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Sustainability Initiatives among Top Companies in the United Arab Emirates

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Abstract

Purpose: Any organization needs to sustain its performance both in the short and long term. Sustainability is a concept that focuses on financial, social and environmental aspects of management which gained a lot of attention recently. Lean production on the other hand is a philosophy that is focused on the elimination of waste. The purpose of this paper was to highlight the sustainability initiatives taken by the top companies in the UAE and how implementing the sustainable solutions and best practices in the UAE links with lean practices. Various current sustainable practices and initiatives were evaluated to examine whether they are aligned with lean management or not. This research aimed to provide useful insights to sustainability and quality practitioners in the UAE into various sustainability initiatives in UAE the challenges to implementing the initiatives and how they relate to lean concepts.

Methodology: The study employed secondary research as the data collection approach using a systematic review of relevant journal articles. The research explored various sustainability initiatives laid down by the UAE government. It also investigated the relationship between sustainability and lean practices and their effect on organizational performance.

Findings: The study determined that lean production was an effective means through which an organization can realize numerous benefits including costs reductions, increased, operational efficiency and higher waste management.

Recommendations: Through this research study, it was established that lean production has strong potential of influencing achievement of objectives associated with sustainability. The first recommendation is on policy reforms. The second recommendation is on training and development programs in corporations in the UAE.

Keywords: *Sustainability; initiatives, lean, organizational performance.*

Introduction

Sustainability has continued to draw a lot of attention across all industries around the world. Sustainability practices are a key solution to providing high quality of life to present and future generations. The increasing pressure from a variety of stakeholders on organizations to conduct their operations in a manner that promotes social and environmental performance has seen many companies all over the world strive to offer sustainable solutions with more commitment toward the environment, society and economy (Siegel et al., 2019). Sustainability initiatives were thus established as a new way of gaining and retaining competitiveness. Sustainability efforts facilitates development of better working conditions and waste elimination among firms. Additionally, it enhances achievement of a positive return on assets. That way, the company manages to develop a competitive advantage over its rivals (Dieste et al., 2019). To this effect, lean and green programs have been adopted as critical measures for the implementation of sustainability initiatives (Abuhejleh et al., 2016). The main goal for all sectors is to achieve sustainability through the reduction of resource waste and increasing efficiency in processes. The combination of lean and green is a natural alignment given their similarities in objectives and operations management approach.

The government of UAE advocates for sustainable development and has strongly incorporated the sustainability concept into its strategic initiatives. UAE is determined to establish its presence as a global sustainability leader (D'Mello, 2021). According to the Environmental Performance Index (EPI) of 2018 which ranks 180 countries on 24 performance indicators based on 10 categories covering ecosystem and environmental health, UAE scored 77. Based on these data, UAE presents a unique opportunity to study sustainable development (Dieste et al., 2019). This paper examines the sustainability initiatives and sustainable practices taken by top companies in the UAE and how the sustainable practices match or compare with lean practices. It attempts to answer the questions of what and how sustainability initiatives have been adopted in the UAE and find what possible linkages exist between the sustainable initiatives and lean practices.

Sustainability Initiatives in UAE Top Companies

Sustainability is an increasingly important concept in UAE as the nation aims to build an economy that is driven by clean energy and environmentally sustainable. UAE has always aspired to become a global leader in sustainability efforts and has adopted and implemented numerous sustainable initiatives. The UAE government is much concerned about climate change and concerning this, they have extended their efforts through both internal policies and global participation thus placing themselves among the leaders in sustainability actions (Khan & Punjabi, 2021). The sustainability initiatives include the Green Economy for Sustainable Development 2012, the UAE Vision 2021, Dubai 2040 Urban Master Plan, the UAE Centennial 2071, the UAE Energy Strategy 2050 and UAE Green Agenda 2015-2030 (Emirates GBC, n.d).

