

# SUSTAINABILITY MANAGEMENT AMONG ENTERPRISES IN UNITED KINGDOM AND SAUDI ARABIA

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## ABSTRACT

*The purpose of this study is to investigate evolution of sustainability practices in the United Kingdom and Saudi Arabian business enterprises. The study is descriptive in nature and based on secondary data collected from different journals and review literature. It gives a perspective on how top companies in Saudi Arabia and UK view and conduct sustainability. Major U.K., Saudi Arabian and other global corporations have realized the importance of sustainability measures and related market-based mechanisms. Saudi Arabia is committed to implement sustainable development goals and attaches the highest priority to this endeavor, as commensurate with the Kingdom's specific context and national principles. Government should offer tax benefits and training to promote transformation of low-carbon enterprises. Sustainable development indicators should be developed by Government to assess the performance of enterprises and violation of these standards should lead to strict disciplinary actions by the government. As a result, this paper can be used by researchers and government to make policy decisions. This is the first time that such an exhaustive study has been carried out based on Saudi Arabia and United Kingdom.*

**Keywords:** Sustainability, Carbon Foot Print, Climate Change, GHG Emissions, United Kingdom, Saudi Arabia.

## INTRODUCTION

Over the last decade, the concern over global carbon footprint and climate changes has increased manifold, and discussions about greenhouse gases are all omnipresent from general public, to corporate boardrooms to political parties. In February 2005, the Kyoto Protocol was introduced to obligate the industrialized nations for the stabilization of greenhouse gas (GHG) emissions. This protocol was not only disapproved by the industrialized nations, but was also perceived to be inadequate to resolve the issue on global warming. The United Nation's climate change conference at Cancun (29<sup>th</sup> November 2010 to 10<sup>th</sup> December 2010) had to face threats from the Latin American countries which decided to boycott the conference, in the absence of the negotiating text, on the commitment by rich countries for setting new targets for the forthcoming (2012) Kyoto agreement which has to be prepared and endorsed at the conference (Lavanya, 2011; Streck, 2011). There is a common notion with the developing countries that industrialized countries should have much more strictly regulated targets to reduce the emissions on the greenhouse gas. However, the organizational level policies on emission are diversified across the globe (Pinkse & Kolk, 2007). Being the most significant contributors of greenhouse gas emissions, the established corporations have a greater responsibility of minimizing the progression of global warming. As discussed on the outline of the study, this paper focuses to

research on the prevalence of the sustainable measures in UK and Saudi Arabian enterprises including manufacturing and service industries with a predominant focus on the outcome of company's performances after implementing those measures. The research paper initiates with a focus of discovering the sustainability concept evolution and the worldwide dimensions of the fibers and issues associated with the sustainability. Following this, there are descriptions pertaining to the adopted research methodology, selected as case study for the research's purpose. An evaluation on the measures of sustainability in specific case countries and the outcome on the measures implemented are also discussed. Thereafter, the challenges and the associated contingencies associated with the implementation of policies with respect to sustainability. The conclusion section includes future directions of the research.

### **Objective of the Study**

The core objective of executing this academic research is to comprehend the sustainability practices in United Kingdom and Saudi Arabian Enterprises. The research also explores the evolution and concepts of sustainability and carbon emission practices in the countries mentioned above. The report highlights recent policies for sustainability development for the enterprises and analyzes current laws and policies pertaining to the countries. Further the report illustrates previous empirical studies on carbon emission and sustainability development practices in the United Kingdom and Saudi Arabian Enterprises. The report also identifies the barriers and challenges involved in the sustainability practices.

### **REVIEW LITERATURE**

It is rather challenging to measure or formulate with the term "*sustainability*" despite being simple to possibly comprehend it. The origination of the concept dates back to 1970, however the UN Commission on Environment and Development (Brundtland Report) defined it in 1980 (World Commission on Environment and Development, 1987). This report states ("*Development which meets the needs of the present without compromising the ability of future generations to meet their needs*") the definition of sustainable development as, the ability to fulfill the current requirements without depriving or exhausting the abilities required for future generation's requirements. The rationale behind the investigation instructed to the Commission as stated (Labuschagne et al., 2005) was for issues pertaining to resource distribution, global inequality, impacts of the global population and the recommended solutions to resolve these concerns.

