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Application of Structural Equation Modeling (SEM) to Solve Environmental Sustainability Problems: A Comprehensive Review and Meta-Analysis

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Abstract: Most methodological areas assume common serious reflections to certify difficult study and publication practices, and, therefore, approval in their area. Interestingly, relatively little attention has been paid to reviewing the application of Structural Equation Modeling (SEM) in environmental sustainability problems despite the growing number of publications in the past two decades. Therefore, the main objective of this study is to fill this gap by conducting a wide search in two main databases including Web of Science and Scopus to identify the studies which used SEM techniques in the period from 2005 to 2016. A critical analysis of these articles addresses some important key issues. On the basis of our results, we present comprehensive guidelines to help researchers avoid general pitfalls in using SEM. The results of this review are important and will help researchers to better develop research models based on SEM in the area of environmental sustainability.

Keywords: environmental sustainability; structural equation modeling; comprehensive analysis; meta-analysis

1. Introduction

Sustainability is the biggest challenge of the 21st century because civilization has reached a point where natural resources are in rapid decline. Several previous studies have emphasized the vital role of environmental sustainability in various applications areas such as waste management [1–4], energy [5–8], sustainability performance [9–11], green product [12–15], low carbon and climate [16–18], tourism [19–22], information and communication technology [23–26], health [27,28], behavioral science [29,30], innovation [31–33], economic development [34–37], risk assessment [38–40], decision making [41–44], tourist behaviour [45–48], business practices [49–52], industrial manufacturing [53–56], agricultural [57–60], supply chain [61–64], and other applications. The environmental issues such as global warming, ozone depletion, natural resource decline, ecosystem destruction, carbon emissions have raised a concern for the causes of these problems. The conventional thoughts, principles and

methods are currently in question and the challenge we are facing today requires radical changes and global leadership.

Sustainability can be seen as being linked to three main dimensions: the environmental, social, and economic [65–67]. However, Njoh [68] and Luthra, Kumar [24] suggest that there are now four interrelated but competing pillars that have emerged with regard to sustainability. Alongside the biophysical (environmental), the economic, and the social systems, a fourth important dimension is the political system through which power is exercised. This fourth sphere, the political or institutional dimension, functions as the referee that arbitrates in relation to the different and often incompatible claims made by the actors of the social and economic sphere [24]. How much emphasis is placed on these different dimensions or pillars may be linked to different schools of thought, discourses, rationalities or world views regarding the importance of the environment versus economic growth [69–73].

The variety of environmental perspectives on sustainability demonstrates varying emphasis on either altering the resource side or the demand side of the equation [74–83]. They reflect a spectrum from a dark green ecological perspective [84] to a light green perspective (see [85]) which draws on different epistemological assumptions and rationalities. The strong sustainability label is more closely linked to the dark green spectrum, and the light green to the weak sustainability approach. From a dark green perspective, an ecologically rational approach must have lexical priority [73], and ecological values should drive environmental decisions. It is a holistic perspective recognising the interdependence of environmental and social systems.

Collaboration between government, industry, and a strong science and technology sector with requisite research and development funding is the key to solving environmental problems [79,86–88]. While accepting the contribution that science and technology have made in creating environmental problems, they are seen as central to their resolution. Science, therefore, provides the means to better detect environmental dangers, and technological innovation enables the development of alternatives [89]. Talking about theories and models regarding environmental sustainability first raises the question of how environmental sustainability is described in these circles. Scientists doing research in the area of environmental sustainability often cite the definition of environmental sustainability based on the conferences and publications presented in the United Nations program. Kolk and Mauser [90], explore in their review a wide number of different models of environmental sustainability. According to their research, some authors see this as a continuous process towards a higher level of sustainable behavior of the company, therefore called stage models. When researchers do not assume a development over time, models are described more as a continuum of possible strategies or simply choices between equal opportunities. Probably the first publication describing strategies for environmental sustainability is the work of [91] and describes a classification of models for environmental management, based on the survey of 132 managers of US firms. Petulla [91], explores a range of possible strategies. Scholars from a wide range of disciplines and perspectives have sought to unravel the high complexities of sustainability. A mature understanding of sustainability management requires studies to adopt a multidisciplinary systemic lens capable of appreciating the interconnectivity of economic, political, social and ecological issues across temporal and spatial dimensions [92].

Several reviews on sustainability research have been conducted in recent years. However, there is still a gap in the literature regarding review papers in the field of environmental sustainability and Structural Equation Modelling (SEM).Therefore, the aim of this work is to conduct a systematic literature review of the application of SEM in examining environmental sustainability. This paper contributed to current literature by adding some new issues to environmental sustainability and SEM: first of all, the developed a classification scheme with practical considerations; second, structurally reviewed the environmental sustainability literature in a way to present a guide to the earlier research carried out on the application of SEM techniques in assessment of environmental sustainability problems and proposing several recommendations for further investigation. The third contribution of this paper classifies and reviews the selected papers based on several important criteria such as

area, scope and sample, type of method (quantitative, qualitative or mix method), technique (partial least squares (PLS), Analysis of Moment Structures (AMOS) or other techniques), unit of analysis (individual, group and country), number of sample, respondents, related theory, measure validation (Exploratory factor analysis (EFA) or Confirmatory Factor Analysis (CFA)), data collection method (Online or offline survey), name of variables, number of hypotheses, study purpose, gap and research problem, name of author, year of publication, country of authors, and finally results and outcome. Additionally, in we provided the developed frameworks of all selected papers based on the name of author(s). We also present several recommendations and directions for future research in the area of environmental sustainability.

The remainder of this review paper is structured in the following sections. Section 2 presents the research method and procedure of this review paper. Section 3 presents classification of papers based on the application areas. Section 4 provides the breakdown of articles based on scope. Section 5 presents breakdown of articles based on type of method. Section 6 provides breakdown of articles based on technique. Section 7 provides breakdown of articles based on unit of analysis. Section 8 classified the article based related theory. Section 9 categories the article based on measure validation. Section 10 classifies of articles based on data collection method. Section 11 presents the distribution of articles by name of journals. Section 12 provides the articles by year of publication. Section 13 provides breakdowns of articles based on nationality of authors. Section 14 presents the study discussion, and finally Section 15 presents the conclusion, limitations and recommendations for future studies.

2. Research Method

For the research methodology in this study, we used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) provided by Moher, Liberati [93]. The purpose of the PRISMA statement is an evidence-based minimum set of items to help scholars for enhancing the reporting quality a wide array of systematic reviews and meta-analyses. PRISMA as a checklist is not only an instrument for quality assessment for systematic reviews; it can be very valuable for critical assessment objectives in all sections of articles such as title, abstract, introduction, method, results and discussion. PRISMA emphasizes directions in which scholars could ensure a complete and transparent and report of this type of research and presents the substantial transparency in the selection procedure of articles in a systematic review. The flow diagram of PRISMA represents the flow of information in the different stages of a systematic review. PRISMA has two main parts, including systematic reviews and meta-analyses. Systematic reviews provide objective summaries of what has been conducted on a specific research area. This is especially valuable in wide research areas, where many publications exist, each focusing on a narrow aspect of the field [94]. Systematic reviews aim to provide a full overview of research conducted in a specific area until the present date. All research procedures have to be made explicit before the actual behaviour of the review to make the process objective and replicable. Meta-analysis provides a means of mathematically integrating findings employing diverse statistical approaches to study the diversity of the articles. In this kind of synthesis, original studies that are compatible with their quality level are selected. This aspect may help and highlight different facts which individual primary studies fail to do, e.g., it may prove that results are statistically significant and relevant when small primary studies provide inconclusive and uncertain results with a large confidence interval [95]. The main goal of PRISMA is to help researchers and practitioners to complete a comprehensive and clear literature review [96].

There are some other reporting guidelines such as Consolidated Standards of Reporting Trials (CONSORT), Standards for Reporting of Diagnostic Accuracy (STARD) statement, Standards for Reporting Interventions in Clinical Trials of Acupuncture (STRICTA), Systematic Literature Reviews (SLRs), Methodi Ordinatio methodology, however; we believed that the PRISMA is comprehensive guideline for reporting the systematic review because of these benefits: determine quality of the review, allow scholars to evaluate strengths and weaknesses, permits replication of review approaches, format and structure the review through PRISMA headings. Several previous studies have been conducted

using PRISMA in various fields to develop a comprehensive literature review [97–99]. In order to implement the PRISMA method in this study, we performed three main steps including: literature search, choosing the eligible published papers, and extraction of data and summarization [97–99].

2.1. Literature Search

In this step, we have chosen the Web of Science and Scopus databases to provide a comprehensive application of SEM in the assessment of environmental sustainability. The literature search was performed based on several keywords including environmental sustainability (1878 records), green and environmental supply chain (35 records), sustainability (22,021 records), green human resource management (14 records), green and environmental information technology and system (319 records), renewable and sustainable energies (288 records), green and environmental marketing (37 records), environmental operation and production (4963 records) and other related keywords such as partial least squares (195 records) and structural equation modelling (3164 records). In the first step of our search, we found 32,914 scholarly papers related to these mentioned keywords which were extracted according to our strategy search. In the next step, we searched for papers which were published and checked the duplicated papers with redundant information.

After this step, 542 papers were remaining. After removing 89 records due to duplication, we screened papers based on the titles and abstracts, and irrelevant papers were removed. In total, 279 potentially related papers remained (see Figure 1).

2.2. Articles Eligibility

In this step of the review, for the purpose of eligibility, we reviewed the full text of each manuscript independently (which extracted from the last step). In the last step, we carefully identified the related articles to attain a consensus. Book chapters, unpublished working papers, editorial notes, master dissertations and doctoral theses, textbooks, and non-English papers were excluded. In the end, we selected 171 articles related to the environmental sustainability topics and SEM, from 69 peer review scholarly journals, which met our inclusion criteria.

2.3. Data Extraction and Summarisation

In the final step of our methodology, after negotiation with other authors, some required information was collected, and finally, 171 articles were reviewed and summarised.

In Table 1, all the selected articles were classified into different classifications including, green and sustainable Supply Chain Management (SCM), Corporate Social Responsibility (CSR), renewable and sustainable energies, green and ecological innovation, green and environmental Human Resource Management (HRM), environmental information technology and systems, other green and sustainable operation management, and green and environmental marketing. Also, articles were summarised and reviewed based on the various criteria such as area, scope and sample, type of method (quantitative, qualitative or mix method), technique (PLS, AMOS or other techniques), unit of analysis (individual, group and country), number of sample, respondents, related theory, measure validation (EFA or CFA), data collection method (online or offline survey), name of variable, number of hypotheses, study purpose, gap and research problem, results and outcome, name of author, year of publication, and finally country of authors. Furthermore, we have provided and the frameworks of all selected papers based on name of author(s) (see Appendix A). We believe that reviewing, summarising and classifying the articles helped us to achieve some critical and valuable insights. Consequently, some suggestions and recommendations for the future studies were proposed. Furthermore, we believe that this review paper was performed very carefully and it presented a comprehensive source regarding the application of SEM in the assessment of environmental sustainability. It should be noted that the main difficulty of using the PRISMA method was to understand what methodologies were used from the abstract and the research methodology section of the selected articles. Thus, it was required to go through the full content of articles and take a more detailed look to evaluate the exactly used

approach for the evaluation of environmental sustainability problem. Although a considerable amount of time was spent in the selection process, it helped us to choose the most suitable publications in conducting the review.