Table 1: Companies Studied/Researched and Sustainable Initiatives

Company Name	Sustainability Initiatives		
	Social	Economic/Financial	Environmental
Unilever	Positive nutrition and health and well-being initiatives.	Employee welfare initiatives.	Renewable energy/ Greenhouse Gas Emissions initiative. Waste management through plastic recycling.
Handasiyah	Empowering underprivileged individuals.		Clean energy solutions.
Avenda	Clean water initiative for the needy families.		Responsible packaging through packaging with plastic made from plant. Post-consumer recycled (PCR) materials. Responsible manufacturing through renewable energy and material recycling.
Emirates Recycling	Community engagements initiatives. Blood donation drive. Support sporting activities. Emiratisation. Donations to Al-Jalila Foundation.		Sponsoring the Emirates Environmental group Initiative. Preservation of forests. Saving energy.
Enviro Serve			Green Truck initiative. Recycling e-waste.
Al-Ghurair	Safe & Sound initiative- breast cancer awareness campaign Food and school supply drive		Use of recycled aluminium, water and energy recycling initiatives.
ENOC	Blood donation through wellness and social program committee. Clean up UAE initiative to enhance the quality of life of UAE and Dubai residents. Interschool environmental public speaking competition.	Sustainability leadership committee.	Wastewater management system. Waste heat recovery initiative. Renewable energy initiatives.

Green Economy for Sustainable Development initiative

This initiative was established on the view that sustainability is the driving factor to the success of the UAE's economy as it provides the country with a competitive edge in the international business (Emirates GBC, n.d). The green economy initiative outlines the objectives as promoting green energy production and use of renewable energy, encouraging investments in the green economy, preservation of the environment through proper urban planning and efficiency in housing and building, and efficiency in the use of water resources, natural resources and electricity.

UAE Vision 2021

This initiative focuses on six major areas of concern for UAE including improving air quality, reducing solid waste, preservation of water resources and increasing the clean energy share in the energy mix Emirates GBC. (n.d). The sustainability drivers for this initiative include water and waste reductions, emissions reductions, energy efficiency and compliance with CSR policies.

The Dubai 2040 Master Plan was launched to map out the comprehensive future for sustainable urban development in Dubai. This initiative focuses on doubling the size of public park spaces, green and recreational spaces and a significant percentage of nature reserves and natural areas.

UAE Energy Strategy 2050

This initiative aims to increase the contribution of clean energy in the total energy mix up to 50 percent as well as to balance supply and demand and ensure favorable economic development for growth across sectors (Emirates GBC, n.d).

The UAE Green Agenda

This initiative focuses on promoting sustainable environmental practices, promoting awareness and providing incentives to all businesses in support of lean manufacturing, alternative fuel use and promoting green jobs for fresh graduates (Khan et al., 2021). The commitment by the UAE government to implementing the Sustainable Development Goals (SDGs) across the nation, is reflected by the significant increase in many companies that have adopted these practices in their business operations. According to the KPMG, UAE Survey of Sustainability Reporting 2020, corporate sustainability reporting increased among the top 100 UAE companies from 44 % in 2017 to 51 % in 2020 (KPMG, 2021). This significant increase was driven by the commitment toward the government initiatives and efforts to enhance stakeholder confidence by effectively communicating the ESG (Environmental, Social and Governance) performance. The statistics declined slightly in 2021 but it is understandable because of the COVID-19 pandemic that caused many organizations to experience numerous challenges that disrupted their business activities. In 2021, statistics show that the corporate sustainability reporting among major firms declined from 51% in 2020 to 48% in 2021 (KPMG, 2021).

UAE ESG and Sustainability

The Environmental, Social and Governance (ESG) score is used by the investing community to assess the performance of firms in the social, environmental and governance aspects, as they affect financial and firm performance. With sustainability efforts gaining momentum, the demand for ESG information from companies is critical. Large investors are looking to invest in companies that are better equipped in transitioning to the evolving trends regarding sustainability such as transition into a green economy. Dubai Financial Markets (DFM) and Abu Dhabi Securities Exchange (ADX) have in recent years positioned themselves as leading sustainable financial markets in the Middle East. Both are increasingly promoting sustainability reporting among publicly listed companies in UAE (Khan et al., 2021). Many companies in the UAE are adopting practices that are environmentally friendly and integrating sustainability into their strategic initiatives in efforts to achieve the sustainability vision of net-zero emissions by 2050.

Some notable companies have achieved remarkable successes towards the sustainability goals and objectives in UAE. A leading engineering distributor, Handasiyah, provides clean energy solutions to reduce water and electricity consumption (Janahi, 2022). EP&T Global also helps businesses reduce carbon emissions and energy consumption by utilizing the power of advanced data technology. Companies such as Ehfaaz are also transforming the waste management sector by providing solutions that help divert waste from landfills such as upcycling items that cannot be destroyed efficiently or turned into compost such as chip bags and plastic bottles (Janahi, 2022). Unilever UAE has implemented projects intended to achieve a substantial reduction in the environmental impact of its operations. The company is committed to reducing the environmental impact by utilizing more sustainable power sources and saving water. Mentioned are just a few companies that have exhibited outstanding efforts in providing tech-driven solutions to champion sustainable practices. Several top companies in the UAE have championed sustainability by adopting initiatives that are in alignment with the country's sustainability initiatives. Below are the top companies in UAE that are more sustainable.