The significance of the association between the ecosystem health and sustenance of human wellbeing is well expressed from this concept (Abrecht & Birch, 1978; IUCN, 1980). The main theme is that the activities associated for the welfare of the human well-being should not be acquired at the expense of exploiting the social and ecological process on which they depend. As on one hand the properties of macro-scale system of nature and people are described by the concept, it was thought provoking on the manner in which it can be simplified to attain sustainable development which is reasonable for the private enterprises that were smaller social units. A formal organization that functions through its earned income is known to be an enterprise. It was discussed by Figge & Hahn (2004) on the application of the concept to static view or closed systems to enterprises, the dynamic view or the open systems converges at the contribution of the organizations towards the sustainable development of wider section of the society. It is found the latter to be much more useful interpretation due to the recognition that

exists for the enterprises within the dynamic milieu of formal and informal institutions or organizations and also individuals, such that the reflection of the concept is applicable at the level of enterprises. Therefore, as mentioned by Atkinson (2000) and Parrish (2007) a favorable sustainability-driven enterprise would be able to substantiate itself as well as contribute to the development of the social-ecological system of which it belongs.

The sustainability concept is much more questionable from a firm's perspective. With respect to a business view point, the sustainability concept is linked with the aspects of innovation, competitiveness, marketing of companies. Involving all these aspects an organization will be able to differentiate it and also progress with the economic performance from its competitors.

### **Sustainability Assessment Framework**

A number of sustainability assessment methodologies have been implemented to measure the company's performance (Ramachandran, 2000). The Global Reporting Initiative (GRI, 2002a & b), development of standards (OECD, 2002) and World Business Council for Sustainable Development (WBCSD, 1997) promote sustainability management in companies. A systematic standard of sustainability indicators was developed by Krajnc & Glavič (2005) for companies to cover all major aspects of sustainability management. In current scenario composite indicators are increasingly gaining attention to criticize and assess the performance of countries over economy, environment, technology or society development and act as a tool for public communication (Indicators, 2005). Meadows (1998) states that "*Indicators arise from values (we measure what we care about), and they create values (we care about what we measure)*". Indicators are widely accepted and implemented by many countries due to its ability to simplify the complexities of dynamic environment and enables efficient sustainability management (Godfrey & Todd, 2001). Indicators conceptualizes phenomena and recognizes trends and hot-spots, thereby it simplifies the quantifying process and communicates the complicated data (Warhurst, 2002). Bebbington et al. (2007) suggested that there is an urgent need for organizations, societies and individuals for the identification of metrics, tools and models to evaluate the unsustainable activities. They posed two questions regarding the evaluating procedures of sustainability: "*How can today's operational systems for monitoring and reporting on environmental and social conditions be integrated or extended to provide more useful guidance for efforts to navigate a transition towards sustainability? How can today's relatively independent activities of research planning, monitoring, assessment and decision support be better integrated into systems for adaptive management and societal learning?* " Ness et al. (2007) suggested that the main aim of sustainability assessment is to enable policy and decision-makers to assess the international and domestic nature-society systems in the context of short and long term perspectives and identify the actions to promote sustainable society. Eventually the sustainability implementation drivers are supported by personal and organizational values including organizational culture and personal interest whereas the main inhibiting factors are the lack of resources originating from organizational inertness (Kiesnere et al., 2019).

### **Sustainability: Policies and laws (UK and Saudi Arabia)**

In Saudi Arabia's CO<sub>2</sub> emission per unit of GDP from cement production and fossil fuels reached 7% from 2000-2011. As compared to Saudi Arabia CO<sub>2</sub> emission per unit of GDP from cement production and fossil fuels in United Kingdom is decreased. It is necessary to understand the methods and techniques adopted by transition countries to implement successful

