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GREEN SUPPLY CHAIN MANAGEMENT PRACTICES AND PERFORMANCE OF PURIFIED DRINKING WATER FACTORIES

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ABSTRACT

The aim of this research was to identify green supply chain management practicesimplemented bypurified drinking water factories in Shwe Pyi Thar industrial Zone and to determine the effect of implementation of green supply chain management practices on performanceof purified drinking water factories in Shwe Pyi Thar Industrial Zone. The primary data and secondary were used.The primary data were collected by interviewing with 100 employees (50%) who have responsibilities of the sample purified drinking water factories.Descriptive statistics and regression analysis were used.It found out that firms appreciate the role of green supply chain management practices which are green procurement practices, green manufacturing practices, green distribution practices and reverse logistics practices. Among them, green distribution practices have highest mean scores.The relationship between GSCM practices and firm performance are as follows: all of the practices are significant relationship with operational performance except green manufacturing practices. Both the green procurement and green manufacturing practices are significant relationship with financial performance except green distribution and reverse logistics practices. Finally, only green manufacturing practices are significant relationship with environmental performance except remaining practices. The study also confirmed that GSCM practices are important in improving the performance of firms. The study recommends that the implementation of GSCM should be implemented purified drinking water factories because there are benefits that accrue from such implementation. Firms will benefit through increased use of recyclable materials, savings on costs due to effective utilization of available productive resources, reduction of the environmental impact of business processes and reduction of operational costs and risk of prosecution based on anti-environment reasons.

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LIST OF ABBREVIATIONS

ECD	Environmental Conscious Design
FDA	Food and Drug Administration
GD	Green Distribution
GM	Green Manufacturing
GP	Green Procurement
GSCM	Green Supply Chain Management
HACCP	Hazard analysis and Critical Control Points
LCA	Life Cycle Assessment
PE	Polyethylene
PP	Polypropylene
QC	Quality Control
UNEP	United Nation Environmental Programmed
YCDC	Yangon City Development Committee

CHAPTER 1
INTRODUCTION

Many businesses around the world have exploited the environment with impunity, without any thought of sustainability. In absence of regulations, companies tend to create products and services based in part on the (free) cost of the public goods, namely the environment. Globalization has increased customers awareness about environmental issues that introduced business opportunities for environmentally conscious manufacturing industries. Hence, manufacturing industries are facing pressure from global market to improve their sustainability performance by implementing environmental management practices.

In 1972, the environment and sustainability became a topic on the international policy arena, as the United Nations Environmental Programme (UNEP) was established (Trine-Lise Anker-Rasch and Siri Daviknes Sørgard, 2011). Since then, it has inspired and encouraged governments and private organizations to become more environmentally conscious. Several initiatives have been started, environmental organizations established and new technology invented in the continuous work to improve the world's environment.

Many businesses are now facing the challenges of competing in the global competitive marketplace. Therefore, the life cycles of products become shorter and shorter; businesses need to offer the right products, the right numbers, the right time, the right place and the reasonable prices to fulfill their target market needs. In doing so, it can be found that businesses must rely on effective supply chain to compete in global market. Traditional supply chain is the manufacturing process of raw materials into the final products then it is delivered to the customers by the distributor or retailer.

The very first green supply chain came into context in 1989. Green supply chain management (GSCM) as a set of complex activities such as monitoring environmental management process which contains of purchasing, operations, marketing and logistics beside that recycle, reuse, remanufacture and reverse logistics (Zhu and Sarkis (2004b). GSCM practices are carried out by organization to decrease the effect and impact of organizational activities to the environment (Awaysheh &Klassen 2010).

A well-designed green supply chain management enables the firms to reduce negative environmental effects by minimizing wastage, limit the pollution through cleaner production. Green supply chain needs to maximize the economic benefits by decreasing consumption of resources, energy and emission of pollutants to create socially responsible enterprise. Implementation of GSCM practices improves environmental, financial and operational performance of the firms. To achieve competitive advantage, business must have the ability to create and manage the effective green supply chain process. In this way, business can manage to achieve the maximization of their profit and company's image.

1.1   Rationale of the Study

In 2010 the world's greenhouse gas emissions was the highest ever in history. Green supply chain has been driven by practices that have heightened the deteriorating environmental conditions, e.g. reduction of crude material, increased waste materials and high levels of contamination. Green supply chain management (GSCM) is major concern of every company management or production unit. Companies may choose to adopt GSCM for many different reasons: one may be forced due to laws and regulations, one may use GSCM to differentiate oneself in a competitive industry by being environmentally friendly and lastly one might need to implement GSCM to stay competitive if your competitors already have adopted

GSCM. Therefore, green supply chain management plays a vital role in today business world.

Purified drinking water manufacturing business in Myanmar is one sector that largely contributes to packaging (mostly plastics) materials which has contributed towards pollution. Environmental considerations and increasing public feeling are driving manufacturer's choices in manufacturing process; this includes packaging and the afterlife of the products. Packaging has now turned into a fundamental piece of the benchmarks that characterize purified drinking water manufacturing business. Purified drinking water manufacturing businesses recycle the plastics products which manage the waste products. Recycling of plastics products save natural resources and reduce production costs. So, businesses are turning green and coordinating plastics recycling method is not only very profitable but also providing the scarcity of resources.

Purified drinking water manufacturing business in Myanmar has been started during 1970s. The purified drinking water market has developed only after introduction of Market Oriented Economy in 1988. Today, people recognize that using purified drinking water is the sign of modernization and safety for health and higher living status. Myanmar Food Industries registered in 2018; there are 345 purified drinking water manufacturing businesses in Myanmar. Among them, 84 are located in Yangon. There are nine industrial zones in Yangon up to the year 2018. According to Shwe Pyi thar Management Committee, most the purified drinking water factories are located in Shwe Pyi thar Industrial Zone. This paper focuses on GSCM practices and performance of purified drinking water factories in Shwe Pyi Thar Industrial Zone.

1.2   Objectives of the Study

This study is done with the following objectives:

1. To identify the green supply chain management practices implemented by purified drinking water factories in Shwe Pyi Thar Industrial Zone.
2. To determine the effect of implementation of Green Supply Chain management practices on performance of purified drinking water factories in Shwe Pyi Thar Industrial Zone.

1.3   Scope and Method of the Study

The study mainly focuses on green supply chain management practices and its effect on performances of purified drinking water factories. There are seven purified drinking water factories in Shwe Pyi Thar Industrial Zone. Out of them, four factories were randomly selected to collect the data. They are KTM Co. Ltd, Sampar Oo Co. Ltd, Asia Co. Ltd and Globe Co.Ltd.

Both primary and secondary data are used. There are total populations of 200 employees who are responsible for four purified drinking water factories. Among them, the structured questionnaires are used to ask 100 employees (50%) who have responsibilities of purified drinking water factories. This study is used descriptive research approach to achieve the study. Multiple regression analysis is also used to identify the relationship between GSCM practices and firm performance.

1.4   Organization of the Study

This thesis consists of five chapters. Chapter one is introduction chapter and it comprises the rationale of the study, objective of the study, scope and method of the study. In chapter two, the theoretical background is stated by presenting about green supply chain management practices and performance, green procurement practices, green manufacturing practices, green distribution practices and reverse logistics. Two theories are discussed which include institutional theory and resource dependence theory. Historical background of purified drinking water factories, profiles of these purified drinking water factories, GSCM practices and performance of the purified drinking water factories in the study are described in chapter three. Chapter four is a descriptive chapter. Chapter five is conclusion chapter; findings, discussions and recommendation are shown in that chapter.

CHAPTER 2
THEORETICAL BACKGROUND OF THE STUDY

This chapter presents theoretical background of the study which is divided into eight sections. They are concepts of green supply chain management, important of green supply chain management, benefits of green supply chain management, green supply chain practices, firm performance, theories applied green supply chain management, previous studies and conceptual model of green supply chain management practices and firm performance.

2.1   Concepts of Green Supply Chain Management

The concept of Green Supply Chain Management (GSCM) has been observed as a recent and novel managerial principle. GSCM is an environmental concept that is gaining popularity in the world. For many businesses in the world, adopting GSCM is a way to demonstrate their sincere commitment to sustainability. It aims to minimize the environmental impacts of the products end-of-use by tracking and controlling the raw material procurement, in order to ensure compliance with environmental rules and regulations GSCM concept has ranged from green purchasing to integrated supply chains starting from supplier, to manufacturer, to customer and reverse logistics. Reverse logistics deals with the activities of the various processes which are

necessary for returning waste material and used goods to their producer respectively resulting into the complete economic cycle compared to the traditional unidirectional flow economy.

Consequently, GSCM as an integration of the environmental thinking into supply chain management, started with product designed, material resourcing and selection, manufacturing process, final product delivery reaching the end consumer, and the end-of-life management of the product after its useful life. This generates on one hand advances towards sustainable development on the other hand considerable cost reduction to some or even all of the enterprises involved. The awareness about the environmental pollution increased among people around the world which made them curious about the protection of environment as a result people intend to buy green products and concept of green supply chain management got more popularity. GSCM has gradually become into the new concept for the sustainable development of the enterprises. However, it is not the simple problem of concept to really implement the GSCM in enterprises, and there are large numbers of works to do (Zhou, 2009). In recent era manufacturing industries are facing tremendous pressure for the implementation of GSCM as result managers do not have to address social and environmental goals only but they have to achieve those goals. To ensure complete environmental excellence, top management must be totally committed.

Moreover, manufacturing firms have initiated implementation of green supply chain management (GSCM) practices to meet customers demand for environmentally sustainable products and services that are produced by complying government environmental regulations. Green design contains of two fundamental tools known as life-cycle assessment (LCA) and design for environment (DFE).According to United States Environmental Protection Agency, LCA is technique to assess the environmental aspects and potential impacts with a product, process, or service by: (1) compiling an inventory of relevant energy and material inputs and environmental releases, (2) evaluating the potential environmental impacts associated with identified inputs and releases, (3) interpreting the results to help a more informed decision.

LCA typically provides two types of information, a comprehensive life-cycle inventory of relevant energy and material inputs and environmental releases throughout the system, and estimates of the resulting impacts for a wide range of impact categories including global climate change, natural resource depletion, ozone depletion, acidification, eutrophication, human health, and eco toxicity. Design for

environment acknowledges that design determines a product's materials and the processes, by which the product is made, shipped, used, and recover (Larson, 2000). Therefore, design for environment can be used to avoid toxic materials from the outset; minimize energy and material inputs; and facilitate disassembly, repair, remanufacturing. Hence concept of GSCM can be summarized by saying it is an idea originated from sustainability, defines company's goals, flows from product design toward selection of raw material and then streams through manufacturing, distribution till consumption of product, finally retrieves consumed products by using reverse logistics and feeds back those products in supply chain.

