

Sustainability of Supply Chain Management Factors for the UAE Oil & Gas Industry

Marwan Ali¹, Rozilah Kasim², Adejob Ahmodu Adaji³

^{1,3} Researcher, Faculty of Technology Management and Business, University Tun Hussein Onn Malaysia, Batu Pahat, MALAYSIA

² Lecturer, Faculty of Technology Management and Business, University Tun Hussein Onn Malaysia, Batu Pahat, MALAYSIA

ABSTRACT

The Oil and Gas industry plays a vital role in global economy as petroleum and crude oil has become the key fuel source. Nevertheless, intensive and extensive exploitation of oil sources often results to the degradation of the environment therefore raising concerns for sustainability. This paper examined the current sustainability of Supply Chain Management (SCM) for Oil & Gas industry in the U.A.E. A quantitative approach was adopted for this study. The survey tool used was a structured questionnaire that was designed based on the factors derived from the literature. A purposeful sampling procedure was used for selecting 384 senior managers and directors of oil and gas companies in UAE. Statistical Package for Social Sciences (SPSS) was used for data analysis. Findings revealed monetary valuation of resources and the effectiveness of resources use (3.96), encouraging social integration (3.98), and use of materials and resources (3.80) as important factors in economic, social, and environmental aspects in the Sustainability of SCM in the study area. Stakeholders should create adequate awareness among members on the gains of sustainability so as to guide them to take eco-friendly choices or decisions. Hence, future research should concentrate on these identified elements for sustainable SCM.

Keywords

Oil & gas industry, supply chain management, sustainability, UAE.

Article Received: 10 August 2020, Revised: 25 October 2020, Accepted: 18 November 2020

Introduction

The oil and gas sector is playing a key role in global economy since the petroleum and crude oil has become the key fuel source. Nevertheless, an extensive activities that relate to the oil sources has resulted to raising concerns for sustainability [1]. According to [2], previous studies mainly lack of focus on the challenges of the sustainability linked to the management of supply chains in relation to the oil sector. [3] confirms that organizations are facing treat to sustain their existing supply chain due to the globalization, market challenges, demand uncertainty and economic competitiveness

Sustainability is an integrating of economy, society and environment domains [4]. Therefore, the organisation be able to achieve competitive position in the contemporary global market environment [5]. This means that the success of business to a substantial level rest on efficient supply chain management. That may be responsible for the expression given by [6] that, it is imperative for sustainability consideration to be incorporated in the supply chain functions.

Even though [7] established that sustainable supply chain management has gained prominence

from extensive research inputs, the actual implementation has proven intricate [8]. [9] confirmed that, majority of the Middle Eastern countries including the U.A.E are still late adopters when it comes to the implementation of sustainable supply chain management (SSCM). Hence, need to comprehensively understand the impact of sustainability on supply chains through extensive research is non-negotiable [10]. This offered the rationale of this study to determine the current sustainability of SCM for Oil & Gas industry in the U.A.E. Moreover, SSCM as an advent of a new era that incorporates the performance of environment, society and economy contribution that intersect the three pillars of sustainable development [3]. Therefore, this paper aims to examine the current level of SSCM for oil & Gas industry in the study area from the perspective of economic, social and environmental factors. This is imperative since climate change, the depletion of natural resources and environmental pollution are the main drivers supporting the international efforts to greening the supply chains.

This paper will extensively examine the current level of sustainability of SCM for Oil & Gas

industry in the UAE so as to create awareness on the appropriate measures that will ensure SSCM for Oil & Gas industry in the UAE and elsewhere.

Literature Review

Sustainability is an all-encompassing discipline mainly connected to the study of how natural system function, remain diverse and offer everything it requires for the ecology to maintain balance [11]. In the observation of [12], the concept of sustainability is the interface of environmental, social, and economic tasks. Currently, many companies have swiftly responded to the organisation and business. As defined by [13] sustainability is “development that meets the needs of the present without compromising the ability of future generations to meet their needs”. The word sustainability has been applied numerous times in the corporate world but infrequently with a common definition. Sustainability provides long term potential risks reduction of resource depletion, fluctuations in the cost of energy, product liabilities, pollution and waste management [14]. The organizational engineering defines sustainability as a combination of the economic, environmental, and social dimensions: “a wise balance among economic development, environmental stewardship, and social equity” [15]. The terms sustainability and sustainable development are interchangeable however this study prefer to use as opposed to wide range usage of the term sustainable development [16-17].