Unilever

Unilever UAE has implemented projects intended to achieve a substantial reduction in the impact on the environment from their activities. The company is committed to reducing the environmental impact by utilizing more sustainable power sources and saving water.

Aveda

Aveda has been aggressive in pursuit of environmental sustainability through various initiatives that promote sustainable packaging. The strongest initiative is the post-consumer recycled (PCR) materials in the packaging solutions.

Emirates Recycling

The company is committed to sustainability by manufacturing products that are environmentally friendly and also adopting environmentally friendly processes. Sustainability initiatives are

directed towards preserving forests by developing products that substitute wood, water preservation through recycling water used and saving energy by upgrading equipment to match energy conservation requirements.

Enviro Serve

This company has transformed the electronic waste management arena through pioneering efforts in electronics recycling and promoting proper management of e-scrap. Initiatives such as the Green Truck will redefine the traditional waste and recycling industries. The initiative aims to provide recycling collection services to office and residential premises. Some notable startup companies have achieved remarkable successes towards the sustainability goals and objectives in UAE. A leading engineering distributor, Handasiyah, provides clean energy solutions to reduce water and electricity consumption (Janahi, 2022). EP&T Global also helps businesses reduce carbon emissions and energy consumption by utilizing the power of advanced data technology. Companies such as Ehfaaz are also transforming the waste management sector by providing solutions that help divert waste from landfills such as up-cycling items that cannot be destroyed efficiently or turned into compost such as chip bags and plastic bottles (Janahi, 2022). Mentioned are just a few companies that have exhibited outstanding efforts in providing tech-driven solutions to champion sustainable practices.

Table 2: Lean Principle and Sustainability Initiatives

Company Name	Lean Principle/ Type of Waste	Sustainability Initiatives	Relation between Lean principles and the Sustainability Initiatives
Unilever	Principle: Continuous improvement and Value Waste: plastic waste.	Eliminating waste and increasing efficiency. Cutting plastic waste by using less plastic, better plastic or no plastic at all.	The waste management initiatives aimed at reducing its dependency on plastics are in alignment with the lean principle of waste elimination and continuous improvement.
Handasiyah	Waste management and improved efficiency.	Water and energy efficiency through reduced electricity and water consumption.	The reduced wastefulness enhances sustainability.
Avenda	Waste management Principle. Bad Plastics waste eliminated.	Cutting on bad plastics by using plant plastic and post-consumer recycled materials.	The sustainability initiatives match the lean principles in ensuring efficiency and reducing wastefulness while also protecting the environment from plastic pollution.

Emirates Recycling	Filter bag system with lime injection, to capture and collect particulate emissions.	Recycling the scrap aluminium. Preservation of forests.	Saving energy through Aluminium recycling and reducing emissions are lean initiatives that promote the achievement of sustainable goals.
Enviro Serve	Lean principle: continuous improvement, value and waste management Waste type: Electronic waste.	Transforming Recycling services through the Green Truck initiative.	The lean principle of waste management and continuous improvement will promote sustainability initiatives through protecting the environment and reducing the harmful impact of e-waste.

Table 3: Top Companies and their Sustainability Initiatives

Company Name	Sustainability Initiatives	Category in UAE Sustainability Initiatives
Unilever	Waste Free world-promoting a circular economy. Cutting plastic waste by using less plastic, better plastic or no plastic at all. Climate Action- transitioning to renewable energy and expanding plant-based product range.	These initiatives fall into the UAE Green Agenda and UAE Vision 2021. They also fall in line with lean principles of eliminating waste and increasing efficiency.
Handasiyah	Providing clean energy solutions to reduce electricity and water consumption.	UAE Energy Strategy 2050 and UAE Vision 2021.
Avenda	Responsible packaging to reduce dependency on plastic and global plastics pollution. Emphasis on post-consumer recycled (PCR) materials expanding recycling initiatives. Packaging with plastic made from plant.	UAE Vision 2021. This is in alignment with lean principles that promote waste management. Waste is better managed rather than going to the landfills.
Emirates Recycling	Green Initiative. Preservation of forests. Preservation of water. Saving energy.	UAE Energy Strategy 2050, Green Agenda and UAE Vision 2021.
Enviro Serve	Green Truck initiative -transform recycling services	Green Agenda