2.2   Importance of Green Supply Chain Management

Globalization increased the opportunities for the buyers, with the rapid change in global manufacturing scenario, environmental and social issues are becoming more important in managing any business. The waste and emissions caused by supply chain become one of the main sources of serious environmental problems including global warming and acid rain. GSCM is an approach to improve performance of the process and products according to the requirements of the environmental regulations (Hsu and Hu, 2008); it is recognized as a direct and effective mechanism to address environmental problems along with global supply chain. GSCM enables firms to reduce negative environmental effects by minimizing wastage, decreasing the use of harmful materials, recycling products and their wastage and limit the pollution via cleaner production.

The degradation of environment impels stakeholders to deal with environmental issues effectively, several groups and associations are trying to preserve planet green while pollution continues to affect many parts of the world especially in industrialized country. Industrial growth is the main cause of degradation. According to (Beamon, 1999), waste generation and natural resource use, primarily attributed to manufacturing, contribute to environmental degradation. Moreover scarcity of the resources is other aspect to be considered by industries.

Therefore, Green Supply Chain Management (GSCM) is the way to deal with these issues because GSCM is driven mainly by the escalating deterioration of environment, e.g. diminishing raw material resources, overflowing waste sites and increasing level of pollution. Since environmental issues and scarcity of resources are hinders to achieve sustainable performance, GSCM is the philosophy to optimize the performance in unfavorable conditions. It has potential to minimize environmental impacts of manufacturing by introducing eco-design approach which helps to use environment friendly materials so that environmental impact decreased whereas production efficiency increase in from of reduction in emission. GSCM introduces reverse logistics approach that assists manufacturers to recycle the products after consumption as result overall consumption of raw material decrease which provide solution to the scarcity of resources as well as to the degradation of environment.

2.3   Benefits of Green Supply Chain Management

One may only think of banning toxic chemical substance usages or reducing emission and waste to the environment when considering green supply chain practice. It is much more than merely reducing usage and pollution. The benefits of GSCM are not limited to less toxic consuming or less waste. The GSCM principle can be applied to all departments in the organization. There are numerous studies that mentioned the benefits of adopting GSCM. Duber &Smith (2005) identified ten reasons that the company should adopt green: target marketing, sustainability of resources, lowered costs/increased efficiency, product differentiation and competitive advantage, competitive and supply chain pressures, adapting to regulation and reducing risk, brand reputation, return on investment, employee morale, and the ethical imperative.

In the manufacturing process, the company can apply "green" by several methods to reduce energy and resource consumption, reuse and recycling are imperative. Industrial revolution has enhanced manufacturing process that resulted faster production together with higher quality of the product. On one side it enabled industries to meet human needs despite of growth in population around the globe simultaneously it is responsible for the deterioration of environment. GSCM assist to minimize the environmental impacts of massive production, it does not only decrease

environmental product but it cause to improve organizational performance. It helps to improve brand image as well as company's image and increase the profitability.

2.4   Green Supply Chain Management Practices

Green Supply Chain Management practices has emerged as an important new innovation that helps organizations develop "win-win" strategies that achieve profit and market share objectives by lowering their environmental risks and impacts, while raising their ecological efficiency. Green supply chain management has numerous benefits to an organization, ranging from cost reduction, to integrating suppliers in a participative decision-making process that promotes environmental innovation (Bowen et al., 2001; Hall, 2003; Rao, 2002). According to Awaysheh and Klassen (2010), GSCM refers to a variety of activities and initiatives implemented by organization in an attempt to reduce their impact on the natural environment. These include green procurement practices, green manufacturing practices, green distribution practices and reverse logistics practices.

2.4.1   Green Procurement Practices

Green procurement (GP) is defined as an environmental purchasing consisting of involvement in activities that include the reduction, reuse and recycling of materials in the process of purchasing. Besides green procurement is a solution for environmentally concerned and economically conservative business, and a concept of acquiring a selection of products and services that minimizes environmental impact. According to Holbrook (2004), GP refers to the practice of preventing waste and pollution by taking into consideration environmental impact such as price, performance and other factors when making purchasing decisions.

Carter (1998) defined green purchasing as: in order to facilitate reusing and recycling resource reduction, the purchasing department should participate in every activities of supply chain management and should more concretely purchase reused, recycled materials so as to reduce the use of resources as much as possible. Zsidisin and Siferd (2001) defined that green purchasing is a set of principles, methods under premise of full considering the impact on the environment. Green procurement is the selection of goods and services that minimizes environmental impact where organizations are required to carry out an analysis of the environmental impact of a product over lifecycle.

GP is also known as Affirmative Procurement. This is referred to as the purchase of products and services which are environmentally friendly. The products or services purchased should have a lower impact on the environment over their whole life cycle than the standard equivalent. Zhu (2002) considered green purchasing as: every department in the enterprise consults decision-making to improve business performance by decreasing the using materials cost and end treatment cost, protecting resources and enhancing the enterprise reputation, etc.

Martha and Houston (2010) pointed out the potential aim of green procurement is to eliminate waste, and purchasing department will focus on value by comprehensive considering the total cost in the process of eliminating waste ,which should focus on the business of waste disposal activities. Hokey (2001) proposed that reducing the emissions of exhaust and sewage and so on, not only is the promise of ensuring the implementation of green procurement system, but also is the important way to promote the development of green procurement. The type of companies' resources can influence both the purchasing practice, the technology, equipment and facilities of separating waste can impact the purchasing practice.

2.4.2   Green Manufacturing Practices

Green Manufacturing (GM), is the framework that coordinates products and their design with issues of manufacturing, arranging and control in such a way to distinguish, evaluate, get to and deal with the stream of environmental waste with the objective of decreasing and limiting environmental effect while additionally endeavoring to maintain the standards of the product (Melnyk, 2009). Green manufacturing is defined as production process which use inputs with relatively low environmental impacts, which are highly efficient and which generate little or no waste or no pollution. It can lead to lower raw material costs, production efficiency gains, reduced environmental and occupational safety expenses and improved corporate image. This is a very important area within green operations.

Green Manufacturing (GM), is the system that integrates product and product design issues with issues of manufacturing, planning and control in such a manner to identify, quantify, access and manage the flow of environmental waste with the goal of reducing and ultimately minimizing environmental impact while also trying to maximize resources efficiency (Melnyk et al., 2009). GM is where by the organization uses inputs into its production process that is environmentally friendly with the aim of reducing environmental impact. Green manufacturing enable the organization to have

a competitive advantage since they will incur lower raw material costs, higher production efficiency and improved corporate image. Green technology and Eco-innovation is one the Green manufacturing practices. It is the driver in the move towards green and low carbon economy. Many organizations view the application of green manufacturing technologies as the corner stone for their policies for economic growth.

2.4.3 Green Distribution Practices

Green distribution consists of green packaging and green logistics. Packaging characteristics such as size, shape and materials have an impact on the distribution. Better packaging along with rearranging loading patterns can reduce materials usage, increase space utilization both in the warehouse and trailer and reduce amount of handling required.

Some of the Green Distribution Practices are: Green design which is the use of Environmentally Conscious Design (ECD) and Life Cycle Assessment analysis (LCA) with the aim of developing and understanding how design decisions affect the product environmental compatibility and also waste minimization (Sarkis and Cordeiro, 2001).Environmental labeling/ Eco-labeling is another practice of Green Distribution. It entails describing the information of a product about the environmental impact associated with the production or use of the product. According to Gungor and Gupta (1999), Life Cycle Assessment is also another practice of Green distribution. It is the process of assessing and evaluating the environmental, occupational health and resource related consequences of a product through all phases of its life. It involves tracking all material and energy flows of a product from the retrieval of its raw materials out of the environment with the disposal of the product to the environment.

2.4.4 Reverse Logistics Practices

Base on the findings by Stock (1998:20), the words Reverse Logistics means the work of product returns, logistics in basis reduction, material substitution, reuse of materials, recycling. It requires organizations to put in place a mechanism to switch the regular Logistics process from manufacturers to customers with aim of stock considered unacceptable is traced black to original producers in a convenient way. Reverse Logistics Practices includes forward and in reverse data flow that may

empower the organization to start green Logistics and Learn Logistics as well, which would be of enormous advantage.

According to Xie and Breen (2012), reverse logistics is basically the process of planning, implementing and controlling the efficient, cost-effective flow of raw materials, in process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing or creating value or proper disposal. It requires organization to be able to reverse the normal logistics flow from suppliers to customers so that inventory deemed unsuitable can be located by customers and returned to suppliers in a timely and cost effective manner. Reverse logistics involves forward and backward information flow that may enable the company to initiate green logistics and lean logistics, which would be of immense competitive advantage (Lyons & Farrington, 2006).

According to Smith (2005), reverse logistics aid a company to identify problem areas and patterns of defects, thereby reducing the number of returned items. Lambert (2008); Wisner and Stanley (2007) asserted that reverse logistics activities includes seasonal inventory, processing returned merchandise, restock, salvage recalls, screening defective merchandise. Other practices of reverse logistics are product returns, remanufacturing recovery, reuse and redistribution.

2.5   Firm Performance

Firm Performance is a measurement of how efficient a firm is, not only in terms of economics advancement but where the company sets up its premises to operate. Mostly manufacturing in this case, certain ratios will be considered more meaningful to determine a firm's performance. Production performance involves green product innovation which is defined as the performance of product innovation that is related to green concept. Such product innovations include eliminating pollution, conservation of energy, waste recycling and green product designs (Chen, 2006). There is a way of looking performance in relation to GSCM practices: environmental, financial and operational performance. Environmental performances decrease environmental burdens and financial performances reduce cost and operational performances increase production efficiency. There are several studies that have attempted to link practices of GSCM with firm performance. According to them, result of proactive pollution prevention programs could actually reduce production cost and improve product value or the image of the company.

2.6   Theories Applied to Green Supply Chain Management

Two theories that are used in this study include institutional theory and resource dependence theory. Institutional theory provides firms have an issue in legitimate for environment, with as social approval, then the practices of atmosphere will deployed extra quickly during the supply chain. Resource dependence theory also explains firms in the supply chain to be dependent as well as amalgamating so as to attain adequate performance in the long run to discourage pushing for short term benefits.

2.6.1   Institutional Theory

The Institutional theory tries to explain the ways on how both conscious as well as unintentional options can direct firms to echo the norms, values, as well as ideologies of the managerial countryside. Due to this, all firms that have the required features will meet the environmental regulations, hence given the legality plus confirm valuable of assets by the community and wider atmosphere (Toma, Dubrow, & Hartley, 2005). According to the setting of GSCM, performers in the supply chain work to fulfill the desire of the consumer and the regulations needs. In other cases, Narasimhan and Carter (1998) in situated that firms are practicing these values because of the requirement of outside as well as inside forces as well as an consciousness of the possible outcomes should they fail to adhere by rules of the environment. In cases where the firms have an issue in legitimate for environment, with as social approval, then the practices of atmosphere will deployed extra quickly during the supply chain (carter etal. 2007).