2.1 Sustainable Supply Chains Management (SSCM)

According to [18], SSCM is “the management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development (economic, environmental and social), into account which are derivatives of customer and stakeholder requirements”. [19] defined SSCM as “the strategic, transparent integration and achievement of an organization's social, environmental, and economic goals in the systemic coordination of vital inter-organizational business processes for enhancing the long-term economic performance of the individual company and its supply chains”. In recent time, [20] described SSCM as “the creation of coordinated supply chains through the voluntary integration of economic, environmental,

and social considerations with key inter-organizational business systems designed to efficiently and effectively manage the material, information, and capital flows connected with the procurement, production, and distribution of products or services in order to meet stakeholder requirements and improve the profitability, competitiveness, and resilience of the organization over the short- and long-term”.

Furthermore, SSCM is a process of integrating sustainability into a task or activity [21]. Therefore, there is a need to investigate the operational implications of various policy on integrating sustainability with supply chains [22]. Amongst the researches that can be conducted are enhancing integration of sustainability in supply chain, optimising loads and backloads through vertical and horizontal customers sharing and others [23]. The main features of a supply chain engaging sustainability is the correlation between suppliers and main company. Healthy supply chain relationship can have resulted to better operational efficiency, positive environmental impacts, cost reduction, flexibility in adapting to ever changing demands, technological innovations, energy efficiency and reduction in carbon emissions [24],[25],[26].

2.2 Economic Sustainability Dimension

Economic sustainability means to achieve an economic growth at the same time protecting and safeguarding the environment [27]. Through economic sustainability, the consumption of resources is done through an effective way for positive long term effects while minimising adverse effects due to excessive resource exploitation. The economic sustainability contributes to the higher returns on investment that do not resulted to environmental or social degradation. It deals with natural resources valuation and the effectiveness use of the resources that leads to sustainable economic growth [29], [28], [30].

Economic sustainability expects organisations to manage various types of resources either tangible or non-tangible capitals effectively [31]. The focus of economic theory is to use goods in an appropriate manner with resource efficient allocation [29]. Thus, achieving sustainability requires economic records keeping systems to reflect ecosystems resources [32]. Neglecting environmental and social factors are obstacles to

achieving economic sustainability and the fact that a company is making profit does not guarantee its long term survival, nor does it indicate a positive effect on its immediate social factors and the environment

2.3 Environmental Sustainability Dimension

Environmental sustainability is what many sustainability advocates have historically concentrated on [33]. Environmental issues have been the leading focus of research over the past 20 years [10] and are becoming the primary concern of many organisations in today's world [34]. Environment is a vital component of sustainability [35] and has been in leading attention concerning climate change, global warming and rising energy prices. Environmental sustainability refers to preserving natural resources [27]. Environmental sustainability is the protection of natural mineral or material sources which need by human being. If less was created than the environment will be able to accommodate human consumption sustainably. Hence, environmental sustainability sets constraints for major activities on human economic subsystem such as pollution and waste integration [29]. Nowadays corporate survival relies on the organisation's ability to integrate environmental aspects in its supply chains [36]. Integrating sustainability in the supply chain helps on resource reduction, efficiency and conservation [36]. Organisations that excel on environmental protections gain to societal acceptance and also able to make bigger profit [37].

2.4 Social Sustainability Dimension

Social sustainability is development that is compatible with harmonious evolution of civil society, fostering an environment conducive to the compatible cohabitation of culturally and socially diverse groups' whilst encouraging social integration with the betterment of quality of life for all [38]. Social sustainability is given, when all people in a society and other related institutional arrangements are satisfied [39]. Therefore, social sustainability is about the relationship between human rights and human development; corporate power and environmental justice; global poverty and citizen action [40].

Social sustainability can be viewed as a mean of achieving economic and environmental sustainability. Thus it requires to improve and

maintain quality of life without damaging the environment, such as honesty [39, 40, 41]. This sustainability leads to higher motivation among the employees and this will have resulted to lower operating cost [42].

The foregoing indicates that companies should recognize the prominence of the public awareness of information concerning their sustainable practices. The sustainable knowledge may enhance initiatives and performance of the stakeholders in addressing sustainability issues [42]. According to [28], very little studies focusing on supply chain even with the growing interest from professionals.