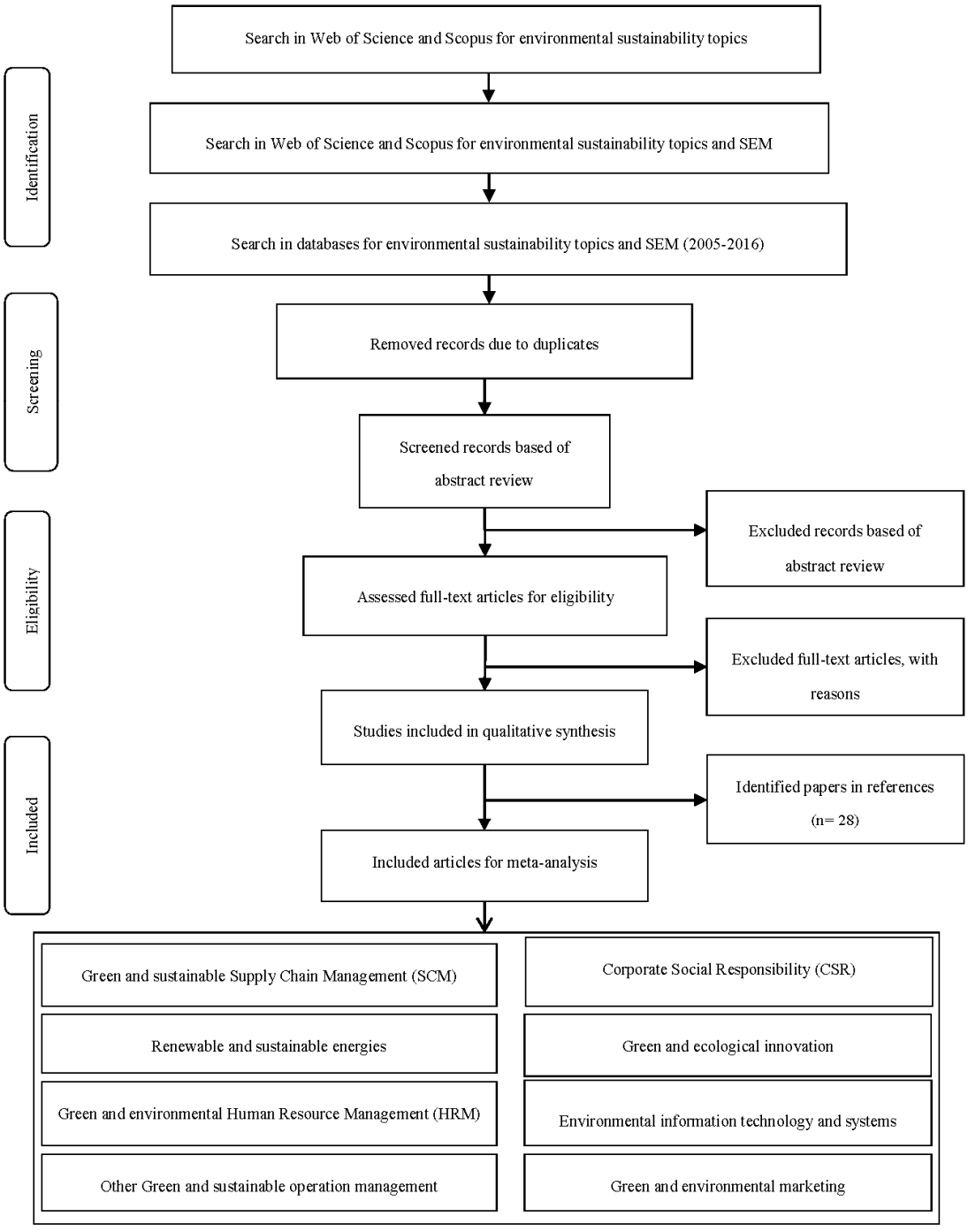

Figure 1. Study flowchart for the identification, screening, eligibility and included of articles.

Table 1. Classification of papers based on application area.

Application Areas	Frequency	Percentage of Frequency
Green and sustainable Supply Chain Management (SCM)	50	29.24%
Corporate Social Responsibility (CSR)	8	4.68%
Renewable and sustainable energies	7	4.09%
Green and ecological innovation	11	6.43%
Green and environmental Human Resource Management (HRM)	32	18.71%
Environmental information technology and systems	8	4.68%
Other Green and sustainable operation management	28	16.37%
Green and environmental marketing	27	15.79%
Total	**171**	**100.00%**

3. Application Areas Classification

Although categorising and combining the articles in this field is complex, for the classification task, we used the opinions of experts in the fields of sustainability.

Consequently, based on the opinions of experts, we categorised articles into six different applications areas (see Table 1). In the following section, all selected articles were summarised and reviewed based on the various criteria.

3.1. Breakdown of Articles Based on Green and Sustainable SCM

Environmental programmes such as green and sustainable supply chain management were an efficient programme for business organisations in handling their operations in a greener manner. Hereby, green Supply Chain Management (GSCM) performs as a significant part in affecting the whole environmental effect of any business engaged in some activities of Supply Chain (SC) and enhances sustainability performance. Many GSCM researches concentrate on the diverse topics that range from organisational research and practice in GSCM [100–104]. The lack of agreement on green SC practices is assumed to be caused from the green SC field being a new field of practice and study since the theories in this field are still identifying and underdeveloped, assessing, and choosing the vital GSCM practices are main purposes for successful GSCM implementation [105]. Several of previous studies used various techniques and methods such as SEM techniques for assessment of green and sustainable SCM. For example, Nagati and Rebolledo [106] mentioned there is lack in previous studies related to sustainable development regarding supplier's perspective. To fill this gap, this study examined the role of supplier participation in sustainable development in 210 Canadian manufacturers with several variables such as supplier's trust, preferred customer status, dynamism of the environment, participation in supplier development activities, and performance improvement. The findings of this paper showed that preferred customer status and trust were two antecedents of the supplier in sustainable development. In addition, there is a positive relationship between suppliers' participation and operational performance. Mariadoss, Chi [107] investigated consumer behavior regarding reserve GSCM perspective in U.S. manufacturing and service industries. This study found that there is a need to examine effect of different firm orientation on supply chain practices and firm purchasing in view of sustainability. The findings of this study reveal that a firm's environmental and cultural orientations affect its SPPs and SSPs, while local community orientation drives SPPs only in the large firms. Youn, Yang [108] investigated antecedents of reverse logistics metric development in 141 manufacturing firms, findings of this paper indicated that; top management support, organizational compatibility and mutual trust had a direct effect on strategic information sharing and indirect and positive effects on operational information sharing by mediate the strategic information sharing. Large and Gimenez Thomsen [109] indicated that few previous studies have paid attention to the development process of the preconditions required to modify the supplier environmental improvement approaches; therefore, this study investigated the relationship among the drivers of green SC performance and purchasing performance and environmental performance in 181 Purchasing industry. The findings of this paper showed that there is a direct influence

between level of green collaboration and the degree of green supplier assessment. In addition, the influence of commitment on green collaboration is mediated by the purchasing department capabilities. Moreover, the results showed that there is a positive relationship between environmental performance and purchasing performance. Lee, Ooi [110] examined the relationship between GSCM and technological innovation in 133 Malaysian manufacturing companies. The results of this paper demonstrated that there was a positive and significant relationship between the internal environmental management and technological innovation, and eco-design had a positive and significant relationship with technological innovation, investment recovery had a positive and significant relationship with technological innovation, and green purchasing and cooperation with customers had a positive and significant relationship with the technological innovation.

According to Table A1 (see Appendix A), in total, 50 previous published papers [111–155] have used SEM techniques for assessment of green and sustainable SCM. This table represents significant distribution findings of green and sustainable SCM based on the author(s) names, year of publication scope and sample of study, area of study, number of sample, respondents, related theory, variables, study purpose, gap and research problem, and results and outcome.

3.2. Breakdown of Articles Based on CSR

The experience of implementing CSR and ethical principles in different industries can be linked to the idea that social responsibility and ethics could be used as a tool to maintain their equilibrium in the market through better communication with stakeholders [156]. Effective communication leads to better understanding of stakeholders' needs and expectations and also more opportunities. Increasing demands on CSR by various stakeholders shows that CSR could not be an exception to this rule [157]. Therefore, satisfaction of customers, as the main group of stakeholders, should be considered an intangible asset that creates real economic value for firm. Gruca and Rego [158] found that customer satisfaction creates shareholder value by increasing future cash flow growth and reducing its variability, and Fornell, Mithas [159] show that a portfolio of firms with high customer satisfaction outperforms major stock indexes. In conclusion, in a well-known definition of CSR by Carroll [160], CSR is the social responsibility of a business which includes the economic, legal, ethical, and discretionary expectations that stakeholders have of organizations at a given point in time. Stakeholders have been defined as those groups or individuals who can affect or are affected by the achievement of the organization objectives. They have been classified frequency by scholars as external and internal, voluntary and involuntary or primary and secondary targets [161]. With regard to banking industry, Pérez, Martínez [162] classify CSR dimensions to five groups as CSR oriented to customers; CSR oriented to shareholders; CSR oriented to employees; CSR oriented to the society; and a general CSR dimension concerning legal and ethical issues. After increasing importance of CSR in financial markets as a primordial part of business strategy, a considerable literature on CSR, customer expectations and outcomes in different context was generated. In recent years, several of previous scholars implemented the SEM methods in field of CSR. For instance, Reverte, Gómez-Melero [163] analyze the relationship between CSR and organizational performance by mediating impact of innovation in 133 manufacturing and non-manufacturing companies based on theory of resources and capabilities with incorporating some variables such as social dimension of CSR, economic dimension of CSR, environmental dimension of CSR, innovation, financial performance and non-financial performance. Results of this article found that there was a significant and positive relationship between CRS, innovation and organizational performance. Ağan, Kuzey [164] indicated that there is a limitation of literature regarding environmental supplier development; regarding this point, this study examined the relationship between CSR, firm performance and environmental supplier development. Some variables of this study were CSR to environment, CSR to media, CSR to employees, CSR to customers, partnership with NGOs, supplier evaluation, incentives, direct involvement, financial performance and competitive advantage. The results of this paper demonstrated that CSR is positively related to environmental supplier development and that environmental supplier

development had the positive relationship between competitive advantage of the participating firms and financial performance. Kang, Chiang [165] investigated the relationship between CSR and business performance by using sustainability balanced scorecard in 200 hotels. To develop the framework, this study used some variables such as corporate social responsibility, financial dimensions, customer dimensions, business dimensions, learning and growth dimensions. The outcomes of this study showed that there is a significant relationship between CSR and business performance in three groups by using a balance score card. Table A2 (see Appendix A) [166–170] provided the important results of CSR papers based on the author(s) names, year of publication scope and sample of study, area of study, number of sample, respondents, related theory, variables, study purpose, gap and research problem and results and outcome.

3.3. Breakdown of Articles Based on Renewable and Sustainable Energies

The implementation of successful renewable energy projects that are sustainable in time, especially at community level, has been related to more open and participatory processes where views, expectations and framings from different stakeholders become integrated. Different methodologies can be found in the literature for assessment of renewable and sustainable energies. Some of them are scenario planning, which seeks to address and put limits on uncertainty, improving the response capacity to multiple futures [171]. Kowalski, Stagl [172], using a combination of scenario planning and Multi Criteria Assessment (MCA) to reduce uncertainty in energy development, where a diversity of stakeholders is included in the decision-making process, considering a broad spectrum of social, economic, environmental and technical criteria. Another approach is Participatory Technological Assessment (PTA) oriented to generate a feedback process between the technological and social criteria, as a way to predict social aspects during the technological development and increase social acceptance (Raven et al., 2009). In addition, some of the previous published papers used SEM methods to examine and analysis the data and testing the model hypotheses [173–177]. For example, Seetharaman, Sandanaraj [173] found that there is need to more focus on renewable energy market to achieve more competitive advantage, regarding to this problem. This study investigated the relationship between internal and external forces on renewable energy business in 106 energy industries with several variables such as, environmental concerns, inadequate customer relationships, technology innovation deficiencies, unstructured business process, lack of societal awareness, performance instability, regulatory policy issues, complex operation, economically unsustainable, business and technology strategies unaligned and talent shortage. The results of this paper showed that there is negative direct effect between external forces and renewable energy, positive indirect effect between internal forces and renewable energy and positive direct effect between external forces and internal forces. Chou, Kim [176] examined the differences and similarities of consumer adoption regarding the understanding of smart meters across of 220 Asian consumers in the residential buildings with involving some variable such as behavioral intention to use, attitude towards behavior, perceived expected usefulness, perceived expected ease of use, perceived risk, user expected satisfaction, social influence/norms, program contents/features, technological complexity, privacy/safety concern and energy tariff/cost. This study found that there is a need to understand consumer perception, intention and expectation regarding affect smart meter adoption behavior. The results of this paper showed that usefulness perception of consumers, risks of smart meters and ease of use influenced consumer acceptance in Taiwan, Korea and Indonesia. Privacy and safety were not the main concerns for Taiwan consumers, and in Vietnam perceived risk had no significant relationship with consumer adoption of smart meters. Böttcher and Müller [177] found there are some challenges and opportunities in manufacturing companies to measuring the reduce carbon emissions; therefore, this study investigated the determinants of measures used by 159 German auto-motive suppliers to cut carbon emissions, and their impact on performance. The results of this study showed that there was a positive impact on carbon and indirect impact on economic performance. Table A3 (see Appendix A) [178,179] shows the results of seven published papers regarding renewable and sustainable energies based on the author(s) names, year of

publication scope and sample of study, area of study, number of sample, respondents, related theory, variables, study purpose, gap and research problem, and results and outcome.