2.6.2   Resource Dependence Theory

The Resource Dependence Theory (RDT) postulated by Godfrey (1998) recommended that, it is important for firms in the supply chain to be dependent as well as amalgamating so as to attain adequate performance in the long run to discourage pushing for short term benefits. In RDT, companies are relying on the resources given by other institutions so as to attain their development while other companies also relying on them. A significant assumption about this is that companies do not autonomies fully with tactically significant resources for survival. The interdependency of supply chain hold hands with quality and efficiency of their combination that leads to the well-being accomplishing the success of employing

GSCM needs not be overlooked. To reduce the perceived uncertainty about their firm's operations, companies need to create a very strong correlation with suppliers. To control the external and internal environment, it is important for firms to form inter-organizational relationship. The creation of control is an issue of advocacy of the supply chain environmental practices.

2.7   Previous Studies

Various research about green supply chain management practices and performance have been carried out in different industries. Zhu (2005) found out that enterprises have increased their environmental awareness due to regulatory competitive and marketing pressures and drivers.

Zhu (2006) studied green supply chain management pressure, practices and performance within the Chinese automobile industry in which observed that increasing pressure from variety of directions have caused the Chinese automobiles SCM to consider and initiate implementation of green supply chain management practices to improve both their economic and environmental performance.

Chung Hsiao (2008) studied the GSCM in electronic industry in which mentions that there various approaches for implementing GSCM practices which has been proposed and recognized in previous literatures according to the author, but there is yet no investigation that identifies the reliability and validity of such approaches particularly in electronic industry. His findings indicated that these enterprises would emphasize on supplier management performance in the crucial role of implementing green supply chain management.

Zhou (2009) studied on the implementation of GSCM in textile enterprises in which argued green supply chain management is a sort of modern management mode which could comprehensively consider the environmental influence and resource utilization efficiency in the whole supply chain and how to implement the green supply chain management in special industrial operation at present has become into one of hotspot problems. Robert and Benjamin (2010) introduced green transportation costs in supply chain modeling in which they think escalating environmental concerns with prevalent transportation modes has led to an increased interest in the adoption of green's sustainability practices in the area of supply chain management.

Locally, Mwirigi (2007) did a survey on GSCM practices by manufacturing firms in Kenya his findings were important as they gave ways of overcoming environmental impacts which comes as a consequence of manufacturing operations since environmental impact occurs at every stage of product life cycle. Obiso (2011) studied concerning GSCM in petroleum marketing firms in Kenya; her findings were adoption of the practices had a positive relationship with environmental performance of oil companies.

Abuko (2011) studied on the impact of GSC practices on the performance of oil companies in Kenya her findings were that adoption of GSC practices positively impacts productivity, cost saving, efficiency and quality improvement. Warner (2012) studied on green supply chain management and supply responsiveness among food and beverage manufacturing firms in Nairobi, the study established benefits experienced by firms that implement GSCM were improvement in information systems, use of recyclable materials is promoted, cost saving by a firm, and reduced environmental impact of business process and reduced risks of prosecution based on anti-environmental reasons. Change (2012) studied on GSCM practices and supply chain performance of private hospitals in Nairobi, Kenya, concluded that waste management practice was the most significant as compared to other GSCM practices.

Although several studies have been conducted in the area of Green Supply Chain Management, Nyariaro (2017) studied on GSCM practices and performance of soft drink in manufacturing firm in Nairobi, Kenya. This study therefore sought to establish how adoption of GSCM practices impacts firms' performance in those organizations. This study aims to establish the relationship between GSCM practices and performance of the firms. The literature has discussed the major four practices of GSCM adopted by organizations though different organizations implement different practices. There are variety of performance measurements and implementation of different settings result in different performance. In the studied, the dependent variable is the firm performance while GSCM practices are the independent variable. GSCM practices include green procurement, green manufacturing, green distribution, green packaging and reverse logistics. Firm performance includes operational, environmental, market and financial performance.

Figure 2.1 Previous Conceptual Framework of GSCM Practices and Firm Performance

Independence Variables   Dependence Variables

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┌─────────────────────────┐              ┌─────────────────────────┐
│ GSCM Practices          │              │ Firm Performance        │
│ -Green Procurement      │              │ -Financial              │
│ -Green Manufacturing    │    ═══════▶  │ -Market                 │
│ -Green Distribution     │              │ -Operational            │
│ -Reverse Logistics      │              │                         │
│                         │              │ -Financial Performance  │
└─────────────────────────┘              └─────────────────────────┘
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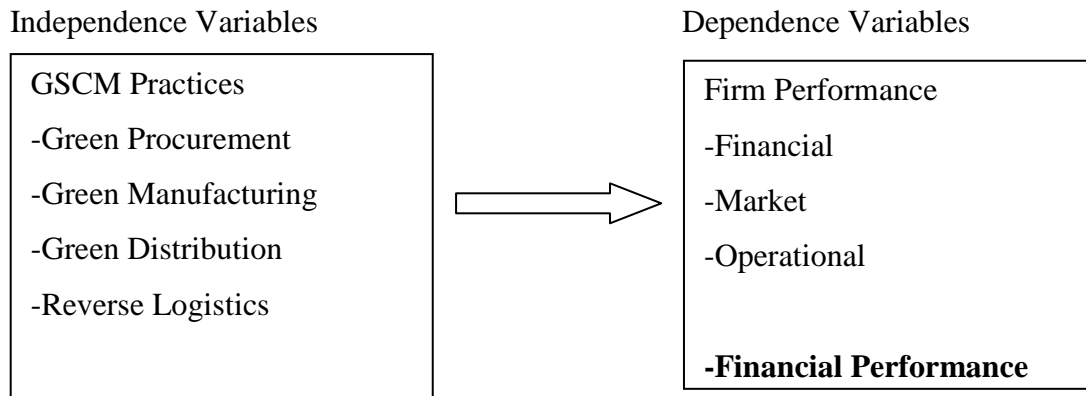
Source: Felix Guda Nyariaro (2017)

2.8   Conceptual Framework of GSCM Practices and Firm Performance

In the study, the dependent variable is the firm performance while GSCM practices are the independent variable. GSCM practices include green procurement, green manufacturing, green distribution and reverse logistics. Kyalo (2015) studied that the implementation of green supply chain management implemented by alcoholic beverage manufacturer in kyena. Firm performance includes environmental, operational and financial performance. The strategies that make GSCM attractive to firms should focus on environment which had the most significant influence on the percentage of costs expended on GSCM.

Figure 2.2 Analytical Framework of GSCM Practices and Firm Performance

Independence Variables   Dependence Variables

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┌─────────────────────────┐              ┌─────────────────────────┐
│ GSCM Practices          │              │ Firm Performance        │
│ -Green Procurement      │              │  - Environmental        │
│ -Green Manufacturing    │    ═══════▶  │  - Financial            │
│ -Green Distribution     │              │  -Operational           │
│ -Reverse Logistics      │              │                         │
│                         │              │ -Financial Performance  │
└─────────────────────────┘              └─────────────────────────┘
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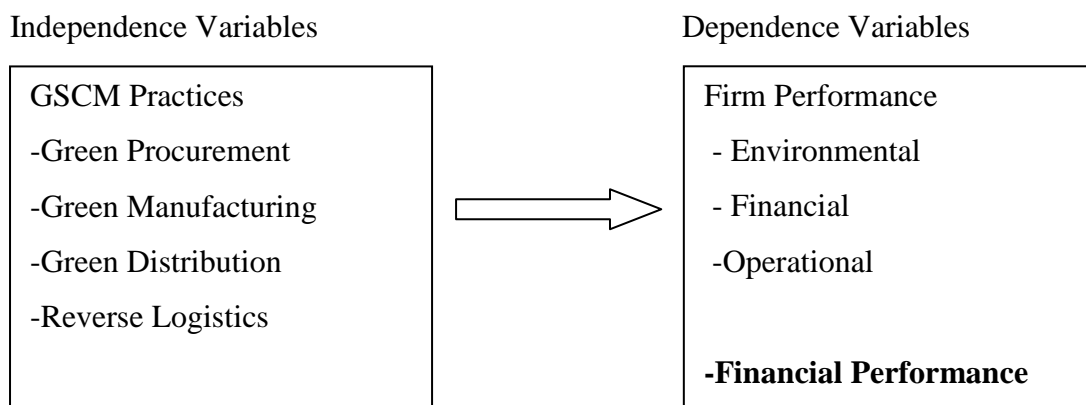
Source: Own Compilation (2018)

CHAPTER 3
OVERVIEW OF PURIFIED DRINKING WATER FACTORIES

This chapter presents overview of purified drinking water factories which includes three sections. The first section includes historical background of purified drinking water factories in Myanmar. In the second part, profiles of four major purified drinking water factories. Third section describes green supply chain management practices of purified drinking water factories.

3.1   Historical Background of Purified Drinking Water Factories in Myanmar

Purified drinking water manufacturing has started in Myanmar during 1970s. However, Myanmar consumers were not aware of this product and the purified drinking water market had not developed at this time. The purified drinking water market has developed only after the introduction of market oriented economy in 1988.The beverage industry encompasses the production and commercialization of purified drinking water, non-alcoholic drinks, and beer and fruits juices. In additions, International Bottled Water Association (2002) presented that purified drinking water refers to natural water, spring water, sparking water and purified water.

Drinking water can from different sources. Ground water is more purified than other sources. As it sinks into the ground and run through sand filter, it naturally purifies. But there are several danger qualities for drinking water. Lead and Arsenic (heavy metal) and other toxic minerals can dissolve in the water, so that it becomes toxic and contaminated. Therefore, drinking water should be free from these dangers. Thus, purified or treated water should be suitable to drinking.

Today, people recognize that using purified drinking water is the sign of modernization and safety for health and higher living status. Habit of drinking scientifically treated purified water is more increased than before. Therefore, it rapidly increases the demand. To take advantage on these opportunities, Myanmar entrepreneurs have been set up purified drinking water factories and distribute to the market and hence production of purified drinking water. Nowadays, people can find purified drinking water almost everywhere. The product varies, in term of price, brand, packaging quality and other characteristics.

Every plant is controlled by Yangon City development Committee (YCDC) supervised by Directorate of Industrial Supervision and Inspection (DISI), Myanmar Industrial Development Committee(MIDC) and Food and Drug Administration (FDA) for quality product. Purified drinking water manufacturing business in Myanmar has to pass the FDA certificate. To pass the FDA certificate, one of the requirements is to fulfill the YCDC standard of drinking water. The pioneering water production in Myanmar is Dagon purified drinking water which was produced by Ministry of Industry (1).

Bottle sizes of purified drinking water in Myanmar are 0.3, 0.6, 1, 5, 20 liters. Packaging size for 0.3 liter is 15-bottle case, 0.6 liter is 12- bottle plastic pack and 1 liter is 6- bottle plastic pack respectively. Most of the small businesses are produced only one category (20) liter. Containers for 20 liters can be classified into two types. They are Polyethylene (PE) container and Polypropylenes (PP) container. Polyethylene is flexible, durable and tear-resistant and these three characteristics are extremely important to contain heavy items. Most of the business use polyethylene for purified drinking water. Other characteristics of PP are crystal clear for great product presentation, stiff and hard plastic rough surface has the potential to produce scratches outstanding vapor and moisture barrier meets FDA specifications. PE bottles are low cost, strength and flexible. Most of the businesses prefer PE bottles. PP bottles are high cost, low strength and rigid.