The Oil & Gas industry is considered because it is fundamental to the deliberations on sustainability. According to [42], the industry plays a very crucial role in the economic and social development. As such, there are heightening concerns on the negative impact of its undertakings and products on the environmental and societal wellbeing. Hence, it becomes imperative for us to know the present state of SSCM in the industry as this will offer us the opportunities for improvement that could expedite effective employability or applicability in the study area.

Research Method

The objective of this paper is to determine the current sustainability of SCM in context of the Oil & Gas industry in the U.A.E. Not much research work has been carried out in this area, and hence, the findings of this work will guide the organizations to re-consider their action plan towards sustainable courses. A quantitative approach was adopted for this study where a structured questionnaire was designed and used for data collection [43]. A pilot study was conducted to validate the questionnaire. A purposeful sampling procedure was used for selecting the participants in this study. This technique was employed to ensure a fairly equal representation of the variables for the study. The purposeful based on the target sampling/respondents of the study which are the 384 senior managers and directors of oil and gas companies in UAE because they are individuals who have the right knowledge and experience of oil and gas industry to answer all aspects of the survey. The questionnaires survey was carried out by physical interaction with the respondents who

are the senior managers and directors of the UAE Oil and Gas Industry. The respondents were asked to rank the current level of sustainability from their perspective using a 5-point Likert scale. The collected data was used to determine the key parameters in SSCM using SPSS descriptive statistics and a ranking of the parameters as perceived by respondents.

Results and Discussion

This section presents the results as well as the discussion of findings based on analysis. As mentioned earlier in this research, three components were examined by the respondents and thus, results and discussion were based on these important elements of SSCM. The analysis of the current sustainability of SCM for Oil & Gas industry is categorized under economic aspects, environmental aspects, and social aspects.

4.1 Economic Aspects

Table 1 shows the parameters considered under the economic dimension of sustainability regarding SSCM for oil and gas industry in the study area.

Table 1: Economic sustainability of SCM for Oil & Gas industry in the U.A.E

Economic aspects	Mean	Standard Deviation	Rank	Remark
Resources monetary valuation and the effectiveness use of resources	3.96	1.089	1	High
Improving production quality and lowering disposal costs	3.93	1.114	2	High
Supplier reliability	3.90	1.152	3	High
Quality assurance	3.88	1.222	4	High
Competitive pressure	3.88	1.216	5	High

Reducing turnover and recruitment costs	3.84	1.269	6	High
Reducing labour costs in form of higher levels of motivation and productivity	3.81	1.237	7	High
Innovation potential	3.80	1.224	8	High
Minimizing adverse impacts of resource exploitation	3.78	1.217	9	High
Cost reduction such as health and safety cost	3.77	1.269	10	High

From Table 1, the data displays that the mean value ranged from a high mean value of 3.96 to the low mean value of 3.77. It can be observed that resources monetary valuation and the effectiveness use of resources, improving production quality and lowering disposal costs, and supplier reliability have a mean value of 3.96, 3.93, and 3.90 respectively. This shows their high ranking positions among the factors considered under the economic aspects in this study. Table 1 displays that the economic aspect of current sustainability of SCM for Oil & Gas industry in the U.A.E is also high. The result supports the mean interval ranking proposed by [44].

4.2 Social Aspect

Table 2 shows the parameters considered under the social dimension of sustainability regarding SSCM for oil and gas industry in the study area.

Table 2: Social sustainability of SCM for Oil & Gas industry in the U.A.E.

Social aspects	Mean	Standard Deviation	Rank	Remark
Encouraging social integration	3.98	1.249	1	High
Freedom of association	3.97	1.190	2	High
Child and forced labour avoidance	3.94	1.297	3	High
Sustainable human development	3.92	1.305	4	High
Fostering conducive environment of culturally and socially diverse groups'	3.83	1.149	5	High
Human rights	3.82	1.196	6	High
Job security	3.81	1.204	7	High
Performance relative to competitors	3.78	1.302	8	High
Equal rights	3.76	1.229	9	High
Health protection	3.74	1.251	10	High

The result in Table 2 shows that the mean value ranged from a high mean value of 3.98 to the low mean value of 3.74. It can be perceived that encouraging social integration has a mean of 3.98, followed by freedom of association with a mean value of 3.97, child and forced labour avoidance has a mean value of 3.97, sustainable human development has a mean value of 3.94, fostering conducive environment of culturally and socially diverse groups' has a mean value of 3.83, human rights has a mean value 3.82, job security has a mean value of 3.81, performance relative to competitors has a mean value of 3.78, equal rights has a mean value of 3.76, health protection has a mean value of 3.74. Table 2 depicts that the social aspect of current sustainability of SCM for Oil & Gas industry in the U.A.E is high. This is in accordance with the mean interval ranking recommended by [45].

