water, energy, waste, culture, and biodiversity. On the one hand, companies recognize input-output analysis, budgeting for EMA, and total cost assessment as EMA practices. On the flip side, I could identify the lack of accounting standards for EMA, unawareness of EMA, and perceived huge costs associated with EMA as barriers to promoting EMA. Managers perceive that EMA improves the brand image, enhances productivity, creates an accurate picture to the organizations, and predicts the future with proactive planning. This research contributes to the EMA knowledge by exploring EMA techniques, obstacles encountered and benefits when following EMA practices of large-scale green adopted apparel enterprises in Sri Lanka. EMA can be implemented in organizations and the problem of hiding the environmental cost within overhead costs can be addressed by recognizing environmental costs and benefits separately. Eventually, this study provides insight to link sustainability into accounting in organizations.

Keywords: *Environment management accounting, green adopted apparel enterprises, Sri Lanka*

ACKNOWLEDGMENT

First, I would like to express my sincere graduate to my supervisor of the Department of Business Management, Faculty of Management Studies, Sabaragamuwa University of Sri Lanka, Dr. H.P.R. Priyankara who encouraged me to do the final research proposal properly and helped me to do this effectively. I am indebted to the lecture Dr. N.P.G.S.I Naotunna who shared her knowledge with us in the lecture series on research methodology

Also, I would like to express my sincerer gratitude to Prof. Athula Gnanapala, Dean of the Faculty of Management Studies, Dr Ushan Peiris, coordinator, practical training unit. I express my special gratitude to all who gave me wonderful assistance to conduct this study successfully.

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

EMA - Environment Management Accounting

UNDSD-United Nation Division of Sustainable Development

FS- Financial Statement

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Currently, climate change is one of the major problems in the world (Henderson et al., 2018). Industrialization and human activities negatively impact the environment in many ways, including water pollution, air pollution, environmental pollution, soil pollution, food pollution, and fossil fuel pollution (Pattnaik et al., 2019). Further, the greenhouse gas amount has increased over the past years and waste generation get increased due to such production activities. Accordingly, with the critical impact of climate change, the global concern on environmental sustainability has been increased in the 21st century.

Being major contributors to environmental deterioration, organizations have to concern about environmental factors when they make decisions, especially in the manufacturing and hotel sectors, because their productions are directly related to the damage of environmental resources. As an example, manufacturing industries mainly impact environmental pollution. Distillery manufacturing companies are one of the major sources of environmental pollution which generates more wastewater to the environment (Chowdhary et al., 2018). Therefore, managing only the organizational perspective is no longer valid. Hence, an organization needs to focus on a wide environment when making decisions since most of the production decisions impact the environment.

Not only environmental effects but also the stakeholders' impact on the environment also has enhanced in various ways. Today's consumers are more aware of the environmental issues caused by heavy industrialization (Sarumathi, 2014). Therefore,

the consumers, investors, and other stakeholders' involvement in the green concept has also increased. Accordingly, organizations have to make consideration of the

environment. Organizations have moved to corporate greening and various functions, including Green Supply Chain, Green Marketing, Green Production, and Environmental Accounting have been introduced.

According to Braam and Peeters (2017), all the stakeholders are expecting companies to become more responsible and accountable with the impact of the decisions on the environment and seek to publish information about the sustainability performance of the company. On the one hand, in response to the heightened corporate greening and stakeholder pressure to publish sustainability performance, it can be seen that there is an increasing trend in applying Environmental Accounting in organizations (Maama & Appiah, 2019). On the other hand, many organizations recently talk about sustainability accounting because traditional accounting objectives have been changed into sustainable objectives. To reach the sustainability goal of an organization three aspects need to be considered; economic, social, and environmental. However, Traditional Accounting only focuses on the financial impact of organizational transactions which is only a part of sustainable accounting. Hill et al. (2006) noted that management accounting has historically treated environmental costs as overheads. Hence, traditional accounting does not provide an opportunity to control environmental costs and benefits. The sustainability accounting framework reflects the economic, social, and environmental impact and demonstrates how they are connected (Persic et al., 2017).

Therefore, the adoption of sustainability accounting caused to generate a new branch of accounting called "Environmental Accounting," which provides information regarding the organizational impact on the environment. Environmental Accounting has been described by Thornton (1993) as the accounting of corporate environmental liability into the accounting system and the disclosure of information in the financial statement. Accordingly, financial statements should include both financial and non-financial information. Environmental Accounting is a broad concept that was created through Environmental Management Accounting (EMA) and Environmental Finance Management.

EMA is the tool that uses to recognize the environmental information of an organization. There is no universally accepted definition for EMA. However, according

to the UNDSD (2001), EMA is defined as collecting, estimating, analyzing, and internal reporting about the monetary and non-monetary environmental information to make environmental decision making within an organization. Further, EMA provides extra information to the management by identifying and quantifying measures such as obligations associated with the significant influences exercised upon the environment; the cost of legal stipulations in the field; the benefits (or cost savings) arrived as a result of implementing the environmental management systems (Man & Vasil, 2012).

The advent of EMA is based on two main reasons. First, the realization of the difficulties and challenges faced by conventional management accounting because conventional management accounting does not take into consideration the environmental performance and hides environmental information in overhead cost. The other reason is the huge environmental impact and its cost (Jamil et al., 2015). Hence, the EMA practice can overcome those negative sides of conventional accounting.

In this study, the focus is on Large-Scale apparel organization to study EMA practices. Some organizations have developed their environmental management systems to a high level while other organizations are still at the infancy stage of adoption. Understanding how the level of maturity/development of EMA alongside environmental management also offers potential benefits for manufacturing companies to develop their environment practices (Gunarathna & Alahakoon, 2016). Considering this importance and arguments, this study focused on the field of Environmental Management Accounting.

1.2 Research Problem

- **Contextual gap**

Researches have researched EMA in both foreign and Sri Lankan contexts. The Global Reporting Initiative (GRI) has emphasized guidelines to provide environmental information including materials, energy, water, biodiversity, emissions, and waste to measure environmental performance. Researches have followed those guidelines to measure EMA practices.

Some studies have been conducted in a foreign context to recognize the role of EMA. As a role, performing EMA practices is very important to have organizational environmental performance (Latan et al., 2018). I also concern about how EMA practices impact organizational decision making. EMA practices positively impact

organizational carbon management and disclosure quality (Qian et al., 2018). Likewise, different scale of research has been conducted regarding EMA in foreign contexts.

However, the research on the concept of environmental accounting is limited in Sri Lanka. Wijayasinghe (2017) investigated the impact of green practices on the financial performance of Small and Medium-sized Enterprises (SMEs) in Sri Lanka. She argued green accounting practices allow organizations to generate both advantages and disadvantages through a win-win situation. However, Wijayasinghe (2017) did not focus much more on the various green management accounting practices conducted in the Sri Lankan context in both SME and large-scale organizations. A study by Gunarathne and Alahakoon (2016) pointed out some EMA practices conducted by companies in Sri Lanka by using the authors' experiences. Thus, there is a doubt about the methodological appropriateness of Gunarathne and Alahakoon (2016). Further, Gunarathne and Lee (2013) study about the EMA practices as a case study in a hotel in the Sigiriya area and found common EMA practices conduct in that hotel sector. Those authors attempted to cover salient aspects such as common EMA tools and techniques. Therefore, there exists the lacuna of methodologically sound researches regarding EMA practices in Sri Lanka.

As earlier emphasized, manufacturing companies directly impact the environment. From that, apparel industries are special due to a higher impact on the environment. Issues of environmental health and safety do not apply only to the production of man-made fabrics. Cotton, one of the most popular and versatile fibers used in clothing manufacture, also has significant environmental damage (Claudio, 2007). Chemical disposal, a high amount of water consumption, and a large amount of energy consumption on the production can be recognized as the main environmental impact of the apparel industry (Toprak & Anis, 2017).

As an example, the following table provides contaminants of textile wastewater.

Table 1. 1 Contaminant of textile wastewater

Type of finish textile products	Dyes,g/kg textile product	Auxiliaries, g/kg textile product	Basic chemical compounds, g/kg textile product
Polyester fibers	18	129	126
Fabric from synthetic fibers	52	113	280
Fabrics from cotton	18	100	570
Dyed fabrics from cellulose fibers	11	183	200
Printed fabrics from cellulose fibers	88	180	807

Source: (Toprak & Anis, 2017)

Likewise, the production of the apparel sector damages the environment in many ways. Therefore, it is imperative to consider the sustainable side of this industry.

Therefore, in this study, the large-scale apparel organizations in the apparel industry are considered as the context of the study since the apparel industry has considerable negative impacts on the environment.

The criteria of the ministry of industry and commerce have been taken to distinguish the large-scale apparel organization from the apparel sector. According to the Ministry of Industries and Commerce in Sri Lanka (2020), the category of Small and Medium-sized Enterprises (SMEs) is made up of an enterprise that employs less than 300 employees. Therefore, if any organization which has more than 300 employees been considered a large-scale organization. Therefore, in this study, all the apparel manufacturing enterprises have been selected with more than 300 employees to study the EMA in large-scale apparel manufacturing organization in Sri Lanka.

On the other hand, the apparel sector is the highest income generation sector through export in Sri Lanka (Cental Bank of Sri Lanka, 2018). According to the Sri Lanka Export Development Board, Sri Lankan garment factories use advanced technology being the world's 1st "Green Garment Factory" by reducing 70% of energy and water consumption. Therefore, the apparel industry in Sri Lanka implements EM practices.

Considering the importance of the apparel sector in Sri Lanka, it is essential to identify the EMA practices adopted by the large-scale apparel manufacturing organizations in Sri Lanka. Therefore, this study recognizes how the apparel sector caters to environmental impact and for stakeholders' different requirements and to understand whether they use international guidelines and practices.

According to the analyses of the literature review, there is a clear knowledge gap about the EMA practices used in the apparel industry in Sri Lanka. According to Gunarathne and Alahakoon (2016), organizations practice different environmental management accounting practices. Thus, I have focuses on the following research problem to recognize different EMA practices in an apparel organization in Sri Lanka.

"What are the practices of Environmental Management Accounting in large-scale organizations in the apparel sector in Sri Lankan?"

1.4 Research questions

- What are the EMA practices adopted by large-scale green implemented Apparel companies in Sri Lanka?
- What are the obstacles encountered by large-scale green implemented Apparel companies in Sri Lanka in using EMA?
- What are the benefits of following EMA by large-scale green implemented Apparel companies in Sri Lanka?

1.5 Research objectives

- To explore the EMA practices adopted by large-scale green implemented Apparel companies in Sri Lanka
- To explore and illustrate the obstacles encountered by large-scale green implemented Apparel companies in Sri Lanka in using EMA

- To explore the benefits of following EMA by large-scale green implemented Apparel companies in Sri Lanka

1.6 Significance of the study

This part describes the academic and practical significance of the research.

1.6.1 Practical significant

Organizations that do their activities relating to the environment, will take benefit from this study. This study only focuses on the apparel sector but any kind of organization can be benefited by identifying the different EMA practices. Therefore, the finding of this study will be able to grab by any kind of organization including a large or small scale. Failure to identify the environment relate to information creates barriers to make better economic internal decisions (Mokhtar et al., 2016). Therefore, with the help of this study, identification of the EMA practices will important to the organization to improve better decision making.

As discussed earlier, the concern about the environment has been increased by the community. Therefore, the information relevant to the environment is required by the community to take decisions. The community benefits from this study by receiving the information relevant to the question of how the apparel sector caters to the environment in Sri Lanka. Then the information can be used to make decisions such as compelling organizations to be green to protect the environment.

The finding of this study allows us to compare and contrast the EMA practices implemented by large-scale organizations in the apparel industry. Hence, apparel organization could improve their EMA practices by identifying the different EMA practices conduct by differently scaled organizations.

1.6.2 Academic Significance

In Sri Lanka, less research has been conducted in the area of EMA practices. Also, there is no research conducted to identify different EMA practices based in the apparel industry. Hence, in this research, I explore the different EMA practices of Large-scale apparel enterprises in Sri Lanka. Therefore, this research adds new knowledge to the EMA body of knowledge by uncovering EMA practices of apparel sector enterprises in a developing country context.

1.7 Chapter organization

The first chapter of the study provide the overview for the study and it further describe the research back ground, research problem, reserch questions, objectives and the significant of the study. The secand chapter has proved a review of the existing studies about the theritical review, empirical review and the methodological review. The third chapter describe about the research design of the study. It has described about research approach, methodologies, data collection and the analysis techniques. The forth chapter discuss about the data analysis of the research and finally the fifth chapeter describe the conclusion based on the gathered data with research implication and the future direction.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction to the chapter

This section provides an overview of the prior research work, which has been done by both foreign and local contexts relevant to the EMA field. This section includes an empirical, theoretical, and methodological review of the existing literature and tries to find out relevant theories, methods, and gaps.

2.2 Empirical review

Before the emergence of EMA as a branch of Environmental Accounting, researchers study about accounting as a money measurement tool which suggests that accounting reports only economic transactions (Maama & Appiah, 2019). But researchers' study accounting as environmental accounting with the emerge of the sustainability concept and the stakeholders demanding the environmental and social performance on its financial health.

When analyzing literature, it can be seen that there is no single universally accepted definition for EMA (Gunarathna & Alahakoon, 2016). However, when analyzing the definition of EMA there is some common characteristic include in the EMA. Accordingly, EMA can be defined as the identification, collection, calculation, analysis, and internal reporting to the management regarding environmental information to make an internal decision (Vasile & Man, 2012). This information can be either physical (energy, water, and material) or monetary (environmental-related cost, earning, or saving) information (International federation of accountants, 2005).

