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Impact of Green Supply Chain (Green Purchasing, Design for the Envirenement, and Reverse Logistics) on Firm Performance. A study of Construction Sector of Pakistan

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ABSTRACT

For last couple of decades, general public, customers and government regulatory authorities has been agitated about global warming and the adverse impacts of non-environment friendly products and services on the environment. The focused mainly on investigation the impact of green supply chain on performance in Construction industry of Pakistan. In this study, green purchasing, design for the environment, and reverse logistics have been considered as independent variables. Whereas, firm performance has been considered as the dependent variable. Development of environment friendly operations and products mostly driven by general public pressure, customer pressure, government regulations, and some economic benefits which organization gain with the positive image in the eye of customers by incorporating eco-friendly activities throughout supply chain processes. This study has been performed over Construction industry by taking the data from twenty companies of Pakistan.

Key Words: Green Purchasing, Design For The Environment, Reverse Logistics, Firm Performance

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CHAPTER 1: INTRODUCTION

1.1 Background

It is being observed in the last decades, general public, customers and government regulatory authorities has been agitated about global warming and the adverse impacts of non-environment friendly products and services on the environment which has been produced by the construction companies(Khan &Qianli, 2017). Managers in every organization have realized that in this competitive era, there has been a large and growing environmental risk existing in the supply chain management, with repaid growing of business operations and competitive environment, the concern about the environment is now more visible and annoying (Dubey et al., 2015). Mostly, green solutions have been considered as traditional control or "end-of-pipe" solutions in which a company tries to overcome its existing harmful environmental effects rather than working on proactive approaches to adopt such techniques which cause low environmental damages. Considering issues within the organizations sometimes may not covers the overall picture, if we take the example of small vendors, their approach towards the environmental practices ae very poor,these things effect the name or the large firms (Roehrich et al., 2017).

Pakistan is the country which is known as one of the most popular countries in the world with an estimated population of 220 million people. The country is underway of the development as the real estate and construction market has been emerged in recent times. Due to large population the country construction industry is utilizing the land by doing a lot of construction. The companies are investing huge amount of money in this industry. According to the economic survey of Pakistan, the construction industry is contributing a 2.53% in GDP and generating 7.61% of the employment or labor force opportunities (GOP, Finance, 2021)

To reduce the origin of waste which causes negative impact on environment across the supply chain process, many organizations have now started to adopt the externally-oriented approaches towards green initiatives. This integrates multiple organizations both upstream and downstream towards a green supply chain (Marhamati& Azizi, 2017). Companies that pursue green practices in their operations gain benefits of cost saving due to reduced energy usage, recycled material and can build a good image in the eye of customer as customers are now more concerned about the ways, companies carry out their operations(Khan et al., 2017). Customers prefer those firms who are more towards incorporating green initiatives and reducing environmental liability. Bad environmental practices can result in lowering stock prices and damaging the image of company. An increasing interest of general public in knowing the ways the company uses in running its operations that whether these are environment friendly or not, and their role towards global warming compel companies to think on the ways which are environment friendly like reuse and recycling of material. Now companies are aware that the more they move towards social responsibility, the more they can build social image which helps them to survive in the long run(Saad & Siddiqui, 2019).

It has been found that firms which combine organizational and environmental practices and run both hand by hand can gain a good customer relationship which leads towards profitability and give those organizations competitive edge amongst their competitors. The growing demand for environment friendly practices has changed the firm's focus on performance, prior firms merely focus on generating wealth through increasing the higher economic performance in terms of liabilities and the market value of assets they have(Ananda et al., 2018). Now, firms tend to focus on social and green practices performance in order to get economic benefit. Mediums on which organizations have been focusing on to get long-term

profitability is reducing the operations that causes increase in environmental risk and started working on the ways which reduces the damage on environment(Jaynat& Tiwari, 2017). All the stages of product life cycle will increase burden on supply chain in environmental context from the acquisition of raw material to manufacturing till recycling and reusing. If firms add green with their activities and operations, it will lead them towards green initiatives such as eco-friendly product designs, green procurement, and reverse logistics. The idea of green initiative is to eliminate or reduce the factors and processes throughout supply chain that have negative impact on environment(Fong et al., 2019).

Previous researches have shown that firms incorporate environment friendly operations usually increases more cost both for manufacturer and for consumer specially in manufacturing businesses. It has been seen that consumers and companies both are willing to pay extra cost for green initiatives(Manohar & Kumar, 2016). Firms driven towards green initiatives and lessen the effects they cause on environment through their operations by different stakeholders who are concerned about the ways the organization incorporates to run their operations and their effects on environment. Some of those effects are driven internally and some are driven externally like customers pressure, general public pressure, government regulations toward environmental issue and economic benefit(Chithambaranathan et al., 2015). Firms which take proactive approach towards environmental issues find better opportunity both in strategies by forecasting the upcoming ways of addressing environmental issues and by incorporating new ways of doing their operations better than their competitors. Firms tend to respond better towards environmental issues timely throughout supply chain. Majority of the pollution has been caused due to the process of manufacturing and logistics activities, so there was an immense need to

take steps which can reduce the omission of carbon dioxide during operations and results in decreasing adverse impact on environment(Geng et al., 2017).

Development of environment friendly operations and products mostly driven by general public pressure, customer pressure, government regulations, and some economic benefits which organization gain with the positive image in the eye of customers by incorporating eco-friendly activities throughout supply chain processes. Previous studies conducted on green supply chain have motivated companies to adopt green initiatives and play their role towards environment friendly practices in the service and manufacturing sector(Kirchoff et al., 2016). Prior studies on green initiatives have shown that most of the organizations pursue or implement green processes in their supply chain because of government regulations or make a good image socially that they are towards eco-friendly operations so that they can attract more customers and also to reduce expenses by utilizing resources efficiently through waste reduction(Munawwar, 2016). Government regulations can compel organizations to play their role towards environment friendly operations by installing new and advance technology which causes less emission of carbon dioxide and reduces adverse effects on environment throughout supply chain. Incorporating green initiatives throughout the supply chain operations involves many processes from identification of cost associated with the green processes, finding opportunities of cost reduction, minimizing the impact of operations on the environment to continuous improvement in the process of mitigating the adverse impacts on the environment by gaining the market share, and enhancing firm performance(Dubey et al., 2015).

1.2 Problem Statement

It has been observed that seventy percent of pollution on earth is emitted from manufacturing companies throughout their supply chain operations, as it causes adverse effect on

environment and creates severe issues for ecology, such as global warming, air pollution, depletion of ozone layer, etc.(Khan &Qianli, 2017). The green supply chain concept emerges as the environment needs more protection as the lives of the human being got effected in this regard. Green supply chain practices are needed to be added in the supply chain operations to overcome environmental issues caused by manufacturing processes. Supply chain partners need to play their part towards improving the ecology by reducing adverse conditions caused by manufacturing processes and supply chain activities. Small business organizations due to lack of enough resources and information about how to design and implicate green supply chain, has been recognized as the main enterprises that put adverse effect on ecology through their operations.The construction industry must look into this matter and make a pre defined objectives that will support the SDG's goals of United Nation and contribute towards the betterment of the future.(Qalati, Kumari, Soomro, Ali & Hong, 2022).Hence, with respect to green supply chain concerns, there is lack of awareness amongst Construction firms of Pakistan the role of green supply chain and its influence on firm performance is a major problem which is to be addressed through this study.