4.3 Environmental Aspects

Table 3 presents the parameters considered under the environmental dimension of sustainability

regarding SSCM for oil and gas industry in the study area.

Table 3: Environmental sustainability of SCM for Oil & Gas industry in the U.A.E.

Environmental aspects	Mean	Standard Deviation	Rank	Remark
Use of materials and resources	3.80	1.359	1	High
Reduction in amount of resource use	3.77	1.343	2	High
Biodiversity conservation	3.73	1.367	3	High
Sustainable working condition	3.72	1.238	4	High
decreasing the industry social effect	3.72	1.279	5	High
Carbon footprint reduction	3.70	1.355	6	High
Renewable energy	3.69	1.322	7	High
Waste management	3.68	1.368	8	High
Reduction of greenhouse gas emissions	3.68	1.384	9	High
Reduction of negative impacts on the environment	3.54	1.418	10	High

From Table 3, the data shows that the mean value ranged from a high mean value of 3.80 to the low mean value of 3.54. It is evident that use of materials and resources, reduction in amount of resource use, and biodiversity conservation lead among others with mean value of 3.80, 3.77, and 3.73 respectively. Sustainable working condition has a mean value of 3.72, decreasing the industry social effect also has a mean value of 3.72, carbon footprint reduction has a mean value of 3.70, renewable energy poses a mean value of 3.69, waste management e.g., disposal of chemical

wastes has a mean value of 3.68, reduction of greenhouse gas emissions also has a mean value of 3.68 and reduction of negative impacts on the environment with a mean value of 3.54. These are all good indicators and shows that the environmental aspect of current sustainability of SCM for Oil & Gas industry in the U.A.E is high. This is in accordance with the mean interval ranking suggested by [43].

It can be observed from the results obtained in this study that these factors are very critical to sustainability of SCM in the study area since they support previous studies. Previous studies [45] have identified the critical success factors of SSCM practices in the context of oil and gas industries.

There is need for development of policies that can ensure smooth implementation of SSCM in the oil & gas case study sector.

Conclusion

The paper has presented the study that was conducted in the oil and gas industries. It was found that the resources monetary valuation and the effectiveness use of resources, encouraging social integration, and use of materials and resources as important factors in the three pillars of sustainability which are namely economy, society, and environment aspects in the SCM in the United Arab Emirates. Being an ongoing research, the results obtained in this paper showed strong and positive indicator of economic, social, and environmental aspects in SSCM in the oil and gas industries in the U.A.E. Therefore, efforts should be geared towards elements identified in the research as sustainability of the operation is guaranteed in the study area and similar locations. Stakeholders should create adequate awareness among members on the gains of sustainability so as to guide them to take eco-friendly choices or decisions. In future, similar approach may be extended to other industries for the implementation of sustainability practices.

Acknowledgement

The authors would like to thank the Universiti Tun Hussein Onn Malaysia for supporting this research work.