On the other hand, Burritt et al. (2002) have developed a comprehensive framework for EMA including that of physical and monitory information (Appendix A Framework for Environment Management Accounting)

With the expansion of the EMA in the past period, a different type of management accounting tool has been developed to measure corporate environmental information. Therefore, with these new management tools, studies have been conducted in a foreign context with relevant to the different countries in different sectors to identify how different context follows EMA practices and to recognize its advantages. Those studies revealed Using EMA such as Activity Based Costing (Capusneanu et al., 2020) and

Life Cycle Costing (Chan et al., 2014; Brown & Deegan, 2012), create more advantage to the company. Consequently, new insights have been developed relevant to EMA practices. Water Management Accounting as EMA practice has been recognized as an extension of EMA (Christ & Burritt, 2017). According to Syarif and Noviata (2019), Material Flow Costing relating to the EMA can enhance the production and its performance. Likewise, studies have been followed to developed EMA practices over time.

On the other hand, a lot of researchers have studied to identify the impact of EMA practices on finance and environmental performance. According to the arguments of Al-Mawali et al. (2018), there is a positive relationship between EMA practices and organizational financial performance. On the other hand, Solovida and Latan (2017) argued that EMA practices improve the environmental performance of the company because EMA provides relevant information relevant to the environment. As an example, practicing EMA provides information to have cleaner production within the organization (Burritt et al., 2019), and also it causes to measure and manage the carbon emission in the organization (Qian et al., 2018). Furthermore, EMA cause to have quality corporate governance within an organization (Amoako et al., 2017). For this reason, following EMA not only can cause to enhance both environment and finance performance but also important to have quality corporate governance that important to achieve stakeholders' expectations. However, all those studies have been conducted relevant to large scale organizations.

Not only EMA, as a new branch of accounting has been used by many large organizations but also SME organizations as well. However, lots of SME organizations

practice physical EMA practices rather than focusing on the monetary side (Jamil et al., 2015). Likewise, researchers who researched developing countries argued, many developing countries still do not practice full EMA practices in SME organizations in a proper manner. In line with the argument of Revell et al. (2010) can be recognized reasons for not practicing proper EMA practices, as SMEs have a lack of understanding of the knowledge and expertise required for environmental management accounting.

The following table (Table 2.1) shows the existing studies relevant to the EMA practices in a foreign different context.

Table 2. 1: Existing studies regarding the EMA practices

Author	Year	Context	Purpose	Finding
Burritt, Hahn and Schaltegger	2002	Australia	This article develops a comprehensive framework for environmental management accounting (EMA) linking business actors and EMA tools.	The proposed framework provides a structure for managers to understand and assess the variety of environmental management accounting tools.
Burritt and Saka	2006	Japan	This paper explores the links between environmental management accounting and measures of eco-efficiency in Japanese business	In Japan a provisional standard and guideline state that eco-efficiency information is an essential indicator and should be developed by an EMA system and produced incorporate environmental reports. Practices are varied and there seems to be a need

				for further promotion of EMA
Bartolomeo, Bennett, Bouma, Heydkamp, James, and Wolters	2010	European	This paper reports and analyses the results of a trans-European project to investigate the present and potential future links between the environmental management and management accounting functions of a company or business	Although the Organization uses EMA activity this often represents isolated experimental projects rather than systematic or comprehensive implementation. Results suggest that opportunities sexist for many companies, for both business and environmental reasons, to become more active and adventurous in environmental management accounting,
Man, and Vasil	2012	European	Talk about the EMA dimension and its practices and important.	Nevertheless, EMA is not only a management tool of the interaction with the environment among many others; EMA is rather a set of principles and methods that provide data about materials and energy consumption and costs that are required by the success of all the

				activities in this field of management.
Schaltegger	2017	Germany	This article focuses on the missing link of EMA to sustainability based on the concept of planetary boundaries.	The researcher argued a lot of publication deals with energy and material but not focused on how EMA links to sustainability. From EMA can help to achieve planetary boundary targets. However, content related to EMA related to planetary boundaries can not capture all business activities and related emissions but main links can be created.
Jusoh, Zulkifli and zainal	2017	Malaysian	To recognize EMA practices in a Malaysian company	That company follows EMA practices such as waste management, cost reduction, lifecycle costing and carbon-footprint.
Qian, horisch and Schaltegger	2018	Us, Germany, Australia, and Japan	To recognize EMA application and its effectiveness on the carbon emission management and disclosure	Lots of firms of those countries have applied EMA practices but few have applied full scale of EMA practices. Further found that EMA application has a

				huge positive impact on carbon management and disclosure quality.
Ferdous, Adams and Boyce	2019	Australia	The purpose of this paper is to examine the influences on the adoption of environmental management accounting (EMA) in corporatized water supply organizations	Two key drivers for the adoption and emergence of EMA are: the emergence of a government regulator in the form of the Essential Services Commission (ESC) and community expectations with regard to environmental performance and disclosure
Fuzi, Janudin and Habidin	2019	Malaysia	The aim of this study is to examine the relationship between environmental management accounting practices (EMAP), environmental management system (EMS), and environmental performance (EP) for the Malaysian manufacturing industry	To achieve success and sustain environmental improvement, the relationship between EMAP, EMS, and EP can be important for the Malaysian manufacturing industry. EMS is a mediating variable in the relationship between EMAP and EP for the Malaysian manufacturing industry.

				EMS provides the guidelines for the Malaysian manufacturing industry to enhance the EMAP and EP
Wachira	2019	Kenya	The major purpose of this study is to provide an overview of the EMA practices in manufacturing companies in Kenya	The results have shown that environmental cost (Environmental cost accounting and material flow costing), waste, and energy are the major categories that use as EMA practices.

Source: (I have developed based on literature, 2020)

According to the table, it can be seen that lots of studies have been focused on developed countries rather than focusing on developing countries. However, the table shows few studies are available in developing contexts such as in Malaysia, Kenya.

Gunarathne and Lee (2013) have studied the EMA practices as a case study in a hotel in the Sigiriya area and they have identified some primary EMA practices implemented by that hotel. On the other hand, Gunarathne and Alahakoon (2016) have recognized the common EMA practices by using the author's experience. Therefore, all those researches have a methodological problem that generates the problem of generalization of the result.

Further, a study in Sri Lanka has found that green practices have an impact on the financial performance of the company (Wijayasinghe, 2017). However, this study has not addressed any EMA practices in the organization and just measure the impact on financial performance in a quantitative way.

2.3 Theoretical frameworks for adoption of EMA

When analyses the literature, EMA is implemented by the organization under three theoretical background

2.3.1 Legitimacy theory

Increase trends in sustainability reporting (Social, Economic, and Environmental) pushed organizations to disclose environmental information voluntarily (Schiopoiu & Popa, 2013). Legitimacy theory provides that organizations' management tends to apply environmental accounting since organizations are at risk because of the 'legitimacy' of the industry that they operate in (Brown & Deegan, 2012). Therefore, this theory influences organizations to ensure that organizations respect to societies values. If organizations do not respond to society as a result government may impose tax or product demand may reduce due to customers' reaction.

On the other hand, researchers have argued that through legitimacy theory organizations gain legitimacy by disclosing social and environmental information voluntarily (Mouse & Hassan, 2015). If society recognizes that organizations perform their activities following the value of society, that organizations are recognized as legitimate and that allow the organization to develop and survive (Dowling & Pfeffer, 1975). Hence, legitimacy theory provides a framework that organizations should disclose environmental information to protect legitimacy to take advantage of society.

2.3.2 Stakeholder theory

Stakeholder theory has been described by Freeman (1984) as that company's stakeholders include all the persons that affected by the company and further, described this theory as an approach that business should create much value to the stakeholders without discriminating them.

Furthermore, this suggests that company success depends on satisfying all the stakeholders and not just focus on more valuable stakeholders. Therefore, it can be argued that organization decisions should be based on all the stakeholders' interests.

Accordingly, the stakeholder theory has emphasized that stakeholders should have the ability to know the environmental information relevant to the organization's activities (Rajapakse, 2008). Therefore, the company has to provide social and environmental information to fulfill both internal and external stakeholders' interests since the company is not only an entity that should focus on profit but also should consider the stakeholder's interest (Abdullah & Yuliana, 2018). If organizations do not consider the stakeholders' interests those organizations will lose the public image which negatively affects the business. Therefore, providing environmental information is important to

the organizational growth by enhancing reputation with stakeholders (Nguyen & Tran, 2019). Hence according to the stakeholder theory, to satisfy different stakeholders' interests organizations have to provide relevant information such as EMA information.

2.3.3 Institutional theory

Institutional theory has been defined by the Scott (2005) as "attends to the deeper and more resilient aspects of social structure. It considers the processes by which structures, including schemas, rules, norms, and routines, become established as authoritative guidelines for social behavior. It inquires how these elements are created, diffused, adopted" (p.1). Therefore, this theory suggests how organizational activities are changed by social elements. The institutional theory highlights the role of social and cultural pressures impact on organizational practices and their structure (Delmas & Toffel, 2004). Hence, institutional theory shows how organizations shape their activities due to the institutional pressure from society, government and other institutions.

Therefore, institutional theory emphasis EMA practices have to be implemented by the organization due to the institution pressure as well as organizational characteristic (Delmas & Toffel, 2004). From the view of institutional pressure theory, organizational practices and behaviors are determined by external factors (Heugens & Lander, 2009). As an example, according to the argument of Jalaludin et al. (2011), policymakers (such as Central Environmental Authority in Sri Lanka) and educational institutions highly influence on the adoption of EMA practices in business.

In general, there are three perspectives are available in an institutional theory called old institutional economics, new institutional economics and new institutional sociology. Among those perspectives, the new institutional sociology perspective argues that accounting is used by organizations according to the requirements of external pressure (Jalaludin et al., 2011). Further, the sociology perspective highly concerns about the isomorphic concept as institutional isomorphic and there are three elements of institutional isomorphic called coercive, mimetic and normative pressures and researchers also focused on how these impact to the adoption of EMA.

According to those studies, researchers have argued about these isomorphic differently due to different contexts. As an example, according to the Jalaludin et al. (2011), normative pressure has the most impact on EMA practices through training and

accounting body membership but Jamil et al. (2015) have argued that coercive pressure have more impact on implementing EMA in SME organization in Malaysia

2.4 Methodological review

In a foreign context, researches have been done relevant to the EMA practices for different contexts by using various research techniques including qualitative and quantitative. Fizi et al. (2019) conducted research focused only on Malaysian manufacturing companies by using the quantitative approach and used survey questionnaires to collect data and they found that EMA practices are very important to have environment performance and Environment Management systems if a company important to have EMA.

On the other hand, some countries have special government bodies to facilitate EMA such as in Japan mix- method research was carried out by Nashioka and Kokubu (2005) by focusing government body and all listed companies in the first section of the stock exchange. Data was collected through a questionnaire survey to find out EMA practices implementation and concluded environmental accounting use for both internal and external reporting and further suggest EMA practices highly support for internal management.

The paper of the Ismail et al. (2014) conducted in a quantitative way to explore EMA practices in Malaysian manufacturing organizations that has taken ISO14001 certificate and data have been gathered by giving online questioner and analyzed by using descriptive statistic. Researchers have found ISO certified Malaysian companies use EMA practices up to a greater extent.

Further review research conducted by Bartolomeo et al. (2000) in Europe with relevance to the EMA practices and future potential found EMA as a specific category of environmental accounting in Europe. This study was conducted to make a conclusion based on reviewing the trans -European projects and interviewing eighty-four environmental management in the European country. Hence, this research's main focus is restricted to the European context. Furthermore, studies have been carried out to find how environmental management accounting facilitates in an organization. As an example, a study conducted by Albelda (2011) studied as a qualitative study involving semi-structured interviews with environmental and accounting managers from six

Spanish factories and suggest that implementing management accounting practices as EMA important to have an environmentally responsible business.

Likewise, different studies have been done relevant to the foreign sector. When it comes to the Sri Lankan experience, few types of research have been studied in the field of EMA practices. The paper of Gunarathne and Alahakoon (2016) attempts to give a snapshot of the EMA practices in Sri Lanka by discussing commonly observed EMA tools in Sri Lankan companies. Here authors gathered data by using their experience from both the private and public sectors. Here, the authors did not specify any industry. Further, Gunarathne and Lee (2013) studied EMA practices relevant to the hotel sector in Sri Lanka. Here, researchers followed the case study method and data collecting by visiting the hotels in the Sigiriya area and conclude that those hotels follow EMA practices successfully.

Chathurangani and Madhusanka (2019) investigate the relationship between institutional pressure and EMA adoption level by using 38 manufacturing companies in the Colombo stock exchange based on a convenient sampling technique. Here data have been collected through a structured questionnaire and analyzed by using descriptive analysis and result shown coercive, normative, and mimetic pressure influence for EMA adoption.

2.5 Empirical and methodological gaps

From the analysis of existing research in both foreign and local context, it shows the area of EMA is widely open to study. On the other hand, more researchers have focused on developed countries rather than focusing on developing countries. Hence, as Sri Lanka is a developing country it is very important to conduct a study to recognize EMA practices with this lack of studies in a developing country. further, lots of studies have been conducted quantitatively by distributing questionnaires hence the result can be biased according to the respondent. Therefore, it can be seen methodological gapes in this context. Since there is a lack of empirical studies are availability relevant to EMA this study was conducted by semi-structured interviews that give a more accurate result and cater to the methodological gaps.

Nevertheless, when it comes to Sri Lanka, no any comprehensive study was conducted relating to the EMA Sri Lanka, A study conducted by Gunarathne and Alahakoon (2016) have followed the author's experience and one case study method has been

conducted by Gunarathne and Lee (2013) to recognize EMA practices. Therefore, it can be clearly seen the lack of methodological sound generalization of the result in the studies conducted in Sri Lanka and no studies have been conducted relevant to the apparel sector. Therefore, with these conditions, the vacuum of knowledge about the EMA practices in the apparel sector in Sri Lanka can be highlighted.

Therefore, can be seen as a clear contextual gap relevant to the EMA in the apparel sector in Sri Lanka. With these gaps in the literature, this study conducts and focuses on the EMA practices, obstacles, and benefits of the large-scale apparel organization in Sri Lanka.