Challenges in Implementing Sustainability Initiatives in UAE

While sustainability offers numerous positive impacts on businesses and the overall economy, it can be challenging to implement these initiatives. Some of the barriers faced while implementing sustainability initiatives in UAE include;

Psychological factors

Several psychological factors are present in the UAE society which influence the consumer's mindset in the region (Seretny et al., 2019). Evidence from various researches suggests that psychological barriers are significantly contributing to challenges in the sale of sustainable products in the region. There is a mindset among people in the country that, the affluent consume more resources. As a result, sustainable products sold are associated with the status quo and cannot, therefore, be consumed. These psychological barriers create a denial in the society's mind to feed any need and seriousness towards embracing sustainable solutions.

Limited resources

There has been insufficient infrastructure by the government to support the effective implementation of the sustainability strategies. Similarly, non-sustainable resources are plenty in the market causing the society not to regard or appreciate the need for sustainable solutions.

Social factors

Social factors contribute significantly toward the appreciation of sustainable solutions. Society is particularly dominated by a traditional mindset which restricts the use of sustainable solutions (Seretny et al., 2019). Research shows that social factors are significantly causing barriers to the distribution and selling of sustainable products and services.

Health and social equity is a factor that applies in corporate sustainability. A company that is socially sustainable is expected to cover several issues including prioritization of disadvantaged and marginalized groups and providing them with opportunities to improve their social and economic welfare (Alsyouf et al., 2018). That company should help the target group to gain greater control over their lives economically and socially. Another factor concerning corporate sustainability is that an organization should uphold diversity and accommodate diverse viewpoints from different stakeholders. The corporation should also pursue social cohesion and ensure that employees achieve a sense of belonging in the corporation and have adequate support to address their distinct needs.

Primarily, sustainability (in the social context) involves addressing three key dimensions. The first dimension is social equity whereby the organization needs to make a contribution in ensuring that products and services are available to all people and the social environment makes issues bearable (Seretny et al., 2019). The second issue is prioritization of ecological systems and it involves development of a distinct perspective among leaders in top firms. The leaders should perceive people are a separate entity from the planet and the resources it has but still, the people are part of that framework. Since there are things that people need from the environment, they should be

encouraged to preserve it and make maximum effort to ensure that human activity does not negatively impact on efforts to preserve the environment (Cherrafi et al, 2016).

The economist issue also applies in social factors linked with sustainability because it involves creating awareness that the practice of treating finite resources as an income is not recommendable. Many individuals and organizations operate based on the culture that available goods should be used to help address the current situation. Few people make an attempt to avoid unnecessary use of resources that might be otherwise depleted if used unwisely. Corporations in the UAE should understand this issue and put in place programs that discourage unnecessary use of finite resources.

Solution: Lean Concept and Sustainability

Lean is an approach that identifies and eliminates waste through continuous improvements. Lean principles match the main objectives of sustainability and are regarded as a way of achieving sustainability through the integration of process efficiencies such as time, quality and cost, and sustainability concepts such as social equity and environmental quality (Cherrafi et al, 2016). Lean practices tend to eliminate wastes, improve processes through enhanced efficiency and reduce the negative impacts of manufacturing and production activities (Caldera et al., 2017). Lean and sustainability overlap in several elements as well as present individual concepts which can be integrated to enhance long term success (Alsyof et al., 2018). An integration of both lean and green programs leads to improved environmental and social efficiency (Sy, 2016; Dieste et al., 2019). In other words, the implementation of the lean approach and sustainable programs can help stimulate process innovation which helps companies achieve sustainable performance with maximum efficiency and minimal resources (Farias et al., 2019).