sustainability measures. Even though several international standards for climate change outcomes are present (carbon intensity data or emissions), still now international standards for comparing climate change policies and measures were not developed. It varies across a wide range of countries. Therefore, to overcome this issue, the Climate Laws, Institutions and Measures (CLIM) were constructed as a global comparative index. According to this report, the UK ranked first with CLIMI score of 0.801 while Saudi ranked 90 with the score of 0.023 (Steves et al., 2011; Dolšak, 2009). Moreover, the average power generation efficiency of UK is 38.6% (Electricity and Cogeneration Regulatory Authority, 2009). According to the Government of Saudi Arabia Sustainable development (UNCSD, 1997) the environment and development policies are based on principles of Islam which states that the primary function of humankind is to thrive and inhabit the earth. Following which, the consumption and use of the environmental and natural resources of the Kingdom have been determined to satisfy the present requirements without impairing the capabilities and rights of the future generations. This framework has been the focal point for Saudi Arabia to adopt the principle of environmental impact assessment within feasibility studies of proposed projects and preventive measures. On the basis of this framework and other policies, the following objectives are covered in the Fifth Development Plan (1410-1415H): To improve the living standards and promote the citizen's well-being; To create a pollution-free environment especially pure and clean water, healthy and hygienic foods; To attain economic development in an eco- friendly manner; To improve the conditions of affected areas because of less care. The Government of Saudi Arabia has taken several steps for sustainable development which includes ensuring availability and sustainable management of water and sanitation, ensuring access to affordable, reliable, sustainable and modern energy, to make cities and human settlements inclusive, safe, resilient and sustainable, ensuring sustainable consumption and production patterns, to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss, Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development<sup>1</sup> In late February 2017, the government of Saudi Arabia established the Green Saudi Company for Carbon Services with a vision to develop and manage carbon emission reduction programs and sustainable development mechanism projects<sup>2</sup>.

## METHODOLOGY

A descriptive research method is taken into account to illustrate nature and dealt with literature review. The literature review includes different aspects related to sustainability practices in UK and Saudi Arabia. The study is based on secondary data and review literatures. To collect secondary data, desk-based research is employed in this study. Jackson (1994) indicates that the application of primary and secondary data for data collection and in the techniques of data collection is used in finding the value of a research. To confirm that the data is accurate and reliable, it is evaluated henceforth (Creswell & Creswell, 2017). The verified and well referenced secondary data those are obtained from academic research articles are used in the report.

## RESULTS & DISCUSSION

### **Current Status: the UK vs. Saudi Arabia**

The Center for International Earth Science Information Network (Columbia University, 2010) and 2010 Environmental Performance Index (Yale Center for Environmental Law &

Policy) ranks 163 countries on 25 performance indicators tracked across ten policy categories covering both environmental public health and ecosystem vitality. Based on the statistics report, UK occupies 16<sup>th</sup> position whereas Saudi Arabia ranks only 10<sup>th</sup> position in the contribution of global CO<sub>2</sub> emission. According to the statistics on CO<sub>2</sub> emission, it is found that these two countries have undergone significant transformation in the period between 1960 and 2019 (The Union of Concerned Scientists, 2019), however the UK emission data displays lower order of magnitude. The data illustrate that the emission per capita of UK declined from 9.23 tones (2001) to 6.5 tones (2015). On the other hand, the emission per capita of Saudi Arabia increased by 19.44 tons from 14.02 (2001) during this period (Index Mundi, 2015).

In terms of Waste and its recycling treatment, the data from Eurostat (2011) revealed that Saudi Arabia accounted for 23.7% high water per capita when compared to UK in terms of water treatment. However, the treatment by recycling (UK 26%, EU27 24%) and landfill (UK 48%, EU27 countries 38%) was not available for Saudi Arabia (UK 26% EU27 24%). This clearly reveals that UK is more eco-friendly than Saudi Arabia. Moreover, it describes the need of indications for Saudi Arabia enterprises to develop sustainability measures and to control carbon emissions. Under this light Saudi Arabia developed its first nationally determined contribution (NDC) under the Paris Agreement that

Include its carbon mitigation goals through 2030<sup>3</sup>. Saudi Arabia has made several successful contributions as compared to the rest of the world in terms of environmental and sustainability awareness (Albanawi, 2015). However, in 2014, the huge legitimate change occurred with the follow-up of more greener and sustainable economic infrastructure. In the last Decade, Saudi Aramco, the national oil company of Saudi Arabia has improved an array of engineering standards and operational benchmark with performance guidelines to implement the company policy, that include environmental assessments, landfill standards emission standards, noise- control regulations, air quality and water recycling procedures, sanitary codes, bioremediation, and hazardous material disposal rules, and oil spill contingency plans (Alshammari & Sarathy, 2017).