1.3 Research Gap

In the recent past researches there are many researches that shows concerns about green supply chain and its relationship with firm performance. Whereas, this area of research have very limited work of research performed in Pakistan emphasisthe relationship between green supply chain and firm performance. However, limited researchers in Pakistan that phut there concerns in the different dimensions of supply chain and their relationship with firm performance(Saad & Siddiqui, 2019). The gap of this research was identified from the research where the research have suggested the future researcher to work further on the relationship between green supply

chain and firm performance, secondly he also suggested to conduct the research on multiple construction firms (Amjad., Abbass., Hussain, Khan, & Sadiq, 2022).Therefore, this study has used green purchasing, design for the environment, and reverse logistics, representing green supply chain, as independent variables. Whereas, firm performance is considered as dependent variable in this study, to testify their relationship within Construction industry of Pakistan excluding the Construction marketing companies. This study has used quantitative research technique to collect the data from organizations working in Construction industry of Pakistan excluding the marketing companies. A structured questionnaire (primary data) is used for examining the relationship between variables mentioned above.

1.4 Research Objectives

Based on the problem statement, this study is aimed:

- To investigate the impact of green purchasing on firm performance in Construction industry of Pakistan.
- To investigate the impact of design for the environment on firm performance in Construction industry of Pakistan.
- To investigate the impact of reverse logistics on firm performance in Construction industry of Pakistan.

1.5 Research Questions

Following are the research questions of this study:

- What is the impact of green purchasing on firm performance in Construction industry of Pakistan?

- What is the impact of design for the environment on firm performance in Construction industry of Pakistan?
- What is the impact of reverse logistics on firm performance in Construction industry of Pakistan?

1.6 Research Significance

This study is significant in identifying the impact that green supply chain has on firm performance in Construction industry of Pakistan excluding the Construction marketing companies. This research will significantly provide a strong foundation for the researchers to conduct further research regardinggreen supply chain (green purchasing, design for the environment, and reverse logistics) and firm performance. It is imperative to identify that whether there exists a relationship between the variables as mentioned above and then identifying the direction of relationship between these variables. In addition, this study has high importance, as it will help managements and stakeholders of Construction industry in understanding the role of green supply chain towards influencing firm performance. Furthermore, this study will help Construction firms to engage in taking green initiatives and understanding the importance green supply chain. Finally, this study will prove beneficial for the supply chain management students and research students in developing or increasing their knowledge regarding this literature.

1.7 Definition of Key Terms

Green Supply Chain: It is an organization's catalyst used for achieving balance between efficiency and responsiveness of supply chain and to meet the competitive strategy of an organization by taking green initiatives(Jaynat& Tiwari, 2017).

Green Initiatives: It is a term used to express organization's endeavor towards making a cleaner and more beneficial environment through their manufacturing strategies (Ananda et al., 2018).

Green Purchasing: It is defined as the procurement of products and services which will have less impact on the health and environment of human beings in comparison to the products and services developed and offered by the competitors for similar purpose. Comparison could be based on maintenance, operation, reuse, distribution, packaging, manufacturing, production, acquisition, war materials or disposal or products and services (Geng et al., 2017).

Design for the Environment: It is also known as Ecodesign which is used by the manufacturing organizations in designing their products with having special consideration towards the impact of them on the environment throughout their lifecycle (Chithambaranathan et al., 2015).

Reverse Logistics: It is considered as an approach used by the manufacturing organizations in which materials and products are recycled and reused. Reverse logistics is such a process in which products are moved back from the point of utilization to the point of generation either for capturing value or for the purpose of proper disposal (Munawwar, 2016).

Summary of Introduction:

This is now observed that the everyone is now concern about the environment. Government, public and customer, because now everyone is aware of the consequences of the traditional practices. Now companies and managers are also concern about the environment to gain competitive advantage. Pakistan is the country of 220M people, and one of the largest growing markets of Real Estate and construction. Due to large number of population construction sector

of Pakistan is contributing in the GDP and generating 7.61% of the jobs. But due to construction on large scale, causes deforestation.

Along with deforestation, it is one of the biggest consumers of the energy. If this sector shift from conventional energy source to the environment friendly energy this can be a big development. It is been observed that in this era now customer is much aware than ever before and if a company peruse green practices it could be the biggest competitive advantage of the company along with cost saving.

CHAPTER 2: LITERATURE REVIEW

Introduction

In context of developed and developing countries, both small and large firms get affected by environmental pollution and sustainability issues. Environmental degradation is contributed by use of natural resources and waste generation which assists in process of manufacturing. Organization have started working on changing their operations and strategies which will help them in coping with growing global concerns regarding environmental hazards and problems. Environmental problems are addressed by the greening business operations or elsewise, there might be devastating consequences in the form of economic, environmental and social(Kirchoff et al., 2016).

2.1 Green Supply Chain

Flow (either upstream or downstream) of products, services and information from the point of generation to the point of utilization through a source is a set of business activities that is recognized as a supply chain(Manohar & Kumar, 2016). Definition of supply chain expresses the last stakeholder at the end of the chain is consumer that reflects the movement of cycle from first point which is point of production to the last point which is point of consumption. Process of production involves natural resources inputs and unlimited capacity for assimilation of waste (Marhamati& Azizi, 2017). Opposite to the traditional models, environmental impacts involved in the process of production are considered as the green supply chain which leads to the movement of goods to the consumers through supply chain. In addition to the traditional modes of supply chain, a green supply chain has extended to next level as it includes activities that are less responsible in affecting environmental hazards throughout the whole product cycle. Those

extended activities have been resource saving, green design, product recycle, and reduction of harmful materials (Fong et al., 2019).

Recent definitions related to traditional and modified green supply chains help in revealing the attempt made by supply chain to work towards the betterment of environment by including factors such as remanufacturing, reusing and recycling of materials and products within a supply chain. Prime aim of green supply chain is to minimize the adverse impacts on the environment in terms of water, air and land pollution (De Giovanni &Vinzi, 2012). Green supply chain is to protect the resources that get wasted while acquiring raw materials for the purpose of manufacturing and wasted during supply of products to the final consumers. Green supply chain helps in coping with environmental issues which takes place in delivering of goods and services to the final consumers. In addition to that, it also assists in recycling products into raw materials through remanufacturing, reusing, and reprocessing (Hsu et al., 2013). The green supply chain involves diverting used products from landfills and collecting them for economic value recovery. Similarly, secondary resources have been employed to reprocess those products that has been used for once to take place of a supply chain's primary resources As a result, the green supply chain will be extremely beneficial to both businesses and the environment. Suppliers will look forward to adopting of green supply chain practices if such activities help them in saving information, enforcement and bargaining costs. Although, decrease in the transaction cost may be the driving force for suppliers to be adopting green supply chain practices(Khan &Qianli, 2017).

About the green supply chain various researcher have conducted the research covring the literature. According to his definition, green supply chain management is defined as the incorporation of environmental thinking into supply chain management, such as end-of-life

management of the good or service after its life span, delivery of the final product to consumers, manufacturing processes, material sourcing and selection, and product design. (Green et al., 2012). Based on the definition mentioned, green supply chain management is related to production of wide range which begins with the designing of a product and may ends with recycling of a product or destroying it. Green supply chain management practices are similar to the normal product lifecycle in which during production, a product moves through all stages until completion of whole life cycle(Seman et al., 2012). Green supply chain is to protect the resources that get wasted while acquiring raw materials for the purpose of manufacturing and wasted during supply of products to the final consumers. Green supply chain helps in coping with environmental issues which takes place in delivering of goods and services to the final consumers. In addition to that, it also assists in recycling products into raw materials through remanufacturing, reusing, and reprocessing. Green practices are considered as interchangeable with sustainability. Sustainable supply chain practices result in provision of environmental, social and economic requirements that are necessary for the conversion of materials into products amongst manufacturers and suppliers. Environmental thinking is highly involved with green supply chain management. In addition to that, there are three pillars which further explains the sustainable supply chain management, which are named as environmental, social, and economic pillars(Dubey et al., 2015).