Bergmiller and McCright (2009) established that there is a significant synergy between lean and sustainable practices and that firms that pursue lean initiatives are more successful if they also pursue sustainable objectives. Dües et al. (2013), also support this synergy arguing that lean practices act as a catalyst for the operation of sustainable activities. Lean practices will impact the environment positively because they are operated in such a way that promotes the efficient and proper use of resources. A combination of both lean practices and sustainability initiatives will help achieve several benefits such as;

Many cost-saving initiatives are not sustainable but some professionals understand how to best develop permanent financial relief through sustainable initiatives. One such approach is the lean one whereby operating and maintenance costs are mitigated, vulnerability to fuel price and energy increases are avoided, customer expectations are met, safety is enhanced and overall profit is increased. Reliance on lean practices also contributes to reduced consumption of raw materials, water and energy. Waste management becomes improved, environmental efficiency is enhance, the quality of life improves and financial objectives of firms are met. Most importantly, lean production contributes to significant reduction in environmental pollution.

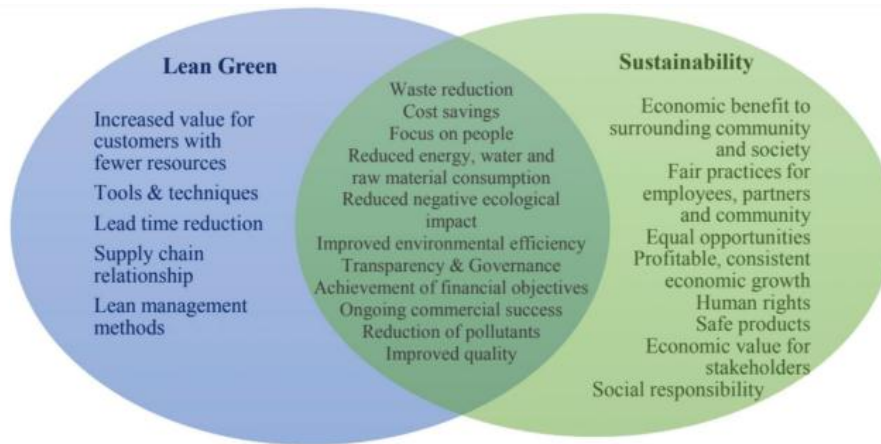


Figure 1: Lean Concept and Sustainability (Dües et al, 2013)

On the economic dimension, embracing sustainable and lean principles is not just a trend. Adopting sustainable and lean practices helps organizations become more efficient, competitive and profitable (Sy, 2016). Proper alignment of a lean supply chain and sustainable practices can positively impact a firm by achieving customer satisfaction and financial goals. Essentially, the integration of lean and sustainability aspects will help a company achieve numerous benefits.

Reduction of energy-related costs

Water and energy costs contribute to a major concern for many businesses. Implementing strategies such as recycling and focusing on continuous improvements can save on supply costs. Sustainability can thus improve the company's bottom line.

Societal impact

Besides helping the company's profitability, sustainability and lean practices can have a societal impact. Implementing changes aimed toward a sustainable and lean direction will help reduce carbon print and also reduce the toxin released into the atmosphere (Caldera et al., 2017). Consequently, future generations will benefit from improved water and air quality, more renewable energy sources and better waste management.

Attracting new customers and increasing sales

Embracing sustainable and lean practices makes a company more marketable. Consumers are becoming more environmentally conscious and potential consumers who value sustainability will be attracted to the company's products and services. Therefore, making improvements and highlighting the company's sustainable initiatives will attract a new base of customers thus resulting in increased sales.

Methodology

This was a desk-based study, which Hague and Wilcock (2021) define as gathering secondary data or information that has already been gathered. Therefore, a desk-based study is a research

technique that involves collecting data from existing resources. It is thus regarded as a low-cost method of collecting data. It mainly consists of published reports and data, which are valuable resources. A desk-based study will identify the articles and journals regarding sustainability initiatives in UAE and how sustainability relates to lean practices.

Data was collected from secondary sources journal articles and the internet. Articles from different sources and databases were selected and examined systematically. To effectively find the most relevant data from the secondary sources, the study used the Boolean search strategy to find the most accurate and appropriate sources for use in the research study. Boolean Search allows the user to limit words or phrases to find the relevant results. The relevant journal articles were retrieved from Search websites such as Wiley Online Library, Research Gate, Elsevier and Springer. Using terms such as or, and, not, etc., enables the researcher to define relationships among concepts. In this study, the search strings included (sustainability), (lean), (sustainable initiatives), (sustainability UAE) etc. This approach is essential in ensuring a thorough and complete exploration of the literature. The search was regarded as complete when the researcher identified articles that keep appearing in the results section and they match the inclusion and exclusion criteria. A final sample of the articles was then identified and data collected from them to find out the main themes of the research study. That is; sustainability initiatives in UAE and lean concepts.