3.4. Breakdown of Articles Based on Green and Ecological Innovation

The concept of green innovation focuses on software and hardware of innovation technology which has a relationship with green process and green products [180]. The authors further explained that green innovation includes technology such as green product designs, corporate environmental management, energy-saving and waste recycling. Based on the many definitions that can be found in the existing literature, in this paper, green innovation concept is given as a new idea, environmental approach, product, service or processes, which is aimed at reducing adverse environmental effects and at the same time develop product differentiation among competitors. Green innovation can be further categorised into four groups, including process innovation, marketing innovation, managerial innovation and product innovation [181,182]. Green innovation is aimed at boosting the environmental management performance to fulfil the environmental regulation requirement [180]. To reach a successful internal environmental management, both support and commitment from the top management is crucial [183,184]. Eltayeb, Zailani [185], further explained that support from the top management will allow for resources needed to implement new technology in addition to acquiring new knowledge more easily. Green innovation can be triggered or created by the internal and external practices in GSCM itself. Chen [186], claimed that companies need to create innovation in both internal and external environments of SCM and react to environmental issues. This was also supported by Porter [187], who indicated that companies in dynamic and competitive environment need to innovate their products or services as well as respond to the pressures from competitors, consumers, regulations and other pressures to survive. The innovation should be comprised of process and product, and environmental defense concepts into companies' product design and packaging in order to produce product differentiation [188]. In recent decades, researchers have focused on the implementing of SEM methods in field of green and ecological innovation. For example, Albort-Morant, Leal-Millán [189] examined the relationship between dynamic capabilities with green innovation performance and the mediate effect of learning capability in 112 firms from the Spanish automotive components' manufacturing sector. Some variables used in this study are: dynamic capabilities, sensing capability, learning capability, integrating capability, coordinating capability, green innovation performance, relationship learning capabilities, information sharing capability, joint sense making capability and knowledge integration capability. The results of this paper found that there were positive and significant direct and indirect effects among capabilities on green innovation performance. In addition, relationship learning capabilities can mediate the relationship between capabilities and green innovation performance. Zailani, Govindan [183] examine the green innovation adoption determinants its influence on firm performance in 153 Malaysian firms in the automotive supply chain industry. Environmental regulations, marketing demand, firms' internal initiatives, green product innovation, green process innovation, economic performance, environmental performance and social performance were variables of this study, results of this study found that, market demand, environmental regulations and firm internal initiatives had the positive relationship with green innovation initiatives, and GIIs had a positive relationship with sustainable performance. Chen, Chang [190] indicated that, there is need to emphasize on green innovation as the important tools for sustainable development in manufacturing industries. Regarding this this paper examined origins two kinds of green innovation including reactive and proactive innovations in three Taiwanese manufacturing industries based on grounded theory. Findings of this paper found that environmental culture, environmental leadership, environmental capability, the environmentalism of investors and clients and environmental regulations can generate green innovation. Table A4 (see Appendix A) [191–198] presented the results of seven published papers regarding green and ecological innovation based on the author(s) names, year of publication scope and sample of study, area of study, number of sample, respondents, related theory, variables, study purpose, gap and research problem and results and outcome.

3.5. Breakdown of Articles Based on Green and Environmental HRM

In recent years scholars have devoted considerable attention to the topic of sustainability, intended as the balance between economic, social and environmental performances of the firm [199]. As a consequence, the concept of green and sustainable HRM takes the development of social, environmental and human capital capitals into account, opposing to strategic HRM that is mostly focused on achieving economic goals and maximize profitability [200,201]. Within the broad field of sustainable HRM, a growing stream of studies explores the specific relation between HRM and environmental sustainability. Indeed, developing employees' commitment and involvement towards environmental sustainability have been found to be a key factor to realize sustainable organizations [202,203]. According to Renwick, Redman [203], the integration of corporate environmental management into HRM is described as green HRM. They also stated that human resources aspects of environmental management are green HRM. Several previous scholars used the SEM methods to examine and test the relationship between hypotheses. For example, Kalamas, Cleveland [204] believed that there is a need to study the understanding of consumers' allocation regarding environmental responsibility related to external forces; in this regard, this study examines how external attributions affect pro-environmental behaviors of consumers among 263 consumers of the Canadian urban area, for developed SEM model this study used TPB by involving several variables such as corporate responsibility, government responsibility, god/higher power and natural earth-cycle. The results of this paper showed analytical ways for government and corporations to improve the pro-environmental efforts. Zhan, Tan [205] evaluated the relationship between lean and green practices and organizational performance by moderation effect of guanxi in 172 respondents from manufacturing industry, this study claimed there is a need to focus on the green and lean practice to attain sustainable development to enhance organizational performance in China context. The results of this study indicated that there was a positive relationship between green and lean practices and improving organizational performance.

Wan and Shen [206] found that there is lack of previous studies regarding urban green space which did not consider the three factors including perceived usefulness attitude, and perceived behavioural control; therefore, this paper investigated the relationships between urban green spaces attributes and urban green space use with mediating effect perceived usefulness attitude, and perceived behavioural control by using TPB theory. Perceived provision of facilities, perceived naturalness, perceived accessibility, attitude, perceived usefulness, subjective norm, perceived behavioural control, behavioural intention and behaviour were the important variables for this paper. The findings of this article found that perceived usefulness attitude, and perceived behavioural control have mediating effect in the relationship between the behavioural intention to use urban green space. In addition, urban green space does not influence behaviour indirectly with attitude factors and perceived behavioural control. Wan, Shen [207] developed a new model of recycling attitude and behaviour for finding the relationship between recycling behaviour and perceived policy effectiveness. The respondents of this study were 198 customers in four different shopping malls and two railway stations, the TPB theory was the supporting theory with some variables being incorporated such as: attitude, subjective norm, perceived behavioural control, moral norm, consequences awareness, perceived policy effectiveness, behavioural intention, direct behaviour, indirect behaviour. The results of this paper demonstrated that recycling intention is affected by moral norms, perceived behavioural control, subjective norms, awareness of consequences and perceived policy effectiveness. Furthermore, self-reported recycling behaviour and support influenced recycling intention. Table A5 (see Appendix A) [208–235] provided the finding of 32 scholarly articles regarding to green and sustainable HRM based on the author(s) names, year of publication scope and sample of study, area of study, number of sample, respondents, related theory, variables, study purpose, gap and research problem and results and outcome.

3.6. Breakdown of Articles Based on Environmental Information Technology and Systems

Environmental information systems including remote sensing, computer modeling, databases and other technologies are developed around the world to address the various issues from climate change to loss of biodiversity to economic underdevelopment [236,237]. The implications for the human welfare, natural environment, and democratic governance are significant [238]. Environmental information systems structure what people see in the environment, and how they collaborate to deal with environmental problems [239]. They make a legal argument, scientific inquiry and consider how citizens contribute in the different governance. They are technologies designed to produce new social relationships, new truths, new forms of political decision-making and, ultimately, a renewed environment. Information system and technology help communities to find problems related to environmental issues and create informed management decisions [240]. The need for enhanced and relevant information on the environment in turn is a prerequisite to managing natural resources towards helping to achieve sustainable development [241]. Regarding these issues, a wide range of literature related to information and technology place an emphasis on environmental problems using SEM methods. For instance; Gholami, Sulaiman [242] believe that few previous papers place an emphasis on the adoption of green IS in organization for reduce the environmental influence, therefore this study examined the perception of 405 senior managers in relationship between green IS and environmental performance in service and manufacturing organizations. Institutional theory used as underpin theory for this study by focusing on some variables like attitude, coercive pressure, environmental performance, future consequences, mimetic pressure, pollution prevention, product stewardship and sustainable development. The findings of this paper show that a coercive pressure impact of attitude toward green IS does not influence mimetic pressure. In addition, there is a positive significant relationship between attitude, green IS adoption and future consequences consideration and green IS adoption had a significant relationship with environmental performance in the long term.

Ryoo and Koo [243] develop a new model based on the following variables of green practices: information system alignment, green practice-manufacturing coordination, green practices-marketing coordination, environmental performance and economic performance in 77 manufacturing firms. The findings of this paper show that there was positive relationship between green practices-IS, green practices-marketing coordination and alignment green practices-manufacturing coordination. Moreover, green practices-marketing coordination and green practices-manufacturing coordination were significant predictors for environmental performance, while green practices-IS alignment had an indirect relationship with environmental performance by incorporating green practices-marketing coordination and green practices-manufacturing coordination. Akman and Mishra [244] examine the role of green information technology in IT professionals in private and public sectors in 182 public and private sectors. Technology Acceptance Model (TAM) was used for this study with the following variables: perceived ease-of-use, subjective norms, perceived usefulness, attitude toward, and actual system usage level of awareness. The findings of this paper showed that: there was diversity among establishments from public- and private-sectors in the impact of the PEU on PU and on the ATU, and TAM is important for private-sector establishments excluding the relations between the PEU and ATU and PEU and PU. Table A6 (see Appendix A) [245–249] represented the results of eight published articles regarding environmental information technology and systems based on the author(s) names, year of publication scope and sample of study, area of study, number of sample, respondents, related theory, variables, study purpose, gap and research problem and results and outcome.

3.7. Breakdown of Articles Based on Other Green and Sustainable Operation Management

The overall success of being able to assess the sustainability of a company's operation management is highly dependent on which set of indicators are used [250]. However, what to measure to truly measure sustainability is difficult to define according to [251]. Indicators can provide a path for the business in it its progress towards sustainability. It can also provide a link between green and sustainability performance and business success. Several frameworks have been developed to guide

businesses in their quest for selecting appropriate indicators [252–254]. Sustainability is an initiative increasingly essential to the core business model of many companies [255]. There are many diverse perspectives on sustainability in operation management such as green product development [256], green procurement and green supplier development [257], green shipping management capability [258], green and environmental issues [259] and corporate sustainability [260] and other perspectives. Some companies consider it to be the burden of more government regulations, new compliance requirements and higher manufacturing costs. However, industry leading companies recognize that sustainability can actually be a business driver for next-generation products, more efficient operations and increased profitability. Previous and current literature has used various techniques and methods to examine and analyze sustainable and green operation management areas such as SEM. SEM methods have been used in various previously published papers; for example, Campón-Cerro, Hernández-Mogollón [261] investigated the role of loyalty for sustainable advantage and identify the loyalty factors for understanding destination loyalty in rural tourism destinations. Expectancy disconfirmation theory was used as the underpinning theory with some additional factors such as image, quality, value, attribute satisfaction, overall satisfaction and loyalty. The findings of this paper showed that quality, destination attribute satisfaction and image were the direct antecedents for loyalty in the rural tourism destination. Blohmke, Kemp [262] believed that there is a need to analyze the interaction among environmental policy determinant; therefore, this study evaluated the determinants of environmental policy on international environmental governance and national environmental policy in private sectors data sets of 47 countries. For this paper, environmental policy theory was used by incorporating some variables such as green advocacy, awareness, governance capacity, international environmental governance and national environmental policy. Findings of this study demonstrated that government capacity and green industry advocacy have a positive impact on environmental policy.