CHAPTER THREE

METHODOLOGY

3.1 Introduction to the chapter

This chapter covers the research design of the study. There are various concepts and methods are available in research design and the researcher needs to understand the best research design in order to achieve research purposes. Therefore, in this section, I discussed the research design including research methodology, research approach, research purpose, research process, and research methods.

3.2 Overview of Methodology

3.2.1 Research philosophy

There are two paradigms available called the positivism paradigm and the anti-positivism paradigms. According to the researchers, a paradigm includes epistemology, ontology, and methodology that describe how a researcher perceives or understands the world and that impact on research methodology (Burrel & Morgan, 1985). That means paradigms is a set of beliefs or assumption of a researcher about the nature of the world. Positivists believe that the external world exists, which means focus on objectivity, and those positivists use quantitative technique while the anti-positivists believe that the world must understand from inside rather than go outside; hence anti-positivists believe in subjective reality (Naslund, 2015). In this research, I wish to explore the subjective EMA practices used by the green implemented apparel organizations. Therefore, this research is based on anti-positivism research philosophy.

3.2.2 Research approach

There are two approaches available to researchers to do research; the deductive approach and inductive approach. In the case of the deductive approach, researchers

research with a general truth, like beginning with a theory, making a hypothesis and testing those hypotheses in order to accept or revised while in the inductive approach, the researcher makes an observation about some phenomenon of interest and develops hypothesis and concepts (Daellenbach & Woiceshyn, 2018). This study aims to deeply study the EMA practices in the large-scale organization in the apparel sector in Sri Lanka. Therefore, I wish to explore the EMA practices, obstacles and benefits of EMA. Hence, with the nature of this study, I use the inductive approach in order to explore the EMA practices.

3.2.3 Research Purpose

Based on the researcher's objective, there are three types of research available, including exploratory, explanatory and descriptive researches. Through explanatory research, the researcher gives meaningful evaluation or conclusion based on a pool of information that already exists (Strydom, 2013). The type of descriptive research systematically describes an area or phenomenon, which means this type of research gives an accurate picture of the thing that the researcher wishes to study. The type of exploratory research is the primary stage of research that explore new things to add new insights into a phenomenon and exploratory research is done with more unstructured information on the new topic exist (Strydom, 2013). Therefore, with the nature of the study, in this research, the purpose of the research is to explore EMA practices. Hence, I selected the exploratory study type.

3.2.4 Research Methodology

There are two major distinct methodological strands such as quantitative and qualitative. Quantitative research is defined as researches that focused on objectivity and suitable for the researcher that can be collect quantifiable data while Qualitative researches recognized as an illustration of the information to understand the problem that cannot be collected quantifiable data (Queiros et al., 2017). Qualitative researches analyze data by using direct observation, interviews and study a real-world setting. I expect to explore the EMA practices in the organizations linked to the apparel industry. Therefore, in this research, I use the qualitative methodology type to reach the objectives of the research.

3.2.5Research Strategy

The research strategy that I adopted is a multiple case study strategy which is a category of case study research design. A multiple case study enables the researcher to explore differences within and between cases (Saunder et al., 2009). The main goal of this method is to find across cases. Because comparisons will be drawn and recognized carefully then the researcher can understand similar and unique results across cases, or predict contrasting results based on a theory (Yin, 2014). Hence, this research used a multiple-case study method to recognize EMA practices within apparel organization and compare and contrast them.

3.2.6 Time Horizon

There are two types of major time horizons are available that the researcher can use to design research called cross-sectional and longitudinal. Longitudinal means that the researcher engages with a repetitive observation about the phenomenon over a period of time and in cross-sectional study data gathered from a particular phenomenon at a particular time (Saunders et al., 2009). This has been described by Saunders et al. (2009) as the researcher takes a snapshot at a specific time about the phenomenon.

However, the main purpose of this study is to identify the EMA practices and do not consider any causal relationship. Therefore, in this research, I followed a cross-sectional data collection method.

3.2.7 Source of Data

Primary data represent the first-hand data that researchers gather by themselves by using interviews, observation, questioner that called primary data analysis and secondary data means researcher gathers data from the work done by someone else such as from reports, articles that called secondary data analysis (Hox & Boeije, 2005). In this research, I have used both primary and secondary data to reach to the purpose of the research. As primary data, I conducted interviews and gather data relevant to the EMA practices from the respondents.

3.2.8 Sample and sampling

The non-probability sampling technique is used by researchers where the type ofstudy is a case study or qualitative one because it focuses on minor sample size and real-life situations (Taherdoost, 2016). In this research, I identified the EMA practices that organizations currently practice in the apparel industry hence research identified as

qualitative research according to the nature of the study. Therefore, to collect information relevant to the EMA practices, I have used a non-probability sampling technique.

Purposive sampling technique relevant where the researcher wants to identify the nature of a culture with an expert who has relevant knowledge regarding the research area (Tangco, 2007). Therefore, from various non-probability sampling techniques, I used purposive sampling technique by selecting management accountants and sustainable executive in an organization which practice EMA that relating to the apparel sector in Sri Lanka.

In this research, I purposively selected the five apparel organizations which follow sustainability practices and conduct five interviews. After that. I interviewed the management accountants and sustainable executive who directly engage with the sustainable work to recognize the EMA practices. It's because sustainability executives are the persons who directly measure the sustainability of the company. As measuring is a key component of the EMA, interview those employees are important. Therefore, as sustainability executives and accountants are the key people who have knowledge and experience about the EMA, interviewing those people allowed me to reach data about EMA.

3.2.9 Data collection method

I used in-depth interviews to gather information on relevant EMA practices.

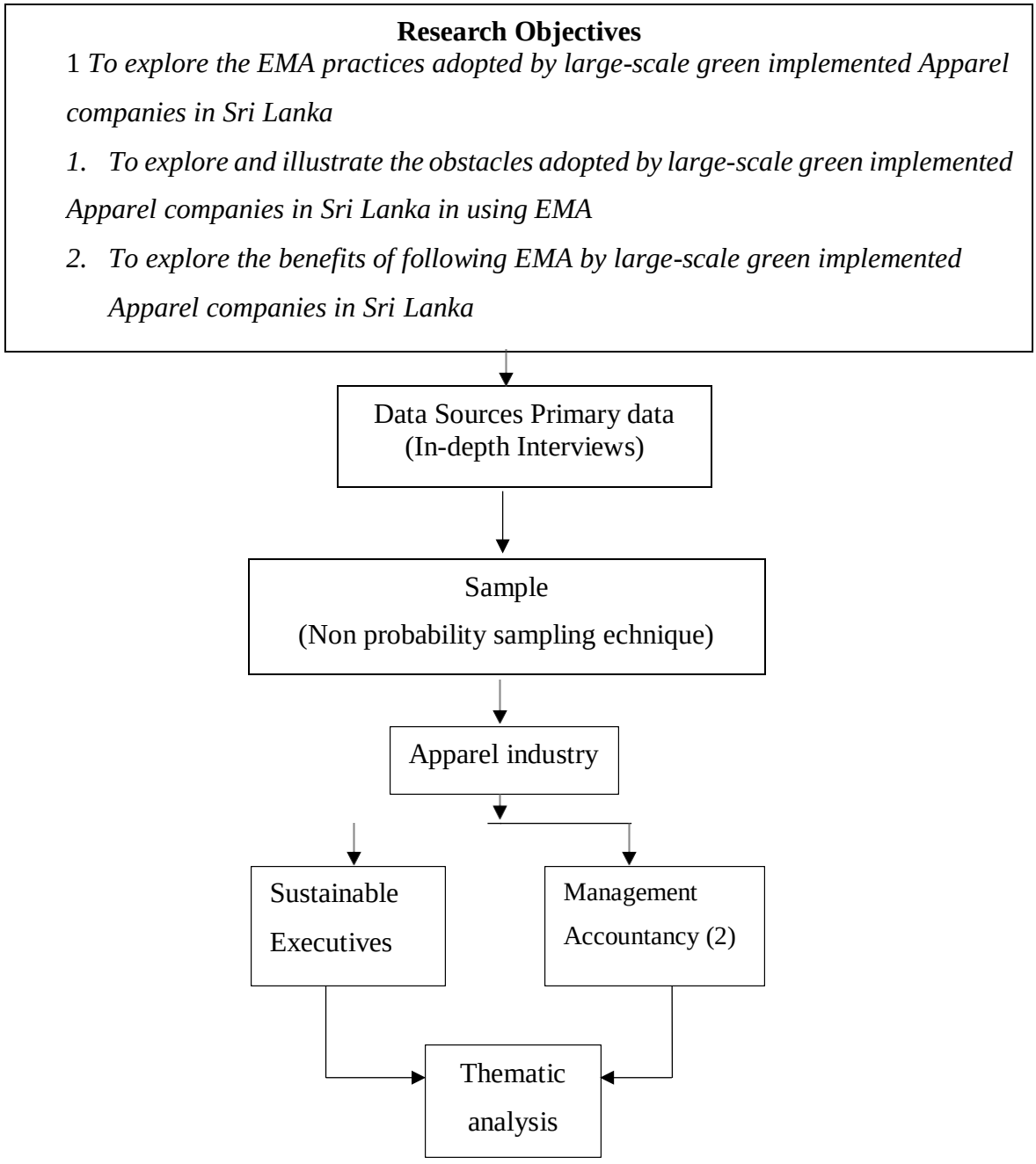
3.2.9.1 In-depth Interviews

The interview is the main data collection method in qualitative research type (Englander, 2012). In qualitative research, the researcher understands the phenomenon deeply but in the case of quantitative research, the researcher investigates and describes the phenomenon up to a certain level. Therefore, the in-depth interview is the main data collection in this study which was carried out to recognize the EMA practices. Hence, in this study, I followed the semi-structured telephone interview to gather information relevant to EMA practices. In the beginning, I developed an interview guide (Appendix B) which covered all the research objectives. Based on the developed interview guide, I interviewed employees who relate to the sustainable practices of the organization including Management accountants and sustainable executives.

I could able to take five interviews from the different large-scale apparel manufacturing organizations in Sri Lanka. The length of the interviews is in the range of 20 to 45 minutes and I kept proper records and relevant notes while I interviewed. Furthermore, I assured ethical matters by taking consent from the interviewee before recoding.

This diagram shows the association between RO, data source, sample, and data

Figure 3. 1: Association between RO, data source, Sample and data collection method



Source: (Developed by me, 2020)

3.2.10 Data Analysis Method

I have used qualitative thematic Analysis to analyze gathered data in a qualitative manner. Thematic analysis can be recognized as a qualitative approach that recognizes, analysis and reports the pattern of the collected data (Vaismoradi et al., 2013). Therefore, primary data are analyzed by using thematic analysis methods.

- **Analysis of the in-depth interviews**

I have used in-depth interviews to gather data for the research. For an in-depth interview, data may be collected in a documentary or non-documentary way (Recording) (Boyce & Neale, 2006). Therefore, I have gathered data by recording the telephone interviews and to evaluate those gathered data, I used thematic analysis. Through thematic analysis, systematically analyzing the interviewed data through data reduction and researcher need to record the interview fully and make necessary skill making notes (Saunders et al., 2009). Therefore, I have recorded all the interviews with the permission of the respondent and make necessary notes. After that, I transcribed (Appendix C) the interviews separately for each record. After end of this process, I started the initial coding process (Appendix D). Thereafter, I recognized similar coding and gave different coding numbers for each similar coding which was recognized from the initial coding. I have given separate topics for the codes that are identified as similar codes. And has been given a separate coding number for each identified topic. These recognized topics are taken as categories. According to Saunders at el. (2009) categorizing means forming, arranging recognized code units. Therefore, from this process, I could be able to critically analyze all the information taken from the interviews and finally come up with a conclusion.

3.2.11 Certifying Quality of the research

Quality research is very important because it ensures that the scientific method has been followed in all aspects of the research, including the establishment of the problem, developing a research design, data analysis, and conclusion, and this important to reduce bias and errors. According to Tracy (2010), emphasize eight criteria that good quality research should include. The first criterion is that the topic should be worthy. This means the topic should be a relevant, timely, and interesting one. In this study, I have studied the EMA practices of apparel organizations in Sri Lanka. EMA is a new

branch of accounting and still developing in Sri Lanka. Therefore, it can be concluded that this study is worthy. On the other hand, research should have rigor. That means I should give enough effort to complete the research with good sample selection, enough data gathering, and systematically analyzing them. In this research, I have gathered primary data and analyze them in a systematic way (Recording, Transcribing, coding, etc). Hence, I gave an appropriate effort to complete the research. In this research, I have concluded after a systematic analysis of the gathered data and the generalization of the findings also at a good level since any organization can understand the EMA practices with evidence. Hence, creditability and resonance are also reached by this qualitative research. Not only this research has been conducted by adhering to all ethical requirements but also this study contributes to both theoretical and practical applications. There is a meaningful full coherence throughout the research to ensure that the research achieves what it purports to be about. This means research comprise significant contribution, ethical, and meaningful coherence. Therefore, this research adheres to the quality requirement of qualitative research through good design.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

4.1 Introduction to the chapter

Previous chapter emphasis the research methodology and the study. According to the above guideline, I have conducted interviews and identified the EMA practices, obstacles encountered when implementing EMA practices, and the importance of EMA practices in a systematic way (transcript, coding, etc.). Therefore, this chapter describes the findings of the study. Hence, this chapter includes a discussion that shows the differences and similarities in EMA practices with the finding of the existing studies in the global developing and developed context

4.2 Overview of the apparel organizations of the study

- **Organization One**

This factory has over 2800 employees and makes Socks, shirts, underwear men's and women's clothes. This factory was deemed as the first Asian apparel manufacturing company that was deemed as carbon neutral. This company has been built by following the green building concept of the US green building council. Further certified from ISO 14001 (Environmental management system).

