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**An Investigation into the Environmental Sustainability Practices in Saudi Arabian
Small and Medium Sized Enterprises (SMEs) in Manufacturing Sector**

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Abstract

Acknowledgement

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Chapter 1: Introduction

1.0. Introduction and background

Environmental sustainability is a practice that business organizations incorporate in their work activities, so that a stable and secure future for their business is achieved. Environmental sustainability is defined as the ability of a business organization to adapt to change in the business environment to capture contemporary best practice methods and to achieve and maintain superior competitive performance (Lonial, 2015). It relates to the futuristic plans that business formulates and then operate upon, such as to reduce waste, assure the efficiency of supply chains and building its brand. Sustainability is an all-inclusive practice, targeting everyone involved in the business i.e. the suppliers, the operations, the consumers (Lonial, 2015). Sustainability is gaining momentum when it comes to business practices, government policies and academic work globally.

In Saudi Arabia, environment is facing a severe threat caused due to the change of climate and depletion of natural resources. Climate change causes numerous threats to ecosystem, economic strength, water and food reserves. Due to high living standard in Saudi Arabia, consumption of natural resources has been enhanced resulting misbalancing in the natural reserves (Quinn, 2011). Majority of natural resources come from fossil fuel and burning of fossil fuel becomes the major threat and reason of global warming. Extreme climate conditions across the region has caused the depletion of the ozone layer triggering skin and respiratory problems. In the timespan of 1980 to 1990, the demand of water from the natural resources has been increased from 9.95m³ billion to 22.60m³ billion which is an alarming situation (Agwu et al, 2015).

The change of environment causes global warming which negatively impacts the humanity and biological system (Achoui, 2009). All of these negative effects sums up and enhance the destruction of species that reside in the planet earth. There are three levels of climate change impact which are described are as under:

- The first one is change in the physical system of earth which is melting of glaciers, land sliding, sea / river flooding and terrestrial erosion.
- The second level of climate change impact is the variation in the biological system. In marine and land ecosystem, it is observed and witnessed the demise of fauna and flora which is a huge environmental disaster.

- The third level is the variation in the human system. The destruction of food and crops due to vigorous climate change causes loss of economy and wealth.

There are some of the important factors to be implemented by the manufacturing industrial sector so that the environmental sustainability is attained in the most professional manner. This is to be more environmentally sustainably and be a better business.

Resource efficiency is key when it comes to environmental sustainability in businesses and SMEs. It is significant to use natural sources of energy for the generation of electricity, gas etc. installation of solar panels at home will generate electricity and so as the use of wind mill can generate ample volume of electricity to operate water turbines. The use of natural sources will lessen the utilization of fossil fuels and will enhance the earth's life. Some of the most peculiar wind power project includes Saudi Aramco's Turaif 2.70 Mega Watt project. Famous solar energy project includes Sakaka Project with the capacity of 300 MW generation of energy and Al-Midra Power Project generates 10.50 MW of energy (Wiesner, 2018). However, there is a long way to go for SMEs to be more environmentally sustainable. Public awareness is needed for saving the natural resources on a wider spectrum so that the species that exist in the earth can live hale and hearty. The release of dangerous gases from the industrial units weakens the ozone layer which directly implicates the growth of human health risk factors. So as the marine life gets disturbed due to water pollution and disturbs the ecosystem. It is obligatory to make constructive arrangements to make the planet earth healthier and stronger so that the species existing in it can live well (Al-Mahrouq, 2010). Saudi Arabian government has initiated environmental sustainability initiatives such as recyclable and biodegradable products as an alternate of plastic bags that would make the environment free from bad impacts (Soininen, 2012). Despite various ad hoc sustainability practices there is a need to carry out further research and support managers with more insights into effective practices.

1.1. Problem Statement

The implementation and maintaining of environmental sustainability practices is the modern and latest area of concern for the small and medium sized enterprises (SMEs) all around the world. This is particularly important for SMEs in the Saudi Arabian manufacturing sector due to its operational business activities and significant environmental impact. There is a concern for climate change due to increasing carbon emissions due to business operations. Environmental

sustainability can help minimize carbon emissions and address the issue of climate change which is a serious global concern at the moment.

1.2. Research Aim and Objectives

The main aim of this research study is to explore how Saudi Arabian Small and Medium Size Enterprises (SMEs) are implementing environmental sustainability into their core business operations in the manufacturing sector.

Following are the specific research objectives which will help in meeting the main aim of the research:

1. To investigate the current state of environmental sustainability practices in SMEs in Saudi Arabian manufacturing sector.
2. To explore the drivers and motivations for implementing environmental sustainability in SMEs in Saudi Arabia manufacturing sector.
3. To investigate the barriers/challenges to effective implementation of environmental sustainability in SMEs in Saudi Arabia.
4. To give recommendations for improving the implementation of environmental sustainability in Saudi Arabian SMEs and in other countries more generally.

1.3. Research Methodology

There are couple of research methodology approach i.e. qualitative and quantitative. The data collection method of quantitative approach to be used that would help to obtain the research aim and objectives. Small and Medium Enterprises in Saudi Arabia are consistently working hard to ensure that the required amount of information is retrieved related to environmental sustainability practice (Whittington, 2017). SurveyMonkey tool would be utilized by the relevant managers for the purpose of data collection and data analysis will then be carried out. Professionals of different categories will be invited for the questionnaire related to the environmental sustainability factors for the manufacturing sector. This will give the clear identification of small and medium enterprise professional intention and ideology related to sustainability approach (Smart, 2016).

1.4. Research Implications

Small and medium enterprises are the backbone of the economy and it is very important for them to adopt practical strategies for the implementation of environmental sustainability approaches. The proper use of the latest technology will induce efforts to make the society maintained and sustainable. The study will offer contribution to knowledge through empirical research. It will also give recommendations to SMEs managers in the manufacturing sector for improving the implementation of environmental sustainability in Saudi Arabia and in other countries more generally.