Lai and Cheng [263] investigate the influence of undergraduate students regarding green marketing practices and their attitude toward the environment, their environmental responsibility and the seriousness of their perceived environmental problem. The results of this paper found that there is a strong relationship between perceived environmental responsibility and green products purchase willingness, there is no relationship between perceived seriousness of environmental problems and undergraduate students' green product purchase willingness and there are significant relationships between students' willingness to purchase green products and their green purchase behavior. Luzzini, Brandon-Jones [264] found there is lack of focus in previous studies in relation of sustainability commitments on development of collaborative capabilities for supply functions and purchasing on sustainability performance; therefore, this study examined the relationship between sustainability commitment, collaborative capabilities and performance. The finding of this paper showed that there is a link between sustainability commitment and collaborative capabilities, cost performance and social and environmental performance. Jabbour, Jugend [256] investigated the relationship between GPD practices on firm performance such as market, environmental and operational aspects with some factors such as environmental practices, operational performance, human/organizational aspects, green performance, technological aspects and market performance. The results of this paper found that GP practices affected firm performance and technical aspects. Table A7 (see Appendix A) mentioned the analysis of 28 studies [265–283] regarding green and sustainable operation management based on the author(s) names, year of publication scope and sample of study, area of study, number of sample, respondents, related theory, variables, study purpose, gap and research problem and results and outcome.

3.8. Breakdown of Articles Based on Green and Environmental Marketing

Green marketing is on the rise and a rather new area acknowledged for research. There is no one universal definition of green marketing and the definition generally varies according to the researcher's viewpoint. The most recent definition of green marketing has completely progressed in terms of its

variables. It states that green marketing involves the marketing strategies used to achieve a firm's financial as well as strategic goals while reducing its negative impact on the environment [284]. Kumar and Anand [285] and Ottman [286] have characterized green marketing as an integration of ecological concerns into marketing aspects including production, distribution and logistics, promotion and packaging along with marketing communications. On the other hand, Prakash [287] defines green marketing as an environmentally considered strategy that consists of disclosing information to consumers at different levels like industry, firm and product level. Green marketing is associated with identifying the consumer needs and satisfying those needs in a valuable and sustainable manner [288]. It can be inferred from various literature that green marketing basically bridges the communication between environmentally conscious firms and consumers, in turn strengthening their relationship. Empirical researches have recognised that issues regarding sustainability, awareness about environmental issues and green brands are becoming a focal point in developed and developing nations, with added consciousness from the government and population in general. Various other studies have been pursued on green marketing and the strategies used for communication in order to influence the consumer purchase behaviour. It is observed that a correlation exists between consumers' environmental beliefs and their confidence in the performance of green products [289]. Empirical researches have used several methods and approaches like SEM. For example, De Giovanni and Esposito Vinzi [290] analyzed the relationship between environmental training and environmental management maturity in 178 manufacturing companies. This study found there is a lack of work in previous studies regarding empirical study related to external and internal environmental management and firms performance. The results of this paper showed that the European Union's Emissions Trading System (ETS) should focus on internal environmental management, internal environmental practices to improve the economic performance, and supplier collaboration which can slightly affect firms' performance.

Martínez-Martínez, Cegarra-Navarro [291] investigated the role of the SECL model mediated between the environmental knowledge and organizational performance with socialisation, externalisation, combination, internalisation and business performance. The finding of this paper showed that time is an important factor for implementation of the SECI model in organizations operating. Jabbour, Jabbour [292] believe that there are no studies related to environmental management, operational performance human resource and lean manufacturing. Therefore, this study examined the impact of environmental management on operational performance by incorporating human resources and lean manufacturing. Human resources, operational performance, environmental management and lean manufacturing were the main factors for this study. The results of this paper demonstrated that human resources had a significant relationship with environmental management, lean manufacturing and influence on environmental management compared to operational performance and there was a positive relationship between environmental management and operational performance. Xia, Chen [293] investigated the relationship among green technology selection, firm performance and circumstance pressure by using ecological theory. The findings of this paper demonstrated that there is a significant relationship between certain task-oriented circumstances and macro circumstances and green technology selection. The authors of [294] investigated the role of core Environmental Management System (EMS) in sustainable competitive advantage in manufacturing firms. The theory of production competency, RBV theory and contingency theory have been used for this study. The findings of this paper showed that environmentally responsible suppliers, cross-functional cooperation and top management team's strategic perception were the important factors for successful implementation of EMSs. Yu and Ramanathan [295] believe that there is a need for more study in relationships among stakeholder pressures, internal green management, green product/process design and environmental performance; thus, this study explores stakeholder pressures, internal green management, green product/process design and environmental performance by implementing the stakeholder theory in 167 Manufacturing firms. The main factors of this study were stakeholder pressures, internal green management, green product/process design

and environmental performance. The findings of this study showed that stakeholder pressures had a positive and significant influence on internal green management and there was a significant and positive relationship between internal green management and green product/process design. Also, two green operations practices had a positive and significant relationship with environmental performance. Table A8 (see Appendix A) represented the findings of 27 studies [296–316] regarding green and environmental marketing based on the author(s) names, year of publication scope and sample of the study, area of study, number of sample, respondents, related theory, variables, study purpose, gap and research problem and results and outcome.

4. Breakdown of Articles Based on Scope

SEM has become prevalent within a variety of disciplines, particularly management research, for analyzing the cause-and-effect relations between latent constructs [317]. The term SEM refers to a family of covariance-based statistical methods. SEM is a very general statistical modeling technique, which is widely used in the various fields such as sustainability. It can be viewed as a combination of factor analysis and regression or path analysis. The interest in SEM is often on theoretical constructs, which are represented by the latent factors [318]. The relationships between the theoretical constructs are represented by regression or path coefficients between the factors. The structural equation model implies a structure for the covariances between the observed variables, which provides the alternative name covariance structure modeling [318]. SEM method has been used in various studies around the world in several different industries like tourism and the hospitality industry service and manufacturing industries, transportation industry, firms, universities and other industries and sectors.

In Figure 2 we provided the percentages of each industry which is incorporated in this study and implemented the SEM method. According to the results of this paper, manufacturing firms or industry had the highest percentage with 53 percent, the second rank was related to service firms with 17 percent, and tourism and hospitality had the third rank with 11 percent among other industries and sectors. The information related to the percentage of all scopes is provided in Figure 2.

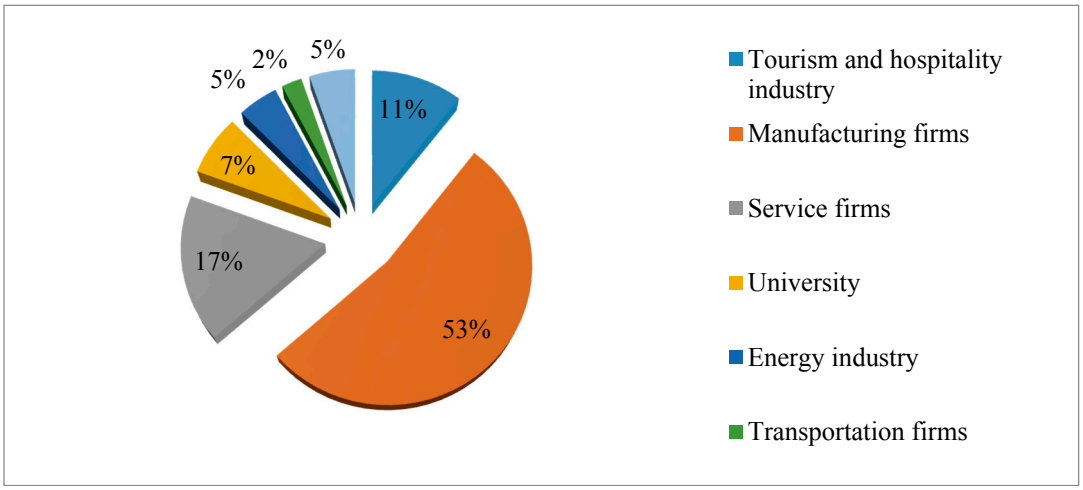

Figure 2. Breakdown of articles based on scope.

5. Breakdown of Articles Based on Type of Method

Types of research methods can be classified into several categories according to the nature and purpose of the study and other attributes. Types of research methods can be broadly divided into two categories, quantitative and qualitative. Quantitative research describes, infers, and resolves problems using numbers. Emphasis is placed on the collection of numerical data, the summary of those data and the drawing of inferences from the data [319]. Qualitative research, on the other hand, is based on words, feelings, emotions, sounds and other non-numerical and unquantifiable elements.

It has been noted that "information is considered qualitative in nature if it cannot be analysed by means of mathematical techniques. This characteristic may also mean that an incident does not take place often enough to allow reliable data to be collected" [320]. In this study, to show the type of method, we divided the selected studies into three types of methods, including: quantitative, qualitative and a mix of quantitative and qualitative methods.

The frequency of each method is provided in Figure 3. According to Figure 3, from 171 reviewed papers, 168 papers use the quantitative method and no paper uses the qualitative method. However, the mix method was used in three papers. In our review paper, we focused on the application of SEM in previous studies; therefore, for this reason the number of studies which used the qualitative method was zero. The breakdown of articles based on type of method is presented in Figure 4.

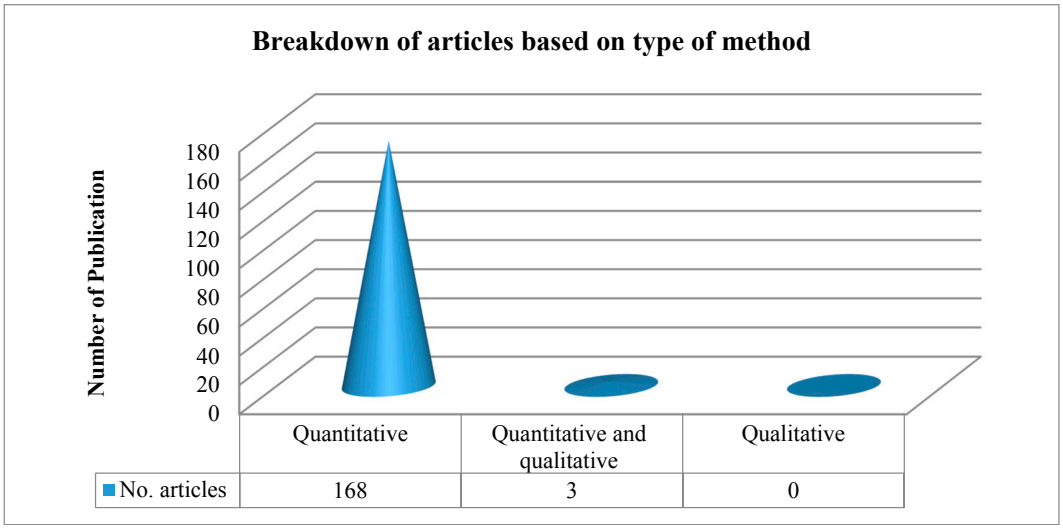

Figure 3. Breakdown of articles based on type of method.