### **Sustainability and Carbon Emission in UK Enterprises**

The aim of manufacturers is to support eco-friendly production processes in addition to maintaining socio-economic benefits. According to the report by MIT Sloan Management Review (2013) many consumers prefer products that were manufactured in a sustainable manner. As a result, many manufacturers all over the world started to implement sustainable manufacturing process and techniques to attain competitive advantage. Sustainability measurement techniques were developed by manufacturing enterprises. Few techniques were developed to successfully measure manufacturing impact on society and environment. While, the professional service enterprises also strongly feel that there is a need for developing a robust policy that would help to achieve sustainable development goals in the long run. The major players of this sector are aware that they need to manage operations within certain limits that would support in building a sustainable economy. However, the challenges this sector is facing are that of consistency in meeting long-term goals, measuring their impact on environment and sustainability efforts and to address these challenges there is a committee that has come into action PSSI (Professional services sustainability initiatives). This committee comprises members from the big professional service firms in UK.

In spite of several policies and claims, studies on business attitudes revealed the perception of several firm owners on environmental management. According to the firm owners,

sustainable measures increase the operational costs (Hillary, 2000; Isusi, 2002; Smith & Kemp, 1998; Revell & Rutherford, 2003; Baylis et al., 1998; Tilley, 2000). After reviewing 33 studies, Hillary (2000) suggested that small firms are resistant towards environmental reforms and are facing pressure to implement sustainable manufacturing process from consumers and suppliers. In spite of the awareness over business benefits of sustainable manufacturing process, low “*eco-literacy*” level indicates that firm owners feel unprepared to implement environmental reforms (Gerstenfeld & Roberts, 2000). Firm owners believe that government rules and regulations are the only approach to promote environmental friendly SMEs and this prevents the ‘free riders’ in attaining competitive edge in the market (Rutherford et al., 2000). From this, it is clear that firm owners may not pose as trustable members of UK government’s sustainable policy. In addition, more studies have to be investigated to have a clearer insight regarding the above-mentioned issues.

In regards to the large enterprises the statement by WWF report shows that “*while the industry represents perhaps the single biggest threat to society and the natural world, it can also represent one of our greatest allies in our mission to safeguard it and provide for its sustainable development*” a statement by the World Wide Fund for Nature (WWF). This statement emphasizes that large private sector international companies can really provide solutions for long-term sustainable developmental goals. According to EIRIS Sustainability Report, April (2012), some of the major issues/challenges that global companies face are the inherent nature of the business that affects the environment and water management, having operations and suppliers in developing nations with supply chain issues and not developing best practices to address this issues. On the other hand, according to the same report three amongst the top ten global sustainable leaders are companies from UK.

This has been supported by the study by Bebbington et al. (2007) explored how public and private sector large firms are responding to government policies and impact of global climate change and emission of greenhouse gases. They interviewed 24 private and public sector enterprises in service sector that heavily use water and other energy sources and manufacturing industry. The results indicated that, to reduce GHG emission the approach has to be collaborative and holistic, a single sector cannot work towards it effectively. There has to be financial accountability and cost effectiveness as well. Based on the interview findings a ten step action plan was integrated to help organizations address GHG emission and Global Climate Change issues. The study reported that accounting management can contribute to a large extent in setting carbon benchmarks and supporting long-term investment goals. It also highlighted that organizations are actively working towards addressing GHG emission challenges, however organizations that have strategic and holistic approach to this issue will be able to sustain and comply with regulatory changes.

### **Need for Low Carbon Emission in the Enterprises**

According to the 2009 report of McKinsey & Company’s working paper, “*Pathways to a Low-Carbon Economy*”, there is a huge potential for reduction of carbon emissions in enterprises. (1) Low-carbon concept is a viable option for sustainability measures for enterprises. (2) Tax benefits and others rewards encourage implementation of low-carbon enterprises. Low-carbon enterprises require a technological framework; hence government should implement guidelines and offer training to support low-technology products. Stringent rules enforced control the carbon-dioxide emission for high-pollution enterprises (3) Increased consumer awareness resulted in the increasing sales of eco-friendly products.