Below is the distribution of company type depending upon the number of employees in Saudi Arabia. This disintegration assists in making the analysis of efforts made in maintaining environmental sustainability.

Type of Organization	Number of Employees	*Annual Revenue
Micro	1 to 4	Less than 3 million
Small	5 to 19	Less than 40 million
Medium	20 to 199	40 to 100 million
Large	200 plus	More than 200 million

**Saudi Arabian Riyal*

There are competent authorities in Saudi Arabia which always track and monitor the activities of small and medium enterprises who are in the business of manufacturing as their production of specific products require technical processes which produces gases and by-products effecting the environment. Some of the significant institutions along with the assigned responsibilities are as under:

Saudi Institutions	Assigned Responsibilities
NCWCD- National Commission for Wildlife Conservation and Development	Preserving and security of the marine and worldly wildlife
MoA- Ministry of Agriculture	Maintaining fisheries, forests and animal resources
MoMRA- Ministry of Municipal and Rural Affairs	Maintaining waste management policies in the nation
MoH- Ministry of health	Maintaining health measures across the region
Saudi Aramco	Environmental issues of the region
SABIC- Saudi Arabia Basic Industry Culture	Environmental issues of the region

Therefore, environmental sustainability has gained strategic importance due to external and internal policy drivers from the government. According to survey, in the year 2015, the water consumption for the industrial purpose was in total 4% for which water treatment plants were also needed to the purification of waste water so that there is no harm cause to the society.

1.5. Thesis structure

The structure of the thesis would be as below:

Chapter 1: Introduction

This chapter gives an overall introduction to the research study. It presents the R research background, problem statement, research aims and objectives, research methodology and implications of the study.

Chapter 2: Literature Review

This chapter critical review of existing literature around the topic of environmental sustainability in business organisations in general and SMEs in particular.

Chapter 3: Research Methodology

This chapter presents methodological approaches used in this research study with justifications.

Chapter 2: Literature Review

2.0. Introduction

Environment sustainability is becoming one of the most important leadership challenges in business world. An extensive literature has explored the drivers for sustainability at different levels. A country's long-term sustainable development is mainly based on environmental sustainability of small and medium enterprises (SMEs). In several developing countries' economics, the SMEs are playing vital role. According to the World bank's 2018 report SMEs contributing about 40% of Gross domestic product and 60% of total employment in developing countries (Fatoki, 2018). As the environmental sustainability practices impact on human activities and it can lead for more reliable products or services by reducing the waste and increasing the profitability in the long run. Environment sustainability practices can make profitable economic sense in business context (Henderson et al., 1972). Furthermore, the climate conditions in Saudi Arabia hinder the development of communities and cities and building industry has undergone major development. However, with use of extra resources, Saudi Arabian SMEs are at a level that is not sustainable. The building industry has adverse impacts on natural environment in terms of global warming and from the last few decades the sustainability of environment assessment has emerged for promoting sustainable SMEs schemes (Crawley and Aho, 1999). This literature survey reviews sustainability as a concept, environmental sustainability in business organisations and small and medium size enterprises (SMEs) in general and Saudi Arabia. It also reviews its drivers and barriers to its implementation.

2.1. What is Sustainability?

Sustainability derived from the word sustainable which accounts for a kind of development which satisfies the current needs without compromising the ability of the future generations to satisfy their needs. Different countries came across to different sustainability challenges and follow the respective pathways. Sustainability is important in term of providing environmental quality for generating healthy communities. Natural resources, clean and fresh fair, non-toxic environment are the major constituents of a healthy community (Holden et al., 2017).

Sustainability science is the most useful thought of research which not covers the basic or applied research whereas it provides the advanced knowledge for creating a dynamic bridge between enterprise and modern science technology (Kates, 2011). UN also defines sustainability

development according to which sustainability is an organizing principle whose goal is to meet human development as well as sustain the ability of natural system to give ecosystem services and natural resources on which economy of society based. UN General Assembly acquire agenda for sustainability development “integrated, universal and transformative” in September 2015. UN also provides a set of 17 sustainability development goals that are to be implemented in each country in all over the world from 2016 to 2030. The purpose of sustainability development is to develop a balance in environmental, economic and social needs. This development allows prosperity for both new and future generations. It allows to change the ways of developing countries and allowed them to meet basic needs of water, food, employment, energy and sanitation. The sustainable development conceptually divides into three main components including social sustainability, environmental sustainability and economical sustainability and these are also known as pillars of sustainability (Panel et al., 2011).

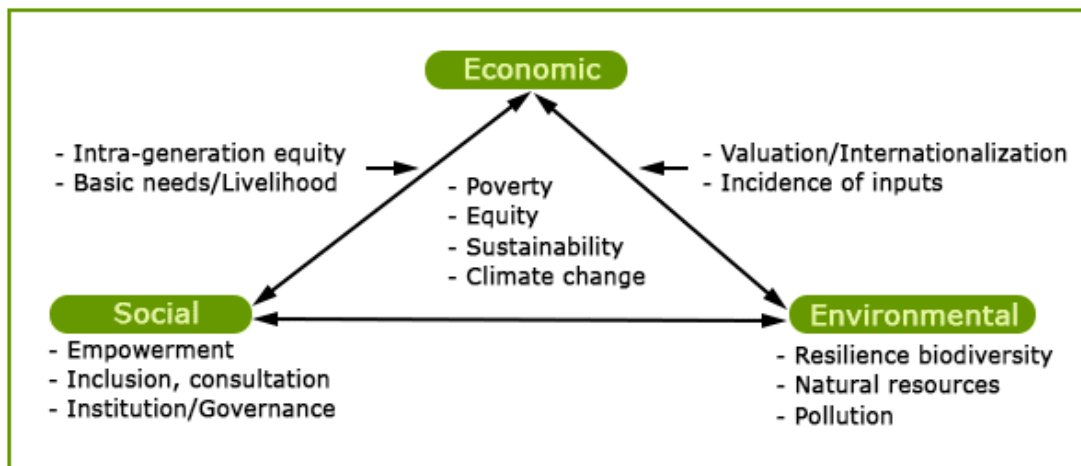


Figure 1: Components of sustainable development (Panel et al., 2011)