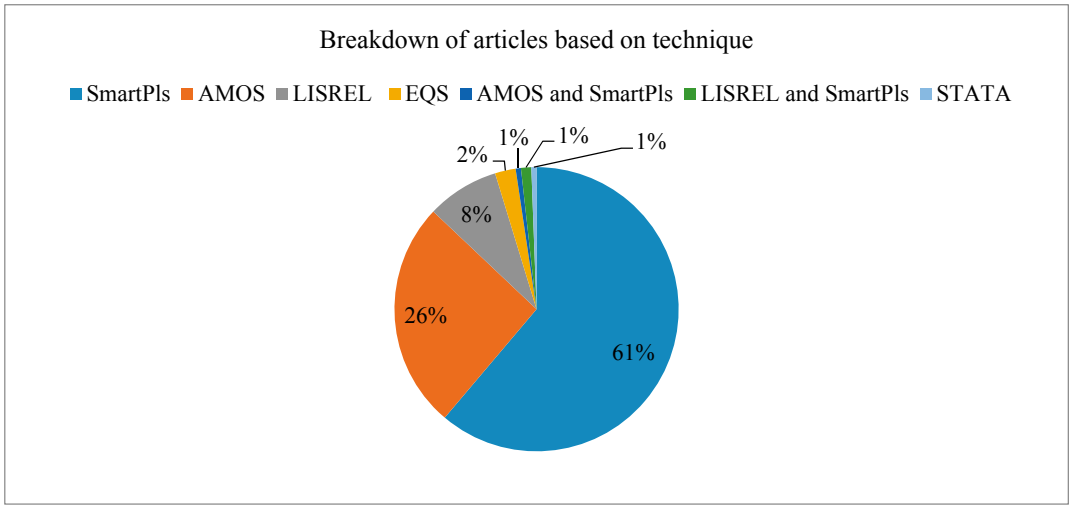

Figure 4. Breakdown of articles based on technique.

6. Breakdown of Articles Based on Technique

The technique for the analysis of selected studies was another important category for this review paper. In this section, we divided the reviewed papers based on SEM techniques such as AMOS, SmartPLS, LISREL, STATA, EQS, integration of AMOS and SmartPLS and integration of SmartPLS and LISREL.

According to the findings, we found that most of the published papers have used SmartPLS with 105 papers. AMOS has the second rank among 171 selected papers with 26 percent. The information regarding the percentages of techniques is provided in Figure 4.

7. Breakdown of Articles Based on Unit of Analysis

One of the most important ideas in this research review was the unit of analysis. The unit of analysis is the major entity that researchers have analyzed in environmental sustainability fields. Typical units of analysis include individuals, countries, groups, social organizations and social artifacts. In our review paper, we divided the unit of analysis into three main levels including individual level, organizational level and country level.

According to the findings of this study, we found that individual level had the first rank among 171 papers with 78 percent and organizational level was the second type of unit of analysis with 21 percent. Information regarding all parts is shown in Figure 5. The comparison of the results presented by Figure 5 is interesting as we can see that organizations played an important role in environmental sustainability developments as the majority of the research was conducted at the organization level. Generally, this indicates that organization level has been more important for environmental sustainability developments in relation to the individual and country levels.

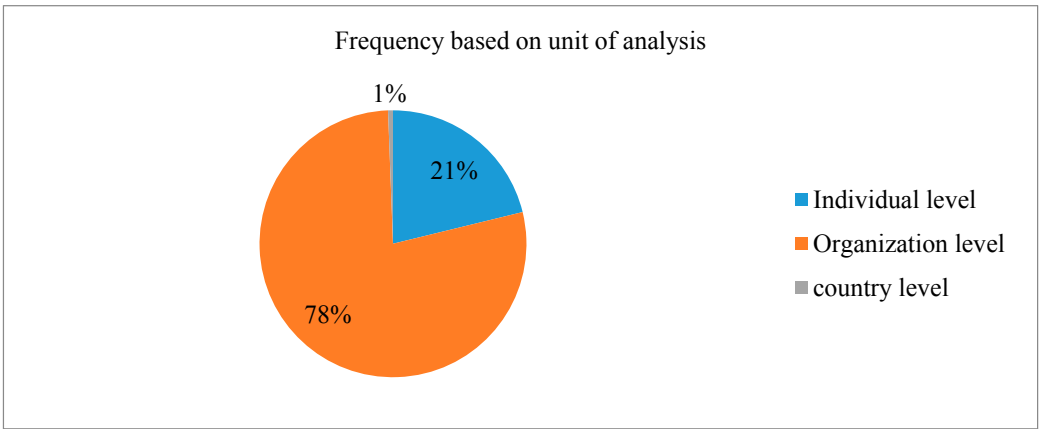

Figure 5. Breakdown of articles based on unit of analysis.

8. Breakdown of Articles Based on Related Theory

Categorizing the selected papers based on theory was another interesting issue for this review paper. According to our findings, various theories have been implemented in environmental sustainability fields. In total, 40 theories contributed to the field of environmental sustainability. Some important theories were: Resource-Based View (RBV), stakeholder theory, institutional theory (INT), Theory of Planned Behavior (TPB), transaction cost theory, Transaction Cost Theory (TCT), Resource Theory (RDT), social capital theory, Theory of Reasoned Action (TRA), contingency theory, ecological modernization theory, technology acceptance model, organizational theory, expectancy theory, theory of dynamic capabilities, agency theory, motivation theory, Schwartz's theory, absorptive capacity theory and social network theory. However, based on our review, in some of selected articles, we could not find related theories; therefore, we categorized these articles with a no or none-theory label.

According to our findings, in fields of environmental sustainability, RBV theory and stakeholder theory had the first and second rank with 26 and 24 records respectively. Figure 6 represented the information of all theories. The comparison of the results presented by Figure 6 is interesting as we can see that RBV, which has been found to be a management device used to assess the available amount of a business' strategic assets, is often used in conducting research on environmental sustainability.

This indicates that the resource-based method is seen as an effective and efficient application for all useful resources that will help environmental sustainability developers in determining their competitive advantage. In addition, although, as discussed earlier, several empirical studies have been conducted for environmental sustainability development by investigating the critical success factors incorporated to the research theories, the results presented in this study can be seen as comprehensive because most theories along with their factors are reported in this study for the first time in the literature.

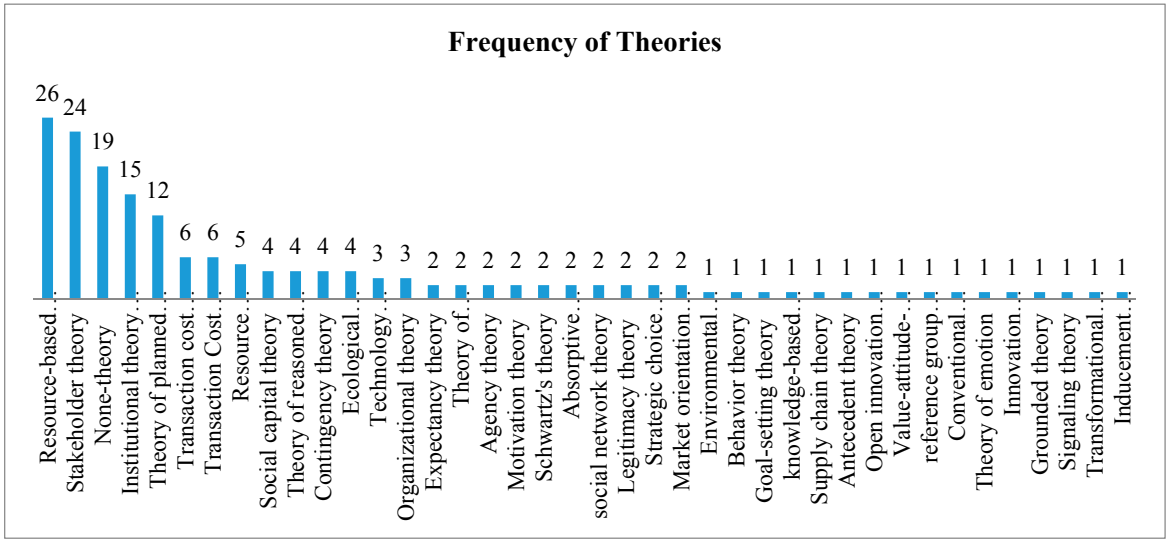

Figure 6. Breakdown of articles based on related theories.

9. Breakdown of Articles Based on Measure Validation

Figure 7 provided the frequency of papers based on the measurement validation. Measurement instruments are widely used for research and policy decision making purposes in many professional disciplines. The quality of the data and the quality of the decisions and inferences made based on the scores from the measurement instruments are therefore not inconsequential. Validity and validation are the most fundamental issues in the development, evaluation, and use of measurement instruments. Validity refers to the quality of the inferences, claims, or decisions drawn from the scores of an instrument and validation is the process in which we gather and evaluate the evidence to support the appropriateness, meaningfulness, and usefulness of the decisions and inferences that can be made from instrument scores [321]. In this paper, we divided the measurement validity based on two important types: Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA).

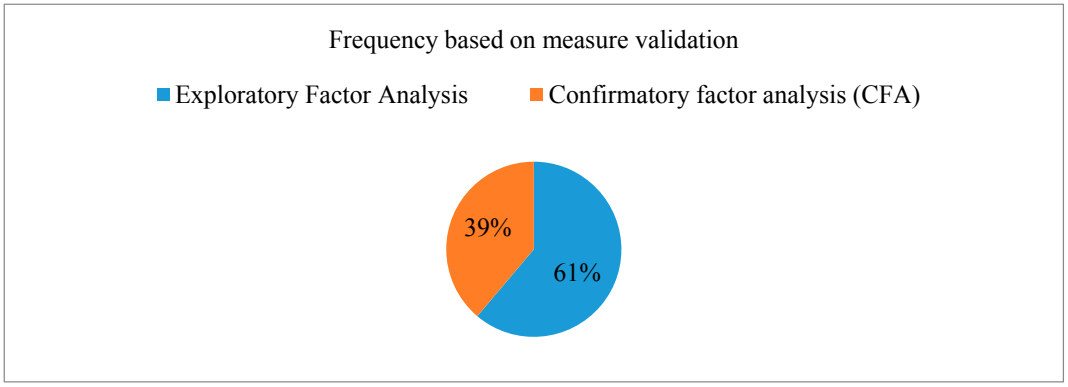

Figure 7. Breakdown of articles based on measure validation.

According to the findings of this section, EFA has been used in the selected papers with 105 records and CFA with 65 records. Figure 7 represents the frequency of measure validation use in the selected articles.

10. Breakdown of Articles Based on Data Collection Method

Data Collection is an important aspect of any type of research study. Inaccurate data collection can impact upon the results of a study and ultimately lead to invalid results. There are several ways to undertake data collection. In this study, we classified the papers based on two types including an online survey and offline survey.

According to the outcome of this section, we found that 60 percent of the reviewed papers used an online survey to collect the data for their model evaluation. The frequency of articles based on the data collection method is shown in Figure 8.

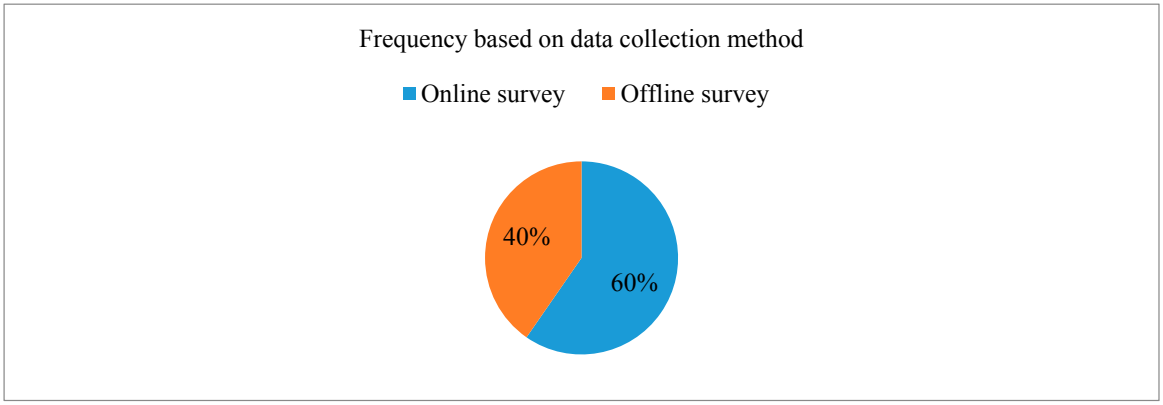

Figure 8. Breakdown of articles based on data collection method.