2.2 Green Supply Chain Initiatives

Firm may get involve in performing activities that helps in decreasing the adverse impacts on the environment caused by the product and services' life cycle. which begins with the stage of designing, followed by the acquiring of raw materials, then followed by consumption of products and disposal of products(Roehrich et al., 2017). However, there are some initiatives

such as end-of-pipeline green solution and firm-specific which are very beneficial for the environment, that has been evolved as green supply chain concepts, but they are not widely spread. Higher cost and uncertain returns are associated with initiatives of green supply chain. Firms have to tackle with the issues regarding lack of capabilities, expertise and resources for green supply chain. In addition to that, firms have to sort out the relationship complexities associated with green supply chain(Marhamati& Azizi, 2017). Researchers and scholars have not conducted must of research regarding the literature of green supply chain as the novelty of this literature remains yet to be disclosed. Various initiatives such as organizational practices, technology and practices, and prescriptive models has been addressed within the literature of green supply chain management. Reverse logistics is a green initiative that company takes, and it is all about a product flowing back from the customer to the manufacturer and explains the concept of recycling process of a product. Reverse logistics is further divided into several activities such as reusing, sorting, inspection, and product collection(Ananda et al., 2018).

In last couple of decades, Malaysia has been such a developing country which has gone through spontaneous economic development within no time. Although, this sudden increase in economic development of the country has led to increase in environmental pollution which has become a major concern for people(De Giovanni &Vinzi, 2012). To cope up with adverse conditions, government of Malaysia and regulatory authorities have developed policies which empowers the existence of environmental programs. Such positive initiative taken by the regulatory authorities have been a shift from depending mainly on the activities of government to control environmental issues to institutes that must take preventive measures to work for prevention of environmental degradation proactively. It is obvious that businesses have been the pivot source behind economic growth and financial investment as businesses prove highly

significant in playing their role towards the protection of environment(Laosirihongthong et al., 2013). With respect to the finds of Standard and Industrial Research Institute of Malaysia (SIRIM), government of Malaysia has taken steps to stimulate green initiatives by industries and businesses to proactively work towards the protection of environment. Awareness regarding to the environment has been increasing in Malaysia with the passage of time as the government has been working on preventive measures against the degradation of environment. Such measures are to facilitate the control of environmental hazards. Suppliers have been evaluated and provided environmental certification on clearance as it intensifies organizations to have hazardous free products. Businesses are persuaded to get themselves involved towards sustainable development through focusing on remanufacturing, recycling, and disposal initiatives(Fong et al., 2019).

With respect to focus of SIRIM and ENSEARCH, there are three fundamental green initiatives that has significant importance out of all environmental drivers. Those three fundamental initiatives have been reverse logistics, design for the environment, and green purchasing. These initiatives have been very prominent and unique when considered in Malaysian economy as Malaysian government highly supports the engagement of business firms to perform such practices which will result in improving the protection of environment through green supply chain management(Geng et al., 2017). In addition to that, these initiatives have also been adopted by other emerging economies such as India and China. Green purchasing is all about creation of external linkages with external suppliers to ensure commitment towards performing environmental hazard free activities through smooth supply chain management. Design for the environment is focusing on the external and internal integration towards designing process and product. Reverse logistics is emphasizing on closed-loop system whose main focus

is to recycle, reuse and remanufacture materials(Yang et al., 2013). Major phases in operations of supply chain management has been the three initiatives mentioned earlier. First phase has been green purchasing which has the aim to placing what is needed before performing operations of supply chain management. Second phase has been designed for the management with the objective of the requirements placed while the operations of supply chain management has been taking place. Reverse logistics has been the third phase which is adding value to the manufactured product through eliminating or minimizing environmental adverse activities to protect the environment. These three initiatives have been defined under the umbrella of supply chain management within all emerging economies(Munawwar, 2016).

From conception to recycles or destruction or from the beginning to the end of product, supply chain activities are involved. Supply chain activities are related to individuals, departments, and many organizations. Meanwhile, green supply chain management involvesthird party logistics,distributor,retailer, manufacturer, and several roles(Hsu et al., 2013). Green supply chain management also involves multiple departments including customer services, packaging,engineering, and product design. It has been clarified that green supply chain management practices are extremely extensive. Green supply chain management literaturehas been divided into several practices such as: green operations and green design(Chithambaranathan et al., 2015). Green design is all about emphasizing on product development's design phase. Products that are friendly towards the environment has been designed through green designing. For example, green design is recognized as elimination of hazardous materials and their replacing with materials that are non-hazardous materials or less harmful. New regulations have highly impacted on green design. Green design category is explained through life-cycle analysis (LCA) or life-cycle assessment. Life cycle analysis is a

process of assessment and evaluation of resource, occupational health, and environmental related consequences of any product during its different life phases. Other category of green operations has been about waste management, network design,reverse logistics, and green manufacturing and remanufacturing. Reduction of resource consumption and energy usage is done through green manufacturing or green remanufacturing. For improvement of production efficiency, green manufacturing could be adopted by the company during process redesigning(Khan et al., 2017). Remanufacturing is done through the process of recycling method which has been a common one. In addition to that, reverse logistics is all about a product flowing back from the customer to the manufacturer and explains the concept of recycling process of a product. Reverse logistics is further divided into several activities such as reusing, sorting,inspection, and product collection. Waste management has been another important category of green operations. Waste management is about the elimination of waste and polluted materials by the company. This elimination is done in different forms with the prime purpose of reducing negative impact that harmful materials and products has on the environment(Saad & Siddiqui, 2019).

2.3 Green Purchasing

Green purchasing is assuring the item purchased by the customers must have several ecological attributes such as recyclability, reusability and nontoxic materials. In addition to that, green purchasing also addresses the environmental issues such as minimization of waste composed of hazardous materials, waste reduction, substitution of materials through appropriate raw materials sourcing(Jaynat& Tiwari, 2017). Environmental goals are achieved through the involvement of suppliers. Companies that have been active in participating towards the safety of environment have increased the management of suppliers' performances towards the betterment of environment. Such companies have been actively involved in purchasing raw materials that

are environment friendly and focusing on having suppliers that provide such ecofriendly raw materials. In addition to that, companies have also been using manufacturing processes that are environment friendly to manufacture products. For instance, Code of Conduct in the Electronic Industry has been the major guideline that promotes the concept of green purchasing in Industry of Electronics. Companies such as Matsushita and Sony that has been amongst the leading Malaysian multinational corporations have focused highly on implication of green procurement policies and building relationship with suppliers to eliminate the adverse environmental hazards(Manohar & Kumar, 2016). Provision of advices towards improving their performance by the firms to the suppliers and evaluating the performances of suppliers towards the environment has been considered as green purchasing. ISO 14001 has been an environmental management certification that is set as the standard by organization who has concerned about environment, as this standard encourages suppliers of the firms to be ecofriendly. In their study, significant relationship amongst supplier and manufacturer has been maintained through green supply chain management which is considered as an emerging concept. Government of Malaysia has set standards and policies to encourage business communities performing within the premises of Malaysia in holding seminars for suppliers regarding awareness about the environment. Corporates and organizations can form environmental teams to demonstrate their commitment to guiding suppliers in developing environmental initiatives. Such teams will be visiting suppliers' facility frequently to guide them and provide recommendations in setting up of environmental programs(Kirchoff et al., 2016).