From Figure1 above, the sustainability pillars are integrated, for the economic sustainability which is helpful in decision making. This integrated approach also expresses a range of economic, social and environmental effects. In a community the sustainability cannot be achieved unless the whole community gets involved in it with continual improvement (Nyfeler, 2013). All these three pillars of Environmental sustainability are also represented through Venn diagram visually depicting nested concentric circles for sustainability indicators. This figure also shows the integration through different patterns. The Environmental sustainability pillars explicitly embedded in their formulation and lacks the strict logical properties (Sidiropoulos, 2014).

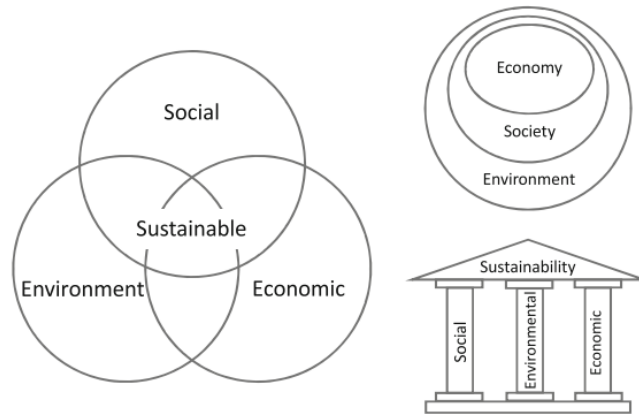


Figure 2: Environmental sustainability pillars representation through Venn Diagram
(Sidiropoulos, 2014)

In Figure 2, the left picture representing the sustainability by three intersecting circle whereas the right picture showing alternative depictions and literal pillars presenting the concentrating approach for environmental sustainability (Nyfeler, 2013). In 1994, a concept of triple Bottom line was proposed by Elkington for sustainable practices in business. He also concludes the three aspects for a sustainable conduct including Economic prosperity, environmental quality and social justice in more elaborated forms. This concept magnifies the business focus on financial bottom line by considering social and environmental aspects. (Majid and Koe, 2012). The concept of triple Bottom line was used by many scholars for sustainable development as it proves helpful in financial return, social impact and environmental responsibility. After years many researchers also proposed their models based on the idea of triple Bottom line model and concluded that the three aspects (social, economic and environment) remains as main challenge for most of the businesses (Nwogugu, 2009).

For a detailed framework to understand the sustainable development the researchers developed a more complex model expressing how three pillars of sustainable development can interlink to determine the sustainability of an entity. A framework named Five Capital Model was developed by an organization by highlighting the numerous challenges for a business to get sustainable development. The base of this model was “capital” which include “Natural Capital”, “Human Capital”, “Social Capital”, “Manufactured Capital” and “Financial Capital”.

Natural Capital mainly include the natural resources as well natural pollutants and the organizations must try to avoid the depletion of the natural resources by introducing the techniques for regeneration of environmental resources.

Human Capital covers issues related to health, skills and knowledge of the humans. For any organization smooth and effective result generation the skilled persons play the vital role and looking after of the employees is an important part of sustainable business development (Parkin, 2000).

Social Capital helps in developing common values in terms of increasing trust, networking and relationship with others which helps in communication resulting significant benefits.

Manufactured Capital mainly linked with the workforce which helps in transforming the raw material into a useful product. If the quality of the workforce is not good, then eventually it generates severe impacts and decrease the efficiency. The manufactured capital mainly includes buildings, transportation network and different machine tools etc.

Financial Capital covers the assets which is money and it can be in the form of shares or bonds. The financial capital is not always sustainable even if the rest of the four capitals are managed well. In case of any natural disaster, the estimated value of financial capital can be changed (Parkin, 2000).

2.1.1. Social sustainability

Sustainability concept was emerged in 1960s in response to environmental degradation due to poor resource management. From last few decades, it this pillar of sustainability was becoming ignored and was not getting publicity. Only bio-physical economic issues of sustainability were becoming focused by people, but this approach did not show any significant change in “development” and “economic growth” (Firth and Smith, 2018) After failure of this approach, researchers started focusing on social sustainability. (Gough, 2009). A review of literature shows that social sustainability has very importance in development of societies. Purpose of literature review is to determine diverse literature that is meant for social sustainability and describes different ways by which it plays its role in social sustainability. Social dimension of sustainability is widely used in America and all other developed countries including Saudi Arabia (Bridge, 2000). Literature suggested that developing countries should also focus on social sustainability for meeting their needs of employment, food and water etc. The important part of social sustainability

is that it addresses organizations, government and citizen about their social life and social needs. After failing of last approaches, researches are focusing on social sustainability and increase focus of people in researches and teaching of social sustainability (Kibert, 2016).