11. Breakdown of Articles by Journals

Table 2 presents the results of analyzing articles based on the title of the journals. The articles related to environmental sustainability have been chosen from 69 different international scholarly journals indexed in the Web of Science and Scopus databases. Selected published articles, along with an extensive diversity of journals that focus on environmental sustainability, validate the willingness of different scholarly journals to publish in this field. By far the highest ranking journal is the Journal of Cleaner Production with 32 articles, followed by the International Journal of Production Research with eight papers. Additionally, in other rankings, the Journal of Operations and Production Management and Industrial Management and Data Systems had the third highest rank with seven publications, followed by the journal of Transportation Research Part E: Logistics and Transportation Review with six articles.

Table 2. Breakdown of articles by journals.

Title of Journal	No. Paper	Percentage (%)
Journal of Cleaner Production	32	18.71%
International Journal of Production Research	8	4.68%
Journal of Operations & Production Management	7	4.09%
Industrial Management & Data Systems	7	4.09%
Transportation Research Part E: Logistics and Transportation Review	6	3.51%
Industrial Marketing Management	5	2.92%
Journal of Business Research	5	2.92%
International Journal of Production Economics	5	2.92%
Journal of Purchasing and Supply Management	5	2.92%
Supply Chain Management: An International Journal	5	2.92%

Table 2. Breakdown of articles by journals.

Title of Journal	No. Paper	Percentage (%)
Tourism Management	4	2.34%
Journal of Business Ethics	4	2.34%
Resources, Conservation and Recycling	3	1.75%
International Journal of Hospitality Management	3	1.75%
Management Decision	3	1.75%
Technological Forecasting and Social Change	2	1.17%
Journal of Environmental Psychology	2	1.17%
Renewable and Sustainable Energy Reviews	2	1.17%
International Journal of Information Management	2	1.17%
Journal of Environmental Management	2	1.17%
Computers in Human Behavior	2	1.17%
International Business Review	2	1.17%
Management Research Review	2	1.17%
The International Journal of Logistics Management	2	1.17%
International Journal of Contemporary Hospitality Management	2	1.17%
European Journal of Innovation Management	2	1.17%
Production Planning & Control	2	1.17%
Business Strategy and the Environment	2	1.17%
The International Journal of Human Resource Management	2	1.17%
Maritime Policy & Management	2	1.17%
Journal of Destination Marketing & Management	1	0.58%
Environmental Research	1	0.58%
Transportation Research Part D: Transport and Environment	1	0.58%
Decision Support Systems	1	0.58%
Habitat International	1	0.58%
Energy Policy	1	0.58%
The Social Science Journal	1	0.58%
Information & Management	1	0.58%
Expert Systems with Applications	1	0.58%
Asia Pacific Management Review	1	0.58%
Management Accounting Research	1	0.58%
Journal of Sustainable Development & World Ecology	1	0.58%
Management Research: Journal of the Iberoamerican Academy of Management	1	0.58%
IEEE Transactions on Engineering Management	1	0.58%
Facilities	1	0.58%
The International Journal of Advanced Manufacturing Technology	1	0.58%
Clean Technologies and Environmental Policy	1	0.58%
Information Systems Frontiers	1	0.58%
Information Technology and Management	1	0.58%
Quality & Quantity	1	0.58%
Applied Research in Quality of Life	1	0.58%
Review of Managerial Science	1	0.58%
Logistics Research	1	0.58%
The Service Industries Journal	1	0.58%
Engineering Management Journal	1	0.58%
Global Business Review	1	0.58%
International Journal of Logistics Research and Applications	1	0.58%
Total Quality Management & Business Excellence	1	0.58%
Journal of Environmental Planning and Management	1	0.58%
International Journal of Physical Distribution & Logistics Management	1	0.58%
International Journal of Productivity and Performance Management	1	0.58%
International Marketing Review	1	0.58%
Marketing Intelligence & Planning	1	0.58%
Online Information Review	1	0.58%
Journal of Computer Information Systems	1	0.58%
Social Responsibility Journal	1	0.58%
International Journal of Consumer Studies	1	0.58%
Technological and Economic Development of Economy	1	0.58%
Anatolia	1	0.58%
Total	**171**	100.00%

Hence, based on the results of this section, we can conclude that these selected journals can be considered as the main journals on environmental sustainability. Table 2 presents the list of journals where such work has been published.

12. Breakdown of Articles by Year of Publication

In recent decades, application of SEM in environmental sustainability has increased dramatically in the literature. A historical growth of environmental sustainability has existed for many years. A frequency analysis of the 171 articles based on the articles published for different years is shown in Figure 9. During 2010–2012, the articles published on the application of SEM in environmental sustainability were at a steady rate with zero, three and 21 articles. An uptrend in output was observed from the year 2012 until 2016. Figure 9 presents relevant information based on the frequency of breakdown by the year of publication.

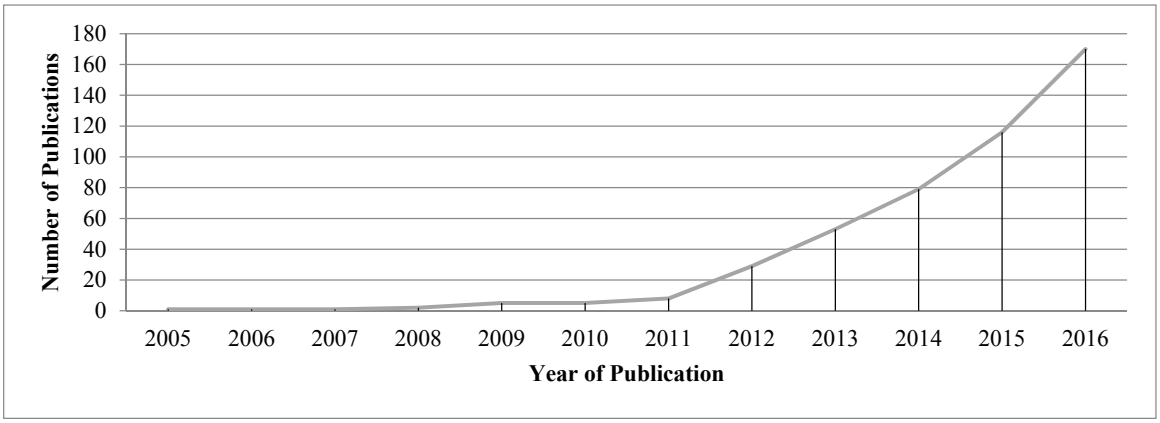

Figure 9. Breakdown of articles by year of publication.

Accordingly, it can be indicated that nowadays there are many researchers in the field of environmental sustainability and it can be predicted that in coming years these numbers will increase.

13. Breakdown of Articles Based on Nationality of Authors

This review paper attempted to show the difference among countries related to environmental sustainability. Two kinds of principles were used for identifying the characteristics in selected articles, including the information gained directly from the papers or the nationality of the first author. Figure 10 shows that authors from 31 nationalities and countries used SEM in environmental sustainability.

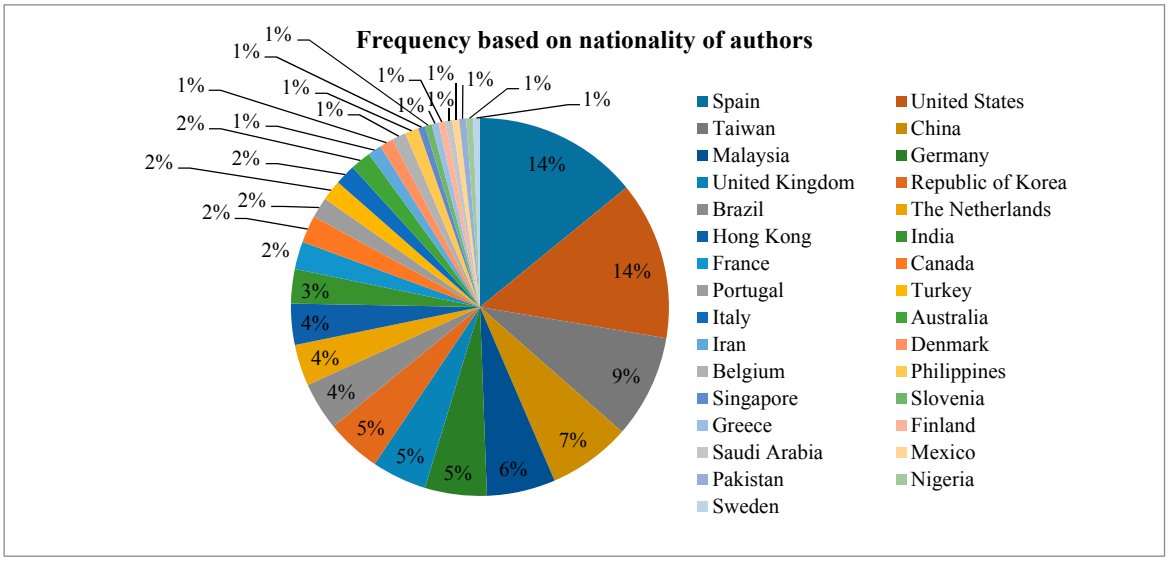

Figure 10. Breakdown of articles based on nationality of authors.

Most of the published papers were from Spain with 25 publications followed by United States, Taiwan and China with 23, 15 and 12 publications, respectively. Figure 10 shows the breakdown of articles based on the nationality of authors. The comparison of the results presented by Figure 10 is interesting as we can see that some developing countries such as China and Malaysia are relatively good at conducting research on environmental sustainability. However, we can find some research in the literature that shows research into environmental sustainability being conducted separately for some countries. However, such results for the majority of developing and developed countries are reported in this study for the first time in the literature.

14. Discussion

There are some challenges regarding the application of SEM in environmental sustainability problem areas that could be interesting for discussion and future studies. The interesting result of this review paper was the outcome regarding the data collection method, which, in this review, we divided into two main groups: online survey and offline survey. According to the outcome of this section, we found that 60 percent of reviewed papers have used an online survey for data collection. These results show that, nowadays, use of the internet by managers, students, tourist, employees, consumers, customer, organizations, hotels, companies, universities, firms and other people and sectors has increased dramatically. The last decade has seen a tremendous increase in computer-mediated communication and internet use. Scholars in several disciplines use the internet as a successful field for conducting survey research. As the cost of computer software and hardware continues to decrease and the acceptance of the internet increases, more sectors of society are using the internet for information and communication. Another exacting result was regarding the number of countries that participated in this review paper. The results of this section showed that, in total, 31 nationalities and countries were focused on the sustainability environmental fields. Among these countries, there are some developing countries, and this shows that in recent years these countries have also attempted to focus more on environmental sustainability issues.