Environmentally preferable purchasing (EPP) or green purchasing is acquisition and selection of products and services that results highly in reducing the negative impact on the environment and impact positively towards manufacturing companies' transportation, life cycle,

disposal, recycling and use. EPA has defined green purchasing as practices used by the manufacturing companies towards preventing pollution and waste by considering impact towards the environment during decisions made during purchasing, in the form of performance, price, and traditional selection factors(Seman et al., 2012). Scottish industries have started focusing on understanding green purchasing. With respect to the results shown by different companies associated with multiple industries such as chemical industry, electronics, paper making, as these companies have started taking initiatives towards the environment on consistent basis. His conclusions have explained that characteristics of a product can be limited to take initiatives towards protection of environment. There are two important factors of green purchasing such as size of customers and geographical origin of raw materials or purchased components. There has been a model developed for green supplier development. These authors have mentioned three categories which explains activities and practices of green purchasing. Management and organizational practices, investment and resource transfer, and green knowledge transfer and communication were the three categories. (Green et al., 2012). Purchasing activities that impacts the environment are categorized into five different areas named as inbound logistics processes, supplier evaluation, supplier process improvement, product design processes, and product design for the environment(Khan &Qianli, 2017).

2.4 Design for the Environment

To reduce the impact of products on environment during their life cycle is considered as design for the environment. Initially, the focus was primarily on bringing technical improvements within the processes and products that can be undertaken with the aim of reducing environmental costs(Roehrich et al., 2017). In addition to that, organizations that have been committed towards actively participating in protecting the environment has recognized the

critical importance of developing a healthy relationship with suppliers, consumers, regulatory authorities, government authorities to design for environment as it is recognized as a vital portion of green supply chain initiatives. An external socio-cultural, normative and coercive pressure which is imposed on the organizations is considered as a vital pre-requisite for initiation towards design for the environment. Cross-functional cooperation between different units both internally and externally proves the success factor of design for environment. In an emerging economy like Malaysia, pressure exerted on the government by international regulatory authority has imposed the government to ensure business firms to get involved in design for environment while performing their functions and operations(Marhamati& Azizi, 2017). Malaysian economy facilitates the large electronics and electrical manufacturers belonging to Japanese and US markets. Although, firms working within the Malaysia has to follow the strict legislations imposed by the international regularities in a same way as it has been imposed in Japan and USA. These compliance issues ranging from product assessment in terms of life cycle, reducing the consumption of energy and material and ensuring the material use for the packaging has not been reusable, but most of the contents used during processes must be recyclable. For instance, with reference to the program introduced for producing efficiency in production of energy and products that are recyclable and hazard free by Hewlett-Packard. In accordance with developments of Nokia corporation, a design has been prepared for an environmental program which ensures production of products that does not contain any restricted material, consumption requires less energy, and products must be high recyclable(Jaynat& Tiwari, 2017). Referring to the developments of Dell Corporation, a program for environmental program has been designed to manufacture products that are energy efficient and helps to promote the concept of reuse, upgradeability and recycling(Ananda et al., 2018).

Designing a product begins with the concept of product lifecycle.Eco designing also knows as green designing focused mainly on the design that is conscious to the environment as well as assessment or analysis of life cycle. For product designing, a team responsible for designing the product must be focused on changing their raw materials while the process of manufacturing is in process as raw materials used must be less toxic and highly friendly towards the environment(Geng et al., 2017). Green designing is also recognized as design for the environment. For instance, hybrid car has been a famous example of a green product. Due to decrease in petroleum supply and increase in demand, automobile manufacturers tend to restructure and redesign an engine that consumes fuel of less quantity. Hybrid car has become an evolutionary design for the environment which has been highly appreciated by the society. Manufacturers must use fewer and lighter materials for manufacturing of an automobile suitable to the green design. During product designing, manufacturers require high level of cooperation with the suppliers(Yang et al., 2013). Design for the environment is brought into consideration by the manufacturing companies and their suppliers. In the study, authors have shared couple of examples for cooperation between suppliers and manufacturers on the agenda of successful green supply(Dubey et al., 2015).

2.5 Reverse Logistics

Reverse logistics has been categorized as activities that are performed to recover discarded products which might include shipping materials, packaging, backhauling of raw materials to the central point where these can be remanufactured or recycled. Logistics professionals are required to handle the mechanism of reverse logistics as their significant attention is vital to do so(Fong et al., 2019). Firms having the desires to perform business at international level must be dealing with backhauls for handling the waste packaging and also to

sort out the issues related to the satisfaction from recoverable products. Pressure from the competitors have been forcing most of the business firms being part of US economy towards adoption of these practices(Manohar & Kumar, 2016). Although, environmental issues have not been a serious threat till now, but with respect to the expectations, environmental issues will soon become a significant threat with the increase in competition and passing of more stringent regulations(Saad & Siddiqui, 2019).

In Germany, there has been a law for transportation packaging which enforces manufacturers to take-back all strapping, cardboard boxes, pallets, and stretched and shrink wrapping which could be utilized for protection of products while shipping is in process. Additionally, prohibition of land filling products such as electronics and major customer appliances has been necessary(Munawwar, 2016). Netherland and Germany have been the countries which prohibits all business firms working within their countries to ship waste to such countries which still allows the land filling. European countries other than these have been planning to adopt same legislation in the near future. In USA, landfills have been continuously reaching maximum capacity, as congress of US have continuously been working to make manufacturers pursue the legislation on remanufacturing and recycling(Hsu et al., 2013). Referring to the reports within the study of (Council of Logistics Management), reverse logistics is affected by three major issues. These issues are planning for the flow of materials, structure of the network, and routing and materials' classification(Kirchoff et al., 2016).

In a forward flow logistics system, goods collected from a marketplace is not a demand-driven flow, as it is supply-driven flow which has been a significant aspect in recognizing reverse flows. Great deal of uncertainty has been created by supply-driven flow in terms of timing, quantity and conditions of items. There are several reasons which has resulted in lack of

attention towards reverse logistics in Malaysia. These reasons are absence of closed-loop infrastructure and lack of focus on policies regarding management of waste. Although, the focus of Malaysian government in last three years has been mainly on imposing taxes on the firms that are involved in using non-renewable resources including natural gas and coal(Chithambaranathan et al., 2015). Imposition of penalty-based system from governmental subsidies system has forced many firms in Malaysia to cope with practices that are environment friendly. In addition to that, additional pressures exerted by suppliers, competitors and customers have been another reason for organizations to move towards adaptation of environmental conscious practices(Khan et al., 2017).

There are certain drivers that plays encouragement role in encouraging firms towards adaptation of green supply chain initiatives. Such initiatives taken by the firms result in reflecting the pressures exerted by most of the stakeholders such as community, government, suppliers, customers, investors and employees(Laosirihongthong et al., 2013). Another source of encouragement for the firms to adopt such initiatives has been the moral desire and organizational culture. Response of organizations towards the pressure exerted by multiple institutions has been defined by the institutional theory. Firms that has been proactively involved in their business tends to compete with the well-being and economic health in addition to the striving for scarce customers and resources(Green et al., 2012). Majority of scholars have agreed to the fact that organizations face immense pressure in adapting to institutional environment and staying consistent to it. Organizations have to keep their operations with respect to the standards set by environmental institutionalization(Roehrich et al., 2017).

2.6 Firm Performance

Every organization have some financial and functional goals, how much effectively they achieve those goals is firm performance. In order to measure the firm performance, company need to to consider multiple dimensions like the profit ration of the firm, server level quality, efficiency of the supply chain, and the customer retention. In the modern word firm performance is one of the hot topic of the modern research's (Saad & Siddiqui, 2019). To identify the problem, and satisfy the customer in this competitive environment, if a firm is not measuring its performance for sure the organization is not performing well. It is mandatory to measure the firm performance. To archive strategic fit, long term goals and short term objectives firm must practice effective and efficient supply chain. If firm want to measure the performance, the firm mush measure the efficiently of the supply chain practices they are following. Customer satisfaction is totally dependent on the supply chain practices a firm follow. The first priority of the firm is customer retention and that can be achieved through best supply chain practices. (Dubey et al., 2015). A firm that is completing its task by integrating supply chain, the firm also need to measure both firm performance and supply chain performance. The difference between forecasted performance and actual achieved performance is the efficiency, which can be defined as the firm performance. That a firm is doing fine to active its forecasted targets or not. (Manohar & Kumar, 2016).