3.2   Profiles of Four Major Purified Drinking Water Factories

In the purified drinking water factories in Myanmar, there are nine industrial Zones in Yangon. In Shwe Pyi Thar Industrial Zone, four major purified drinking water factories are KTM Purified Drinking Water Co.Ltd, Sampar Oo Purified Drinking Water Co.Ltd, Asia Purified Drinking Water Co.ltd and Globe Purified Drinking Water Co.Ltd. The profiles of these factories are summarized as follows.

3.2.1   KTM Purified Drinking Water Co.,Ltd

KTM purified Drinking water Co.,Ltd is an organization engaged in manufacturing, marketing selling and distribution consumer products and plastic products throughout Myanmar sine the year 2005. The first purified drinking water brand in the capital city of Myanmar country is in Nay Pyi Taw. KTM Company limited is an expert on producing and distributing quality purified drinking water and plastic materials allover Myanmar country.

The main products are 20 Liter, 5 Liter, 1 liter, 0.6 liter, 0.35 liter purified drinking water, and also quality plastic products such as bottle perform tube, bottle cap, finished bottle, and PE (packing plastic). KTM are strongly emphasizing on the promising quality and constantly development with the help of more than 500 professional employees to answer the need of value customer. Therefore, KTM pursued and already redeemed the international standard such as FDA standard, ISO 9001:2008, and HACCP for the better quality and healthy life of their customers. KTM purified drinking water company limited possessed 6 global standard factories that ready to serve the need of value customer. It is situated in No.94, Thardukan Street, Shwe Pyi Thar Industrial Zone, Shwe Pyi Thar Township in Yangon.

Mission and vision of KTM are to promote better health and better life for people. Establishing own plastics factory to ensure that only new plastics materials is being used to produce packaging in order to achieve company's goals.

The organization structure of KTM Co.Ltd has four departments such as production department, QC department, Admin & Store department and blowing department. Directors, General Manger, and Factory Manager are responsible for management activities such as making important decision, setting company policies, rules and regulation, strategies and management level are set up. Production department includes production supervisor for 20 liter, RO supervisor, production supervisor for 0.35/0.6/1 liters and operator and team. Production department is

responsible for production of purified drinking water product 20 /0.35/0.6/1 liters. QC department is responsible for water quality control monitoring system. Admin department is carried out management of employees and blowing department is responsible of blowing of bottle perform tube, bottle cap, finished bottle and PE shrink.

3.2.2 Sampar Oo Purified Drinking Water Co.Ltd

Sampar Oo is the fast growing brand for people who want stay hydrated and healthy with clean water or quality beverage. They are the dedicated water and beverages company providing consumers with quality and unique taste. With the pure clean H2O in transparent bottles. Sampar Oo water gives everything need a day for hydration. Sampar Oo was established in November 2011, as a local-renowned business unit for manufacturing, production, distribution and selling of purified drinking water and soft drinks since the beginning in Shwe Pyi Thar Yangon, serving customers across the country.

Striving for consistency in their products and efficiency in their business takes tremendous pride in customer service and superior products. All of Sampar Oo products are manufactured in an ISO standard based sterilized environment which gives both consumers and the company the confidence, safety, quality and good tastes of products. It is situated in No.113, Kaung Minthar Gyi Street,Zone (4) Shwe Pyi Thar Industrial Zone, Insein Township.

Vision of the company is to be the country's most valued and trusted beverage brand, to preserve the nature proof water, taste, flavors and ingredients in manufacturing process and an organization their consumers, investors and staffs are proud of. Mission is to strengthen the organization 'brand position' by predominantly emphasizing on the standards of quality, delivery and cost through continuous improvement and consumer interactions, to enhance their presence in Myanmar beverage market and to achieves 15% of the market share in drinking water and 20% in soft drink. Objective of the Sampar Oo Co.Ltd are shown in as follows.

Objectives are to exceed consumer's expectations by manufacturing and delivering high-quality and trusted consumer products, to use the best technology that has to offer and the most experienced teams and, to enhance and improve their employee's performance and qualification. Company Slogan "taste & feel the difference".

Total work force in Sampar Oo purified drinking water factory are 200-500 employees. Organization structure is divided into four departments. They are production department, HR department, sale & marketing department, blowing & logistics department. Board of Directors, Managing Director and Executive Director are responsible for management activities such as making important decision, setting company policies, rules and regulation, strategies and management level are set up. HR department is responsible for the process of hiring and developing employees so that employees become more valuable to the organization. Sale & marketing department is carried out company resources to increase customer opinions of the company of the product, service and company perceived value and blowing department is responsible of blowing of bottle perform tube, bottle cap, finished bottle and PE shrink.

3.2.3 Asia Purified Drinking Water Co.Ltd

Asia purified drinking water Co.Ltd is an organization engaged in manufacturing, selling and distribution consumer product and plastic products throughout Myanmar since the year 2004. Asia purified drinking water is situated in No.66/67, Kaung Minthar Gyi Street & Seint Kan Thar Street, Shwe Pyi Thar Industrial Zone (4) in Yangon. Asia Company limited is an expert on producing and distributing quality purified drinking water and plastic materials all over Myanmar country. Asia's main products are 20 liter, 5 liter, 1 liter, 0.6 liter, 0.35 liter purified drinking water. Asia are strongly emphasizing on the promising quality and constantly development with the help of 200 employees to answer the need of ours value customer.

Organization Structure is divided into five departments. These include production department, sale and marketing department, HR department, logistics department and blowing department. General Manger and Factory Manager are responsible for management activities such as making important decision, setting company policies, rules and regulation. Sale & marketing department is carried out company resources to increase customer opinions of the company of the product, and blowing department is responsible of blowing of bottle perform tube, bottle cap and finished bottle. HR department is responsible for the process of hiring and developing employees so that employees become more valuable to the organization.

3.2.4 Globe Purified Drinking Water Co.Ltd

Globe purified drinking water Co.ltd is an organization engaged in manufacturing, selling and distribution consumer product and plastic product throughout Myanmar since the year 1989. Globe purified drinking water is situated in (42/143) Industrial (7) street, Shwe Pyi Thar Industrial Zone, in Yangon. Globe Company limited is an expert on producing and distributing quality purified drinking water and plastic materials all over Myanmar country. Globe's main product are 20 liter, 5 liter, 1 liter, 0.6 liter and 0.35 liter purified drinking water, and also quality plastic products such as bottle perform tube, bottle cap, finished bottle and PE shrink (Packaging plastic).Globe are strongly emphasizing on the promising quality and constantly development with the help of 100 employees to answer the need of value customer.

Organization Structure is divided into five departments. They are production department, Admin & Store department, Sale & Marketing department, QC and Blowing department and Logistics department. General Manger and Factory Manager are instruction of production department, Admin & Store department, Sale & marketing department, QC and blowing department and logistics department.

3.3 Green Supply Chain Management Practices of the Purified Drinking Water Factories

GSCM refers to a variety of activities and initiatives implemented by organization in an attempt to reduce their impact on the natural environment. These include green procurement practices, green manufacturing practices, green distribution practices and reverse logistics practices. The followings are green procurement practices, green manufacturing practices, green distribution practices and reverse logistics practices of purified drinking water factories.

3.3.1 Green Procurement Practices of the Purified Drinking Water Factories

The fundamental goal of the procurement or purchasing function for purified drinking water factories are to acquire optimum quality and quantity of goods and services for the company in a timely manner and at the lowest total cost. Purchasing provides a major opportunity to reduce costs and increase contribution margins. Purified drinking water factories implemented preventing waste and pollution by taking into consideration environmental impact such as price, performance and other factors when making purchasing decisions.

Production department, marketing department, sale department, QC department and blowing department hold the meeting to decide the amount of raw materials to be ordered monthly. These departments also has to calculate how many should be ordered, how much cost and the necessary raw materials according to the production plan in the right quantity at the right cost and time. It is ensure to their firms with environmental objective when it to decide purchasing. These factories have ISO 9001:2008.

The development and use of standard have been integral to the execution of the mission of FDA since its establishment. The fully automatic machines from blowing to palletizing and the international standard production environment guarantee. Purchase materials that contain green attribute and procure products that are made using recycled package. Bottle designs are the leading brand in plastic weight saving, leaving the least impact on environment. The purified drinking water factories contract small business owners to provide these factories to establish a supply network for plastic recycling. Moreover, all four companies have drawn the yearly plan for raw material requirement, the amount of production, sale target and estimated profit for each product. Green procurement practices of purified drinking water factories are shown in figure 3.1.

Figure 3.1 Green Procurement Practices of Purified Drinking Water Factories
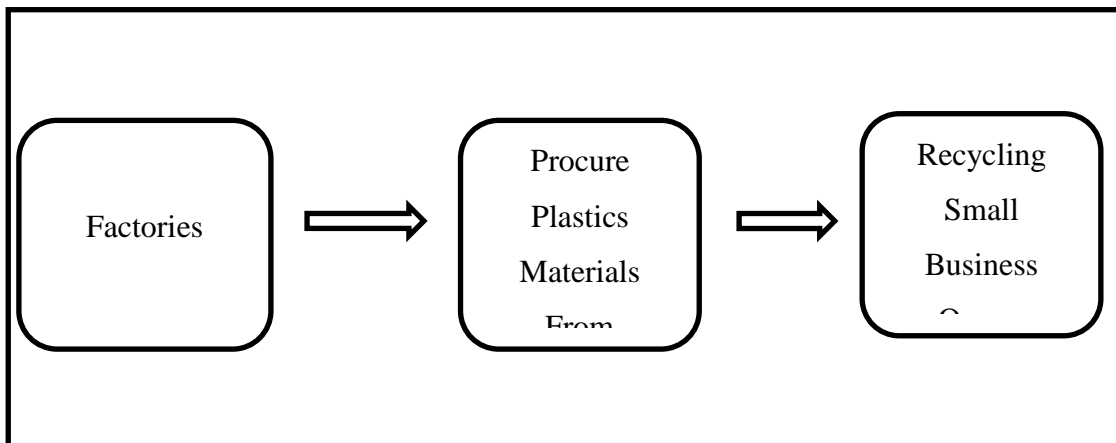
Source: Purified Drinking Water Factories (2018)

3.3.2 Green Manufacturing Practices of the Purified Drinking Water Factories

Purified drinking water factories practiced green manufacturing, planning and control in such a manner to identify, quantify, access and manage the flow of environmental waste with the goal of reducing and ultimately minimizing environmental impact while also trying to maximize resources efficiency. Purified

drinking water factories aim to guarantee the highest safety standards for drinking water and ensure a taste in accordance with consumer preference.