In addition, in our review paper, the results were interesting regarding the scope of studies. In the section of scope, we classified the sectors and organizations based on hospitality industry service and manufacturing industries, transportation industry, firms, and universities. According to the results, although manufacturing industries had the first rank among other sectors and industries with 53 percent, the service industry had only 17 percent. Based on this result, we can indicate that, nowadays, manufacturing industries have more focus on environmental sustainability compared to other sectors. Furthermore, in this review paper, there are some challenges regarding underpinning theories that selected studies have implemented to develop study models and frameworks. According to the results of this paper, in total, 40 theories have contributed to the field of environmental sustainability. Some of the important theories were: RBV, stakeholder theory, INT, TPB, transaction cost theory, TCT, RDT, social capital theory, TRA, contingency theory, ecological modernization theory, technology acceptance model, organizational theory, expectancy theory, theory of dynamic capabilities, agency theory, motivation theory, Schwartz's theory, absorptive capacity theory and social network theory. According to our findings, the theory of RBV contributed more to the fields of environmental sustainability more than other theories, with 26 records. The second theory which contributed in this field was stakeholder theory with 24 records. There was a challenge regarding using the TPB theory in the fields of environmental sustainability. By extending the TPB, as seen in [322], which claims that users' intentions are a very powerful predictor of actual behavior, a number of researchers have investigated a consumer's intention in order to predict the actual purchases [323,324]. The TPB is one of the most commonly used models in explaining and predicting the individual behavioral intention [323]. TPB is an attitude-intention-behavior model, which posits that an individual's behavior is determined by perceived behavioral control and intention. Intention, in turn, is determined by attitude, subjective norm, and perceived behavioral control [323]. Although in this paper we attempted to present a comprehensive review paper regarding environmental sustainability, nonetheless, only a few

previous papers have used TPB. According to this result, we can indicate that, in recent years, behavioral intention was not an important issue in the field of environmental sustainability.

We also found that there are some challenges in the literature regarding environmental sustainability fields, for example, in the field of sustainable rural tourism destinations. Future studies require us to continue to extend our understanding of the role of loyalty in the area of rural tourism destinations and sustainable ways to take the benefits of socioeconomic of tourism in rural environments. Furthermore, further research would allow us to examine the relationships between perceived sustainability and behavioral constructs or other different perceptions in the area of tourism experience, like overall image, attitude towards the destination, loyalty and behavioral intention. In the field of sustainable and green SCM, some studies focused on the improvement of supplier operational performance only; therefore, it is necessary to explore the influence of supplier sustainable development on the performance of suppliers' marketing and financial situation. In addition, further studies need to advance the understanding of the behavioral implications and assessment of green consumer perceptions in reverse green SCM. Moreover, further research might focus on the strategic sustainability orientation to better explain the sustainability behaviors which are implemented in a firm. Future studies can also emphasize the various types of green SCM that could be worth considering by conducting the research to examine differences by size, industry or age of company to develop the inter-organizational relationships. In the area of environmental orientation, further research would explore the role of green SCM on the impact of some management-based practice mediation mechanisms, such as marketing-based downward stream management practice and performance relationship. In the area of reverse logistics and supply chain, future research is required to emphasize some antecedents and outcomes such as financial performance agility and trading partner relationship satisfaction. However, in the field of green and sustainable SCM there are some other topics which would be interesting for further research to consider.

Finally, compared to the research found in the literature, our study contributed to the literature by analyzing the papers conducted by a statistical technique, SEM, which is a powerful analytical tool for methodological evaluation of models by multivariate analysis. In addition, in our study, a complete collection of research papers conducted empirically for environmental sustainability developments were analyzed and the results were reported. The findings can be interesting as the theories and their factors for environmental sustainability developments were comprehensively investigated for developed and developing countries in this study for the first time in the literature. In addition, compared to the empirical qualitative and quantitative research found in the literature, this study analysed the papers conducted on environmental sustainability on several methodological aspects which can give researchers insights into their data analysis and model development from new perspectives.

15. Conclusions

This review paper presented a comprehensive overview of recent SEM methods in the various applications areas of environmental sustainability. In total, 171 papers were selected for systematic review and meta-analysis in the period 2005–2016 from popular international journals accessible in the Web of Science and Scopus databases. We carefully selected and reviewed 171 studies about environmental sustainability and SEM based on the title, abstract, introduction, research methods and conclusions. These selected papers were categorised into eight application areas. Also, all papers were classified based on the name of the author, year of publication, country of authors, area, scope and sample, type of method (quantitative, qualitative or mix method), technique (PLS, AMOS or other techniques), unit of analysis (individual, group and country), number of sample, respondents, related theory, measure validation (EFA and CFA), data collection method (Online or offline survey), name of variables, number of hypotheses, study purpose, gap and research problem, and finally results and outcome. In addition, in the Appendix A we provided the developed frameworks in the selected papers based on the name of author(s).

An understanding of some issues regarding the application of SEM in environmental sustainability is gained from this review article. The vast majority of reviewed articles were published between 2012 and 2016. In total, the papers were classified into eight areas including green and sustainable SCM, CSR, renewable and sustainable energies; green and ecological innovation, green and environmental HRM; environmental information technology and systems, other green and sustainable operation management, and green and environmental marketing. Green and sustainable SCM was the most important application area with 50 papers. Furthermore, 69 international peer review journals were considered in the current review paper. The Journal of Cleaner Production had the first rank among the considered journals regarding publishing papers related to environmental sustainability and SEM.

Finally, various limitations inherent to this review study give rise to directions for future studies. The articles published at the beginning of 2017 (if any) have not been included in the present paper because of the limited reporting time. However, we attempted to use those published articles in other sections of our review paper, such as related works and introduction sections. Nonetheless, this present review can be developed to include the future studies. Another limitation is that the data was collected from journals, while the examined documents did not include textbooks, doctoral and master's theses and unpublished papers regarding application of SEM in environmental sustainability problems. Although we attempted to provide a comprehensive review based on current and old literature, nevertheless, as a recommendation for future studies, the data can be collected from these sources, and the obtained results can be compared with the data obtained and reported in this study. Another limitation of this review was that all of the papers were extracted from journals written in English. Hence, scientific journals in other languages were not included in the review. However, the researchers believe that this paper comprehensively reviewed most of the papers published in international journals. In this paper, we reviewed 171 papers which recently studied environmental sustainability but attempted to include a comprehensive list of papers in other sections. We carefully selected and summarised the available papers of several publishers in the Web of Science and Scopus databases. However, some relevant outlets remained beyond the scope of the current study. Therefore, future researchers may attempt to review the papers which are not considered in the current review. Another limitation of the survey is that, although the paper presents various journals and conference publications that recently studied the application of SEM in environmental sustainability, it does not include any aspects of this topic discussed in the published books.

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Appendix A

Table A1. Breakdown of articles based on green and sustainable SCM.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Nagati and Rebolledo [106]	Canadian manufacturers	201	Senior executives or production managers	Expectancy theory	Supplier's trust, Preferred customer status, Dynamism of the environment, Participation in supplier development activities, Performance improvement	Examine role of supplier participation in sustainable development.	There is lack of previous studies related to sustainable development regarding supplier's perspective.	Findings of this paper showed that preferred customer status and trust were two antecedents of supplier in sustainable development. In addition, there is a positive relationship between suppliers' participation and operational performance.
Couto et al. [111]	Flash Barometer from 28 European countries	26,573	Consumers	Transaction cost economics; social network theory; stakeholder theory; and institutional theory	Buying Decision, Product information, Perceived value and consumer willingness to pay or buy.	Investigated consumer behavior regarding reserve GSCM perspective.	Need to focus on Behavior of consumers regarding to pay or buy green product.	Results of this study found that there is a strong relationship between buying decision process and perceived value and positive relationship willingness to pay and product information and no relationship between perceived value and product information, willingness to pay and perceived value and willingness to pay and the buying decision process.
Mariadoss et al. [107]	U.S. manufacturing and service industries	149 managers	Managers	Stakeholder theory	sustainable purchasing practices, sustainable supply practices environmental orientation, cultural preservation orientation, societal orientation, and local community orientation	Examined the relationship between firm's orientation and sustainable SCM.	Need to examine effect of different firm orientation on supply chain practices and firm purchasing in view of sustainability.	Our findings reveal that a firm's environmental and cultural orientations affect its SPPs and SSPs, while local community orientation drives SPPs only in large firms.
Cheng and Sheu [112]	Green manufacturing firms	451 manufacturing	senior management team	Behavior theory	Relational benefits, Relational proclivity, Connectedness, Opportunistic behavior, Dysfunctional conflict and Quality of strategy.	Proposed a novel study model to investigate the relationship of factors influencing the quality of strategies developed and inter-organizational relationships in the green SC.	Need to highlight the role of value-based partnership in the relational and economic views.	Results of this study found that there is a positive relationship between strategy quality and relationship orientation.
Chan et al. [113]	Foreign invested enterprises	194 foreign invested enterprises operating	30 senior executives working	Organizational learning theory and institutional theory	Internal environmental orientation, External environmental orientation, Green Purchase, Customer Cooperation, Investment Recovery, Competitive Intensity Corporate Performance and Social Desirability Bias.	Examined the relationship among environmental orientation, GSCM activities and corporate performance.	Few previous studies have focused on the relationship among environmental orientation, GSCM activities and corporate performance, despite the potential for employing GSCM to improve marketing practices and ultimately enhance firm competitiveness such employment.	Outcomes of this paper showed that there is positive relationship between green purchase, customer cooperation and external and internal environmental orientations, and a positive relationship with corporate performance, also there is a positive relationship between customer cooperation and corporate performance.
Hazen et al. [114]	United States Department of Defense supply chain	60	Senior management	Goal-setting theory and the knowledge-based view	Cost effectiveness, Processing effectiveness, IS capability, Goals and metrics.	Investigated antecedents of reverse logistics metric development.	There is hardly any literature regarding antecedents and outcomes of reverse logistics metric development.	Results of this article found that specified goals and information systems were the most important antecedents of reverse logistics metric development.
Youn et al. [108]	Manufacturing firms	141	Top management	None	Information sharing, mutual trust, top management support, organizational compatibility, strategic operational information sharing, environmental and business performance	Examine the relationship between strategic supply chain partnership (SSCP) and environmental supply chain management (ESCM).	Regarding the global environmental requirements, need to explore and integrate ESCM and SSCP for attain the sustainable competitive advantage.	Findings of this paper indicated that top management support, organizational compatibility and mutual trust had the direct effect on strategic information sharing and indirect and positive effects on operational information sharing by mediate the strategic information sharing.

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Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Large and Gimenez Thomsen [109]	Purchasing industry	181	Customers	Antecedent theory	Strategic level of purchasing, Environmental commitment, Purchasing's environmental capabilities, Green supplier assessment, Green collaboration with suppliers, Environmental performance improvement and Purchasing performance.	Investigated the relationship among the drivers of green SC performance and purchasing performance and environmental performance.	Few previous studies have paid attention to the development process of the preconditions required to modify the supplier environmental improvement approaches.	Findings of this paper showed that there is a direct influence between level of green collaboration and the degree of green supplier assessment. In addition, the influence of commitment on green collaboration is mediated by the purchasing department capabilities. Moreover, there is a positive relationship between environmental performance and purchasing performance.
Xu and Gursoy [115]	Hospitality	499	Consumers	Means-end theory and social theory	Customer satisfaction, customer loyalty, customer willingness to pay, environmental and economic and social dimensions.	The main purpose of this study to examine the impact of SSCM on customers' behaviors and attitudes.	There is a need to consider to three dimensions of sustainability including economic, social and environmental in all section of hospitality industry such as collaboration with stockholders involve supply chain.	Findings of this paper showed that there is positive relationship between customer satisfaction, customer loyalty, willingness to pay a premium and environmental and economic criteria, there was negative relationship between social criteria and willingness to pay a premium, and a positive relationship with customer satisfaction.
De Giovanni and Esposito Vinzi [116]	Italian firms	138	Executives	None	Internal environmental management, Internal environmental management, Environmental performance and economic performance.	The main aim of this paper is to investigate the relationship between EM and performance in GSCM.	Need to use performance as the formative variable in green supply chain management.	Results of this paper found that internal EM increased the performance compared with external EM, although it did not increase economic performance.
Esfahbodi et al. [117]	128 manufacturing firms (72 in China and 56 in Iran)	128	Managers	Resource dependence theory (RDT)	Sustainable procurement, Sustainable distribution, Sustainable design, Investment recovery, Environmental performance, Cost performance	Investigated and compared the effect of sustainable SCM adoption on cost and environmental performance.	There is a need for more investigations to understand SSCM in developing countries.	Findings of this paper found that, there were some similarities between Iran and China; also results found that SSCM adoption practices in higher levels of the environmental performance but does not necessarily lead to improved cost performance.
Lee et al. [110]	Malaysian manufacturing	133	managerial	Resource-based view (RBV)	Internal environmental management, Eco-design, Investment recovery, Green purchasing, Cooperation with customers and technological innovation	The main goal of this paper is to examine the relationship between GSCM and technological innovation.	Lack of attention on technological innovation in previous studies in relationship between GSCM and performance.	The results of this paper demonstrated that there was positive and significant relationship between internal environmental management and technological innovation, and eco-design had a positive and significant relationship with technological innovation. Investment recovery had a positive and significant relationship with technological innovation, and green purchasing and cooperation with customers had a positive and significant relationship with technological innovation.
Akamp and Müller [118]	137 German firms	137	Purchasing managers and managing directors of firms	Transaction cost theory	Supplier selection and evaluation, Supplier monitoring, Supplier development and Supplier integration	The main aim of this paper is to investigate the measure of supplier management can improve buyer satisfaction and supplier performance.	There are various challenges in developing countries related to sourcing activities and environmental and social problems.	Findings of this paper showed that supplier development, supplier selection and evaluation, and supplier integration can improve supplier performance.
Kuei et al. [119]	Focal, downstream, and upstream firms	167	Senior executives	None	Relative advantage, compatibility, complexity, organizational support, quality of human resources, customer pressure, regulatory pressure, government support, environmental uncertainty, focal firm—green practice, process efficiency, product quality, economic performance, green performance and environmental management capabilities.	The main aim of this paper is to identify the critical factors which impact on the adoption of GCM practices.	There is need to present the comprehensive framework for help to successful implementation of green SCM.	Results of this study found that the external environmental factors were the most important factors in adopting of green practices, these factors were environmental uncertainty, regulatory pressures, customer pressures and government support.