References

- [1] M. S. Florescu, E. G. Ceptureanu, A. F. Cruceru, and S. I. Ceptureanu, "Supply sustainable chain management strategy influence on supply chain management functions in the oil and gas distribution industry," *Energies*, vol.12, April, 2019, pp. 1-16.
- [2] R. Hussain, T. Assavapokee, and B. Khumawala, "Supply chain management in the petroleum industry: challenges and opportunities," *Int. J. Glob. Logist. Supply Chain Mgt.*, vol. 1, 2006, pp. 90-97.
- [3] Z. N. Ansari and R. Kant, "A state-of-art literature review reflecting 15 years of focus on sustainable supply chain management," *J. of Cleaner Produc.*, vol. 142, 2017, pp.2524-2543.
- [4] S. I. Ceptureanu, E. G. Ceptureanu, C. E. Luchian, and I. Luchian, "Community based programs sustainability: a multidimensional approach," *Sustainability*, vol. 10, 2018, pp. 870.
- [5] M. Khodakarami, A. Shabani, R. F. Saen, and M. Azadi, "Developing distinctive two-stage data envelopment analysis models: an application in evaluating the sustainability of supply chain management," *Measurement*, vol. 70, 2015, pp. 62-74.
- [6] V. Jayaraman, R. Klassen, and J. D. Linton, "Supply chain management in sustainable environment," *J. Oper. Mgt.*, vol. 25, 2007, pp. 1071-1074.
- [7] W. N. K. W. Ahmad, J. Razaeei, L. A. Tavasszy, and M. P. de Brito, "Commitment to and preparedness for sustainable Supply chain management in the oil and gas industry," *J. Environ. Mgt.*, vol. 180, 2016, pp. 202-213.
- [8] Linear B. Wagner and G. Svensson, "sustainable Supply chain practices: Research propositions for the future," *Int. J. Logist. Mgt.*, vol. 2, 2010, pp. 176-186.
- [9] H. Younis, B. Sundarakani, and P. Vel, "The impact of implementing green supply chain management practices on corporate

- performance,” *Competitiveness Rev.*, vol. 26, 2016, pp. 216-245.
- [10] C. R. Carter, and P. L. Easton, “sustainable Supply chain management: Evolution and future directions,” *Int. J. Phys. Distrib. Logist. Mgt.*, vol. 41, 2011, pp. 46-62.
- [11] H. B. B. Doyduk, and E. Y. Okan, (2017) “Sustainable city branding: Cittaslow–The case of Turkey. In A. Bayraktar & C. Uslay (Eds), *Global Place Branding Campaigns across Cities, Regions, and Nations* (pp.166-184). Hershey, PA: IGI Global.
- [12] M. Szuster, *Supply Chain Sustainability Drivers, Inhibitors, Solutions*, In *Technology Management for Sustainable Production and Logistics* (pp. 57-80). Springer, Berlin, Heidelberg, 2015.
- [13] S. Dresner, *The principles of sustainability*, Routledge: UK, 2012.
- [14] R. K. Singh, H. R. Murty, S. K. Gupta, and A. K. Dikshit, “An overview of sustainability assessment methodologies”, *Ecol. Indicators*, vol. 15, 2012, pp. 281–299.
- [15] K. Muduli, K. Govindan, A. Barve, and Y. Geng, “Barriers to green supply chain management in Indian mining industries: a graph theoretic approach,” *J. Clean. Prod.*, vol. 47, 2013, pp. 335-344.
- [16] S. Dresner, *The Principles of Sustainability Second Edition*, London. Earth Scan, 2008.
- [17] Adeyemi, A., Martin, D., & Kasim, R. (2017). The relevance of lean thinking to sustainable improvement of public office buildings in Nigeria. *Journal of Engineering and Applied Sciences*, vol. 12 (6), pp.1365-1376.
- [18] S. Seuring, and M. Muller, “From a literature review to a conceptual framework for sustainable supply chain management,” *J. Clean. Prod.*, Vol. 16, 2008, pp. 1699-1710.
- [19] C. R. Carter, and D. S. Rogers, “A framework of sustainable supply chain management: moving toward new theory,” *Int. J. Phys. Distrib. Logist. Mgt.*, vol. 38, 2008, pp. 360-387.
- [20] P. Ahi, and C. Searcy, “A comparative literature analysis of definitions for green and sustainable supply chain management,” *J. Clean. Prod.* 52, 2013, pp. 329-341.
- [21] H. Haake, and S. Seuring, “Sustainable procurement of minor items – exploring limits to sustainability,” *Sustain Dev.*, 17, 2009, pp. 284-294.
- [22] D. J. Linton, R. Klasen, and V. Jayaraman, “Sustainable Supply Chains: An Introduction,” *J. Oper. Mgt.*, vol. 25, 2007, pp. 1-11.
- [23] T. Abubakar, *A study of sustainability in the oil and gas supply chain* (Doctoral dissertation, University of Central Lancashire), 2014.
- [24] D. F. Simpson, and D. J. Power, “Use the supply relationship to develop lean and green suppliers’ supply chain management: An Int. J., vol. 10, 2005, pp. 60–68.
- [25] H. Kaynak, and I. Montiel, “The relationship between sustainable supply chains management and sustainable performance: An Integrated Framework”, *Academy of Mgt. Proc.*, 2009, pp. 1-6
- [26] G. Svensson, “Aspects of sustainable supply chain management (SSCM): conceptual framework and empirical example,” *Supply Chain Mgt., Int J.*, vol. 12, 2007, pp. 262–266.
- [27] Y. Y. Yusuf et al., “The UK oil and gas supply chains: an empirical analysis of adoption of sustainable measures and performance outcomes,” *Int. J. Prod. Econ.*, vol. 146, 2013, pp. 501-514.
- [28] W. L. Tate, L. M. Ellram, and J. F. Kirchoff, “Corporate social responsibility reports: a thematic analysis related to supply chain management,” *J. Supply Chain Mgt.*, vol. 46, 2010, pp. 19-44.
- [29] R. Goodland, “The concept of environmental sustainability,” *Annual Review Eco. Sys.*” vol. 26, 1995, pp. 1-24.