Some accepts like productivity, and financial concerns like return on investment and profitability of the organization. Firm performance also include some more measures which is non tenable like goodwill, company reputation, staff behavior but these aspects gives very low information of the customer retention and satisfaction. That is why most of the organization focus on the tangible assets like ROI, quality of services they firm is providing, I used customer

satisfaction through the quality and customer level services, instead of the tangible dimension of the firm. In this student I used only customer services capability to measure firm performance. The firm performance not only dependent on tangible thing it is also associated with non-tenable things. (Geng et al., 2017). When thee is high out put firm performance increased and when there is low input firm performance decreases(Fong et al., 2019). Companies that are from manifesting industry are in putting there efforts as inputs including capital, labor and time etc.,by putting these efforts as input they get some out like opportunity, expertiseoutput that takes into account possibilities, difficulty, pace, responsiveness, quality, creativity, production, industry uniqueness, consumer loyalty, development of new clients, cash, margin, and profit, among other factors .(Jaynat& Tiwari, 2017).The operational excellence and efficiency of corporate entities within their chosen fields are demonstrated by the firm performance. Trying to distinguish supply chain activities is the basis for setting business plan to boost performance and productivity. The companies use great distribution efficiency and low unit costs of production to minimize timeframes. Supply chain operations can be isolated from one another to provide clients with the highest goods and services. Customers will be satisfied and committed as a result of better supply chain management, that also boosts absolute earnings. (Kirchoff et al., 2016). Production of a large number of products and goods while using limited resources has resulted in increased firm productivity. (Chithambaranathan et al., 2015).

2.7 Green Supply Chain and Firm Performance

Organizations are encouraged to adopt green supply chain initiatives through a variety of motivating factors. Researchers' previous research on this literature has aided in trying to identify some of the important driver that result in motivating organizations to adopt environmental practices. These drivers exist as a result of pressure both from internally and externally parties

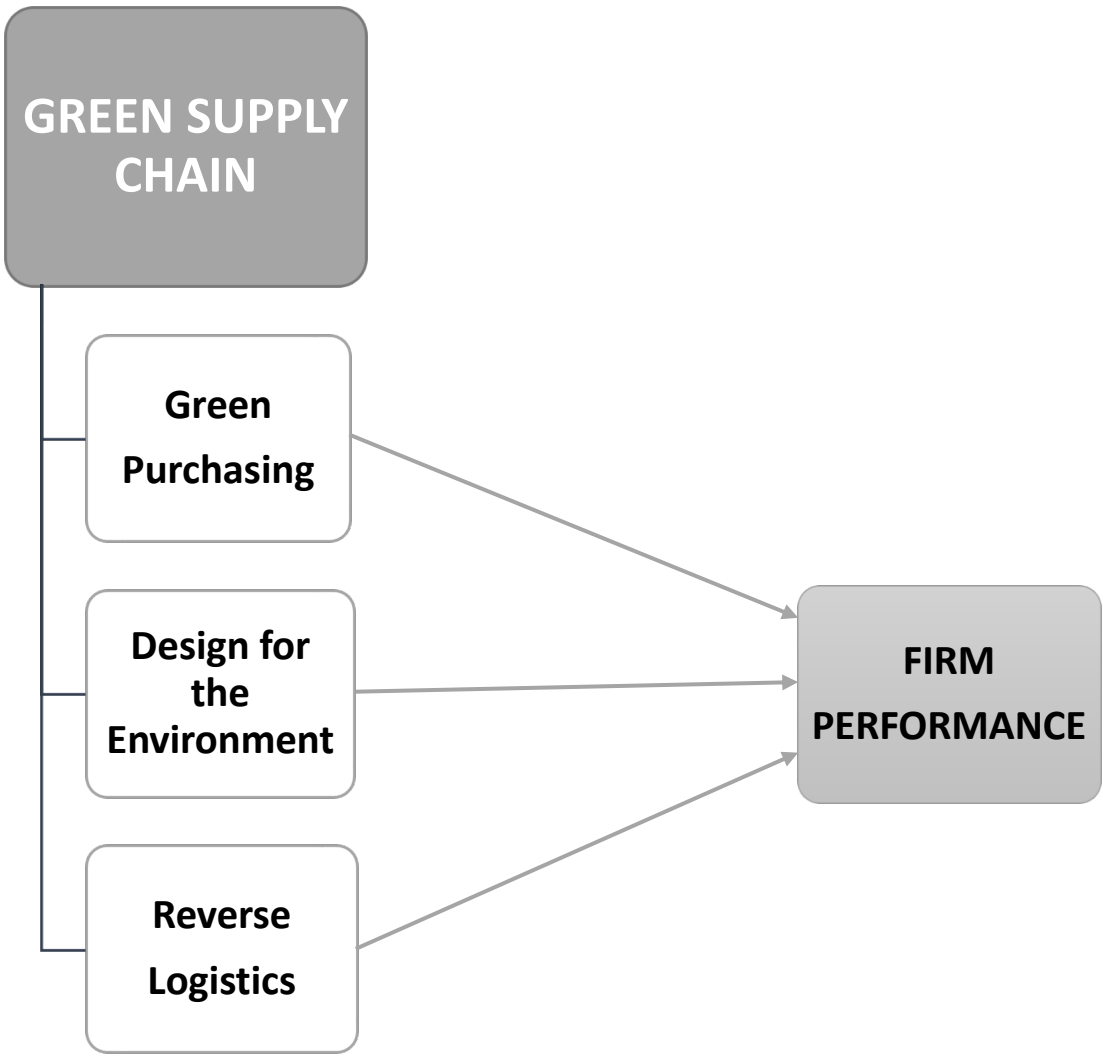
such as suppliers, customers, government, communities, and employees. Moral values and organizational culture are also factors that contribute to the development of such drivers. (Khan et al., 2017). Entities tend to adopt green supply chains as a result of these motivating factors, and transformation of green supply chain management by organizations in terms of these motivating factors has been a multifaceted concept, leading to an improvement firm performance. Recent scholars have effectively discussed the impact that sustainable supply chain drivers have on effecting the initiatives taken by organizations toward green supply chain. (Marhamati& Azizi, 2017). Green supply chain initiatives are encouraged by the motivators, as these drivers play a significant role in influencing organizations to adopt practices that are favorable for the environment as well as helpful in improving firm performance. This study has provided a theoretical model to explain the relationship between green supply chain initiatives and firm performance (Munawwar, 2016).

As (Laosirihongthong et al., 2013) has centered basically on communicating the drivers that causes an impact on a company towards embracing green supply chain administration inside their operations. (Green et al., 2012)performed a review of 314 Chinese producers within the Chinese economy in order to assess and depict green supply chain management and firm execution. According to the findings of the review, mindfulness toward the environment has been expanded within Chinese companies through promoting, competitive, and administrative weights, as these weights have demonstrated to be critical variables for improving natural mindfulness among Chinese companies.Furthermore, according to another study conducted on 341 Chinese producers within the Chinese economy, there is a strong relationship between green supply chain activities and firm execution. The results of the conducted review revealed a

positive impact of green supply chain and Chinese company execution. The green supply chain ensnared by Chinese companies has positively impacted their execution (Jaynat& Tiwari, 2017).