- **Organization Two**

This is one of large apparel manufacturing organization in Sri Lanka which have 2000 employees and produce garments including shirts, jackets, hoodies etc. Furthermore, this organization export apparel for Canada, the USA, etc. On the other hand, this apparel organization is recognized as a green implemented apparel organization that has certified with ISO 14001 and ISO 9001.

- **Organization Three**

This organization also a large-scale apparel organization that has 3500 employees. This factory makes mainly swimwear, leisure and children's swimwear and export to more than thirteen countries. This company practice sustainability and has certified ISO 14064- The sustainable future group and it has met all the criteria for Carbon, water & waste Conscious® certification.

- **Organization four**

This organization has over 3000 employees and produces sportswear, swimwear, men's and women's wear. This organization is highly recognized as a green implemented apparel organization. Reforestation, environmentally friendly energy generation, waste and water management are the key sustainability practices.

- **Organization Five**

The product categories of organization five included Casual wear, Intimate wear, Sleep and Loungewear. There are 2500 employees are available in the factory. This factory is recognized as a greening factory and has the world's first LEED Platinum certification for the factory.

4.3 The greening concern of the apparel organization in Sri Lanka

In Sri Lanka, it can be seen as diffusion to be green in the apparel sector.

> *"Now lots of garment factories have come to think about the environment. But previously, the Organization didn't much consider the environment. But now organizations consider the environment." (INTERVIEW 01)*

Therefore, this concern has been impacted by the implementation of EMA practices in the apparel organization. Finding clearly shows that EMA practices have been developed up to some extent within this decade in Sri Lanka. The finding of the study shows that the concern for the environment is of high importance for the long-term success of the apparel sector.

"Every organization should have a good understanding of the carbon and water footprint" (INTERVIEW 03)

Hence, not only concern about the environment but also apparel organization should consider the reporting of sustainable work or implement EMA practices.

4.4 Environmental Management Accounting Practices in Sri Lanka.

When analyzed the interviewed data, it can be identified some mutual EMA practices of the apparel sector organizations. Normally in the apparel sector, organizations have conduct EMA practices mainly for seven categories including Water, energy, waste, Culture and Biodiversity, input-output analysis, budgeting for EMA, and total cost assessment

For these categories, each company establishes KPI daily, monthly and annually and they try to achieve those sustainable KPI. Therefore, they have to incur costs as well as for some projects it generates revenue also. Hence, organizations maintain records for these sustainable words as Environmental accounting. Mainly organizations maintain records as the unit's calculation (Physical EMA) and rupee calculation (Monitory EMA). In each stage, organizations established a budget by using the information generated through EMA practices.

4.4.1 EMA practice for Energy.

When it comes to energy apparel organization follows EMA practices. Energy types can be recognized as gas, oil, wind, and water power. In an apparel organization, energy may include in the final product (chemical reaction of the garments). However, energy use as raw materials for the production process. Therefore, the apparel organization follows sustainability methods. Hence organization use EMA practices

- **Accounting for electricity**

When it comes to energy, what organizations do is establish a target to save energy.

"When considering the energy stage. We set a target in our company and we have to archive 3% reduction from energy consumption annually." (INTERVIEW 02)

Then, organizations implement different projects for that achievement. When it comes to EMA, this energy phase is very important because organizations practice EMA

highly in this phase. For energy saving, a lot of organizations established solar panel system. For that, they incur mainly initial cost and maintenance cost. Hence, they take those cost into financial statements as well as an organization to make a budget for energy saving and energy generation from sustainable methods

> *"We installed solar panels which can generate 380kw and we hope to expand it up to 500kw in next year. We can generate integral energy through it and it helps to reduce electrical power which is generated from hydropower or coal power." (INTERVIEW 03)*

Each month, organizations measure the consumption of Kw of each department and recognize how they achieve those targets. For that, they use the information generate from environmental management accounting.

Not only that, in the case of energy-saving from the solar panel, some apparel organizations also earn profit by selling extra Kw generated to the Ceylon Electricity Board.

> *"Previously I told you, we use 85% of solar power and the rest 15% of electricity power take from the electricity board. That's how we fulfill our full demand. Our plant does not work on Saturdays and Sundays. But there is an extra electricity generation and we sell it. Then we pay balance part of the bill with a reduction of sold electricity" (INTERVIEW 3)*

Through different techniques, organizations save energy and account for the. As an example, the company boiled water up to 90 ^{0}C. Then for the other 10 ^{0}C only they use electricity. Hence, can be saved more energy from this project. Then they measure those saving and that take to the FS.

- **Industrial lighting**

Many manufacturing companies use incandescent lights, which can be quite a significant energy and money drain. LED lighting uses approximately 75% less energy, longer than other lighting systems, and boosts the energy efficiency of facilities. Therefore, apparel organizations use an LED lighting system and they have measured how much they can save from applying an LED lighting system

Organizations take those saving into financial statements. Therefore, in the case of energy, organizations implement Environmental Accounting by taking both the cost and benefit of sustainability works.

> *"We annually predict electricity consumption. Normally apparel organizations measure production according to the produced mints as KW hours" (INTERVIEW 4)*

Apparel organization measure energy consumption for produced mint as follows

$$\text{electricity per minit} = \frac{\text{total electricity consumption}}{total\ produce\ minit}$$

The factory has separate sub-meters of different departments and sections. That is the way that company uses to measure the electricity in the factory.

- **Accounting for Diesel and Gas**

Another main energy use for apparel organization is Diesel and Gas.

> *"We measure the total consumption of our diesel and Gas which use for boilers. We measure monthly diesel consumption" (INTERVIEW 05)*

The apparel company has established a floor meter attached to the diesel tank. Hence, it can measure diesel consumption use for generators and boilers. Then the company converts those measures into megajoule. Then checked per produce minute usage of energy and take that information for decision making.

4.4.2. EMA practices for water

Most of the textile industrial processes, such as scouring, laundry, sizing, dyeing, and finishing consume substantial amounts of freshwater with the discharge of large volumes of wastewaters which are diverse in chemical composition. Therefore, the apparel organization concern about the EMA practices in water.

> *"In the apparel sector water is a very important thing and therefore water should be saved by the organization. On the other hand, the fabric stage includes dying, washing. Have more impact on the emission and the water consumption" (INTERVIEW 01)*

Therefore, EMA practices can be seen in water management.

- **Water Accounting**

Some apparel sector organizations conduct water accounting (water audit). Water accounting includes the gathering, calculation, documentation and analysis and recording of the water-related physical and monetary results.

> *"Then we annually plan to find what are the things that we have to do to achieve the Water KPIs inside the factory. For that, we do a water audit and projects to achieve our targets" (INTERVIEW 02)*

Apparel organizations measure water as physical conditions of Water are expressed in liters / cubic meters, and monetary water aspects are calculated in cash. EMA Water accounting is used as a strategy for evaluating water streams and quality in complex frameworks.

> *"In our company, the water footprint per person is 35l per day. Those 35l liters measured including drinking, hand washing, water usage in the washroom, AC generation. For these measurements, we use EMA"*

Likewise, apparel organizations keep records about water with the end goal of decreasing water use and regularly getting decrease unnecessary water use. For that EMA practices are important.

- **Double water system**

The apparel factory has been designed which can be used water in dual way.

> "*In our organization, 70% of water usage from the water treatment plant for domestic and industrial purposes. For other 30% water requirement, we use freshwater"* (*INTERVIEW 02)*
>
> *"We treat 80% of water and use back to the production process. For the other 20%, we take fresh water from the water board"* (*INTERVIEW 05)*

To manage those requirements, as EMA practices, organizations keep records on water usage of the factory by including the amount of treated water and freshwater.

Organizations compare water usage monthly and it has integrated measures such as Average Water Units each business hour or weekly, Water use per client employee. Likewise, water measurements are performed by apparel organization.

- **Water treatment plant**

This organization use information generated through EMA practices to reduce water waste. Another thing is the apparel organization established a water treatment plant. First of all, the organization measure the water usage of the factory. Organizations incur costs to implement the water usage plant inside the factory and they take those costs to their cost statements. Water is treated from the water treatment plant used for the organization's uses. Therefore, organizations save money annually. Those saving they take into the financial statement and use to maintain the water treatment plant.

> *"We take all these costs to the financial statement as monitory EMA. But other water measures are Physical EMA" (INTERVIEW 04)*

Hence, in the case of water, it can be seen both physical and monitory water use in apparel organization. By using EMA for water, the organization tries to reduce the cost of water.

> *"We use water to air cooling process. Actually, this process reduces the water consumption from outside. Our treatment plant takes 6.5 million of investment and it has a capacity to use 48 m^3/ 48000L per day" (INTERVIEW 03)*

When applying these technic company can save costs. If these water requirements take from outside have to be incurred huge costs. For those saving organizations give value and account for them.

To measure water consumption, each plant have separates sub-meters. Further sub meters are available in the canteen and washrooms (domestic use) and plants (Industrial use). Then measured the daily consumption of the waters.

Companies maintain an excel sheet of the water usage of the factory and each month they conduct a reconciliation of water. Take water usage inside the factory and the total water input to the factory. After they can even measure the water leakage. That is the way apparel organizations reach their KPIs. Those inputs should tally to the output. On

the other hand, the company measures water liters per employee and water usage per production minute.

4.4.3 Input/ output analysis

This is a common technique that most of the apparel organizations follow as EMA. In input-output analysis consider that what input to the production process should generate output. From this input-output analysis, the organization can recognize materials use and its results with waste and emission.

> *"All apparel organizations do this. It is because to recognize waste, Fabric waste, cutting waste, etc. Then we calculate the cost of those waste" (INTERVIEW 5)*

Likewise, the organization can recognize the wastage of their production process. After that, include the cost for those wastes and take those costs to the financial statement. This allows the organization to recognize the impact of its wastage.

4.4.4 EMA for waste management

Waste management is recognized as a main sustainable method that uses EMA. In the textile and apparel industry, major types of solid waste that get generated are, fabric, polythene, paper, plastic, glass, metals, and cardboard. This waste management is a huge part of apparel organization sustainability work. Each and every waste apparel organization dispose of according to a sustainable way.

- **Income from waste**

Organizations maintain less level of waste by using EMA. Some apparel organizations earn revenue by selling waste as a by-product. Each month apparel companies earn money by selling those waste and take those into financial statements. As an example, HY Vital (Pvt) Ltd is a company that takes the waste of the apparel organization further paper waste given to the Shakthi Lanka Company that named as a recycling company. For plastic apparel, organizations sell to Nippon polypus company. Likewise, apparel organizations sell and earn income from waste.

- **Cost for waste**

> *"There is a process which is called eco-cycle and they burning those waste. That is not open burning" (INTERVIEW 03)*

Therefore, wastes that cannot be sold are burned in a way that has less impact on the environment. However, the apparel organization has to bear a cost for that. Those cost they take into Financial Statements. As an example, many apparel organizations sell waste to Holcim (Lanka) limited to burn under minimum environmental effect. In the case of wastewater, apparel organization treat those as mentioned above

In the case of waste, the apparel organization measures waste per production minute. Because of EMA practices, organizations have a comprehensive method to collect data relevant to waste. Then the recognize that measurement.

4.4.5 Accounting for Culture Project and biodiversity

Apparel organizations use EMA practices by conducting culture projects.

> *"In culture events, we have a Culture Activation Form. From that we measure how much administrative cost have been taken for that event, who are the beneficiaries of our project, likewise, we record those things which come under EMA practices" (INTERVIEW 02)*

However, in the case of culture projects, organizations are difficult to measure the benefits of the financial side. Therefore, they take cost into financial statements.

For example, organizations conduct awareness programmers to protect the environment. Then the measurement of the benefits to the environment is difficult.

> *"In the culture stage, we measure and only take the cost of these events to the financial statement. We don't invest more funds in the culture stage. We spend only on small investments and those we take to the financial statements. This is how to do EMA with relevant Culture" (INTERVIEW 04)*

On the other hand, biodiversity is one area that uses EMA practices. As biodiversity, apparel organization implementation reforestation programs.

> *"We take bare land from the government and plant trees. The cost incurs for those things take to Financial Statements" (INTERVIEW 05)*

Thereafter, organizations maintain track records on the type of trees and animals. Likewise, EMA practices in different ways.

4.4.6 EMA for budgeting

Sri Lankan apparel organizations use budgeting as an environmental cost accounting practice. Apparel companies identify, assign, and analyze environmental costs as a framework for profitability evaluation of possible environmental investments.

> *"On the other hand, we annually budgeted cost for that sustainable project. As an example, imagine you have a factory that has 1000 bulbs that have 20% LED. Hence, if you want to totally bulbs convert into LED, each year you should achieve 20% saving from your investment. Likewise, we do budget as EMA. Therefore, it can be recognizing budgeting as the main EMA practice" (INTERVIEW 05)*

On the other hand, each year budget the water and energy requirement (Electricity and fuel) for the company. Then companies establish KPIs based on the budget. Then each month assesses the achievement of the KPI created from the budgeted details.

4.4.7 Total Cost Assessment

Total cost assessment aid to apparel organization to the prevention of pollution and better decision making. Apparel organizations do this by adding environmental costs into capital budgeting and investment appraisal.

> *"We do total cost assessment. Such as we take pollution prevention cost for investment appraisal" (INTERVIEW 04)*

Therefore, this emphasizes that environmental costs (such as pollution prevention) take into traditional costing. Hence, the long-term financial analysis for the wide range of costs and saving of a project improve the decision-making process of apparel organization.

4.5 Obstacles when implementing EMA practices

4.5.1 Lack of Accounting Standard

An accounting standard is a general collection of rules, guidelines, and protocols that describe the basis of the rules and practices for financial accounting. Accounting principles make financial reporting more transparent in all countries. As an example, In the Sri Lankan context, SLFRS and LKAS. Those accounting standards have been build based on the International Financial Reporting Standards which build by the International Accounting Standard Board.