2.1.2. Economic sustainability

Economic sustainability is defined as a matter of intergenerational equity, but the specification of this sustainability is sustained not straightforward. Economic sustainability provides a relationship between sustainable development, pure time preference, distributional equity, and optimal growth. It is a complementary factor and maintains a balance between two equities. (Delrue et al., 2012). Literature attempted to provide a long-term new observational narrative for economic sustainability for the economic health of both developing and developed countries. When literature matches the results of many observations, it is clear that economic sustainability is essential for the development of a healthy society. It provides a good natural ecosystem for living organisms. Nowadays, the concern of people for the study of economic sustainability and its relationship with the other natural sources is increasing day by days (Jänicke, 2012). Literature also analyses the economic sustainability of energy crops for developing its concept. It shows that the use and production of the biomass of energy has two types of impact on the environment that can be positive and negative impacts. The Dutch Centre for Agriculture and Environment has also developed a systematic methodology for assessing the economic and socio-economical sustainability of biomass crops. The method that they used for assessing biomass energy of crops was related to Life Cycle Assessment. The literature highlights that the economic sustainability of every department is necessary and has importance for the development of Saudi Arabia. It not only develops society but also develops the life of living things (Dauber et al., 2012).

2.1.3. Environmental sustainability

Global is increasing its attention toward environmental sustainability. Carbon footprints and natural resources are recycled to improve economical sustainability. In the business, it gives opportunities to organizations to coordinate comprehensive sustainability targets (Panel et al., 2011). It also provides strategies and responsibility programs to organization to create a balance between two equities. Today, economic sustainability is more discussing on public debate and has more potential than others. Scientific researches and literature provide policies for economic sustainability such as Paris Agreement and Sustainable Development Goals. Environmental sustainability is important for all types of organizations either it is of small scale or large scale.

Both individual citizens and corporate citizens are focusing on improving environmental sustainability in incrementally and transformative ways (Smeets et al., 2008). Each positive step of any organization either it is small or large act as a first step to create a virtuous cycle of sustainability. It can reduce harmful or excessive wastes of any organization and can improve the condition of that organization to create sustainable society, planet and economy for present and future generation (Roseland, 2012).

The term Environmental sustainability expands the common perception of human activity by interlinking the ecological concept of interdependence corresponding to the functioning of ecosystem. More specifically Environmental sustainability is the condition of balance that allows human society to fulfil their needs for the nature by supporting the ecosystem and adopting the generation or recycling methods (Morelli, 2011).

The natural environment has remarkable ability to sustain its viability. Consider the example of a tree or plant when it decomposes it provide nutrition and mineral to the soil which helps in sustaining the further growth of the plants. As nature counts a major pillar in environment and the violation in nature rules can generates fundamental problems with empirical studies (Elkington, 1994).

In a nutshell, the environmental sustainability is the capacity for improving quality of human life by supporting the ecosystem. With increase of the population the increase is usage of natural resources is also obvious which is declining the balance between human and nature. This is generating the negative impact on human and environment which can be reduced recycling and regeneration (Regan et al., 2000).

2.2. Environmental sustainability in business organisation

Sustainable development was provided as an agenda for examining and guidance of global environment and development. Now, this concept is getting progress and has been transferred to various fields especially in studies and business practice (Elliot, 2011). The concept of environmental sustainability is doing progress day by day. There are many reasons of increasing its practice but most important are mentioned here. Stakeholder groups (such as media, employees, government, stakeholders and society etc) are increasing the demand of adopting and implementing responsible management practices. Therefore, these stakeholders are demanding strong economic performance as well as social and economic sustainability of that

organization. This is because, unsurprisingly Corporate Social Responsibility, Sustainable Management and Business Ethics are becoming an important part of any organizational strategy. Environmental sustainability is also becoming organizational day-to-day operations and also becoming an important part of curriculum development in business schools. The second and most important reason due to which the concept of environmental sustainability is increasing now-a-days is “Business Case for Sustainability”.

Business case for sustainability describes that how a relation between social, environmental and corporate economic success can be advanced, together, innovated and managed. By doing literature review, sustainability-related activities directly and indirectly play role in developing societies and business. Stakeholders are using different sustainability models such as Triple Bottom Line for developing of business in developed countries. Triple bottom line model provides designs for all pillars of sustainability that are social sustainability, environmental sustainability and economic sustainability (Stubbs and Cocklin, 2008).

The sustainability of an organization is linked with the transformation of environmental priorities in which the concept of sustainability targets the driving force in decision making. By this the organization generates internal cultural values to achieve certain level of sustainability through collaboration with other stakeholders (Stubbs and Cocklin, 2008). The framework of sustainability utilized the assumptions of ecological modernization to business practices and behaviour. The sustainability aim in business is to engage the entities in different situations rather than presenting one version of sustainability (Stubbs and Cocklin, 2008).

2.3. Drivers and Barriers to implementing Environmental Sustainability in Business Organizations

The management has emerged as an essential organizational philosophy to overcome social and environmental risks because role and importance of business is changing in contemporary society. There are many drivers that play positive role in implementing environmental sustainability in business organizations. On the other hand, there are also some barriers to environmental sustainability. Literature review shows that drivers for sustainable practices are directly related to internal factors and other factor that is of great importance for implementation of sustainable practices is organizational factor. While organizations describe that barriers for implementation of sustainable practice are internal. Some other barriers are lack of financial resources such as machinery, equipment and increase of demand for better development.

Literature survey indicates that for sustainable practices, drivers are most common and identified than barriers. The barriers of environmental sustainability that are experienced by different organizations are tends to become more internal and external (Giunipero et al., 2012). Some of drivers of environmental sustainability are organizational values, organizational culture and ethical principles while barriers include workers resistance to change (Giunipero et al., 2012).

2.4. Environmental Sustainability in Business Organizations in Saudi Arabia

Among Middle Eastern Nations, Saudi Arab is the most important and developed country. Saudi Arab is considered as a vital country among all over Middle Eastern nations because it has a key role in International Petroleum Production. Environmental sustainability practices are becoming more prominent in both public and private sector of Saudi Arabian business enterprises. For tackling environmental and social problems the government of Saudi Arab has become serious. Primary data showed that managers of private sector in Saudi Arabia were better prepared and were eager to deal with the carbon management and sustainability problems as compare to public sector enterprises. Saudi managers of Surveyed reported that employees of their organization will start rewarding positive environmental sustainability actions and will also take part in educating their managers about sustainability and carbon cycle management. The findings and results of literature survey can enforce Saudi Arabian leaders and policymakers of private and public sector universities to change the structure of higher education sector. The purpose of this step is to prepare their students for various jobs for future. This will help Saudi Arabia to pursue environmental sustainability (Mandurah et al., 2012).