Moreover, there are certain basic components created which can help the supervisors in utilizing green supply chain administration. Electronic and electrical businesses of Taiwan have been utilized for creating a sample test. Based on the outcomes about appeared through the conducted sample test, there has been four basic components which help supervisors in utilizing green SCM practices (Yang et al., 2013). From 1994 to 2007, authors have collected 191 published papers for proposing a model that defines sustainable supply chain management drivers. There have been external drivers for sustainable supply chain management. These drivers could be from stakeholders, customers, and government. These drivers result in pressurizing the companies and such pressure is moved on to the suppliers which eventually results in influencing the companies(Ananda et al., 2018). Organizations adopt practices such as reverse logistics and environmental designing of product, due to pressure exerted by drivers such as cultural cognitive pressure, normative pressure and institutional pressure in order to improve their productivity and performance (Marhamati& Azizi, 2017).

2.8 Theoretical Framework



This theoretical framework shows that there are three independent variables and one dependent variable. Green purchasing, design for the environment, and reverse logistics, representing green supply chain, are considered as independent variables. Whereas, firm performance is considered as dependent variable within this study, to testify the relationship

between green supply chain (green purchasing, design for the environment, and reverse logistics) and firm performance in Construction industry of Pakistan.

- The relationship between Green Purchasing and Firm Performance (Dubey & Bag, 2018).
- The relationship between Design for the Environment and Firm Performance (Dangelico, Pontrandolfo,2015)
- The relationship between Reverse Logistics and Firm Performance (Abdullah, &Yaakub, 2014).

2.9 Hypotheses

Below are the hypotheses of the research study:

H_1. Green purchasing has positive impact on firm performance in Construction industry of Pakistan excluding the Construction marketing companies.

H_2. Design for the environment has positive impact on firm performance in Construction industry of Pakistan excluding the Construction marketing companies.

H_3. Reverse logistics has positive impact on firm performance in Construction industry of Pakistan excluding the Construction marketing companies.

CHAPTER 3: METHODOLOGY

3.1 Research Design

For the collection of the data, analysis and measurement this research constitute the blue print,(Flick, 2015). Mostly, two methods are used for conducting a research study named as quantitative and qualitative methods. This research study, on the other hand, is based on primary data. As a result, it is a research study that employs a quantitative approach.

3.2 Variables that will be study in this research

There are two kinds of variables in this study: dependent and independent variables. (Jonker &Pennink, 2010). Green purchasing, design for the environment, and reverse logistics are being used as independent variables in this study. Firm performance is being used as the dependent variable to test the relationship among them in Pakistan's construction industry.

3.3 Type of Investigation

The causal nature of this research study explains the cause-and-effect relationship between variables. Majority of the researchers who have already conducted research on this literature has used questionnaire technique to gather the data (Kumar, 2019). Therefore, major procedure used to gather the data within this research has been structured questionnaire, as structured questionnaire is distributed amongst the organizations operating within Construction industry of Pakistan excluding the marketing companies.

3.4 Population

In this study, companies operating within Construction industry of Pakistan excluding marketing companies have been the sector chosen to explore the relationship between green

supply chain (green purchasing, design for the environment, and reverse logistics) and firm performance. Excluding the Construction marketing companies the organizations targeted for data collection include Among the organizations targeted for data gathering are FWO (Frontier Work Organization), Pak Land Builders & Developers, NU Builders & Developers, EC Engineering, and 6D Builders. Estate Valley Developers, Arch Builders & Developers, and Design Edge In contrast, the population of this study includes entities active in Pakistan's construction industry, including marketing firms.

3.5 Sample Size

With reference to the Morgan's Table the sample size for this study is finalized (Krejcie& Morgan, 1970). The sample of 15 companies that is working the sector of construction of Pakistan, excluding the real estate dealers, or those companies which are providing marketing services only. This represents the complete population.

3.6 Research Tools

As a research tool to collect the data from the selected sample (Organization working in the construction industry of Pakistan, excluding real estate agents and companies which are doing only marketing) a structured questioner was floated. The floated questioner has been adopted from the past conducted research.

3.7 Pilot Testing

Pilot testing has been used to check the suitability of the questionnaire with the literature topic. For that purpose, pilot testing has been performed by distributing questionnaires to 300 respondents (Organizations working in the Construction industry of Pakistan excluding the marketing companies), which have been included in total 250 respondents. The purpose of running the pilot testing was to identify if there is any problem regarding the understanding of

questions, to check clarity of questions, and to ensure the authenticity of responses provided by respondents in comparison to literature topic.

3.8 Data Collection Method

The questionnaire has been carefully adapted and simplified to ensure that the process of answering is as simple as possible in order to obtain reliable responses from the participants involved in data collection. Such questionnaire simplification has automatically eliminated factors such as ambiguity and suspension. (Flick, 2015).Data was gathered from organizations involved in Pakistan's construction industry. (FWO – Frontier Welfare Organization, NU Builders, PREDAMS, Umer Associates, Estate Valley, Pak Land Builders and Developers, One Source Developer, Design Edge, Arc & co, Maksons, EM Engineering, Roshan Din, MES, Zafi Builders, 6D Builders, BSM Developers, Ghulam Husain Co, Lariab Associates and Developers etc)through the distribution of structured questionnaire on personal basis. The Questionnaires that were collected were properly synchronized to aid in the study's reasonable findings and conclusions. It is adequate to state here that construction project will always result in some consequences for the environment, though "sustainable construction" should mitigate this to some extent. The commercial benefits of implementing sustainability initiatives are obvious. (Ojo, E., Mbowa, 2014).

3.9 Data Analysis

Following data collection, data was analyzed using various tests to complete the analysis procedure. After the data has been collected, various statistical tools such as regression and correlation have been used to further the analysis.Other statistical tools, such as descriptive frequencies, ANOVA, and coefficient, are used in conjunction with SPSS software to determine the extent and direction of relationship between variables.These statistical tools demonstrated the

descriptive and influential relationship between green supply chain and firm performance in Pakistan's construction industry.

3.10 Validity and Reliability

Cronbach's Alpha and Pilot testing were used to assess the reliability and validity of the structured questionnaire. (Kumar, 2019).In this study, a reliable and valid sampling technique known as systematic random sampling was used. Using this sampling method,first organization has been selected randomly, and other organizations are selected with the difference of every five respondents of every organization of Construction industry chosen. Variables used within this study such as green purchasing, environmental design, and reverse logistics (Independent Variable), as well as firm performance (Dependent Variable), are reliable and valid A sample of 20 people chosen for this type of research study is valid and reliable. Furthermore, statistical instruments such as correlation and regression, as well as the procedure for data analysis, are highly reliable and valid instruments that are widely used for data analysis all over the world.

3.11 Scale Adaption

The following are the scales which are adapted from published research articles. The details of the variable along with Items and references are provided in the table below.

Sr No	Variable	Scale Adapted	Items	Reference
1	**Green Purchasing**	likert scale	8	(Setyaning, Wiguna, &Rachmawati, 2020)
2	**Design for he Environment**	likert scale	8	(Luo, & Deng, 2008)
3	**Reverse Logistics**	likert scale	8	(Bor, 2020)
4	**Firm Performance**	likert scale	8	(Mohammad, 2019).

CHAPTER 4: ANALYSIS AND FINDINGS

4.1 Data Analysis

4.1.1 Reliability

Reliability Statistics (Collective)

Cronbash's Alpha	No of Items
.879	32

This section focuses on Cronbach's alpha. The specific source is the reliability coefficient, which tells us how chosen items in such a set have positive correlations with one another.The higher the internal reliability, the closer the reliability coefficient is to one. Cronbach's alpha, as measured by reliability analysis, is 0.879, which is highly favourable in the context of our study. Cronbach's alpha is 0.879, which is quite close to 1, demonstrating the reliability of the questionnaire used as well as the reliability of respondents' responses.