Hence, to attract customers and to gain good reputation, transformation to low-carbon industries is increasing. Moreover, sustainability measure helps to achieve competitive advantage in the market. Thus, a framework for sustainability can be created by incorporating corporate responsibilities, government guidance, and consumer support and inter-enterprises motivation (Parrish & Foxon, 2009).

### **Saudi Arabian Enterprises**

Taleb & Sharples (2011) studied the consumption practices of water and power in the Saudi Arabian households (apartments) to develop guidelines for promoting sustainable housing projects in the upcoming years. In this study examined the faults related to designs in the existing Saudi Arabian residential buildings. It is identified that faults are related to inefficient utilization of water and energy resources. Hence, there is an urgent requirement for more studies on enterprise level sustainable measures in Saudi Arabia.

Awareness level of low carbon emission among manufacturing enterprises considered as an important factor. Kadasah (2013) assessed the attitude of managers towards the potential effect of ISO 14001 in Saudi Arabia and the findings reported that managers had positive attitude towards ISO and believed that safe work place and better environment are the sustainable factors. Sar (2018) in his study mentioned that enterprises with high corporate governance index (CGI) are directly proportional to sustainability performance. However, the barriers identified for not implementing these factors are costs, expertise availability and costs of certification agencies. The Saudi government has not yet pressured companies to implement ISO 14001 concentrating only on the municipal and local environmental laws and legislations. The absence of the environmental groups in the country makes companies not to be serious about implementing ISO 14001 or other related standards. There have been very limited attempts to implement ISO 14001 in Saudi Arabia. Respondents in this study do not give high consideration to government influence or relations regarding ISO 14001. Similarly the Noweir et al. (2013) assessed 314 companies in five industrial regions with regards to the implementation of ISO, results revealed that the implementation is unproductive and the concept of integration has not gained much acceptance due to low awareness among the managers. Analyzing specific enterprise studies provided better insights about the current scenario. An organization performs well and can secure long-term economic performance by avoiding the short-term behaviors which are socially detrimental (Yang et al., 2013).

Gharaibeh et al. (2011) provided an overview of and evaluated Municipal Solid Waste (MSW) management in Al-Ahsa located in Easter Saudi Arabia. The finding of the study revealed that most of the MSW were not being treated and were sent to landfills causing health and environmental hazard. In 2008 the league of Arabian countries addressed the significance of solid waste treatment and they urged researchers to prepare proposals for solid waste management at country level. The study evaluated the prevalent solid waste disposal practice and recommended various procedures to treat solid waste in lieu of collection, disposal and recycling.

Al-Razeen & Karbhari (2004) described the association between voluntary and compulsory disclosures in the annual reports of Saudi Arabian enterprises. Listed and non-listed companies were included in sample. Three separate disclosure indices were constructed to evaluate the data with respect to mandatory disclosure and voluntary disclosure. The study results suggest that a positive, significant correlation exists between voluntary disclosure and mandatory disclosure which in turn related to mandatory disclosure index. It also indicated that

an insignificant and weak correlation exist between voluntary disclosure and two other indices. In this regard, a similar study was conducted in Saudi Arabia to evaluate the relationship between enterprise-specific features and disclosure. Around 20 voluntary were prepared to evaluate the disclosure level in the yearly reports of forty firms. The study findings suggest that mean of the disclosure index was below average. It also indicated a positive relationship between firm size and disclosure level. Nevertheless, ownership dispersion, debt, age, industry, audit firm size and profit margin were considered to be insignificant in describing the voluntary disclosure variation (Alsaeed, 2006). Corporate social responsibility (CSR) is a key function in enterprises to spread social and environmental awareness. CSR is thus gaining much attention in Saudi Arabia in recent years.