2.5. Environmental Sustainability in SMEs

People are witnesses of worst natural calamities and by adapting the good environmental practices, the SMEs can gain competitive advantage which can help in sustaining a business. There is some misunderstanding in achieving this practice where different organizations believe that environmental issues effect their businesses (Simpson et al., 2004). The scale as well as rate of environmental degradation is widely spreading among governments, businesses and civil society with the help of economic activities. Corporations are adopting sustainability practices and sustainability reporting in all over the world. This practice is more common in premises of most of corporation of Saudi Arabia. Large organizations procure their all service and manufacturing operations to small and medium corporations and enterprises. Thus, large organizations

effectively convert their whole environmental burdens on small enterprises and vendors. In developing countries, weak enforcement of environment laws and poor regulations leave SMEs on their own and allow them to improve their environmental practices. Limited resources and managerial capabilities of developing countries are not adequate to do sustainability practices (Bos-Brouwers, 2010). According to a research the business practices offer obvious benefits for SMEs as the size of corporation increase the demand of environmental management also increase which contribute directly is sustainability efforts. In many organizations the insurers charge high premium from SMEs due to environmental risks (Lee, 2008).

2.6. Environmental Sustainability in SMEs in Saudi Arabia

In middle East region, Saudi Arabia has begun to exploit its potential as destination for individuals as well for business organizations. Saudi Arabia is now being more outward facing as a result of its Vision 2030 where sustainability is at the heart of it. Along the environmental challenge the country is facing many economic challenges. In this situation the Environmental sustainability in SMEs is helpful in planning development initiatives with focus on sustainable environment (Johnson, 2010). Many foundations and project partners have hosted a number of sustainability practices in Saudi Arabia. These programs provide a foundational understanding of sustainability business concept to small and medium size enterprises. The purpose of those programs was to provide knowledge and skills about environmental sustainability to Saudi SMEs. These skills can apply directly to get well-established business. These training programs are also held to build entrepreneurial capacity, to improve business performance and to increase knowledge of International Sustainability leading practices and to share organizational learning (Joanne Johnson, 2010). This section needs to be expanded with more relevant literature.

2.7. Gap in the knowledge

In any business or organizational environment, the unpredicted fundamental changes help in forming traditional business models which help in achieving the target in obsolete situations. In present day, business improvement techniques polish the skills and effectively monitor the improvement of processes through visual management system. This review has explored that environmental sustainability has been well researched in the context of developed countries. Past researchers have explored a range of dimensions of environmental sustainability both in business organisations and SMEs. They have also investigated drivers and barriers to change. However, there is a lack of literature in environmental sustainability in the context of SMEs and that as well

from Saudi Arabian perspective. This suggests that this is an under-developed and under-researched area and offers the foundation of future research. SMEs have a key role in an economy and in SMEs, the competitive capacity can be increased with the economic growth in Saudi Arabia (Swanson, 2007).

2.9. Data Collection and Analysis

This research study will adopt quantitative research approach in order to answer the central research aim and objectives. Quantitative data collection method of questionnaire survey will be used to collect the required data to answer the main research aim and specific objectives. Managers in Saudi Arabian SMEs in the manufacturing sector will complete the questionnaire which will be carried out online with the help of SurveyMonkey tool. Junior, middle and senior management in Saudi Arabian SMEs will be invited to complete the questionnaire to gain their perspective. Statistical analysis will be carried out with the data collected from Saudi Arabian SMEs.

2.10. Conclusion and Summary

Sustainability is most important part for business organizations among all over the world. It improves the condition of developed as well as developing countries. There are three pillars of sustainability that are social sustainability, environmental sustainability and economical sustainability. All these pillars are core part of any society and play role in their development. Environmental sustainability is most important pillar among all others and plays beneficial role in business growth. Developed and developing countries are arranging programs to provide knowledge and skills of environmental sustainability and gain competitive advantage. Based on the literature survey and gap in the existing academic knowledge, this study's main aim is to explore how Saudi Arabian SMEs are implementing environmental sustainability in their core business operations.

Chapter 3: Research Methodology

3.0. Introduction

In order to meet the objectives of a research, it is crucial to adapt an appropriate research approach which helps in guiding all of the procedures of conducting a research. Research methodology is the most important part of a research approach, which makes it coherent and comprehensive. It spans from broad and varied assumptions to comprehensive procedures of data collection, sampling, data analysis and interpretation. According to Steele (2000), whether it is applied or fundamental research, adapting a proper research framework/methodology helps in enhancing validity, generalizability and authenticity. Because, it ensures that the researcher has taken care of research ethics and followed a concrete pathway to meet the findings and meet the research objectives.