Reliability Statistics

Variables	Cronbash's Alpha	No of Items
Green Purchasing	.867	8
Design for the Environment	.895	8
Reverse Logistic	.899	8
Firm Performance	.884	8

4.1.2 Descriptive Analysis

To test the data, for this research I grouped the data in to different groups/ classes, so that is easier to interpreted. In the sample size we have different groups and they are as following, gender, experience and designation. The questioner is floated and who every filled the questioner properly is indeed the part of this research.

Demographics		Frequencies	Percentages
Gender	Male	160	64
	Female	90	36
Designation	Supply Chain Manager	23	9
	Assistant Supply Chain Manager	55	22
	Operations Manager	84	34
	Procurement Officer	88	35
Experience	Less than 5 years	22	9
	5 to 10 years	112	45
	More than 10 years	116	46

With reference to total responses we got which was 250, if we separate it on the bases of gender it was 160 which is almost 64% of the total number we got, are male and remaining 90 which is almost 36% of the total number are female. Now if I count it on the bases of designation I received 30 responses from the Supply Chain Manager which is 12% of the total turn out. While 60 respondents are assistant supply chain manager, and this is about 24% of the total responses I got. Then I have got a large number of repones from the management professionals,

the number for the management professionals are 92 that covers almost 36.8 % of the total turn out. The remaining 68 respondents are procurement officer the personage of procurement officers is 27.2% of the total turn out.

Now if I count the responses on the bases of experience 9% of the responders with number of 22 had experience of less then 5 years. The responders how had experience of more then 5 years and less then 10 years were 112 which is a good number in percentage of 45%. However the remining 116 responders were having over 10 years of experience.

4.1.3 Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	S. D
GP	250	1.63	3.75	2.7526	.54425
DE	250	1.63	3.63	2.7891	.55970
RL	250	1.75	3.88	2.7865	.50789
FP	250	1.50	4.63	3.2943	.76209
Valid N (listwise)	250				

4.1.4 Correlation

The relationship between two variables are called correlation. If the two variables are highly correlated the number of correlation will be higher, and same on the other hand if the variables are not depending upon each other than the degree of correlation will be low. Which means the relation between those variables are not strong. If the degree of correlation is low it means that these two variables are hardly relating to each other. Studding this complete process and performing the measurement of the correlation between variables is named as correlation

analysis. I few see the result the rand should very from -1 to +1 of a correlation- coefficient. The correlation coefficient mostly used has been Pearson r.

Correlation Analysis

Variables	**1**	**2**	**3**	**4**
Green Purchasing	1	.414**	.633**	.663**
Design For The_Environment	.414**	1	.567**	.624**
Reverse Logistics	.633**	.567**	1	.667**
Firm Performance	.663**	.624**	.667**	1

All the values of the analysis are mentioned in above table, if we look in to the table values it clearly shows that green purchasing and firm performance so significant at 0.01 level with magnitude of .663** which clearly leads to the result towards positive direction. Now if we read it for the next variable which is design for the environment and firm performance is also significant with magnitude of .624** and this relation also leads to the positive direction.

Now if we look at the values for the reverse logistics and firm performance that is again significant at 0.01 and the level of magnitude is .667** the relation again in the positive direction.

4.1.5 Regression Analysis

When we are doing analysis another statistical analysis is mandatory to perform is regression analysis. This method is again very much important to measure the degree of relation

and dependances of the variables, which will tell us that the variables have the relation directly of inversely proportional. It will also tell us that how much a variable is depending on the other variable, which one dependent and which one is independent. On this level I used linear regression analysis for my variables in this study. After running this analysis it gives us a clear view of the relevant and reliable data.

Model Summary

Model	R	R Square	Adjusted R Square	S. E of the Estimate
1	.699[a]	.609	.596	.34421

a. Predictors: (Constant), Green_Purchasing, Design_For_The_Environment, Reverse_Logistics

As value of R indicates the simple correlation. Based on the value of R we have which is 0.699 (69.9%) gives strong indication of high degree correlation between green purchasing, design for the environment, and reverse logistics (independent variables) and firm performance (dependent variable). Similarly, R^2 gives an indication of extent to which "firm performance" can be explained by "green purchasing, design for the environment, and reverse logistics". Additionally, R^2 can also be considered as percentage of change that is brought by the independent variable in dependent variables. Regarding this study, R^2 is 0.609 (60.9%) which is very high. On the other hand, Adjusted R^2 shows how fit our theoretical model is. So, when it comes to this study, Adjusted R^2 is 51.5% fit, which is an excellent sign.

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	22.084	3	7.361	62.131	.000[b]
Residual	5.213	44	.118		
Total	27.297	47			

a. Dependent Variable: Firm_Performance

b. Predictors: (Constant), Green_Purchasing, Design_For_The_Environment, Reverse_Logistics

The significance level of this model is .000 which is less than .05 which itself shows that it is highly significant.

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.071	.308		2.179	.000
	Green_Purchasing	.380	.168	.485	4.042	.000
	Design_For_The_Environment	.552	.110	.699	8.674	.000
	Reverse_Logistics	.101	.199	.134	2.311	.000

a. Dependent Variable: Firm_Performance

Unstandardized coefficients are those generated by the model of linear regression after it has been prepared using independent variables measured in their original scales, i.e. in the same units in which the dataset from the source was taken to train the model.

Standardized Coefficients: Researchers can compare the relative magnitude of the effects of different explanatory variables in the path model by adjusting the standard deviations so that all variables, regardless of unit of measurement, have equal standard deviations.

Based on the concept, this table indicates the contribution made by independent variable to the dependent variable with certain significance level. In this study, the contribution made by green purchasing is 38.0% with the significance of .000, design for the environment is 55.2% with the significance of .000, and reverse logistics is 10.1% with the significance of .000 to employee performance.

A t-test is a statistical test used to compare two groups' means. It is frequently used in hypothesis testing to determine whether a process or treatment has an effect on the population of interest, or whether two groups differ. That is why in this research I use T-Test. F test can be used for different population. If the population is from different sectors then F test will be used.

4.2 Findings

Based on the results expressed above, following have been the findings in concern to the hypotheses of this study.

Hypothesis 1 was ‘green purchasing has positive impact on firm performance in Construction industry of Pakistan excluding the Construction marketing companies’ has been accepted in correlation and regression analysis. In correlation analysis, green purchasing is positively related with firm performance has been proved highly significant with the magnitude of .663. In regression analysis, it has been proved that there exists a significant relationship between green purchasing and firm performance, which indicates that increase in green purchasing increases the firm performance and vice versa.

Hypothesis 2 was ‘design for the environment has positive impact on firm performance in Construction industry of Pakistan excluding the Construction marketing companies’ has been accepted in correlation and regression analysis. In correlation analysis, design for the environment is positively related with firm performance has been proved highly significant with the magnitude of .624. In regression analysis, it has been proved that there exists a significant relationship between design for the environment and firm performance, which indicates that increase in design for the environment increases the firm performance and vice versa.