Katsiolouides & Brodtkorb, (2007) observed that most of the CSR initiatives in Saudi Arabia is taken by western MBCs such as Shell, Intel, DHL, etc. However local enterprises are found to be lacking in this area. Local enterprises are now taking measures to implement CSR effectively, because of the statement by World Bank which suggested that responsibility and good governance are crucial factors for sustainability and economic development in Middle East countries. Hence, with this view, researchers investigate on best practices. Katsiolouides & Brodtkorb (2007) evaluated the CSR of organizations in United Arab Emirates (UAE) & gulf countries particularly Saudi Arabia. They indicated that UAE corporate managers have strong and indirect awareness regarding CSR. Enterprises of this region are more sensitive towards community affairs, environment and consumers. However, these enterprises lack effective CSR when compared to America and Europe. Moreover, the well-defined CSR policy is found to be lacking in enterprises of these areas with the exception of those enterprises which adhere to country's rules and regulations. This research concluded that lack of experience in formulating CSR policies was the main reasons for the above-mentioned factors. In order to improve the CSR in organizations, the Dubai Ethics Resource Centre launched seminars to improve the skills of corporate executives in UAE and Gulf countries. The training sessions highlighted the importance of CSR knowledge for business professionals to manage a wide variety of related strategies, programs, and infrastructures.

Khan (2008) indicated the need of formal CSR policies so that enterprises can play an important role for the development of education, housing, health and environment sectors on a sustainable basis. He suggested three methods by which CSRs are incorporated in firms within the region. Firstly, Public- private partnerships (PPP) integrate private sector and government for example, the Tameer Group, within the MENA and UAE region, played a significant role in the large-scale project for improving Al Salam City in the Emirate of Umm Al Quwain (UAQ). Secondly, incentives and awards can be provided to the best performing corporate sectors such as "*Best CSR*" for their CSR contributions. Finally, corporations can be allotted with certain activities, such as establishing colleges, schools, or vocational training facilities. A lack of stringent legal rules and regulations for sustainable construction of buildings has been observed in addition to highly subsidized electric current, abundant oil reserves, and water prices are the reasons for less awareness over environment and act as barriers for sustainable architecture in Saudi Arabia (Al-Yami & Price, 2006). Recently, the government has taken some measures to implement sustainable environment approach in Saudi Arabia. For instance, with the inception of National Water Company in Saudi Arabia, the concept of wastewater treatment has gained attention (Fallataha, 2008). Alzahrani et al. (2007) indicated that government campaigns on water scarcity and its conservation create public awareness regarding the present issue. However, there is an immediate need for further studies on sustainable measures in Saudi Arabia.

Challenges faced by Saudi Arabian enterprises in implementing low carbon technologies are High Capital cost, Lack of expertise, lack of stringent rules, less awareness and Costs certification agencies (Figure 1).



**FIGURE 1**  
**CHALLENGES FACED BY SAUDI ARABIAN ENTERPRISES IN IMPLEMENTING LOW CARBON TECHNOLOGIES**

The Saudi Arabian oil and natural gas industry with an intention to maximize the optimal use of the Kingdom natural resources but due to less consideration paid the year 2017 has resulted in undesirable consumption rates of recourses and energy during the Hydrocarbon exploration phases of projects whereas The Government of Saudi Arabia has made several attempts towards global sustainability and conserving the environment by implementing number of policies and guidelines, as well as joining several global agreement and conventions over the past several years (Alshuwaikhat & Aina, 2005).

## CONCLUSION

The study clearly presents the need for environmental awareness and implementation of eco-friendly policies. It is high time for organizations to understand the importance of environment sustainability measures and to implement the same. Even though UK leads many countries in their 'green' approach, it has to reduce its carbon emission to reach the first ranking position. The firm owners in UK still consider sustainability measures as cost-burden and are resistant towards environmental reforms. Hence, by creating awareness and implementing tax benefits and subsidies improvement in the acceptance of sustainability measures can be established in UK. The water scarcity problem in Saudi Arabia resulted in the efficient use of resources. However, the sustainability measures of Saudi Arabia are very limited when compared to other developed countries. Most of the enterprises in Saudi Arabia are ill-equipped and sub-standard. The challenges faced by Saudi Arabia enterprises in implementing sustainability measures are inadequate expertise, investment cost, and lack of awareness and costs of certification agencies. Lack of stringent rules for implementing sustainability measures may also be a factor for less sustainability in Saudi Arabian enterprises. Hence, government should offer tax benefits and training to promote transformation of low-carbon enterprises. Government

should campaign regarding the importance of water and energy conservation and should aim to improve the awareness among the people. Sustainable development indicators should be developed by Government to assess the performance of enterprises and violation of these standards should lead to strict disciplinary actions by the government.