Water is carefully collected through UPVC pipes (Food grade standard pipes) from the quality water source. Water received in storage tanks on monitored on a daily basis. And then, next step consists of removing chlorines and THMs (trihalomethanes) through a daily-monitored activated carbon filtration process. A water softer is use to reduce water hardness. Pharmaceutical grade micro-filtration removes particles as small as 1 micron.

Dosing system has been used to control pH balance and chlorine level in order to guarantee the quality of the water. Demineralization removes unwanted minerals through reverse osmosis. Ozone disinfection was implemented to ensure the cleanliness by using a highly reactive form of oxygen. Ultra-violent filtration provides additional product disinfection. The filling room is highly sanitary to ensure bottling is conducted in a microbiologically controlled environment. It is continuously monitored and controlled. Manufacturing process of purified drinking water factories are shown in figure 3.2.

Figure 3.2 Green Manufacturing Practices of Purified Drinking Water Factories
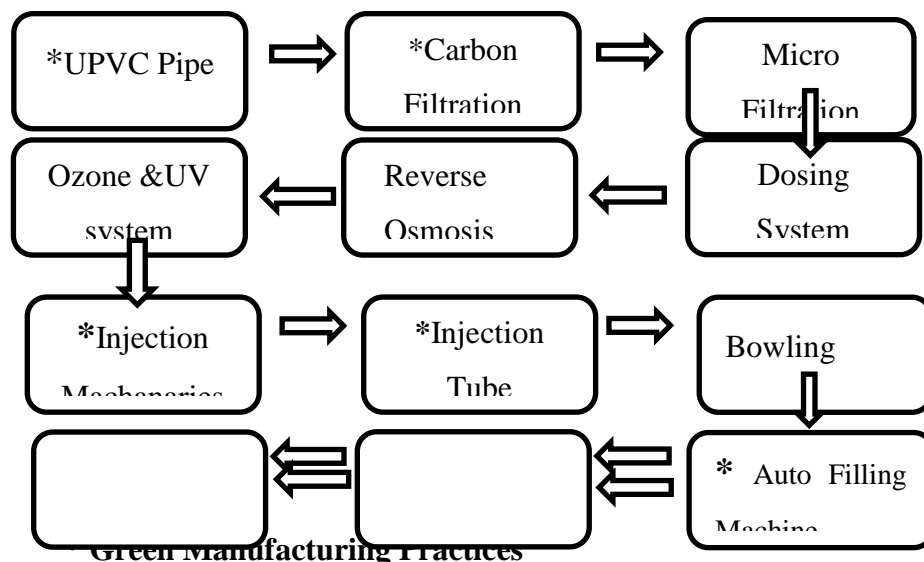
Source: Purified Drinking Water Factories (2018)

These factories tested daily PH test, TDS test, daily conductivity test, water hardness test and monthly water analysis and HACCP. Standard–setting activities include matter such as development of performance characteristics, testing methodology, manufacturing practices, product standards scientific protocols compliance criteria. All of the rejected plastics products are sent to their plastics

injection machineries that take full responsibility to recycle and to use to manufacture new plastic product for grade packaging. All four companies have been integral to the execution of the mission of FDA since its establishment.

3.3.3 Green Distribution Practices of the Purified Drinking Water Factories

Purified drinking water factories implemented green distribution practice that is consisting of green packaging and green distribution. A portion of the green distribution practices are green plan, which is the utilization of Environmentally Conscious Design (ECD) and Life Cycle Assessment Analysis (LCA) with the aim of developing and understanding how design decisions affect the product environmental compatibility and also waste minimization.

The purified drinking water sector is responsible for distribute and sales of the all size of the brands. KTM purified drinking water have two product lines: KTM and snow white. Sampar Oo purified drinking water have two product lines: Sampar Oo and "Mingalabar". Asia and Globe purified drinking water distribute main brand only. Distribution practices of purified drinking water factories are shown in figure 3.3

Figure 3.3 Green Distribution Practices of the Purified Drinking Water Factories
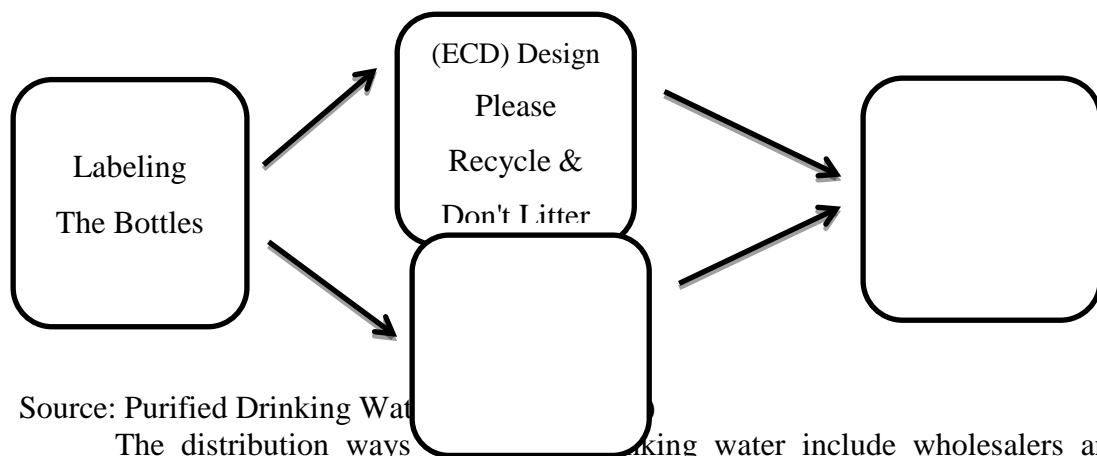
Source: Purified Drinking Wat

The distribution ways king water include wholesalers and distributors. All labels tagged in product of contains company name, location of manufacturer firms, contact numbers, the manufacturing date, expired date, indication for how to use the product and how to see the product safely. Packaging quality assurance is conducted by human inspection to ensure the removal of any packaging defects. Adding to environmental conscious design (ECD): please recycle, don't litter and life cycle assessment (LCA): store in clean, dry &cool place, and health care. Bottle designs are the leading brand in plastic weight saving, leaving the least impact

on environment. All four companies are assessing and evaluating the environmental, occupational health and resource related consequences of a product through all phases of its life.

3.3.4 Reverse Logistics Practices of the Purified Drinking Water Factories

Purified drinking water factories use product returns, reverse logistics in basis reduction, material substitution, reuse of materials, recycling. They are carrying out recalling plastics bottles. For purified drinking water producer, delivering returnable bottles back to the plants reduce the cost, increase production efficiency and reduce resource consuming. All of the returnable plastics products are sent to their logistics department that takes fully responsibility to recycle and to reuse to returnable plastic product for grade packaging. This department wash-up used plastic bottles and bottle cap at 50°C. They are continuously monitored defective plastics bottles. Light box is screening particles in the bottles. And then, this department fills the water. Purified drinking water factories redistribute high quality plastic bottles.

Reverse logistics practice of purified drinking water factories have led to reduce the amount of energy, time and other vital resources used in plastic packaging. All four companies are practicing reverse logistics to reduce energy, saving time and environmental load friendly in purified drinking water market. Reverse logistics process of purified drinking water factories are shown in figure 3.4.

Figure 3.4 Reverse Logistics Practices of the Purified Drinking Water Factories
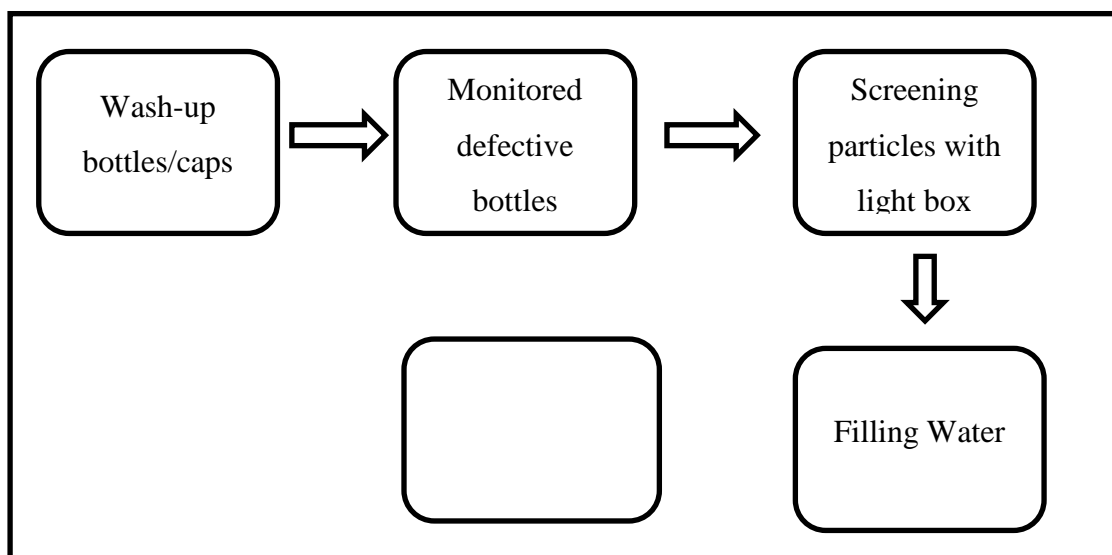
Source: Purified Drinking Water Factories (2018)

Source: Purified Drinking Water Factories (2018)

CHAPTER 4

ANALYSIS OF GREEN SUPPLY CHAIN MANAGEMENT PRACTICE AND PERFORMANCE OF PURIFIED DRINKING WATER FACTORIES

This chapter presents analysis of green supply chain management practices and performance of purified drinking water factories. It is divided into five sections. They are research design, demographics profiles of the respondents, analysis of independent factors as practices to measure of purified drinking water factories,

analysis of dependent factors as performance to measure of purified drinking water factories and relationship between green supply chain management practices and firm performance of purified drinking water factories.

4.1 Research Design

This study sought to establish green supply chain management practices and its effect on performance of purified drinking water factories in Shwe Pyi Thar Industrial Zone. The study used a descriptive research design and primary data that are collected with structure questionnaire. The total population of the study consists of 200 employees who are responsible for four purified drinking water factories. Among them, the structured questionnaires are used to ask 100(50%) employees.

The structure questionnaires are divided into three sections. The first section includes the background information of respondents. It comprised of question on gender, educational level, total service of respondents, and salary of the respondents. The second section describes practice of green supply chain management. It composed of question on green procurement practice, green manufacturing practice, green distribution practice and reverse logistics practice of purified drinking water factories. The third section involves green supply chain management practices effect on firm performance of purified drinking water factories. To analyze the collected data, the statistical analysis of Statistical Package for Social Science (SPSS) was applied. Data analysis methods are multiple regression analysis to find out the relationship between green supply chain management practice and firm performance.