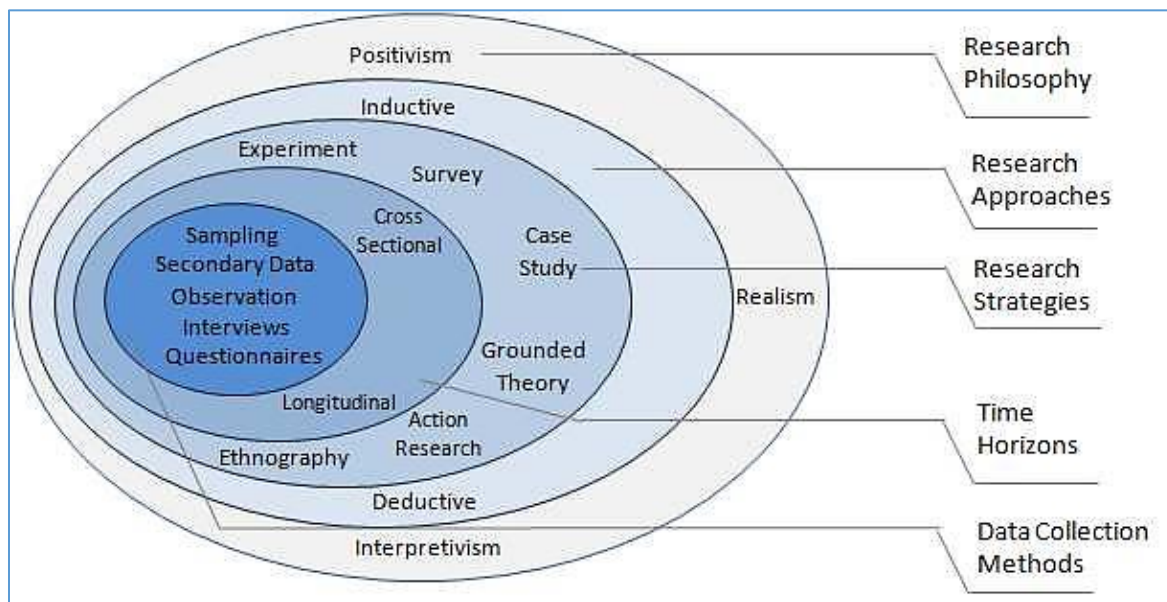


Figure 3: Research Onion (Saunders, 2011)

This chapter particularizes the key decisions and their rational about the research methodology which will be adapted to conduct the research. In order to make particular choices about the research phases and procedures, onion framework (Saunders, 2011) is followed which elaborates all of the phases and approaches which could be considered in conducting different types of researches.

Saunders (2011) has helped in making discrete choices about research methodologies by confining the constituent processes, comprehensively, in five layers, to cover every aspect of a methodological choice. with the help of this Onion Framework, this chapter develops the decisions & rationales about research philosophy, research approach, methodology, research instruments, data analysis, time horizons and sampling techniques. All of these particulars are developed after careful examination of research aims and objectives, limitations and ethics in this study.

3.1. Research philosophy

The broader term “research approach” is used to collectively describe a set of activities (research process) which involves the intersection of **research philosophy**, design, strategy and specific methods for data collection.

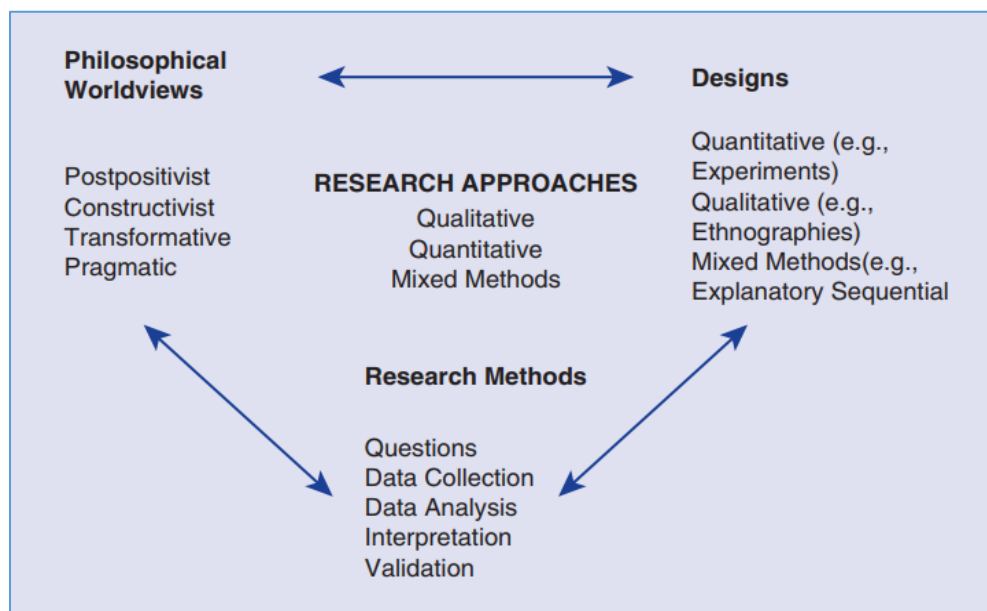


Figure 4: Research methodology selection process

Choice of research philosophy is a basic step which specifies how, when and what resources will be used to collect the data as well as their analytical framework to extract the findings and reaching the conclusion. Hence, investigation of a particular research problem begins from the selection of philosophical approach, leading to the decisions of research design and methods (Cook, 2000).

Neuman (2000) identified four research philosophies which take into account the general philosophical orientation, nature of the research, research's discipline orientations, researchers' inclinations and experiences. these philosophies include the following:

Postpositivism	Constructivism
• Determination • Reductionism • Empirical observation and measurement • Theory verification	• Understanding • Multiple participant meanings • Social and historical construction • Theory generation
Transformative	Pragmatism
• Political • Power and justice oriented • Collaborative • Change-oriented	• Consequences of actions • Problem-centered • Pluralistic • Real-world practice oriented

Figure 5: Philosophies for a research

The **post- positivists** deal with the deterministic philosophy or causal studies in which cause & effect relationship is found. It particularly deals with experimental & scientific studies and provides with very authentic & valid research findings (Dillman, 2011). It often leads to adaption of quantitative research method.

The **constructivist philosophy** is, typically seen as an approach leading to qualitative method and deals with the social construction of reality. It involves in seeking the understanding, general knowledge and subjective meanings, which are varied & multiple, hence, complex (Duffy, 2005).