> *"Firstly, I want to say that there is no accounting standard when it comes to EMA. Hence, no guidance. Hence, the implementation of EMA practice is difficult. Hence, the management of the apparel organization faces difficulties"* (*INTERVIEW 01)*

On the other hand, there is not any consistency in the reporting of such information. Different apparel organization follows different techniques to report both physical and monitory result of the environmental impact of the organization. Hence there is no consistency of reporting. Therefore, in this study, it has been recognized that not having a specific standard for environmental accounting is a major problem for the organization when reporting sustainable information. That may be a result of a lack of EMA apply in the Sri Lankan organization.

4.5.2 Lack of knowledge of people

The knowledge gap is a major problem of the EMA.

> *"Mainly to implement EMA practices there should be a person who has both accounting and sustainable practices knowledge. Hence, finding such kind of person s difficult" (INTERVIEW 01)*

> *"When it comes to implementation part it is very difficult to implement EMA because of lack of knowledge" (INTERVIEW 04)*

The finding shows that most managers inside the apparel organization (administration section in specific) have little information about natural expenses emerging from their activities. This absence of information is primarily because of a lack in the bookkeeping frameworks and lack of sustainability knowledge of accountants.

"It means, we maintain a cost for sustainability, but we don't consider it as a sustainable cost. We add those into the overhead cost" (INTERVIEW 03)

Therefore, if consider the apparel organization, lots of sustainability costs do not come under environmental cost even though they perform EMA. It's because of a lack of knowledge. Hence, measurement and implementation of the EMA practice are difficult.

4.5.3. Huge cost

Environmental management accounting occurs with the sustainability practice within the organization

> *"To implement EMA, that should link with sustainability. To perform such kind of sustainability work, there is a huge cost***"** *(INTERVIEW 01)*
>
> *"one is when we account those things, have to use technology to measure sustainability work. Therefore, we have to bear the high cost for those measuring instrument and other technologies such as water measurement equipment's" (INTERVIEW 02)*

Therefore, managers argued that high cost also impacts the less application of the EMA practices within the apparel sector.

4.6 Benefits of implementing EMA practices

4.6.1 Improve brand image

Brand image is expanding in significance these days and Sri Lanka is one of the most sustainability-focused nations when it comes to apparel sector production. Environmental management accounting is viewed as a key factor for business development and organizations consolidate this angle in their image advertising methodologies.

Implementing EMA practices give organizations to charge a premium price for their product. Hence, organizations can earn a high price.

4.6.2 Enhance productivity

EMA has caused to enhance organizational productivity.

"Further, we have KPI to reduce waste. Therefore, employees have to produce under fewer wastage conditions" (INTERVIEW 03)

Apparel organizations have KPI to achieve in the case of wastage. Because implementing EMA organizations can recognize information relevant to the wastage. Hence, employees have to give more contribution to produce under less wastage to achieve such KPI. Therefore, the ultimate result of this may increase the productivity of the organization.

4.6.3 Income source

As discussed above, sustainable practices generate income for the company.

"It means we sell extra electricity generate from the solar panel on Saturday and Sundays to electricity board and those saving and cost we take as EMA" (INTERVIEW 04)

On the other hand, when using treated water for the domestic and industrial purposes of the apparel organization, that makes saving for the organization instead of buying water. Therefore, the saving of water buying cost takes to Financial Statement. Therefore, EMA practices can be recognized as a tool that recognizes those saving and adds those into financial statements.

4.6.4 Create an accurate picture to the organizations

"EMA is important to take an accurate picture of cost because it includes environmental and another cost" (INTERVIEW 01)

EMA is important to recognize the environmental impact to the organization. Therefore, the accuracy of the decision-making process of the organization also improves. If don't consider EMA, cannot be understood the environmental effect of the company. Hence from EMA can recognize overall economic and environmental effects at once.

4.6.5 Predict the future with proactive planning

When implement EMA, apparel organizations can predict the future.

> *"As an example, if considered about water, we can recognize future water usage, required treated water for production process likewise. Which means proactive planning can be done with this EMA" (INTERVIEW 05).*

Therefore, EMA is used by apparel organizations to predict the future and that makes better strategic plans for the organization.

4.7 Discussion

- Research objectives

- To explore the EMA practices adopted by large-scale green implemented Apparel companies in Sri Lanka
- To explore and illustrate the obstacles encountered by large-scale green implemented Apparel companies in Sri Lanka in using EMA
- To explore the benefits of following EMA by large-scale green implemented Apparel companies in Sri Lanka

According to the results, I developed the following table that includes EMA practices by recognizing Monitory EMA and Physical EMA.

Table: 4. 1: Environment management accounting practices

EMA practices	Monitory EMA	Physical EMA
Accounting for water	• Accounting for revenue and cost generated from water • Project appraisal for water (To implement water treatment plant.)	• Water Flow Accounting • Wastewater generate calculation per production minute
Accounting for energy	• Accounting for electricity	• Measurement of electricity

	• Revenue generated from electricity • Cost for electricity • Accounting for Diesel and Gas monitory value • KPI measurement for energy	• Electricity (kW) per production minute • Measurement of electricity generation and saving from the solar panel (kW) • Daily electricity consumption measurement of production flows • Accounting for Diesel and Gas physical value • Establish KPI for energy
Accounting for waste	• Accounting for income and cost from waste.	• Establish KPI to reduce water usage • Measure waste generate per production minute and from KGs
Accounting for Culture project and Biodiversity	• Accounting for cost incur for culture and biodiversity projects.	• The physical measurement of Biodiversity.
Input-Output analysis	• Conduct input-output analysis for material (Monitory)	• Conduct input-output analysis for material (Physical)
Budgeting for EMA	• Budgeting for Energy • Budgeting for water	• Energy flow activity-based budgeting for water
Total cost Assessment	• Total cost assessment for production	-

Sources: Developed by me (2020)

In the European develop context, lots of apparel companies follow the EMA for pollution prevention and Energy and material accounting (Bartolomeo et al., 2000). Even though Sri Lanka is a developing country, it can be seen that the Sri Lankan apparel organization also follows similar EMA practices. On the other hand, Man and Vasil (2012) recognized that budgeting and executing the environmental management systems, pollution prevention, and clean manufacturing and balance of material flows of processes, and products as EMA practices that mostly follow by organizations. The finding shows that the Sri Lankan apparel organization also follows similar activities as diffusion of the EMA.

Existing studies have revealed that Activity Based Costing (Capusneanu et al., 2020) and Life Cycle Costing (Chan, Wang, & Raffoni, 2014; Brown & Deegan, 2012) use as EMA practices in a developed context. But when it comes to Sri Lankan apparel organizations, these EMA practices cannot be seen as EMA practices.

In Sri Lanka, most apparel organizations tend to follow material flow costing as EMA. It's because that the material represents a large amount of total cost. Also, Indonesia as a developing country follows material flow costing as EMA practices (Syarif & Noviata, 2019). Therefore, it seems that the material flow costing follows as EMA practice in developing context.

The key finding of the research recognized that the organization omits a golden opportunity by ignoring the environmental relate cost within the financial statement. Finding shows, even though apparel organizations incur costs for their sustainable approaches, they hide those costs within administration cost. Therefore, financial statements misrepresent the financial statement users. As an example, costs that incur to convert the water tap system into a sensor tap, the cost incurred for that included in administration cost. However, this problem also appears in the global context too. Doorasamy and Garbharran (2015) argued that the environmental cost represents in the financial statement was incorrect by hiding in production cost.

Lots of researches conducted on EMA practices have recognized different obstacles and advantages encountered when implementing EMA practices. Such as, the major obstacles of following EMA are lack of specification environmental accounting information, the allocation of environmental costs, legislation issues, and the lack of environmental accounting standards (Xiaomei, 2004). On the other hand, Jamil,

Mahamed, Muhammad, and Ali (2015) recognize the low priority of accounting for environmental cost and difficulties of collection of environmental cost as obstacles when implementing EMA practices. Some studies have recognized different barriers such as lack of organizational learning culture, restrictions to change, and absence of guidance of EMA (Settheskko, 2010).

However, the finding of the research also represents similar obstacles such as lack of knowledge and lack of accounting standards and less guidance on EMA. But the major problem of a lot of apparel organization is an additional cost. It's because to implement EMA practices organizations have to follow sustainability practices. For that, have to be incurred huge cost such as for water treatment plants. Hence, huge additional costs are recognized as major problems of apparel organizations in Sri Lanka.

On the other hand, there are different findings are available when it comes to the advantages/ benefits of following EMA such as better product pricing, increase shareholder value and improve the reputation of the organizations (Wahyuni, 2009). On the other hand, some researchers have argued that implementing EMA generate advantage such as apply stricter control over environmental cost, access to a new market (Baba, 2012). This study revealed similar advantages and different benefits such as implementing EMA can take accurate pictures of the operational cost, aid to reach the legal requirements, predict the future with proactive planning.

According to the study, it indicated that the non-financial employees (Engineers) of the apparel organization play a big role in the case of reporting sustainable practices. It because they are the employees how directly involve with the implementation of the sustainable practice. However, Bartolomeo et al. (2000) suggest that when sustainable implementation people directly link with the financial people that may cause to improve the EMA practice. Therefore, that link should be further improved in the Sri Lankan apparel organization.

CHAPTER FIVE

CONCLUSION

5.1 Introduction to the chapter

This chapter concern the main findings discovered in the study and the conclusion of the research. Besides, I indicated the practical and theoretical application of the research relevant to the Environment Management Accounting that implements by the apparel organizations in Sri Lanka. Subsequently, I have provided future directions.

5.2 Conclusion

The purpose of this research was to investigate the EMA practices that implement by the apparel organizations in Sri Lanka and obstacles and advantage that encounter when implementing EMA practices in apparel organizations in Sri Lanka. The research questions of the study were, what are the EMA practices used by green implemented Apparel companies? What are the obstacles encountered by green implemented Apparel companies in using EMA? and What are the benefits of following EMA?

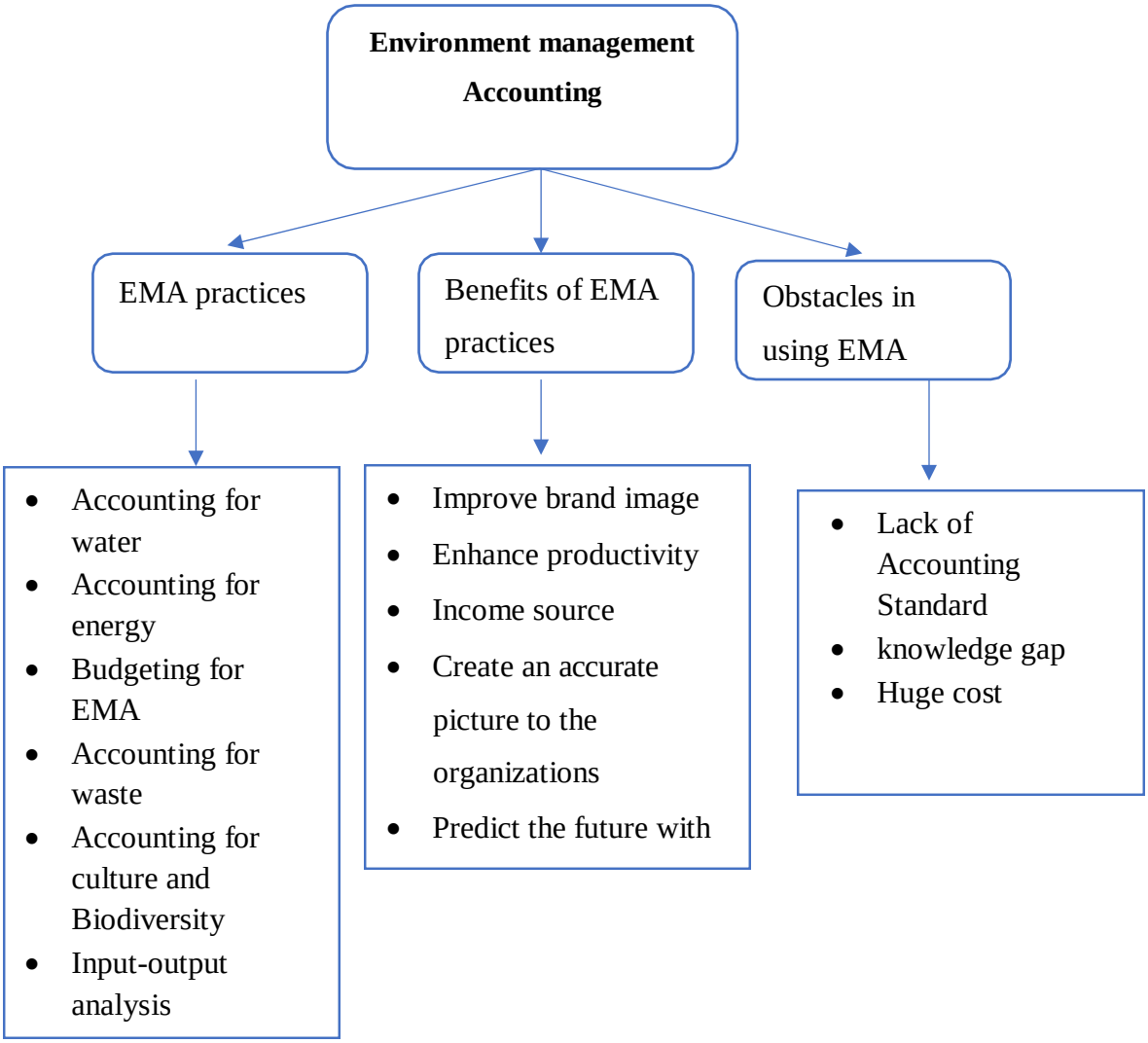
Particularly, I demonstrated the implication of EMA tools and practices of the apparel organization. Furthermore, the study demonstrates the perceived advantages and obstacles when follows EMA practices.