4.2 Demographic Profiles of the Respondents

Demographic profiles of the respondents are analyzed by gender, education, service and salaries of the respondents are presented as follow:

Table 4.1 Demographic Profiles of the Respondents

Gender	Number	Percent (%)
Male	51	51
Female	49	49
Education	**Number**	**Percent (%)**
Bachelor	92	92

Master	8	8
Service	**Number**	**Percent (%)**
Less than 2 years	30	30
2-5 years	31	31
6-9 years	30	30
10 -15 years	9	9
Salary (Kyats)	**Number**	**Percent (%)**
100,000 -300,000	41	41
300,000 -500,000	48	48
500,000 -700,000	6	6
700,000 above	5	5

Source: Survey data (2018)

According to the Table 4.1, 51% of the respondents were male and 49% of the respondents were female employees. Employees of the male respondent of the factories are more than female respondents. 92% of the respondents were bachelor degree and 8% of the respondents were master degree of employees. 31 respondents have worked for their companies 2-5 years; this indicated that the respondents are familiar with the operation of the firm. 48 of the respondents have received 300,000-500,000 kyats payroll.

4.3 Analysis of Independent Factors as Practices to Measure of Purified Drinking Water Factories

In this study, GSCM includes green procurement practices, green manufacturing practices, green distribution practices and reverse logistics practices. The study sought to know the extent to which green supply chain management practices used by the sample purified drinking water factories .According to the study used five point likert scale, where; 1= strongly disagree, 2= disagree, 3= natural, 4=agree, and 5= strongly disagree. The results are presented on table 4.2 below.

Table 4.2 Green Procurement Practices of Purified Drinking Water Factories

Green Procurement Practices	Mean	Standard Deviation
Ensure suppliers meet their environmental	4.3	.59

objectives		
Require suppliers to have ISO 14001	4.0	.82
Purchasing materials that contain attributes	4.2	.62
Purchasing energy saving equipment	4.2	.50
Procure products that are made using recycled packages	4.1	.65
Use paperless methods to order materials	3.2	.65
Average	4.0	.64

Source: Survey data (2018)

According to Table 4.2 explained that the four factories has purchased the green procurement practices because the average mean value in high scale level of 4.Among all the practices, the factories get highest score mean level of 4.3 regarding the purchase transaction for meeting the environmental standard which is followed by purchasing material green attributes, purchasing energy saving equipment, procuring product that are made recycled packages and requiring supplier to have ISO 9001and using paperless methods to order materials were least used. Therefore, it can be concluded that the purified drinking water factories are implemented to participate green procurement practices.

Table 4.3 Green Manufacturing Practices of Purified Drinking Water Factories

Green Manufacturing Practices	Mean	Standard Deviation
Manufacturing process impacts minimizing environmental effects	4.4	.57
Use life cycle Assessment to evaluate environmental load	4.5	.57
Products that have clean-up in process	4.3	.46
Minimize pollutions and wasting products	4.4	.65
Ensure products have recyclable contents	4.2	.57
Using electrical energy	4.5	.55
Encourage reuse of products and recycled	4.2	.57

materials		
Ensure products have standard packaging	4.9	.35
Use minimizing methods of warehousing	4.4	.74
Average	4.4	.56

Source: Survey data (2018)

According to Table 4.3 explained that the four factories has operated the green manufacturing practices because the average mean value in high scale level of 4.4.Among all the practices, the factories get highest score mean level of 4.9 regarding the products have standard packaging which is followed by using life cycle assessment to evaluate environmental load, using electrical energy, producing optimal level of inventory, minimize pollutions and wasting products, manufacturing process impacts minimizing environmental effects, products that have clean-up in process, encourage reuse of products and recycled materials and ensure products that have recyclable contents. Therefore, it can be concluded that the purified drinking water factories are implemented to participate green procurement practices. Firms have integrated their products with issues of manufacturing, planning and control in such manner to identify, quantify, access and manage the flow of environmental waste.

Table 4.4 Green Distribution Practices of Purified Drinking Water Factories

Green Distribution Practices	Mean	Standard Deviation
Recycling and reuse programs	4.5	.78
Labeling ECD (Environmental Conscious Design)	4.7	.63
Labeling LCA (Life Cycle Assessment)	4.7	.50
Reducing the size of packaging	4.5	.59
Reducing the size of warehousing	4.4	.56
Average	4.6	.61

Source: Survey data (2018)

According to Table 4.4 described that the four factories has distributed the green distribution practices because the average mean value in high scale level of 4.6.

Among all the practices, the factories get highest score mean level of 4.7 regarding the distribution transaction for labeling ECD which is followed by labeling LCA, recycling and reuse programs, reducing the size of packaging and reducing the size of warehousing. Therefore, it can be concluded that the purified drinking water factories are implemented to participate green distribution practice.

Table 4.5 Reverse Logistics Practices of Purified Drinking Water Factories

Reverse Logistics Practices	Mean	Standard Deviation
Recalling used plastic bottles	4	.46
Used products that are recycled	4	.41
Restocking	4	.10
Screening defective merchandise	4.3	.49
Re-do the product of quality step by step	4.8	.40
Redistribution high quality products	4.7	.44
Average	4.3	.38

Source: Survey data (2018)

According to Table 4.5 described that the four factories has used the reverse logistics practices because the average mean value in high scale level of 4.3. Among all the practices, the factories get highest score mean level of 4.8 regarding the reverse logistics transaction for redoing the product of quality step by step which is followed by redistribution high quality products, screening defective merchandise, used product that are recycled, recalling used plastics bottles and restocking. Therefore, it can be concluded that the purified drinking water factories are implemented to participate reverse logistics practice. All of the averages of green supply chain management practices are summarized in figure 4.6.

Table 4.6 Average of Green Supply Chain Management Practices of Purified Drinking Water Factories

GSCM Practices	Mean
Green Distribution Practices	4.6
Green Manufacturing Practices	4.4
Reverse Logistics Practices	4.3

Green Procurement Practices	4

Source: Survey data (2018)

According the Table 4.6 shows the averages of green supply chain management practices of purified drinking water factories. All of the averages of green supply chain management practices have 4 and above. As the result, average of green distribution practices was ranked the highest practices, followed by green manufacturing practices, then reverse logistics practices and finally, green procurement practices.

4.4 Analysis of Dependent Factors as a Performance to Measure of Purified Drinking Water Factories

The study measured the firm performance in terms of environmental performance, financial performance and operational performance. The study sought to know the extent to which green supply chain management practices effect on firm performance of the sample purified drinking water factories. The results are presented on table 4.7 below.

Table 4.7 Firm Performance from implementation of GSCM Practices

Environmental Performance	Mean	Standard Deviation
Reduce environmental hazardous and toxic materials	4.2	.43
Reduce environmental burdens	4.3	.48
Average	4.2	.46
Financial Performance	Mean	Standard Deviation
Improve company public image	4.5	.52
Reduce cost in recycle product	4.3	.47
Average	4.4	.49
Operational Performance	Mean	Standard Deviation
Increase production efficiency	4.2	.53
Time taken	4.4	.61
Improve recycling & remanufacturing activities	4.0	.45

Average	4.2	.53

Source: Survey data (2018)

According to Table 4.7 described that green supply chain management practices effect environmental performance of the factories because the average mean value in high scale level of 4.2. Among all the practices, the factories get highest score mean level of 4.3 regarding the environmental transaction for reducing environmental burdens which is followed by reduce environmental hazardous and toxic materials. Green supply chain management practices also affect financial performance because the averages mean value in high scale level of 4.4. Among all the practices, the factories get highest score mean level of 4.5 regarding the financial transaction for improving company public image and reducing cost in recycle product. Green supply chain management practices also effect operational performance because the averages mean value in high scale level of 4.2. Among all the practices, the factories get highest score mean level of 4.4 regarding the operation transaction for reducing time taken which is followed by improving production efficiency and improving recycling & remanufacturing & recycling activities. The averages of firm performance of purified drinking water factories are summarized as follow.

Table 4.8 Average of Firm Performance of Purified Drinking Water Factories

Firm Performance	Mean
Financial Performance	4.4
Environmental Performance	4.3
Operational Performance	4.2

Source: Survey data (2018)

According to Table 4.8 shows all of the averages of firm performance have more than 4 score level. As the result, average of financial performance was ranked the highest performance, followed by environmental performance and finally operational performance.

4.5   Regression Analysis

Regression analysis was used to predict green supply chain management practices effect on firm performance of purified drinking water factories in Shwe Pyi Thar Industrial Zone. The study measured the firm performance in terms of environmental performance, financial performance and operational performance. According to the study used five point likert scale, where; 1= strongly disagree, 2=

disagree, 3= natural, 4=agree, and 5= strongly disagree. The regression model was as follows.

$Y= \beta0 + \beta1 X1 + \beta2 X2 + \beta3 X3 + \beta4 X4 + + \epsilon$

Where: Y = Firm Performance ϵ = Error term

      X1= Green Procurement practices

      X2= Green Manufacturing practices

      X3= Green Distribution practices

      X4= Reverse logistics

$\beta0, \beta1, \beta2, \beta3$, and $\beta4$ are coefficient of the variables.

The regression analysis to determine the relationship between green supply chain management practices effect on firm performance of purified drinking water factories are presented as follows.

Table 4.9 Green Supply Chain Management Practices and its effect on Environmental Performance

Model	Unstandardized Coefficient		Standardized coefficient		
	B	**Std. Error**	**Beta**	**t**	**Sig.**
1 (Constant)	4.423	2.060		2.147	.034
Green Procurement	-.044	.035	- .130	- 1.271	.207
Green Manufacturing	.126***	.031	.382	4.035	.000
Green Distribution	-.017	.039	- .044	- .447	.656
Reverse Logistics	.018	.061	.031	.300	.764
R square	.165				
Adjusted R square	.130				
P vale	4.685(.000)				

Dependent Variable: Environmental Performance
Source: survey data (2018)
Statistical Significance indicates *** at 1 % level, ** 5% level and *10% level.

   According Table 4.9, in order to analyze the relationship between green supply chain management practices and environmental performance, multiple regression analysis is used. The result shown that the degree to which green supply chain

practices of purified drinking water are related to environmental performance is expressed in the positive correlation coefficient (R square =.165) and adjusted R square=.130). The result of the study indicated that green procurement practices and green distribution practices are negative related to environmental performance while green manufacturing practices and reverse logistics practices are positive related to environmental performance. Among the practices, green manufacturing practice of purified drinking water factories are increased the environmental performance. It can be concluded that it is suitable for green supply chain management practices are relationship with environmental performance.

Table 4.10 Green Supply Chain Management Practices and its effect on Financial Performance

Model	Unstandardized Coefficient		Standardized coefficient		
	B	Std. Error	Beta	t	Sig.
1 (Constant)	10.867	2.317		4.690	.000
Green Procurement	.058*	.039	.149	1.468	.100
Green Manufacturing	-1.30***	.035	-.351	-3.719	.000
Green Distribution	.037	.044	.084	.858	.393
Reverse Logistics	.034	.069	.051	.499	.619
R square	.174				
Adjusted R square	.139				
P vale	5.011(.000)				

Dependent Variable: Financial Performance

Source: survey data (2018)

Statistical Significance indicates *** at 1 % level, ** 5% level and *10% level.