The transformative view deals with the issues of social justice or power, discrimination & oppression and other societal perspectives. It is largely based on qualitative research method and results in explanatory & descriptive research findings (Evans, 2005).

The **pragmatic philosophy** is derived from the work of James et al (1992). It arises from certain situations, actions and consequences, and deals with the situational factors i.e. What works and what could be the solution to the problem. Briefly, it is intended to be used for the researches which are problem- solving or intended to seek a solution for a particular situation whether it is social or scientific. This philosophy leads to either qualitative, or quantitative or mixed method approaches (Evans, 2005). It is multidisciplinary in nature, can be adapted for every kind of

research, given the pragmatic solutions to the problem, reality based, extract factual information and highly generalizable.

To conduct this research “investigation of sustainability practices in SMEs of Saudi Arabia”, **post - positivism research philosophy** is adapted. The choice is made because of the following advantages which it offers:

- It reverts the positivist’ concept that “a research and researcher are independent of each other” and believes that backgrounds, values, theories and knowledge of the researcher influence the observations, thus, the research findings too (Harris, 2009).
- It helps in strategizing a way for collection and analysis of quantitative data which leads to the conduct of a more valid, authentic, coherent and generalizable research.
- It helps in presenting knowledge of the social world as that of scientific one and lead to the critical analysis of social phenomenon.
- It helps in investigation of a reality within a social or natural phenomenon, applying the rigorous techniques and making it as valid as a scientific research (Duffy, 2005).

Generally, it will help in investigation of social entities, businesses and project based organizations to examine their efforts for sustainability and their impact in solving the sustainability issues in Saudi Arabia.

3.3. Research approach

Research approach comes after the selection of philosophical standpoint and there are two approaches i.e. Deductive and inductive. Inductive approach deals with the construction of a new theory after analysis of certain data. While deductive approach is aimed to test or study an existing theory, idea, social phenomenon or effect, after development of hypotheses or research objectives (Mackenzie, 2006). For this study, deductive approach is selected as it is intended to study an existing phenomenon of environmental sustainability within a prescribed population (SMEs in Saudi Arabia). This study is underpinned by the review of literature as part of its methodological design, therefore, it is deductive in nature.

3.4. Research Design

All of the procedures (data collection, sources, sampling, analysis, timing, tools) are contingent upon the selection of research design which can be quantitative or qualitative in nature. Both of

these designs have discrete processes, as mentioned above. Quantitative research design taken into account the quantitative data (numeric in nature) which is collected from surveys, observations or experiments. While qualitative research design is descriptive and explanatory in nature. It is used to investigate social occurrences or social phenomenon in natural sciences (Mackenzie, 2006). Post-positivism paradigm allows the researcher to find the cause and effect relationships and adaption of **quantitative research design**, hence, it is adapted for this study. It relies on collection of numeric data, encoding the data and statistical analysis, leading to valid and concrete research results (Mkansi, 2012).

3.5. Research strategy

It is a step-by-step plan that directs a researcher to articulate his/her efforts & thoughts, enabling the researcher to conduct the process systematically. It also takes into account the scheduling, detailed reporting and generating results. There are many research strategies which are divided according to the research design i.e. Qualitative or quantitative (Dillman, 2011). Qualitative research design usually focuses on gathering non-numeric data which is descriptive in nature. For this, common research strategies are unstructured or semi-structured techniques of data collection, focus groups, case studies, group discussions, individual interviews, ethnographic modeling, grounded theory, narrative modeling and observations. Quantitative research designs emphasize numeric, statistical, mathematical analysis or objective measurements (Duffy, 2005). Hence, the mostly used research strategies are surveys, pre-existing statistical data, polls and close-ended questionnaires.

It is intended to adapt survey as the research strategy for this study. It is chosen because of its advantages in data collection process which include:

- It allows researcher to reach to thousands of participants. Hence, it will enable to contact hundreds of managers in SMEs of Saudi Arabia to conduct this research.
- It offers low cost and fast processing of collecting data. Hence, it will enable to communicate and contract with key respondents at very low cost (online conduct of survey), speedy manner (instant sending and receiving data) and increased reach (SMEs across whole country).
- It enables a researcher to get more accurate sampling and data collection as well as it offers easier data sorting by putting the responses directly to MS excel or SPSS (Nardi, 2018).

- It offers anonymity and confidentiality of data as through online survey one cannot recognize respondents and their credentials. Moreover, the data could be kept secured through proper encoding.
- Statistical analysis and results exhibit more validity, accuracy, authenticity and generalizability for a research. In other words, the research significance will be increased.

3.6. Research instrument

A research instrument is a measurement tool which is designed to collect data from research subjects. It is also called as research method. For this research, questionnaire method is adapted among many others i.e. Interviews, focus group, observation, document analysis, charges and notes etc. (Noor, 2008)

Questionnaire development

A questionnaire is developed, using the close- ended questionnaire and adapting the following process:

Comprehending the research objective: investigation of environmental sustainability practices among SMEs in Saudi Arabia.

Type of questions: close- ended questions and multiple-choice questions (MCQs)

Channel to administer: online administration through survey monkey

Organization/assortment: collecting Responses through survey monkey and auto- assortment of responses

Designing the questionnaire: it is consisted of the discrete four sections for better understanding and convenient responding

Purpose: clear instructions as well as purpose of collecting the data is provided in the first section of questionnaire so that respondents can effectively comply with the survey

Revise: prior to administration, necessary improvement must be taken for survey's efficacy

The procedure of designing a questionnaire is complex, and many "**issues in questionnaire development**" could be faced by the researchers. There could be methodological issues such as wording, formatting, administrating process, content development, ethical consideration and facilitating cultural adaptation.