## RECOMMENDATIONS

The Saudi Arabia Government should implement more policies such as financial subsidies, tax cuts, government procurement and also the introduction of “*low-carbon development fund*” to promote low-carbon transformation in enterprises. Establishing regulations and binding indicators, such as, environmental monitoring organizations to execute carbon assessment, carbon audit and carbon disclosure enable transition from high-carbon to low-carbon type enterprises. Similarly, low-carbon information platform can be organized by the government to provide access to enterprises for utilizing information sources from universities and institutions. This will create awareness regarding sustainability measures among enterprises. Saudi Arabia government should launch low-carbon technology programs to offer training to employees to improve the knowledge on low-carbon transformation. Low-carbon operation plays a significant role in sustainability of enterprises hence this level is treated as responsible core (Yan, 2010). The lead-in mechanism of enterprises should be based on four aspects: (1) the low carbonization activity of an enterprise is determined by its cultural connotation and values. (2) Each production activities of enterprises like selection of raw materials, energy recycling and reusing and waste circulation should be oriented towards low-carbonization (3) to improve the environmental awareness of employees and leaders MBO, TQM, 5S Visual Management should be intensively followed in the enterprise management. (4) Low-carbon service should be promoted as characteristic of service-oriented enterprises thereby act as a marketing tool to attract the customers. Thus, this organic approach has socio-economic advantages. Low carbon services help to conserve both energy and resources through service processes such as service consumables, service design, service marketing and service product.

### Inter-enterprise Level

Neither of the enterprises is provided with adequate resources for low carbon services. Recent companies are focusing on sustainability practices as it is of great importance for corporate strategy and practice Kunz et al. (2014). Hence, a platform should be developed among different enterprises of same industry to share available resources and information regarding low carbon technologies. Implementing information-resource management platform helps to exchange information regarding low-carbon technology, low-carbon products and low-carbon project research. This strengthens the association between research institutes and enterprises. Moreover, the information-resource management platform helps to reduce cost and increases efficiency of low carbon technologies (Yong, 2008).

### Consumer Level

The transformation to low-carbon enterprises acts as promotional feature to attract consumers. The environmental awareness among consumers resulted in the increasing purchase of eco-friendly goods (Ming, 2010). Hence, to achieve competitive advantage, the enterprises started to manufacture low-carbon products. Even though, low-carbon technologies can save

energy up to 35%, many Saudi Arabia enterprises are equipped with inefficient facilities due to lack of expertise and capital investment (Alyousef & Abu-ebid, 2012). The quality of life of the urban population has also have a significant impact on sustainability of the enterprises (Sopilko et al., 2017). Modern consumers are more concerned about environmental sustainability (Sledge 2015).

### Studies for Future Studies

The study presents certain limitations which can be the foundation for future studies. Firstly, there are very few studies on sustainability measures in Saudi Arabia. Further studies should focus on business attitudes of firm owners in Saudi Arabia over sustainability measures in enterprises. The cost involved in implementing sustainability measures, eco-literacy of firm-owners may be the factors for resistance of environmental reforms. Evaluating these factors in detail will be instrumental in devising appropriate plans and policies to establish a sustainable environment. Analyzing challenges faced by organizations in implementing sustainability measures will help organizations to eliminate the difficulties associated with such programs. More studies should concentrate on measures to help Saudi Arabian organizations in addressing global climate change and GHG emission issues. Studies can also focus on the impact of government policies on public and private sectors over global climatic change and emission of greenhouse gases. Addressing these gaps in future studies will enable policy makers to take a holistic approach with regards to building a sustainable environment. Saudi Arabia is one of the driest countries in the world and the issue of water crisis is increasing due to rapid growth. However, there are only limited studies focused on sustainable measures of Saudi enterprises. Most of the available studies were based on transport, electricity, building (infrastructure) and car parking.

### END NOTES

- 1 Towards Saudi Arabia's Sustainable Tomorrow, First Voluntary National Review 2018 -1439
- 2 <https://www.climateactionreport.org/2017/05/saudi-arabia-emission-reduction-policy/>
- 3 King Abdullah Petroleum Studies and Research Center (KAPSARC), Policy Pathways to Meet Saudi Arabia's Contributions to the Paris Agreement

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