According Table 4.10, in order to analyze the relationship between green supply chain management practices and financial performance, multiple regression analysis is used. The result indicated that the degree to which green supply chain practices of purified drinking water are related to financial performance is expressed

in the positive correlation coefficient (R square =.174 and adjusted R square=.139). The result of the study indicated that green manufacturing practices is negative related to financial performance while green procurement practices, green distribution practices and reverse logistics practices are positive related to financial performance. Among the practices, green procurement and green manufacturing practice of purified drinking water factories are strongly related to the financial performance. It can be concluded that it is suitable for green supply chain management practices are relationship with financial performance.

Table 4.11 Green Supply Chain Management Practices and its effect on Operational Performance

Model	Unstandardized Coefficient		Standardized coefficient		
	B	Std. Error	Beta	t	Sig.
1 (Constant)	12.514	3.424		3.655	.000
Green Procurement	.085*	.058	.150	1.465	.100
Green Manufacturing	-.047	.052	-.087	-.910	.365
Green Distribution	.224***	.064	.346	3.482	.001
Reverse Logistics	-.202	.102	-.206	- 1.988	.050
R square	.153				
Adjusted R square	.118				
P vale	4.306(.000)				

Dependent Variable: Operational Performance

Source: survey data (2018)

Statistical Significance indicates *** at 1 % level, ** 5% level and *10% level.

According Table 4.9, in order to analyze the relationship between green supply chain management practices and operational performance, the multiple regression analysis is used. The results show that the degree to which green supply chain practices of purified drinking water are related to operational performance is expressed in the positive correlation coefficient (R square =.153 and adjusted R square=.118). The result indicated that that green manufacturing practices and reverse

logistics practices are negative related to operational performance while green procurement practices and green distribution practices are positive related to financial performance. Among the practices, green procurement, green distribution practice and reverse logistics practices of purified drinking water factories are increasing the operational performance. It can be concluded that it is suitable for green supply chain management practices are relationship with operational performance. The result of the study of the green supply chain management practices effect on firm performance of purified drinking water factories are shown as follows.

Figure 4.1 the Result of the study
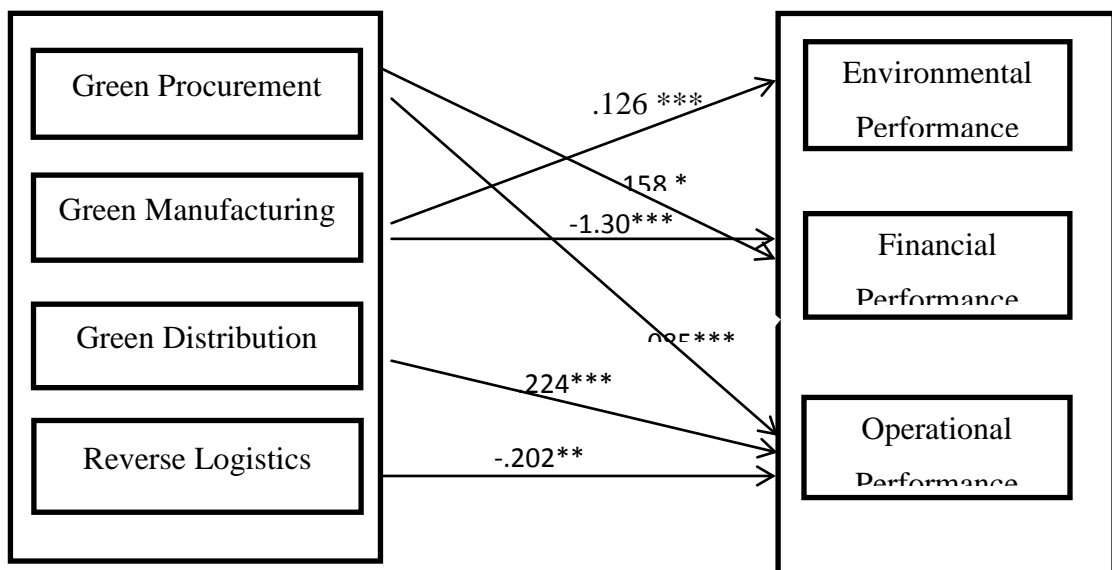
CHAPTER 5
CONCLUSION

This chapter presents conclusion chapter which is divided into three sections. Findings and discussions describe in section one. Second section presents recommendations and suggestions. Finally section describes needs for further studies.

5.1 Findings and Discussions

Myanmar is steadily developing with new political, social and economic changes which are quite different from the early periods. Especially, the growth of large manufacturing firms and small and medium-sized enterprises in Myanmar is increasing with very high intensity. Among them, purified drinking water manufacturing businesses, one of the food and beverage groups are high demand today and standing at a strong market position. Purified drinking water manufacturing business in Myanmar is one sector that largely contributes to packaging (mostly plastics) materials which has contributed towards environmental pollution. Recycling of plastics products save natural resources, reduce production costs and decrease deteriorating environmental conditions. The study established that purified drinking water factories in Shwe Pyi Thar Industrial Zone appreciate the role of green supply chain management practices and its effect on firm performance.

There are seven purified drinking water factories in Shwe Pyi Thar Industrial zone. Out of them, four factories were randomly selected to collect the data. The total population of the study consists of 200 employees who are responsible for four purified drinking water factories. Among them, the structured questionnaires are used to ask 100 employees (50%). Descriptive statistics indicates frequencies and percentages relating to the demographics characteristics of the respondents of the factories. Employees of the male respondent of the factories are more than female respondents. For educational level, bachelor degree has 92 respondents and master degree has 8 respondents of the factories. 31 respondents have worked for their companies 2-5 years; this indicated that the respondents are familiar with the operation of the firm. 48 of the respondents have received 300,000-500,000 kyats payroll.

This study found to accesses green supply chain management practices which include green procurement practices, green manufacturing practices, green distribution practices and reverse logistics practices. The average of green distribution practices was ranked the highest practices, followed by green manufacturing practices, then reverse logistics practices and finally, green procurement practices. In green distribution, the purified drinking water factories label (ECD) and (LCA) design to distribute the products. On practicing green manufacturing, the most practices are ensuring products have standard packaging, using life cycle assessment to evaluate environmental load, producing the optimal level of inventory and manufacturing impacts minimizing environmental effects. This indicated that purified drinking water factories that are environmental friendly load. Reverse logistics, it was found out that purified drinking water factories contact small owner and retailer to establish a supply network for plastic recycling. These factories practice green procurement where the most practices were ensuring suppliers meet their environmental objectives, purchasing materials that contain green attributes and purchasing energy saving equipment. It was found out that using paperless methods to order materials were least used. All of the averages of firm performance have more than 4 score level. As the result, average of financial performance was ranked the highest performance, followed by environmental performance and finally operational performance.

The study also found to describe relationship between green supply chain management practices and its effect on firm performance. From the study, it is evident that the four independent variables of green supply chain management practices increase firm performance. Firm performance includes environmental, financial and operational performance of the factories. The study found that analyzing the green supply chain management practices effect on environmental performance, among all the practices, green manufacturing practices strong relationship with environmental performance. From this study, analyzing the green supply chain management practices effect on financial performance, among all the practices, green procurement practice and green manufacturing practices also increase financial performance of the factories. And then, analyzing the green supply chain management practices effect on operational performance, among all the practices, green procurement practices, green distribution practices and reverse logistics practices are increasing operational performance of the purified drinking water factories. From results, multiple regression analysis showed that there is strong relationship between green supply chain

management practices and performance of purified drinking water factories in Shwe Pyi Thar Industrial Zone. The four purified drinking water factories agreed that the usage of green supply chain management practices have improved reuse, recycle and remanufacturing opportunities and also improved company public image.

5.2   Suggestions and Recommendations

The study suggests that purified drinking water factories may employ "green" by number of ways to decrease energy and resource expenditure, use again plus recycling are very important. Purified drinking water manufacturing businesses recycle the plastics products which manage the waste products. Therefore, GSCM also provide solution to the scarcity of resources as well as to the degradation of environment. These practices entail reduction of consumed energy, reuse, recycling and using environmental friendly materials. This practices that enable the firm to reduce environmental degradation by minimizing wastage, decreasing the use of harmful materials, recycling product and their wastage and limit the pollution through cleaner production. According to the study, GSCM practices play a critical role in Firm performance. The study also recommends that firms should emphasize on suppliers to have ISO 9001, use life cycle assessment to evaluate environmental load, cooperate with suppliers to standardize packaging and recalling plastics to improve their performance. Green supply chain management that assists the purified drinking water factories to improve the performance. The outcomes from the study would contribute to social, economic and environmental development of country.

5.3   Needs for Further Research

This study focuses on Green Supply Chain management practice and performance of purified drinking water factories in Shwe Pyi thar Industrial Zone. The study shows there is growing importance among the companies hence need to conduct further research on GSCM practices affect performance of firms in the purified drinking water factory as well as other types of organizations such as wholesalers and retailers. In addition, the study suggests on further research on the tools and techniques required to measure the performance of firms who have adopted GSCM practice.

APPENDIX A

Research Questionnaire

Company …………………………………………………………………………

Name   …………………………………………………………………………..

Address ………………………………………………………………………….

Establish Year…………………………………………………………………….

No of Employee…………………………………………………………………..

Post…………………………………………………………………………..

This research questionaries' has been designed for the purpose of collecting data on green supply chain management and firm performance of the purified drinking water factories in Shwe Pyi Thar Industrial Zone. The information is for academic purposes only.

Section I: Background Information

1. Gender: Male [ ]   Female [   ]

2. What is your level of education?

   Bachelor Degree [   ]   Master' Degree [   ]

3. Total Service

   Less than 2 year   [   ]   2-5 years   [   ]

   6-9 year   [   ]   10 -15 years [   ]

4. Salary
   100,000-300,000   [   ]   300,000 -500,000   [   ]

   500,000 -700,000   [   ]   700,000   above   [   ]

SECTON II: PRACTICES OF GREEN SUPPLY CHAIN MANAGEMENT

Below is a list of practices of Green Supply Chain Management. Please tick appropriately the extent to which each of them is practiced in your company.