I. Order of words

Wording play a considerable role in initiating a proper response. Hence, attention must be given to avoid technical jargons, abbreviations, slangs, cultural verbal gestures and improper words which can raise ethical, ethnic or cultural issues (Onwuegbuzie, 2013). Particular attention is given to avoid all of these issues as well as double- barreled questions, unclear, personal, ambiguous and invasive questions are avoided to include.

II. Formatting

Formatting must be comprehensible, easily. In development of the questionnaire, formatting is studied and then, questionnaire is organized into four sections for a clear perspective as well as to makeup the respondents' minds to what information is needed in each section. The arranging order is "from general to particular" and "from factual to abstract" (Peffer, 2007).

III. Administration issues

There could be many issues related to the questionnaire administration process if it is outsourced or shared or collaborated with other parties which are collecting similar information. In order to avoid these issues, self- administration is adapted through an online media which offers easier implementation, cost- effectiveness, respondents' anonymity and confidentiality (Wright, 2005).

IV. Cross- cultural adaptation

It is highly conceivable that the managerial posts (in SMEs of Saudi Arabia) are filled with personnel belonging to diverse cultures, ethnicities, nationalities and values. As, the modern business world is hiring emotionally intelligent managers from international pool of human resources to better run their organizations as well as to promote workforce diversity (Mkansi, 2012). Hence, adapting cross- cultural intelligence and avoiding any cultural inappropriate contents have been the basic principle during questionnaire development.

V. Social desirability

It is referred to the extent to which persons tend to convey auspicious image of themselves during the social interactions. It is considered during the development of questionnaire that there is no content which can invade a respondent's privacy. It is possible that the inquiries from managers in SMEs might contain riskier information for other parties, related to company's private information, or might not allowed as a social rule (Onwuegbuzie, 2013). Hence, it is predominantly considered that no personal, socially unacceptable or company- related information is asked. The questionnaire is kept totally un- biased and neutral.

3.7. Population and sample size

it is necessary to adapt a sampling technique and population selection process so that the data size could be reduced (enough to be processed and analyzed), and to stay focused on attainment of research objectives. There are many sampling techniques which can be adapted to conduct a research, however, the selection depends on the research aims and targeted population (Cook, 2000). In this research, the aim is to investigate environmental sustainability practices in SMEs of Saudi Arabia in the manufacturing. Hence, the targeted population's main category is "SMEs of whole country" in the manufacturing industry. Further, the personnel at managerial positions are the main population. However, there are three sub- categories i.e. Junior, middle and senior managers.

Methods of sampling from a population include: Simple random sampling, Systematic sampling, Stratified sampling, Clustered sampling, Convenience sampling and Quota sampling (Dillman, 2011).

It can be said that stratified sampling will help in better achievement of the research aims as it is intended to contact managers at three positions. A stratified sample is a set of respondents which ensures that the strata or subgroup of a given population is adequately represented within the whole population of a research. Hence, instead of randomly selecting managers of SMEs, it is better to select appropriate number managers within each category. Hence, the intended division is as follows: 100 senior managers, 100 middle managers and 100 junior managers from all of the SMEs in Saudi Arabia. Every effort will be made to get maximum response rate which can help facilitate validity, reliability and generalization of research findings.

3.8. Time Horizon

Defining the time horizon increases the effectiveness and efficacy of a research, as it makes the research more focused, limited to certain time period/s and helps in better resource allocation. According to Saunders (2011), there are two types of researches based on time horizons i.e. Longitudinal and cross-sectional. In longitudinal research, data is collected many times, over certain intervals, to measure a pattern among occurrences or observations under study. While, in cross- sectional research, data is collected once, based on certain events/ observations within a particular time period (Harris, 2009).

This is cross-sectional research as SMEs will be contacted once to inquire about their environmental sustainability practices. This study is intended to investigate only current practices which means the sustainability practices adapted by SMEs in Saudi Arabia till 2019. The past and future are exclusive of this study's scope.

3.9. Data Analysis

Selecting the analytical tools is necessary prior to initiate the data collection process. It helps in selecting the channel for data collection, assortment and presentation for final analysis. Hence, it is intended to use SPSS to analyze data which is collected from the online administered questionnaire. The responses from close-ended questions will be collected and sorted by Survey Monkey. The data will be presented in numeric form and the analytical tools will be applied which may include regression analysis, and correlation with simple descriptive analysis in SPSS. The final presentation of data analysis will be in form of charts, figures and graphs along with the descriptive analysis.

3.10. Research Ethics

Following research ethics are adapted to serve the privacy rights and moral values for respondents:

Anonymity and confidentiality is considered by asking no demographic information as well as keeping the necessarily asked credentials secure from the other agencies or marketing companies.

Encoding is done for the collected data, to keep it encrypted as well as unrecognizable in case of leakage, cybercrimes and hacking.

Legal written consent is taken prior to send the questionnaire, through direct email to the respondent.

Formal statement of purpose for data collection is developed and shared through the email in which formal consent is sought so that the respondent can effectively contribute in the research.

Ethical Approval Form will be completed and signed. Supervisor will approve and sign the form prior to the data collection process. See Appendix 1 for the ethical approval form.

3.11. Conclusion and Summary

The whole process of studying, analyzing and selecting the research methodology is described in this chapter which is started from the selection of research paradigm, studied all of the constituents and ended with the statement of ethics. The study aims to investigate environmental sustainability practices in manufacturing sector SMEs in Saudi Arabia. This underlying objective is duly considered, and post-positivism research philosophy is chosen which allows the quantitative research method adaption and data analysis. Survey is the research strategy and questionnaire are research instrument which will be administered online through survey monkey. Final analysis will be done through SPSS and it is cross-sectional study hence, the data will be collected once from the SMEs in the Saudi Arabian manufacturing sector

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