This study has recognized EMA practices that following by the apparel organization under seven major categories named as water, energy, waste, Culture and Biodiversity, input-output analysis, budgeting for EMA and total cost assessment. Therefore, apparel organizations follow EMA practices relevant to these categories. Under these categories, I have recognized different EMA practices which can be categorized as monitory EMA practices and Physical EMA practices. Among these categories, lots of

apparel organization follows EMA for energy, water, and waste pillar and less EMA for Culture and Biodiversity.

Lack of knowledge, lack of accounting standards and huge costs are the major obstacles faced when implementing EMA practices by the apparel organization in Sri Lanka. On the other hand, finding shows applying EMA practices generate benefits to apparel organizations such as improve the organizational reputation, cost reduction, improve accurate decision making. Apparel Organizations in Sri Lanka utilize EMA practices as an indicator to gain a high reputation of investors and buyers.

Figure 5. 1 : Summary of the finding



Source: Developed by me (2020)

5.3 The implication of the research

The finding of the study indicates that the apparel organization in Sri Lanka follows different EMA practices. However, EMA is a still-developing field of the accounting

of Apparel Organizations in Sri Lanka. Eventually, when it comes to Energy and Water, the EMA practices have developed to some level. Mainly energy and water-related KPIs and EMA of companies allow them to explore new ways to reduce and to save costs in organizations.

- Link Sustainability into accounting

This study shows to all apparel organizations that the EMA plays a vital part in management accounting in the future. For that, the organization will require to have good linkage sustainable practices with the finance departments (Nguyen & Tran, 2019). Therefore, the apparel organization should link these two areas. That will result to improve the application of the EMA practices.

- Recognition of Environmental cost-benefits separately

On the other hand, by improving EMA practices organizations can measure the actual result of the operation by considering cost and revenue generated from the environmental impact. As revealed by the study, Apparel organizations measure the environmental cost and underestimate and hide them in the administration cost. Hence, organizations should recognize those environmental costs and benefits separately for their decision making. That improves the decision-making of the organizations.

- Improve Knowledge and training

Even though the apparel organization follows EMA up to some level, the knowledge regarding the key concept of the EMA is less. Therefore, organizations must concern to give relevant knowledge and training relevant to EMA. That improves the application of EMA.

5.4 Limitation and future directions

One limitation of the study is that this research has been conducted using a limited number of large-scale organizations in the apparel sector. To get a comprehensive picture of EMA in the Apparel sector it will be important to study SMEs in the industry too. Therefore, Future researchers have a wide area to discover EMA practices.

Second, the industry of research is limited to the apparel industry in Sri Lanka. However, there are other industries available that are related to the environment. Thus, future researchers are encouraged to explore the EMA practices in other industries in Sri Lanka.

The third , this study has been conducted as a qualitative multi case-study to explore the EMA practices. Therefore, future researchers can conduct a quantitative study to recognize EMA practices with more samples.

Furthermore, future researchers can conduct a study by focusing on the EMA practices of the government sectors also to recognize how government sector organizations use EMA.

References

Abdullah & Yuliana. (2018). Corporate Environmental Responsibility: An Effort To Develop A Green Accounting Model. *Journal Akuntansi, 22*(3), 1-18.

Adel-Rahim, H. Y., & Abdel-Rahim, Y. M. (2018). Green Accounting-A proposition for EA/ER Conceptual implementation Methodology. *Journal of Accounting*.

Albelda, E. (2011). The role of management accounting practices as facilitators of the environmental management. *Journal of Sustainabiliti Accounting, Management and Policy, 2*, 76-100.

Al-Mawali, H., Sharif, A., Rummam, G. A., & Kerzan, F. (2018). Environmental Stratergy, Environmental Management Accounting and organizational performance: Evidence from Arab Emirates Markets. *Journal of Environment Accounting and Management, 6(2)*, 105-114.

Alvi, M. H. (2016). A Manual for selecting Sampling Technique in Research. *Journal of MPRA*, 1-56.

Amoako, K. O., Marf, E. O., Gyabaah, E. N., & Ghorman, K. O. (2017). Achiving a sustainable Business: the role of Environmental Management Accounting in Corporate Governance. *International Journal of Acedamic Research in Accounting, Finance and Management Science, 7(4)*, 11-20.

Baba, M. C. (2012). Advantages of implementing enviromentla accounting within an economic entity. *Journal of Anale Seria* , 15-24.

Banerjee, A., & Chaudhury, S. (2010). Statistic without tears: Population and samples. *Industrial Psychiatry journal, 19(1)*, 60-65.

Bartolomeo, M., Bennett, M., Bouma, T. J., Heydjamp, p., James, p., & Wolters, T. (2000). Environmental management accounting: corrent practice and future potential. *Journal of European Accounting Review*, 31-52.

Bowen, A. G. (2009). Document Analysis as a Qualitative Research method. *Qualitative research Journal*, 27-40.

Boyce, C., & Neale, P. (2006). Conducting In-Depth interviews: A guide for Designing and conducting in depth interviews for evaluation input. *Pathfinder International tool Seriuos*, 1-16.

Braam, & Peeters. (2017). *Coporate sustainability performance and assurance on sustainability report.*

Brown, N., & Deegan, C. (2012). The public disclosure of environmental performance information—a dual test of media agenda setting theory and legitimacy theory. *Accounting and Business Research, 29*, 21-41.

Burrel, G., & Morgan, G. (1985). Sociological paradigms and organizationaal analysis: Element of the sociology of corporate life. *Ashgate publishing*, 1-6.

Burritt, R. L., Hahn, T., & Schaltegger, S. (2002). Towards a comprehensive framework for Environmen Management Accounting and link between business actors and Environment Management Accounting tools. *Australian Accounting Review*, 39-50.

Burritt, R. L., Herzig, C., Schaltegger, S., & Viere, T. (2019). Diffusion of environment management accounting for clearner production: Evidence from some case studies. *Journal of cleaner production, 224*, 479-491.

Capusneanu, S., Topor, D. L., Constatin, D. M., Manole, A., & Hint, M. (2020). Environmental Management Accounting: a business perspective on the policies, analysis and benifits of its implementation. *Management Accounting Standard for sustainable business Practices*, 27-50.

Cental Bank of Sri Lanka. (2018).

Chan, H. K., Wang, X., & Raffoni, A. (2014). An integrated approach for green design: Life-Cycle,Fuzzy AHP and environmental management accounting. *Journal of british accounting review, 64(4)*, 344-360.

Chathurangani, H., & Madhusanka, K. (2019). Environmental Management Accounting (EMA) adoption level among listed companies in Sri Lanka: Institutional Theory Perspective. *Journal of Research in Social Science*, 1-12.

Chowdhary,Raj & Bharagava. (2018). Environmental pollution and health hazards from distillery wastewater and treatment approaches to combat the environmental threats: A review. *ScienceDirect, 194*, 229-246.

Christ, K. L., & Burritt, R. L. (2017). Water Management Accounting: A Framework for coporate practices . *Journal of Clear production*, 1-33.

Claudio. (2007). Waste Couture: Environmental Impact of the Clothing Industry. *Environmental Health Perspective, 115*(9), 448-459.

Daellenbach, U., & Woiceshyn, J. (2018). Evaluating inductive versus deductive research in management studies: Implications for authors, editors, and reviewers. *Qualitative Research in Organizations and Management*, 183-195.

Delmas, M., & Toffel, M. W. (2004). Stakeholders and Environmental management Practice: An institutional framework. *Business stratergy and the environment*, 209-222.

Doorasamy, M., & Garbharran, H. (2015). The role of Environmental Management Accouting as a tool to calculate environmental cost an identify their impact on a companies environmentla performance. *Asian Journal of Business and Management, 3*, 8-30.

Dowling, J., & Pfeffer, J. (1975). Organizational Legitimacy: Social Values and Organizational Behavior. *Pacific Sociological Association*, 122-136.

Englander, M. (2012). The interview: Data Collection in Descriptive Phynomenological Human Scientific Research. *Journal of Phenomenological Psychology*, 13-35.

Fizi, N. M., Janudin, S. E., & Habidin, N. F. (2019). Environmental management accounting practices, environmental management system and environmental performance for the malayasian manufacturing industry. *Journal of business excellence*, 120-136.

Freeman, R. E. (1984). *Strategic Management: a stakeholder approach.* Pitman publishing imprint.

Gunarathna, A. N., & Alahakoon, Y. (2016). Environmental Management Accounting Practices and their diffusion: The Sri Lankan experience. *NSBM journal of management, 2*(1), 1-26.

Gunarathne, N., & Lee, K.-H. (2013). Adopting and implementing environmental management accounting (EMA) practices in the hotel sector: A Sri Lankan experience. *Journal of EMAN global research*, 95-103.

Henderson, Reinert, Dekhtyar & Migdal. (2018). Climate change in 2018:Inplication for business. *Harvard Business School*.

Heugens, P. P., & Lander, M. (2009). Structure Agency (And other Quarrels): A Meta-Analysis of institutional Theories of Organization. *Academic of Management Journal, 52(1)*, 61-85.

Hox, J. J., & Boeije, H. R. (2005). Data Collecton Primary vs Secondary. *Encyclopedia of Social Measurement, 1*, 593-599.

International federation of accountants. (2005). *Internal guidence document: environmental management accounting.* New York.

Ismail, M. S., Ramli, A., & Darus, F. (2014). Environmental management accounting practices and Islamic corporte social responsibility compliance: evidence from ISO14001 companies. *Journal of Social and Behavioral Sciences*, 343-351.

Jalaludin, D., Sulaiman, M., & Ahmad, N. N. (2011). Understanding environmental management accounting (EMA) adoption: a new institutional sociology perspective. *Journal of Social Responsible*, 540-557.

Jamil, C. Z., Mahamed, R., Muhammad, F., & Ali, A. (2015). Environmental management Accounting Practices in small medium manufacturing firm. *Journal of Social and behavioral Sciences, 172*, 619-626.

Kajornboon, A. B. (2005). Using interviews as research instrument. *E-journal for research teachers*, 2-18.

Latan, H., Jabbour, C. J., Jabbour, A. B., Wamba, S. F., & Shahbaz, M. (2018). Effects of environmental strategy, environmental uncertainty and top management's commitment on corporate environmenta performance: The role of

environmental management accounting. *Journal of Cleaner Production*, 297-306.

Lombard, M., Snyder-Duch, J., & Bracjen, C. C. (2002). Content Analysis in Mass communication: Assessment and Reporting of intercorder reliability. *Journal of Humn Communication Research, 28(4),* 587-604.

Maama, H., & Appiah, K. (2019). Green accounting practices:lesson from an emerging economy. *Qualitative Research in Financial Markets, 11*(4), 456-478.

Man & Vasil. (2012). Current dimension of environmental management accounting. *Procedia-Social and Behavioral Science, 62*, 566-570.

Ministry of Industries and Commers. (2020). *Ministry of Industries and Commers.* Ministry of Industries and Commers.

Mokhtar, N., Jusoh, R., & Zulkifli, N. (2016). Corporate characteristics and environmental management accounting (EMA) implementation: Evidence from Malayasian Public Listed companies (PLCs). *Journal of Clearner Production, 136*, 111-122.

Mouse, G., & Hassan, N. (2015). Legitimacy Theory and Environmental Practices: Short Notes. *International Journal of Business and Statistical Analysis, 2*, 41-53.

Nashioka, E., & Kokubu, K. (2005). Environmental management Accounting practice in Japan. *Journal of Eco-Efficiency in Industry and Science*, 321-342.

Naslund, D. (2015). Logistics needs qualitative research - espacially action research. *International Journal of Physical Distribution & Logistics Management*, 321-338.

Nguyen, L. S., & Tran, M. D. (2019). Disclosure levels of environmental accounting information and financial performance: The case of Vietnam. *Management Science Letters* , 557-570.

Pattnaik,Das & Pradhan. (2019). Environmental laws and restrains of criminal. *Library Philosophy and Practice*, 5-24.

Persic, Jankovic & Krivacic. (2017). *Sustainability accounting: Upgrading Coporate Social responsibility.* ResearchGate.

Qian, W., Horisch, J., & Schaltegger, S. (2018). Environmental Management Accounting and its effects on carbon managemet and disclosure quality. *Journal of clearner production, 174*, 1608-1619.

Queiros, A., Faria, D., & Almeida, F. (2017). Strengths and limitations of qualitative and quantitative research methods. *European Journal of education studies, 3*, 369-387.

Rajapakse, B. (2008). Environmental Reporting: Significance and Issues: A Case from Sri Lanka. *Department of Accounting in Colombo University*, 1-14.

Revell, A., Stokes, D., & Chen, H. (2010). Small business and the environment: turnong over a new lesf. *Journal of Busines Stratergy and the environment, 19(5)*, 273-288.

Sarumathi, S. (2014). Green Purchase Behavior–A conceptual framework of socially conscious consumer behaviour. *Global Journal of Finance and Management, 6*(8), 777-782.

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students.* England: The Pearson Education Limited.

Schiopoiu, A. B., & Popa, I. (2013). Legitimacy theory. *Corporate social responsibility*, 1579-1584.

Scott, W. R. (2005). *Institutional Theory: contributing toa theoretical research program.* Oxford UK: Oxford University press.

Settheskko, W. (2010). Barriors to development of environmental management accounting. *EuroMed Journal of Business, 5*, 315-331.

Solovida, T. G., & Latan, H. (2017). Linking Environmental stratergy to environmental performance: msdiation role of environmental management accounting. *Journal of Sustainabiility Accounting management and policy*, 1-33.

Strydom, H. (2013). The evalution of the purpose of research in social work. *Social work, 49*(2), 149-164.

Strydom, H. (2013). The evalution of the purpose of research in social work. *Social work, 49*.

Syarif, A. M., & Noviata, N. (2019). Environmental Management Accounting with Material Flow Costing: stratergy of Environment Management in Small and medium-sized Enterprises Production activities. *Journal of Indonesian Management and Accounting Research*, 147-170.

Taherdoost, h. (2016). Sampling Methods in Research Methodology: How to choose a Sampling Technique for Research. *Journal of Accademic Research in Management*, 18-27.