(1) strongly disagree   (2) disagree   (3) natural   (4) agree   (5) strongly agree

II -1 Green procurement practices	1	2	3	4	5
Ensure suppliers meet their environmental objectives					
Require suppliers to have ISO 14001					
Purchasing materials that contain attributes					
Purchasing energy saving equipment					
Procure products that are made using recycled packages					
Use paperless methods to order materials					

II -2 Green manufacturing practices	1	2	3	4	5
Manufacturing process impacts minimizing environmental effects					
Use life cycle Assessment to evaluate environmental load					
Products that have clean-up in process					
Minimize pollutions and wasting products					
Ensure products have recyclable contents					
Using electrical energy					
Encourage reuse of products and recycled materials					
Ensure products have standard packaging					
Produce optima level of inventory					
II -3 Green distribution practices	1	2	3	4	5

	1	2	3	4	5
recycling and reuse programs					
Labeling ECD (Environmental Conscious Design)					
Labeling LCA (Life Cycle Assessment)					
Reducing the size of packaging					
Reducing the size of warehousing					

II -4 Reverse Logistics Practices	1	2	3	4	5
Recalling used plastic bottles					
Used products that are recycled					
Restocking					
Screening defective merchandise					
Re-do the product of quality step by step					
Redistribution high quality products					

Section III: Relationship between Green Supply Chain Management Practices and Firm Performance

Please tick appropriately how you rate performance of your firm with regards to the parameters listed.

(1) strongly disagree   (2) disagree   (3) natural   (4) agree   (5) strongly agree

Model Summary

Environmental Performance	1	2	3	4	5
Reduce environmental hazardous and toxic materials					
Reduce environmental burdens					
Financial Performance					
Improve company public image					
Reduce cost in recycle product					
Operational Performance					
Increase production efficiency					
Time taken					
Improve recycling & remanufacturing activities					

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.406[a]	.165	.130	.59775

a. Predictors: (Constant), RL, GM, GD, GP

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.696	4	1.674	4.685	.002[b]
	Residual	33.944	95	.357		
	Total	40.640	99			

a. Dependent Variable: Environmental
b. Predictors: (Constant), RL, GM, GD, GP

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.417[a]	.174	.139	.67231

a. Predictors: (Constant), RL, GM, GD, GP

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.060	4	2.265	5.011	.001[b]
	Residual	42.940	95	.452		
	Total	52.000	99			

a. Dependent Variable: Financial
b. Predictors: (Constant), RL, GM, GD, GP

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.392[a]	.153	.118	.99341

a. Predictors: (Constant), RL, GM, GD, GP

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.998	4	4.250	4.306	.003[b]
	Residual	93.752	95	.987		
	Total	110.750	99			

a. Dependent Variable: Operational

b. Predictors: (Constant), RL, GM, GD, GP

REFERENCES

1. Abuko, G (2011). The impact of GSC practices on the performance of oil companies in Kenya.

2. Ankerrasch, T.L and Sorgard, S.D (2011). A study on Green Supply Chain Management within the Plump and Paper Industry.

3. Awayshench, K and Klassen, F (2010). Green Supply Chain Management Practices and Competitiveness of Commercial Banks in Kenya.

4. Beamon, B (1999). Designing the green supply chain. Logistics information management, Vol.12 No. 4, pp. 332-324.

5. Bititci, U.S. and Turner. T. (2000). Dynamics of performance measurement systems. International Journal of Operations & Production Management, Vol. 20 No. 6, pp. 692-704.

6. Beamon, F.E (1999). The role of supply management capabilities in green supply. Production and Operations Management, 10(2), 174-189.

7. Carter, B.D (1998). Does coercion drive firms to adopt 'voluntary' green initiatives? Relationships among coercion, superior firm resources, and voluntary green intiaitative. Journal of Business Research, Vol. 59 No. 4, pp. 483-91.

8. Chen, M.K and Shih, L.H (2007). An empirical study of the implementation of Green Supply Chain Management Practices in the Electrical and Electronic Industry and their relation to Organizational Performance.

9. Chaung, H (2008). Creating a Green Supply Chain Information Technology as an Enabler for a Green Supply Chain in Electronic Industry.

10. Das, K. (2012). Integrating reverse logistics into the strategic planning of a supply chain. International Journal of Production Research, Vol. 50 No. 5, pp. 1438-1456.

11. Duber, A.S and Smith, R (2011). Green Supply Chain Management, Conference Paper January 2011.

12. Elting, J (2009). Green Supply Chain Management in Manufacturing Companies in New Zeland: A Competitive Case Study Analysis.

13. Eltayeb, T., Zailani, S. and Ramayah, T. (2011). Green supply chain initiatives among certified companies in Malaysia and environmental sustainability: investigating the outcomes, Resources, Conservation and Recycling, Vol. 55, pp. 495-506.

14. Esinah, O.N (2011). Green Supply Chain Management Practices and Supply Chain Performance on Mobile Phone Firms in Kenya.

15. Field, J. and Sroufe, R. (2007). The use of recycled materials in manufacturing: implications for supply chain management and operations strategy. International Journal of Production Research, Vol. 45 No.18/19, pp. 4439-4463.

16. Geffen, C. and Rothenberg, S. (2000). Suppliers and environmental innovation: the automotive paint process. International Journal of Operations & Production Management, Vol. 20 No. 2, pp. 166-86.

17. Gibson, B.J., Mentzer, J.T. and Cook, R.L. (2005). Supply chain management: the pursuit of a consensus definition. Journal of Business Logistics, Vol.26 No. 2, pp.17-25.

18. Green, K., Zelbst, P., Meacham, J. and Bhadauria, V. (2012). Green supply chain management practices: impact on performance, Supply Chain Management. An International Journal, Vol. 17 No. 3, pp. 1-44.

19. Hall, J. (2003). Environmental supply chain innovation. Greening of the Supply Chain, Greenleaf

20. Hervani, A. A., Helms M. M., and Sarkis, J. (2005). Performance measurement for green supply chain management, Benchmarking: An International Journal, vol. 12, no. 4, pp. 330-353.

21. Heying, A. and Sanzero, W. (2009). A case study of Wal-Mart's Green Supply Chain Management.

22. Hsu, C. and Hu, A. (2008). Green supply chain management in the electronic industry.

23. Holt, D., Ghobadian, A. (2009). An empirical study of green supply chain management practices amongst UK manufacturers, Vol. 20 Issue 7.

24. Huan, S.H., Sheoran, S.K., and Wang, G. (2004). A review and analysis of Supply Chain Operations Reference Model. Supply Chain Management: An International Journal, Vol. 19, No.1, pp. 23- 29.

25. Jemutai, K.G (2014). Green Supply Chain Management Practices and Performances of Firms in Automotive Industry in Nairobi, Kenya.

26. Julkaisuga, T.Y (2018). Green Supply Chain Management Practices and firm Performance: evidence from Finland.

27. Kaliani, V.P., Bahrin, A.S., Othman, A.A and Munir, Z.A (2017). Green Supply Chain management Practices in Malaysia Manufacturing Industry. An International Journal SCM, Vol.6, No.2, June 2017.

28. Khanna, M. and Anton, W. (2002). Corporate environmental management: regulatory and market-based incentives. Land Economics, Vol. 78 No. 4, pp. 539-58.

29. Kyalo, K.C (2015). Green Supply Chain Management Practices and Performances of Alcoholic Beverage manufacturers in Kenya.

30. Kumarasiri, K.H and Arunathilake, S (2005). Effective logistics Process for Soft Drink Industry.

31. Lambert, M.D (2008). Supply Chain Management: Processes, Partnerships, Performance. New York, NY: Supply Chain Management Institute.

32. Larson, S.Y. (2000). Drivers for the participation of small and medium-sized suppliers in green supply chain initiatives. Supply Chain Management: An International Journal, Vol. 13 No. 3, pp. 185-198.

33. Lee, S.M., Kim, S.T. and Choi, D. (2012). Green supply chain management and organizational performance. Industrial Management & Data Systems, Vol. 112 No. 8, pp. 1148-1180.

34. Martha, H. and Houston, W. (2010). Green purchasing strategies: trends and implications. International Journal of Purchasing and Materials Management, Vol. 4, pp. 10-17.

35. Mohamed, K. (2012). Green supply chain management and performance of manufacturing firms in Mombasa, Kenya. Unpublished Research Project, University of Nairobi.

36. Mollenkopf, D., Stolze, H., Tate, W.T and Ueltschy, M(2010). Green, lean and global supply chains. International Journal of Physical Distribution & Logistics Management, Vol. 40.

37. Mudgal, R.K., Shankar, R., Talib, P. and Raj, T. (2010). Modelling the barrier of green supply chain practices: an Indian perspective. International Journal of Logistics Systems and Management, Vol. 7 No. 1, pp. 81-107.

38. Melnyk, P.M (2009). Green Supply Chain Management Practices by manufacturing firms in Kenya. Unpublished MBA project, University of Nairobi.

39. Njoroge, R. (2007). Automotive industry sector in Kenya. Retrieved August 27, 2007.

40. Nyariaro, F.G (2017). Green Supply Chain Management Practices and Performances of Soft Drink manufacturing Firms in Nairobi, Kenya.

41. Obiso, E.I. (2011). A survey of Green Supply Chain Management in the Petroleum Marketing Firms in Kenya. Unpublished MBA project, University of Nairobi.

42. Olorunniwo, F. and Li, X. (2010). Information sharing and collaboration practices in reverse logistics. Supply Chain Management: An International Journal, Vol. 15 No. 6, pp. 454-462.

43. Omonge, O.W. (2012). Green Supply Chain Management Practices and Competitiveness of Commercial Banks in Kenya. Unpublished MBA project, University of Nairobi.

44. Qazi, F.A (2016). Effect of Green Supply Chain Management Practices on Sustainability Performance of ISO 14001 SMEs. University Tun Hussein Onn Malaysia.

45. Rahmn, A.A., Ho, J.A and Rustli, K.A (2014). Pressure, Green Supply chain Management Practices and Performances of ISO 14001 certified Manufacturers in Malaysia. An International Journal of Economic and Management 8(s):1 -24 (2014)

46. Rao, G (2005). Best practices in implementing green supply chain, Logistics Management Institute.

47. Robert, J and Benjamin, F(2010). Green transportation costs in supply chain modeling. Journal of Operations and Supply Chain Management, 4(2), 56-70.

48. Stock, J (1998). An overview of green supply chain management in India.Research Journal of Recent Science.

49. Toma, G.,Dubrow, K and Harly, S(2005). Performance measurement for green supply chain management. Benchmarking: An international journal, 12(4), 330-353.

50. Warner, J (2012). Green supply chain management and supply responsiveness among food and beverage manufacturing firms in Nairobi, Kyena.

51. Xie, K and Breen, J (2012). Supply Chain Management measurement and its influence on Operational Performance. Journal of Operations and Supply Chain Management, 4(2), 56-70.

52. Zhu, Q., & Sarkis, J. (2004).Relationships between operational practices and performance among early adopters of green supply chain management practices in Chinese manufacturing enterprises.Journal of operations management, 22(3), 265-289.

53. Zhu, Q (2016).Green supply chain management pressure,practices and performance in Chinese Automobile Industry.

54. Zhou, K (2009). Implementation of GSCM in Textile Enterprise.

55. Zisidisin, G and Siferd, F (2001). Green Supply Chain Best Practices in hospitality industry in Kenya. Global Journal of Commerce and Management Perspective, Vol. 2(3).