Stratified random sampling will be utilized in this research study. While the volume of articles chosen will be high, they will be passed through an exclusion and inclusion process that will focus on issues such as date of publication, quality of article (peer-reviewed or not) and relevance of the study content to this study. The expectation is that after all factors have been considered, the minimum number of studies that will be suitable for this study will not be less than 30. That means that 30 top corporations from the UAE will be discussed in this paper.

Findings and Discussions

UAE's sustainable growth depends heavily on food, energy and water security. Adoption of tech-driven solutions will be the key to achieving holistic sustainability that integrated the economic, social and environmental goals (D'Mello, 2021). Organizations in UAE have to ensure that the available and necessary resources are capable of lean and sustainability integration. Aspects such as technology, equipment condition, professional expertise and labor skills have to meet both lean and sustainability requirements.

Sustainability and lean integration

Sustainability goals are to enable a firm to become more socially, environmentally and economically sustainable. Those of lean is to ensure waste reduction and process efficiency. Integrating lean and sustainable practices across all companies in the UAE will lead to the achievement of success following the UAE sustainability initiatives (Snee, 2010). Technology solutions as a lean tool will certainly help UAE increase efficiency in their supply chains and decentralize production. The main effects of sustainable and lean practices on environmental and social sustainability are related to the cost reductions in terms of reduction of manufacturing time,

transportation that is unnecessary and material consumption (Cherrafi et al., 2016). Also, lean increases the productivity of companies by eliminating unnecessary production steps thus increasing efficiency in processes (Sy, 2016). In this case, lean contributes to a direct relationship with sustainability practices. Cost reductions and process efficiencies of lean production will contribute to positive environmental impacts by reducing energy consumption, water consumption and enhanced waste management.

Commitment and management support

The findings suggest that most top UAE companies have adopted sustainable practices while maintaining leanness in their operations. However, some firms find that adopting the concept of sustainability is draining their profitability and derailing their future success. Furthermore, integrating lean practices is incomprehensible and may face resistance from employees (Seretny et al., 2019). To ensure that the UAE sustainability efforts are successful across the nation, the top management of companies needs to remain committed and engaged in the initiatives. Management could ensure the implementation is done through their involvement, supporting the teams and removing any potential barriers (Cherrafi et al. 2016). According to Snee (2010), in cases where the top management is not convinced about investing in sustainability initiatives, the initiative should not be pursued since the chances of success are very low.

Conclusions

Sustainability has become an indispensable strategy sought to be implemented and promoted by countries worldwide to ensure success for their people and also to protect the planet. The growing demand for environmental and social performance of firms and their products and services offerings has necessitated companies to adopt sustainability practices into their core strategy. The UAE government has sought to transform the concept of corporate social responsibility (CSR) from mere contribution to charitable activities to launching well-established development initiatives nationwide. Based on the discussions above, UAE focuses on developing innovative sustainable development initiatives that are consistent with the social, economic and environmental dimensions of sustainability. Essentially, UAE is taking significant steps to promote ESG compliance, UN SDGs and sustainable development across all sectors.

Research Limitations

First, the study was limited to a few numbers of articles that provide evidence of the implementation and success of sustainability efforts in the UAE. Second, the sample was not obtained in a randomized manner and it may be subject to bias thus restricting the validity of the research. Third, the sample size of the secondary articles used in this study was relatively small and may not provide sufficient data to assess the relationship between lean and sustainability. Further research is needed to explain to practitioners and researchers how sustainability and lean can be integrated effectively to mitigate the environmental footprint, reduce costs, improve productivity and enhance the quality of life.

Practical Implications

This study contributes to the increase in knowledge about sustainability initiatives as they relate to the implementation of environmental, social and economic areas of sustainable business practices. It also provides useful insights that sustainability practitioners in UAE could use as it offers an extensive examination of the sustainability initiatives in UAE, challenges to implementing the initiatives and how they relate to lean concepts. This study can be expanded to look deeper into the linkage and interdependence between lean and sustainability.

Recommendations

The first recommendation is that the UAE government needs to establish stricter operational frameworks that prompt corporations in the country to uphold greater standards concerning sustainability. Through policy initiatives, large corporations in the UAE will not only focus on enhancing their practices concerning sustainability but they will be stewards in the efforts to achieve that objective.