Tangco, M. (2007). Purposive Sampling as Tool for Informant Selection. *Journal of Planet, people and Applied Researh*, 147-158.

Toprak, T., & Anis, P. (2017). Textile industry's environmental effects and approaching cleaner production and sustainability, an overview. *Journal of Textile Engineering & Fashion Technology*, 429-442.

Tracy, S. J. (2010). Qualitative quality : Eight "Big-Tent" criteria for excelllent qualitative research. *Qualitative inquiry*, 837-851.

Vaismoradi, M., Turunen, H., & Bondas, t. (2013). Content analysis and thematic analysis: Implications for conductiong a qualitative discriptive study. *Nursing and Health Sciences*, 398-405.

Vasile, E., & Man, M. (2012). Current dimension of environmental management accounting. *Procedia-Social and Behavioral Science, 62*, 566-570.

Wahyuni, D. (2009). Environmental Management Accounting: Technique and Benifits. *Journal of Akuntansi University Jember, 7*, 23-35.

Wijayasinghe, C. (2017). The impact of green practices on financial performance: A study on Small and medium-sized enterprices in Sri Lanka. *8th international Conference on Business and Information* , 1-15.

Xiaomei, L. (2004). Theory and Practice of environmental management accounting. *International journal of Technology Management & Sustainable Development, 3*, 47-57.

Yin, R. K. (2014). *Case Study Research Design and Methods Fifth Edition.* United Kindom: SAGE Publication Ltd.

Appendix

Appendix A: Framework for Environment Management Accounting.

		Environmental Management Accounting (EMA)			
		Monetary Environmental Management Accounting		Physical Environmental Management Accounting	
		Short term Focus	Long term focus	Short term Focus	Long term focus
Past Oriented	Routinely generated Information	Environmental Cost accounting (ex, Variable costing, ABC)	Environmental Induced capital expenditure and revenue	Material and energy flow accounting (Short term impacts on the environment, division and company level)	Environmental (or natural) capital impact accounting
	Ad hoc information	Ex post assessment or relevant environmental coating decision	Environmental life cycle (and target) costing Post investment of individual projects	Ex post assessment of short-term environmental impacts (ex, of a site production)	Life cycle investment Post investment assessment of physical environmental appraisal

Future Oriented	Routinely generated Information	Monetary environmental operational budgeting (flows) Monetary environmental capital budgeting (stocks)	Environmental long-term financial planning		Physical environmental budgeting (flows and stocks) (material and energy flow activity-based budgeting)	Long term physical environmental planning
	Ad hoc information	Relevant environmental costing (Special orders, product mix with capital control)	Monetary environmental project investment appraisal		Relevant environmental impacts (ex, given short-run constraints on activities)	Physical environmental investment appraisal Life cycle analysis of specific projects

Source: (Burritt et al.. 2002)

Appendix A: Time Frame

	Activity	Month 1				Month 2				Month 3				Month 4				Month 5	
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	
1	Problem identification	■	■	■	■																
2	Prepare & presenting of proposal				■	■	■	■	■												
3	Primary data collection									■	■	■	■								
4	Search for empirical evidences	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
5	1st chapter preparation and submission					■	■	■													
6	2nd chapter preparation and submission							■	■												
7	3rd chapter preparation and submission									■	■										
8	4th chapter preparation and submission											■	■	■							
9	5thchapter preparation and submission															■	■				

10	Final report preparation and submission																

Appendix B: Interview Guide

- Reference no:
- Date:
- Location:
- Respondents name & Code:
- Position:
- E-mail Address:
- Content Number
- Size of the organization: no of employees

Research Objective [RO]

1. To explore the EMA practices adopted by large-scale green implemented Apparel companies in Sri Lanka
2. To explore and illustrate the obstacles of EMA encountered by large-scale green implemented Apparel companies in Sri Lanka in using EMA
3. To explore the benefits of following EMA by large-scale green implemented Apparel companies in Sri Lanka

Demographic details

1. Can you explain a brief introduction about yourself?
2. How did you get into Management Accounting?

Getting start

1. What do you think about environmental changes in the world?
2. What is your view on environmental sustainability (corporate greening) in organizations?
3. Does your company use Environmental Management Accounting to generate information relevant to environmental management?

Understand about the EMA practices ➔ This covers RO1

1. What are the EMA practices that you follow? (about how they report and control energy, material, waste, water, carbon, etc.)
2. Are there any EMA practices that you wish to follow in the future?

Way of following EMA practices

1. What are the obstacles to follow EMA practices? (Internal and external obstacles) **This covers RO2**

2. What are the drivers for doing so? **This covers RO3**

3. what are the internal and external benefits of following EMA practices? **This covers RO3**

Appendix C: Transcription

INT01 Manager interview

With-Mr. Chalana Randunu Date 28th of March 2020

Time 8.00 p.m. to 8.45 p.m.

P= Paragraph number (P)

D: - Dulan C: - Chalana

D: - Good Evening sir, can you talk right now. **(P-1)**

C: - Good Evening, Yeh, tell me **(P-2)**

D: - Can you briefly introduce yourself? **(P-3)**

C: - I am Chalana Randunu and I am a senior sustainable executive of Linea Aqua (Pvt) Ltd. That's about me **(P-4)**

D: - How did you get into management accounting? **(P-5)**

C: - I work in both the sustainability department and management accounting. I am preferring to do so. Therefore, I work as a management accountant and engage with sustainability work. **(P-6)**

D: - What is your view on environmental sustainability? **(P-7)**

C: - Now lots of garment factories have come to think about the environment. But previously, the Organization didn't much consider the environment. But now organizations consider the environment. That's a kind of improvement of our organization. That is about the environmental view. **(P-8)**

D: - Do your company use EMA to collect information relevant to environmental management, and if so, what are the EMA practices that you follow. **(P-9)**

C: - Well. In our company, we implemented sustainability under the 6 stages. Water, Energy, Biodiversity, Waste, Chemical and Culture were considered under those 6 stages. For those, we implement different measures. Is that clear? **(P-10)**

D: - Yes.

C: - Ok, when considering about **the energy stage which practice EMA.** We set a target in our company and it is we have to archive 3% reduction from energy consumption in annually. Always a previous year is a base year and that is the target. We have done lots of insist on projects. Internally we placed a solar system and it generates integral energy in our company. **We used 10% - 15% solar energy out of whole energy** demand in the company. We installed solar panels which can **generate 380kw and we hope to expand it up to 500kw** in next year. We can generate integral energy through it and it helps to reduce electrical power which is generated from hydropower or coal power. Monthly **we measure the energy saving of this solar panel system and for that saving, we can give value for kw. (P-11)**

D: -Hm ok.

C: - Amaia. we did another project with lights. We converted all the lighting systems in to LED lights. Before that, we used C5 lights. Means tube lights. But now all the lights are LED lights. And we have done a project to get natural sunlight into the production floors. We called it skylight. It's not a light. It's a plate. We used a plate to get skylight. It means we get skylight in to the production floor through that plate. **Then the saving is,** previously I told you we used LED lights and then we installed sensor dimmers to tally with LED light system. When the natural light is getting high LED lights system automatically gets dim. Hence, we **can reduce electrical power when** sunlight getting more. We have to maintain enough lighting levels inside the factory. It has to be comfortable for the eyes and balanced with sunlight and LED lights. We can **get energy saving from that and we account for that**. Our company has an air chiller. Air chiller means it generates AC. The whole plant was fully AC. Those air chillers consume more energy. Therefore, we shifted those air chillers to water chillers with **huge investment as environmentally friendly work**. **We invested about ten million** for that sustainable projects. We had two air chillers and we replaced two water chillers. **We could save more energy from it. (P-12)**

D: - Ah ok.

C: - If we consider the culture it represents how we change the behaviors of the people to be green. In culture, the implementation of EMA is less. **WE only take the cost of these events to the financial statement**. Here we make less investment for that programmers and apply to the **cost calculation.** To that we do some awareness program

to raise the practical knowledge of our employees. This program is held weekly and also all the employees have to face an industrial revolution when they recruit the company. We told them how to reduce energy consumption, how to practice in-home and also what we did in the office. Awareness is the key point to implement sustainability. And we gave chance for employees to charge their electric vehicles and that energy comes from our installed solar panels. Actually, the zero-emission concept is not working with the home electricity. Because there is hydro energy or coal energy at home. And it doesn't help to zero-emission. Actually, these electric vehicles introduced for the zero-emission concept, therefore we established solar energy points to promote electric vehicles and that energy generated from our solar panels. **Hence, this also saves more energy.** They can plug their vehicles to charging points after they park the vehicles. After that vehicle is getting charge automatically by using solar power. They don't want to find some other places for charging their vehicles. And also, that is a zero-emission process. If someone use their vehicle to arrive to the office, they can charge their vehicle free of charge. We gave this opportunity for our employees. That energy isn't coming from hydro or coal power, it's coming from solar power. **Monthly we measure the power taken by those vehicles to charge. (P-13)**

C: - Ok then consider the water, this is the other place that we implement EMA. WE **set a target for us and it is 2% reduction** of water consumption. We have to ***reduce water consumption by 2% monthly***. We plan this month's reduction by using a based month. The based month is the relevant month in the previous year. When we looked our previous projects. We placed a water treatment plant. This plant treats wastewater and those treated water feed into the water chillers. Previously I told you about our movement in air chiller to a water chiller. We have to feed water for those air chillers. We use water to air cooling process**. Actually, this process reduces the water consumption from outside. It takes 6.5 million investment and it has a capacity of 48 m^3/ 48000L per day**. Whole capacity of treated water uses for water chillers to generate AC. Internally, we used sensor taps for reducing water waste. Actually, there is a high-water consumption level in the canteen in the factory. Employees use more water to drinking, wash their hands and wash their plates and cups. Because of sensor taps, there is no need to open and close water taps and it's doing automatically. **We placed 50 sensor taps and one's price was Rs.35000**. This also took a huge investment. We are doing some water projects for the community**. If we get some**

requirements from schools, we analyze the feasibility of our company and the budget. If we have some opportunity for doing that, we definitely do it. We have done lots of projects such kind of that. **(P-14)**

D: - Oh it's really helpful

C: - **Ok when talking about the waste, zero** landfilling is the target. Definitely, there is no landfilling. It must be finished by recycling, reusing or energy generation without any kind of land fillings. Our company is following the 3R concept. **We use All of these wastes to earn a price. And also, there is two companies which are buying our fabric waste. Each month we earn money by selling those waste and we take those in to financial statements. The first one is HY Vital. (P-15)**

D: - Sorry, can you repeat that company's name?

C: - HY Vital Privet Limited. There is a nylon base in our fabric material and that company extracts nylon and makes some plastic palate by using it. They use that plastic palate to make plug bases. This process is not happening in our country. It's happening in China. They brought our fabric waste and shift to China. And also, the other part of the fabric base and the parts which are can't regret is going to the eco-cycle. There is a process which is called as eco-cycle and they burning those waste**. That is not open burning. There is an incendiary concept and they used the heat which comes from the burning is use as energy. But we have to pay for them. If** we give our waste for them, **we have to make cost for that and we record those things. (P-16)**

D: - Is this process also doing the same company. **(P-17)**

C: - No. There is another company and to generate the energy they burn waste. That is Holism. (P-9) **(P-18)**

D: - Ah ok, Holsim.

A: - Yes. Holcim eco cycle generates energy. Then the other parts buy HY Vital for making plastic. There is an up-cycling process. That means they produce new things by using our waste. All the other things are recycling and there is no any land filling. **Ok, the next stage is biodiversity. To that we doing reforestation projects and those are actually some complicated. For that we implement EMA.** Ok. In reforestation, suppose there is a tea plantation which is done by village people but the

landowner is the government. And also, that was a forest in previously and now people cut all the trees and do their plantation. But the landowner is the forest department. They declare this land and remove the tea plantation. After that, there is a dare land. It means there is nothing after removing the tea plantation. We select such kind of sites which are owned by the forest department. Ownership of the forest department means those lands are located near to a forest. **(P-19)**

D: - It means you take government lands?

A: - Yes, we select some government land area for reforestation. We pay money **and grow new plants.** These projects are going with the forest department because they have land ownership. Normally we come to the agreement with the forest department for five years reforestation project. We have to grow a forest and it is not an easy task. First, we grow some plants and give them a chance to grow up well and then we grow another set of plants. It takes more time. We signed an agreement with the government to planting those lands for five years. We launched two projects such as that. The first one is in Hiniduma in Galle. It's close to Neluwa area. And the other one is located in Horagandeliya. It's also close to Neluwa area. D:- What is the name of that site? **(P-20)**

D: - yeh I got it.

C: - We doing such projects normally. Internally, we planted lot of plants in the garden of the factory. And I told you about the two forestation projects which are launched by our company. To do that, we launched special projects. It means we remove some plants which can be a threat to the Sri Lankan environment. We select some such kind area and do a project to remove them. The reason for that, we can't reduce those trees without removing them. F**or all these things we have to bear costs.** Is that clear? **(P-21)**

D: - Yes

C: - We do this in Bundala national park. **(P-22)**

D: - So you remove the treat trees in there and do a replantation.

C: - No. We just remove those trees. But we don't replant in there and give the opportunity to the natural plantation. If we grow some plants that are taken from another

place, it may occur harmfully. Because we grow something that is unrelated for the environment. **(P-23)**

D: - Oh. That's true.

C: - Therefore, we remove these trees and give natural growth coming from bird's droppings and by wind or something else. We give chance for priorities to grow up. It means trees which grow first. We just remove invaders. In order to that, we remove two types of trees. The first one is "Kalapu Andara" and the other one is "Pathok". In Bundala National Park, there is a very peaceful situation for animals. Therefore, if there are some invader plants, it may occur limits animal freedom. Because there are some thorny trees like "pathok", it may harmful for animal's day to day routine. If trees grow like a wall, animals can't cross it. Hence, we remove those trees for reduce such issues. When consider about the investment cost, we **spend Rs.80,000 per acre to remove trees.** We can't remove those trees easily, therefore we use machines like excavators. We spent about Rs.80,000 per acre for maintaining. Actually, removing trees is not enough and we have to remove small plants again and again. Because trees try to regrow with their roots and infant plants. Therefore normally, we have to maintain an acre thrice per year and its takes about **Rs.45,000 for one to maintain the process. (P-24)**

D: - Ok.