Hypothesis 3 was ‘reverse logistics has positive impact on firm performance in Construction industry of Pakistan excluding the Construction marketing companies’ has been accepted in correlation and regression analysis. In correlation analysis, reverse logistics is positively related with firm performance has been proved highly significant with the magnitude of .667. In regression analysis, it has been proved that there exists a significant relationship between reverse logistics and firm performance, which indicates that increase in reverse logistics increases the firm performance and vice versa.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Based on the findings and results mentioned above, it can be concluded that green supply chain has a significant positive impact on firm performance in Construction industry of Pakistan. In other words, it can also be said that green supply chain (green purchasing, design for the environment, and reverse logistics)brings a definite change in the firm performance in Constructionindustry of Pakistan. As discussed in (Chapter 1), objective of this study was to analyze the impact of green supply chain (green purchasing, design for the environment, and reverse logistics) on firm performance in Construction industry of Pakistan. Adaptive structured questionnaire has been distributed amongst the organizations within Construction industry of Pakistan excluding the marketing companies for data collection, as impact of each variable has been clearly observed in this study. However, a scale has been set which ranges 5% of the significance level in order to test the acceptance and rejection of hypotheses of this study.

Based on the significance level, H_1, H_2, and H_3, have been accepted. As significance level of green purchasing, design for the environment, and reverse logistics for firm performance has been less than 0.05. (Choudhary and Seth, 2011) collectively investigated the relationship of green SCM and firm performance. The said research also found the significant relationship. (Sarkis et al, 2017) also investigated the impact of selected variables on firm performance and identified the results which are aligning with the results of current study. H1, H2 and H3 was formulated and have been accepted and proved significant. Furthermore, green purchasing, design for the environment, and reverse logistics have been empirically tested with firm performance for demographics including gender, age, designation, education, experience, and found positive correlation between them (Eltayeb&Zailani, 2009).

In addition, correlation analysis has shown that green purchasing, design for the environment, and reverse logistics are positively correlated with firm performance with the magnitude of .500, .592, .522 respectively. (Kumar and Chandrakar, 2012) investigated and identified the significant correlating between selected variables. Furthermore, regression analysis has revealed a significant relationship between green supply chain (green purchasing, design for the environment, and reverse logistics) and firm performance (Zhu et al., 2008; Toke at al., 2010; Chin et al., 2015). Conclusively, it can be said that green supply chain positively impacts firm performance in Construction industry of Pakistan excluding the Construction marketing companies. This research will contribute in awareness of the construction industry. There is lots of the way to implement green practices in construction industry. But most of the decision maker in construction industry of Pakistan is not that much lit-rate people. This research will leads them to adopt green practices, while doing miner changes in their daily routine work. This will leads them to realise that you can not construct a house for your self by pushing your future generation into the danger. Non environment friendly activities can push the next generation into an unseen disaster.

This research is intentionally conducted on construction industry, because in construction industry is the come of the main causes of the deforestation. This is for the government, general public and for the concern people working in construction industry. If you are effecting the environment this is your responsibility to give back to the society. And this can be done very easily. Just plat another tree if you cut one. This is very basic and its very easy and implementable if the regulations department implement it.

5.2 Future Research and Recommendations

This study has covered the majority of the topics. There is, however, always room for improvement. While conducting research in the future, some improvements to this literature study could be made. Improvements can take the form of a longer time frame, a different industry, different variables, additional variables, a larger sample size, and so on. In the future, the time frame might be extended to allow for a more in-depth research study. Appropriate time must be assigned to the research scientist for having conducted this extensive research, as it will aid in the collection of responses from organizations associated with the entire Construction industry in Pakistan, excluding marketing firms.Furthermore, this study was conducted on the Construction industry in Pakistan, but it could be conducted on any other industry in Pakistan.Moreover, this study only ever used two types of variables (like dependent and independent variables) and did not include a mediating or moderating variable. As a result, a mediating or moderating variable could be included in the study to provide a more comprehensive study of the relationship between the variables in this study.Eventually, the sample size can be increased to carry out this study more effectively.

5.3 Research Limitations

Limitation has been recognised as a roadblock that a researcher must overcome when conducting a research study. Several limitations were encountered while carrying out this study.The major constraints were a limited time frame, a small sample size, and so on. A significant amount of time was required to cover the literature on the impact of green supply chain on performance in Pakistan's construction industry.Even so, the time frame accessible for completing this study was insufficient because gathering responses from supply chain members associated with Pakistan's construction industry required a prolonged timescale. A good time

frame with some extra time must be considered to conduct an appropriate research covering responses from customers associated with Construction industry and belonging to different Construction companies other than the marketing companies within the country. For a study to be of wide scope, increased time span is required. Additionally, sample size was another constraint. For covering the entire Construction industry of Pakistan, sample size of 250 was not enough. A broad sample size has been required for conducting more detailed research that represents entire Construction industry of Pakisanexcluding the Construction marketing companies.

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APPENDIX

Research Questionnaire

This questionnaire has been designed for the sole purpose of collecting data on the "Impact of Green Supply Chain on Performance of Construction Industry in Pakistan". The data collected will be treated with a very high degree confidentiality and it is meant for academic purpose only. You are kindly asked to fill out this questionnaire by encircling the right number representing a category in front of the applicable answer or in the applicable cell.

Regards:

Saif Ur Rehman

Section A:General Information

Gender

- Male
- Female

Designation

- Supply Chain Manager
- Assistant Supply Chain Manager
- Operations Manager
- Procurement Officer

Experience

- Less than 5 years

- 5 – 10 years
- More than 10 years

Section B:Green Supply Chain

Green Purchasing	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Our firm purchase environment-friendly raw materials	1	2	3	4	5
Our firm substitute environmentally questionable materials	1	2	3	4	5
Our firm use green packaging	1	2	3	4	5
Our firm change for more environmentally-friendly transportation	1	2	3	4	5
Consumption of hazardous/harmful/toxic materials is decreased by our firm	1	2	3	4	5
Our firm choose suppliers by environmental criteria	1	2	3	4	5
Our firm urge suppliers to take environmental actions	1	2	3	4	5
Environmental compliance is improved by our firm	1	2	3	4	5

Design for the Environment	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Our firm provides design specification to suppliers that are friendly to environment	1	2	3	4	5
Our firm optimizes process to reduce solid waste	1	2	3	4	5
Our firm optimizes process to reduce air emissions	1	2	3	4	5
Our firm optimizes process to reduce noise	1	2	3	4	5
Our firm use cleaner technology processes	1	2	3	4	5
Our firm is pursuing sustainability design initiatives that are based on an ecological focus	1	2	3	4	5
Our firm is initiating EcoDesign for environmental and economic benefits	1	2	3	4	5
Our firm is willingly initiating EcoDesign	1	2	3	4	5

Reverse Logistics	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Our firm recycle materials internally	1	2	3	4	5
Our firm recycle products for their reuse	1	2	3	4	5
Our firm recycle products for their better	1	2	3	4	5

disposal					
Our firm recycle products for their safe disposal	1	2	3	4	5
Our firm take back packaging	1	2	3	4	5
Our firm use eco labeling	1	2	3	4	5
Our firm recycle products and materials for benefitting the environment	1	2	3	4	5
Our firm is pursuing reverse logistics initiatives based on an ecological focus	1	2	3	4	5

Section C:Firm Performance

Firm Performance	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Laws/regulations enforce us to actively implicate green supply chain	1	2	3	4	5
To comply with regulations and permits, our firm is actively implicating green supply chain	1	2	3	4	5
Customers emphasize their selection of our firm's products/services based on how we address environmental issues like waste reduction, and recycling	1	2	3	4	5

Customers calling for our firm to focus on issues related to green pro-environmental strategy implementation to accommodate buyer needs	1	2	3	4	5
Green supply chain is a challenging opportunity for our firm	1	2	3	4	5
Green supply chain has become a source of competitive advantage for our firm	1	2	3	4	5
Our firm is actively supporting green supply chain for betterment of the community	1	2	3	4	5
Our firm always seek ways to improve green supply chain for betterment of its performance	1	2	3	4	5