The second recommendation is that training and development programs should be improved in firms throughout the UAE aiming to create awareness regarding the value of lean practices (Cherrafi et al., 2016). Also, those employees would realize the benefits of prioritizing practices that uphold sustainability.

References

- Abuhejleh, A. A., Dulaimi, M., & Ellahham, S. (2016). Using lean management to leverage innovation in healthcare projects: a case study of a public hospital in the UAE. *BMJ Innov*, 2(1), 22-32.
- Alsyouf, I., Kumar, U., Al-Ashi, L., & Al-Hammadi, M. (2018). Improving baggage flow in the baggage handling system at a UAE-based airline using lean Six Sigma tools. *Quality Engineering*, 30(3), 432-452.
- Bergmiller, G. G., & McCright, P. R. (2009, May). Our lean and green programs synergistic? In *Proceedings of the 2009 Industrial Engineering Research Conference* (pp. 1155-1160).
- Caldera, H. T. S., Desha, C., & Dawes, L. (2017). Exploring the role of lean thinking in sustainable business practice: A systematic literature review. *Journal of cleaner production*, 167, 1546-1565.
- Cherrafi, A., Elfezazi, S., Chiarini, A., Mokhlis, A., & Benhida, K. (2016). The integration of lean manufacturing, Six Sigma and sustainability: A literature review and future research directions for developing a specific model. *Journal of Cleaner Production*, 139, 828-846. doi:10.1016/j.jclepro.2016.08.101
- D'Mello, S. (2021). UAE companies on board with sustainability drive. *Khaleej Times*. <https://www.khaleejtimes.com/business/uae-companies-on-board-with-sustainability-drive>

- Dieste, M., Panizzolo, R., Garza-Reyes, J. A., & Anosike, A. (2019). The relationship between lean and environmental performance: Practices and measures. *Journal of Cleaner Production*, 224, 120-131. doi:10.1016/j.jclepro.2019.03.243
- Dües, C. M., Tan, K. H., & Lim, M. (2013). Green as the new Lean: how to use Lean practices as a catalyst to greening your supply chain. *Journal of cleaner production*, 40, 93-100.
- Emirates GBC. (n.d). UAE Sustainability Initiatives. <https://emiratesgbc.org/uae-sustainability-initiatives/>
- Farias, L. M. S., Santos, L. C., Gohr, C. F., de Oliveira, L. C., & da Silva Amorim, M. H. (2019). Criteria and practices for lean and green performance assessment: Systematic review and conceptual framework. *Journal of Cleaner Production*, 218, 746-762. doi: 10.1016/j.jclepro.2019.02.042.
- Janahi, M.A. (2022). How UAE Businesses Are Leading the Sustainability Charge. *The National News*. <https://www.thenationalnews.com/business/comment/2022/01/19/how-uae-businesses-are-leading-the-sustainability-charge/>
- Khan, O., & Punjabi, J. (2021). Steps Taken by UAE Towards Sustainable Development and ESG Compliance. *Tamimi Law*. <https://www.tamimi.com/law-update-articles/steps-taken-by-uae-towards-sustainable-development-and-esg-compliance/>
- KPMG. (2020). The Time Has Come. The KPMG UAE Survey of Sustainability Reporting 2020. <https://home.kpmg/ae/en/home/insights/2020/12/kpmg-uae-survey-of-sustainability-reporting-2020.html>
- KPMG. (2021). Sustainability Reporting Journey 2021. <https://home.kpmg/xx/en/home/insights/2021/03/sustainability-reporting-strategic-direction.html>
- Seretny, M., Milla, A. C., Azeem, M., Gaur, D., Jones, D., Moalla, R. B. A., & Mataruna-Dos-Santos, L. J. (2019). Challenges Companies Encounter When Delivering Sustainable Solutions: Research Conducted in the United Arab Emirates.
- Siegel, R., Antony, J., Garza-Reyes, J. A., Cherrafi, A., & Lameijer, B. (2019). Integrated green lean approach and sustainability for SMEs: From a literature review to a conceptual framework. *Journal of cleaner production*, 240, 118205. doi:10.1016/j.jclepro.2019.118205
- Snee, R. D. (2010). Lean Six Sigma—getting better all the time. *International Journal of Lean SixSigma*. doi:10.1108/ 20401461011033130.
- Sy, M. V. (2016). Impact of sustainability practices on the firms' performance. *Asia Pac. Bus. Econ. Perspect*, 4, 4-21.