- [30] J. Sarkis, Q. Zhu, and K-H. Lai, "An Organizational Theoretic Review of Green Supply Chain," *Int. J. Prod. Econ.*, vol. 130, 2011, pp. 1-15.
- [31] T. Dyllick, and K. Hockerts, "Beyond the business case for corporate sustainability," *Bus. Strat. and Environ.*, vol. 11, 2002, pp. 130-141.
- [32] R. Costanza, and B. C. Patterns, (1995) "Defining and Predicting Sustainability," *Eco. Econ.*, vol. 15, 1995, pp. 193-196.
- [33] G. D. Whitten, K. W. Green, and P. J. Zelbst, "Triple-A supply chain performance," *Int. J. Oper. and Prod. Mgt.*, vol. 32, 2012, pp. 28-48
- [34] S. S. Kuik, S. V. Nagalingam, and Y. Amer, "Sustainable supply chain for collaborative manufacturing", *J. Man. Tech. Mgt.*, vol. 22, 2011, pp. 984-1001
- [35] Adeyemi, A., Martin, D., & Kasim, R (2015). Improvement of existing buildings for sustainability as against maintenance and rebuild. Proceedings of the 25th International Business Information Management Association Conference – Innovation Management and Sustainable Competitive Advantage: from regional Developmanr to Global Growth, IBIMA 2015 pp. 3829-3843.
- [36] G. Büyüközkan1, and G. Çifçi, "Analysis of the sustainable supply chain structure with incomplete preferences", Proceedings of the World Congress on Engineering, vol. III: WCE, June 30 - July 2, 2010, London, U.K.
- [37] C. N. Madu, *Managing Green Technologies for Global Competitiveness*, Quorum, Westport, CT, 1996.
- [38] L. Preuss, "Addressing sustainable development through public procurement: the case of local government," *Supply Chain Mgt. Int. J.*, vol. 14, 2009, 213-223.
- [39] S. Luthra, D. Garg, and A. Haleem, 2015. "Critical success factors of green supply chain management for achieving sustainability in Indian automobile industry". *Prod. Plan. Control*, vol. 26, 2015, 339-362.
- [40] A. J. Hoffman, and M. H. Bazerman, "Changing practices on sustainability: understanding and overcoming the organizational and psychological barriers to action", *Wall Street J.*, vol. 3, 2005, pp. 1-34.
- [41] S. Townsend, "Incorporating sustainable practices for Zoos and Aquariums: a triple bottom line approach," *Int. Zoo*, vol. 43, 2009, pp. 53-63.
- [42] J. Ellington, "The Triple Bottom Line for 21st Century Business' in Richard, S. and Richard, W. (Eds.), *Business and Sustainable Development*, London, Earth Scan, 2001.
- [43] Ishiyaku, R., Kasim, R., & Harir, A.I, (2017). Confirmatory factorial validity of public housing satisfaction constructs, *Cogent Business & Management* 4 (1). 1359458.
- [44] M. Hassanain, and A. Iftikhar, "Framework model for post-occupancy evaluation of school facilities," *Struct. Surv.*, vol. 33, 2015, pp. 322-336.
- [45] R. D. Raut, B. Narkhede, and B. B. Gardas, "To identify the critical success factors of sustainable supply chain management practices in the context of oil and gas industries: ISM approach," *Ren. and Sust. Ener. Rev.*, vol. 68, 2017, pp. 33-47.