C: - Then the culture stage. **We don't invest more funds for the culture stage. We spend only for small investments and those we take to the financial statements.** Culture means changing the human mind. In that case, the key point is the awareness program, what are the areas that we teach them. We explain to them about how we save water, energy and how we grow a plant and what are the importance of plantation and etc. we are doing these awareness programs internally and also externally. We lounge awareness programs for the external community instead of internal employees. Normally we lounge such programs for school students. Hence, there is no any huge investment. We exert competitions in awareness program and we want to budget only for small things like gifts and etc. **(P-25)**

After that, we can consider the chemical stage. Actually, we started this recently. **There is no need to huge budgeting.** Normally, we looking for chemical management

internally. Because there is no high consumption level of chemicals in our Linear Aqua company. Because we are cut and sew plant. **(P-26)**

D: - Ok. Aren't you doing dyeing?

C: - No. We don't make fabrics. There are two industry including textile and apparel. We are in the apparel industry. Apparel means we bring fabrics and doing cut and sew only. In the textile industry, they make fabrics and printing. We only cut and sew therefore we don't use a chemical with high capacity. Normally, we use a chemical for cleaning. We use chemicals for clean and mop the washrooms and canteens. Now, we are looking only the management side of that. We build racks for chemical cans. If there is any damage of these chemical cans it may occur to environmental damage. We didn't invest more for this and we doing this as practice how about use chemicals without any environmental damage. **(P-27)**

D: - But. We have to invest for that. Isn't it?

C: - Yes**. We must invest and we doing it**. Suppose, there is chemical storage and we have to manage it by using racks or secondary contains. We were invested for that. Otherwise, we don't make budgets for chemical purchasing. We are doing chemical purchasing in order to the existing budget. **We invest to build a suitable environment for that. (P-28)**

D: - Ah ok.

C: - And also, we were building a chemical room. In the previous case, we don't have any chemical room. We just hold chemical cans here and there. After that we gave a rack and used numbering stickers. If we buy new chemical cans, then we must put them in to relevant rack according to the pin number. **(P-29)**

D: - Ah ha, it means they must use a relevant rack?

C: - Yes, they must use the relevant rack and pin number. Therefore, anyone can identify the chemical cans and its relevant place in the rack. Because, if fall some chemical cans on the floor, it may occur to environmental damage. **(P- 30)**

D: - Ok.

C: - **We are doing environment management by using those ways yet. In order to that, we were budget for energy and water under sustainability.** In many cases, the maintains department is involved for budgeting for many internal projects. It was not completely under the maintains department, but we budgeting with main plant parallelly. For example, when to consider the sensor taps, it was not under the sustainability budget. It was in maintaining the budget. **(P-31)**

D: - **It means, you maintain a cost for sustainability, but you don't consider it as a sustainable cost? (P-32)**

C: - **Actually, sensor taps reduce the water-consuming level and also, we can present its impact directly.** We can present the saving. But we were not budget for this investment, it was budget by maintain department. **(P-33)**

D: - Its mean environmental cost hides inside the overhead cost

C: - yes. However, as a sustainability work, we gave some recommendations for them about the saving of sensor taps. Actually, it was a huge investment. Previously I told you we spent about Rs.35,000 for one sensor tap. Therefore, we had to spend Rs.1.7 million for this investment. Normally we can't budget for a huge investment like 1.7 million directly. We have to give a recommendation about monthly saving. **Therefore, we take a sample sensor tap and determine its water consumption level. We can check the floor rate with time and we had to show it according to the normal tap. Then it should be multiple by how many times per day of water usage. We can count it. Suppose there are 25 team members and they use the sensor tap at one lunchtime. It means one sensor tap was used 25 times. We can count how many water liters which are used with the water floor rate. It must multiple by 25 and then we can know about the water waste in one lunch shift. After that we can compare the water wastage between a normal tap and a sensor tap. Actually, that is a very big task. We have to take video samples and analyze to show this process. Because we can't give any recommendations at ones. (P-34)**

D: - Ah ha. We have to confirm the saving.

C: - That's right. We must confirm how about monthly saving form water. **Then we calculate annual saving. Also, calculate the ROI.** Therefore, we must calculate saving Finally, we show there is a full saving after the recovery time period. **(P-35)**

D: - If **there is a saving, can you get budget approval? (P-36)**

C: - If **there is a saving, we can budget it specially**. But actually, it's a duty of the maintenance department because they are prevailing this. They can release the budget on our recommendation. We recommend that sensor taps are more feasible than the normal taps in our company and show the future analysis with the saving. After that maintain the department budget it. If they can't release the budget within 6 months, then we budget for that project in next year. **There is also the same procedure in case of solar. We have to show the saving with values. (P-37)**

D: - you should count the energy. Isn't it?

C: - Yes. **In that case of the solar panel also we have to show about energy wastage and energy saving**. We can show it easily in Saturday and Sunday**. It means we sell generated electricity power** to the electricity board in workless days. those saving and cost we take as EMA. **(P-38)**

D: - Do **you generate income from it?**

C: - Yes. But we don't take money in that case. Previously I told you, we use 15% of solar power and the rest 85% of electricity power take from the electricity board. That's how we fulfill our full demand. Our plant does not work at Saturdays and Sundays. **But there is an electricity generation and we sell it. Then we pay the bill with a reduction of sold electricity. (P-39)**

D: - Ah ha, you pay the bill with balancing it.

C: - **Yes. We pay the rest of the bill payment. Suppose, we take energy from the electricity board and our bill payment is Rs.100,000. And also, we sell solar energy and it's about Rs.20,000. Hence, we pay only Rs.80,000 to the electricity board. (P-40)**

D: - Ah ok.

C: - **That is the procedure in the budget side**.

D: -Ok, then what are the obstacles that you experience when you follow EMA practices. **(P-41)**

C: - Ok, when we try to implement EMA practices you know, there should be involvement of all employees in the organization. As an example, if we want to measure the water consumption of an employee, we have kept a record book to record when the use of water. But if employees do not record means we cannot measure exactly water count. **Likewise, take all employee intentions towards this program is difficult. Also, measuring these sustainable works are very difficult. On the other hand, cost is also high. Those are things. (P-42)**

D: -Ok. Then what are the advantages that you take from implementing EMA practices. **(P-43)**

C: - Yeh, first one is we **can improve our image**. Implementing EMA is key to compete in the market. We can show the results of our sustainability work. On the other hand, w**e can improve our productivity**. As an example, when we conduct our productivity, we critically measure the wastage. **Further, we have KPI to reduce waste.** Therefore, employees have to produce under less wastage conditions. Likewise, we can recognize the advantages. **(P-44)**

D: - in your company, you are doing all the things according to green accounting.

C: - Yes. It was like that. we can show that on our projects. And also, we can show that under the budgeting side. **(P-45)**

D: - Do you have any expectations about measuring footprint or something like that in the future with relevant to EMA?

C: - We already measured the footprints. We measured water footprint, carbon footprint, and biodiversity footprint. We have measured all those things under the annual audit. In our company, **the water footprint per person is 47l per day. Those 47l liters measured including drinking, hand washing, water usage in the washroom, AC generation, cooking in the canteen and etc. and that water usage can be divided for every employee. And also, we considered cleaning in the canteen, washing cups, plates and etc. Then we divide it by the number of employees and the answer is 47l. That's the footprint. It means the water consumption level of one person. (P-46)**

D: - Is water footprint a sub concept of carbon footprint?

C: - No. A carbon footprint means how many carbons emitted by one person. **(P-47)**

D: - Is there any indicator for measure the carbon footprint?

C: - We have to process an audit for measure it. We have to consider about our cargo transportation and employee transportation because those are the reasons for carbon emission. On the other hand, I don't know any kind of method for measure the amount of carbon dioxide that is coming from a human's breath. **(P-48)**

D: - Yes, it's impossible.

C: - There may be some methods for measure it. But practically we can't measure it. Therefore, we take Suppose, if we use LP gas for cooking in the canteen, then it may occur to carbon emission. Because there is a burning process. We take the amount of consumed LP gas as monthly. Then we can apply the formula with that and then we can get amount of carbon emission by gas usage. Then consider about transportation, we bring good from outside of the country therefore, we use ships and flights. Actually, there are different ratios, one ratio for ship and another ratio for flight. If we calculate the carbon footprint, we have to maintain all the data about it annually. It's not an easy task. **(P-49)**

D: - Yes. It's very difficult. **(P-50)**

C: - We use lorries for our product's transportation because we have to transport our finished goods to the port and airport. Then carbon emission depends on the weight of the vehicle and also, we have to consider the running kilometers and engine capacity of the lorry. **(P-51)**

D: - D**o you have some expenditures like pay for the audit farm? (P-52)**

C: - Yes. **We pay for the audit farm and we** have an agreement with the audit farm. It's 3 by 3 concept**(P-53)**

D: - **I have another question. Previously you told me about you don't account those things under the green accounting officially. As an example, think about your sensor tap project. In that case, your sustainable department recommended about the project but the project proceeds under the basic cost. Don't you think it's better to take according to the environment accounting. (P-54)**

C: - **Actually it's really good if we can. There must be a person who has best knowledge about converting accounts into green accounting. It means he or she must know accounting and also green accounting. That's all (P-55)**

D: - Yes, otherwise, we can't do that practically.

D: - Can I know Your email address?

A: - chalanaP@lineaaqua.com

D: - Thank You very much for your information Sir.

C: - You are welcome!

Appendix D: Coding Sheet

Research Question	Research Objective	Paragraph Number	Comment	Coding Number	Coding Names	Category	Physical or monitory
RQ1	RO1	P-11	When considering **the energy stage which practices EMA.** We set a target in our company and it is we have to archive a 3% reduction from energy consumption in annually. In that case of the **solar panel a**lso we have to show energy wastage and energy saving. We can show it easily on Saturday and Sunday. It means we sell extra electricity generate from the solar panel on Saturday and Sundays to the electricity board. those saving and cost we take as EMA	A6.2	*Use KPI for energy *Solar panel use for energy category *Both Saving and cost take to financial statement	Energy	Monetary
RQ1	RO1	P-13	If we consider the culture it represents how we change the behaviors of the people to be green. In culture, the implementation of EMA is less. **WE only take the cost of these events to the financial statement**. Then the culture stage. We don't invest more funds in the culture stage. We spend only on small investments and those we take to the financial statements.	A18.1	*Culture is important to EMA *Less investment applicable to culture Investment *cost take to FS as EMA	Culture	Monetary

RQ1	RO1	p-16	**That is not open burning. There is an incendiary concept and they used the heat which comes from the burning is use as energy. But we have to pay for them. If we give our waste for them, we have to make a cost for that and we record that thing**		*That is not open burning. There is an incendiary concept and they used the heat which comes from the burning is used as energy	Waste	Monetary
RQ1	RO1	P-14	Ok then consider the water, this is the other place that we implement EMA. WE **set a target for us and it is a 2% reduction** of water consumption. We have to ***reduce water consumption by 2% monthly***	A1.3	*KPI use for water *Focused on reducing water	Water	Both
RQ1	RO1	P-19	**Ok, the next stage is biodiversity. In order to that we doing reforestation projects and those are actually some complicated. For that we implement EMA. Yes, we select some government land areas for reforestation. We pay money and grow new plants.**	A21	*Do reforestation program *Cost incurred for those programs	Biodiversity	Monetary
RQ1	RO1	P-28	**We must invest and we doing it**. Suppose, there is chemical storage and we have to manage it by using racks or secondary contains. We were invested in that. Otherwise, we don't make budgets for chemical purchasing. We are doing chemical purchasing in order to the existing budget. **We invest to build a suitable environment for that**	A22	* Invest to handle chemical in *environmentally friendly	Chemical Management	Monetary

RQ3	RO3	P-44	The first one is we **can improve our image**. Implementing EMA is key to compete in the market. We can show the results of our sustainability work	A9.1.1	*Improve brand image *Can show the result of sustainability work	Image	
RQ3	RO3	P-44	On the other hand, w**e can improve our productivity**. As an example, when we conduct our productivity, we critically measure the wastage. **Further, we have KPI to reduce waste.** Therefore, employees have to produce under fewer wastage conditions. Likewise, we can recognize the advantages	A24	*Improve productivity *use KPI to reduce the wastage	Improve Productivity	
RQ2	RO2	P-42	Ok, when we try to implement EMA practices you know, there should be involvement of all employees in the organization. As an example, if we want to measure the water consumption of an employee, we have kept a record book to record when the used water. But if employees do not record means we cannot measure exactly water count. **Likewise, take all employee intentions towards this program is difficult. Also, measuring these sustainable works is very difficult.**	A23	*Participation of employees is low *Measuring sustainability works are difficult	Employee intention	
RQ2	RO2	P-42	On the other hand, the cost is also high. Those are the things	A15.1.1	*High cost for suitability work	Cost	

	Special Finding	P-55	**Actually, it's really good if we can. There must be a person who has the best knowledge about converting accounts into green accounting. It means he or she must have knowledge about accounting and also green accounting**	B4	Should have knowledge of Accounting and sustainability	Special	
	Special Finding	P-32/33	D: - **It means, you maintain a cost for sustainability, but you don't consider it as a sustainable cost?** A: - Actually, sensor taps reduce water-consuming levels and also, we can present its impact directly. **We can present the saving**. But we were not budget for this investment, it was budget by maintain department. Hence, that cost is under maintenance. . D: - Its mean environmental cost hides inside the maintenance cost. A: - For some cost yes.	B3	*Some EMA cost hide inside the overhead cost *Saving of censer tap measured	Special	Special