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Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Sancha et al. [120]	Spanish manufacturing firms	120	Manager	Transaction Cost Theory (TCT) and the Resource Based View (RBV)	Assessment, Collaboration, Supplier's Social Performance, benefit of Employee Well-Being, benefit of Social Reputation.	The main aim of this paper is to extend the current sustainability literature to suppliers and focus on suppliers' assessment and suppliers' collaboration.	There is a lack in previous papers of focus on the social dimension of sustainability.	Findings of this paper showed that evaluating suppliers improved the buying firm's social performance and collaborating with suppliers improves the suppliers' social performance.
Woo et al. [121]	Construction suppliers	103	Managers	Social capital theory	Information sharing, environmental collaboration, green alignment, green cost reduction, corporate competitiveness.	The main purpose of this paper is to investigate the relationship between communication capabilities for GSCM and green cost reduction, external green integration and corporate competitiveness.	Need to focus on the increase of satisfaction the needs of buyers and customers related to environmental capabilities in the construction sector.	Results of this paper found that there was a positive relationship between suppliers' communication capability and green cost reduction, green alignment between suppliers and buyers enhanced the supplier competitiveness and environmental collaboration mediated the relationship between information sharing and performance.
Laari et al. [122]	Finnish manufacturing firms	119	Managers	None	Environmental collaboration with customers, environmental monitoring by customers, environmental performance, financial performance, internal GSCM, environmental collaboration with suppliers and environmental monitoring of suppliers.	The main aim of this study is to find the indirect and direct relationships between customer-driven GSCM practices financial and environmental performance.	Need to focus on the literature related to customer-driven GSCM practices and performance.	Results of this study indicated that, there was the positive relationship between environmental performance, internal GSCM practices and internal GSCM practices, and also there was the positive relationship between environmental collaboration and financial performance.
Teixeira et al. [123]	Manufacturing firms with ISO 14001 certification	95	Managers	Ecological modernization theory	Green Training, Green Supply Chain Management, green purchasing and collaborating with customers.	The main aim of this study is to analyze the relationship among green training, collaborating with customer and green purchasing.	Need to emphasis on green training factor for implementation of GSCM.	The results of this paper found that, green training had the positive impact with GSCM practices such as cooperation with customers and green purchasing.
Kumar and Rahman [124]	Manufacturing industry	157	Middle and top-level managers	Resource-based theory (RBT)	Benefits, external influence, top management commitment, supplier selection, supplier development, performance review, economical sustainability, social sustainability, and environmental sustainability	The main goal of this paper is to find the import factors which influence sustainability adoption and interrelationships between them.	Need to focus on sustainability adoption in supply chain.	Findings of this paper demonstrated that expected sustainability benefits and external influence have a positive relationship between commitment of top management towards adoption of sustainable practices and better buyer–supplier relationship had positive relationship with social, environmental and economic performance measures.
Chiou et al. [125]	Purchasing department	124	Purchasing department	None	Greening the supplier, product innovation, process innovation, managerial innovation, environmental performance and competitive advantage.	The main goal of this study is to examine green innovation and greening the suppliers on competitive advantage and environmental performance.	Few previous studies focused on green innovation, greening the supply chain, competitive advantage and environmental performance.	Findings of this paper showed that there was the indirect affected between greening the supplier and green innovation leads to better competitive advantage.
Gavronski et al. [126]	Manufacturing plants	94	Operation managers	Resource based view of the firm (RBV)	Plant size, internal knowledge exchange, external knowledge exchange, top management commitment, environmental investments	The main objective of this study is to present the framework for development of green supply management capabilities.	There is a need to focus on green supply management by managers for developing a greener supply chain.	Results of this study found that plant resources had positive relationship with green manufacturing capabilities and GSM capabilities.

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Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Yang et al. [127]	Container shipping firms	163	Shipping managers	None	Internal green practices, green shipping practices, green marketing, external green collaboration, green collaboration with partner, green collaboration with customer, green performance and competitiveness, decrease of green cost and firm competitiveness.	The main purpose of this study is to examine the relationship between external green integration, internal green practices, firm competitiveness and green performance.	There is lack in previous studies to identify the relationship external green collaboration, green performance, internal green practices, and firm competitiveness in the context of the container shipping industry.	Findings of this paper demonstrated that there was a positive relationship between external green collaboration and internal green practices and green performance, and green performance and external green collaboration act as mediator between firm competitiveness and internal green practices.
Luo et al. [128]	Manufacturing organizations	222	Directors and managers	Transaction cost theory	Asset specificity, volume uncertainty, transaction frequency, competitive environment, guanxi and green supply chain collaboration.	This study assesses the factors influencing green supply chain collaboration in China	Few previous papers have attention pay to investigating the buyer–seller relationship in GSCC.	The result shows that the buyer–seller relationship influences green supply chain collaboration through asset specificity, volume uncertainty, transaction frequency and competitive environment. The results also showed support for our hypotheses that guanxi mediates the effect of asset specificity, volume uncertainty and environmental competition on GSCC.
Dai et al. [129]	Publicly traded firms	230	Supply chain management professional	Stakeholder theory	Stakeholder pressure, competitive pressure (rival pressure), top management support, environmental monitoring on suppliers, supplier involvement on green product development, environmental collaborative planning with suppliers and firm size (log sales).	The main goal of this paper is to investigate the role of stakeholder and rivalry pressure encouraged firms to implement practices of green supply management, and examine how top management support is important factor for firms to competitive pressures to pursue practices of green supply management.	Need for further study to emphasize on the role of top management in the environmental supply chain.	Findings of this article showed that environmental pressure influenced implementation green supply management by a mediated role of top management support for environmental initiatives.
Jabbour et al. [130]	Firms with ISO 14001	95	Environmental Managers	None	Quality management, environmental management maturity, green supply chain management—green purchasing, green supply chain management—customers' collaboration and green performance.	The main objective of this paper is to present the novel conceptual framework based on the relationship of environmental management maturity, quality management, adoption of external practices of green supply chain management and green performance.	There is lack in previous studies regarding the relationship between environmental management maturity, quality management, adoption of external practices of green supply chain management and green performance.	Results of this paper found that quality management was a significant factor for environmental management maturity and impact on adoption of external GSCM practices and influence on green performance. In addition, indirectly, the level of environmental management maturity mediates the relationship between QM and the adoption of GSCM practices and GSCM practices mediate the relationship between the level of environmental management maturity and the green performance of firms.
Zhu et al. [131]	Chinese manufacturer	396	Mid-level or senior managers	Institutional theory	Institutional pressure, eco-design, internal environmental management, green purchasing, customer cooperation with environmental concerns and investment recovery.	The main goal of this paper is to examine the various kinds of institutional pressures motivating manufacturing enterprises to pursue green supply chain management practices and performance.	Need to focus on developing diffusion and performance from implementing GSCM.	Results of this article indicated that institutional pressures have driven the manufacturer adoption of internal GSCM and external GSCM practices adoption and GSCM has not the direct relationship with economic performance.

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Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Caniëls et al. [132]	German automotive suppliers	54	Automotive suppliers	Resource Dependence Theory	Customer requirements, supplier readiness, relational norms (arm's length), relational norms (cooperation), customer investment and supplier participation.	The aim of this study is to explore the role of supplier participation in green initiatives by incorporating of customer requirement, rational norms, supplier readiness and customer investment.	Due to significant ecological perspectives for industrial companies there is lack in previous studies related to internal organizational process, particularly in the area of green SCM.	Findings of this study showed that customer requirements and supplier readiness were important drivers in supplier participation and customer investment and cooperative relational norms were drivers in green SCM for large suppliers.
Gualandris and Kalchschmidt [133]	Manufacturing firms	77	Purchasing manager or plant manager	Stakeholder theory and resource-based perspective	Sustainable supply management, sustainable process management, customer pressure and innovativeness.	The main objective of this article is to examine the sustainable process management, sustainable supply management, customer pressure and innovativeness.	There is lack of previous studies regarding interaction between different groups of sustainable SCM such as sustainable supply management, sustainable process management, customer pressure and innovativeness.	Results of this paper found there was a positive and significant relationship between innovativeness, customer pressure and sustainable process management and also sustainable process management fully mediates the relationships between sustainable supply management and innovativeness had the negative and significant moderates the relationship between customer pressure and sustainable process management.
Gualandris and Kalchschmidt [134]	Italian manufacturing firms	77	Chief procurement officer, purchasing manager or buyer	Resource-based theories	Sustainable process management, sustainable supply management, firm sustainability, buyer–supplier trust and supplier sustainability.	The main purpose of this paper is to explore the relationship of social and environmental performance of manufacturing and relationship between suppliers' sustainability performance and buyer–supplier trust.	There is lack of understanding of improve sustainability performance in manufacturing regarding sustainable SCM.	Findings of this paper showed that sustainability performance in manufacturing firms enhanced sustainable SCM and internal practices had a direct influence on performance, also there was a full mediate relationship between external practices and sustainability performance in manufacturing firms. Results show manufacturing firms' sustainability performance.
Caniëls et al. [135]	Suppliers	93	Executives or functional managers	Stakeholder theory	Green SCM readiness, customer requirements, governmental involvement, social responsibility and competitive advantage.	The main goal of this study is to analysis the drivers for SC participation of suppliers by involving some drivers such as customer requirements towards green issues, green SCM readiness feeling of social responsibility, governmental involvement in greening the supply chain, and competitive advantage by going green.	There is concern about environmental issues and green SCM in shipbuilding industry.	Results of this study found that green SCM readiness, social responsibility and competitive advantage were the important drivers for supplier participation, and also results show that there was no significant support for customer requirements and governmental involvement.
Rao and Holt [136]	ISO14001 certified companies	52	Chief executive of ISO 14001	None	Greening inbound, greening outbound, economic performance, greening production, competitiveness and economic performance.	The purpose of this paper is to explore the relationship between green SCM competitiveness and economic performance.	Few previous papers focused on evaluation of green SCM for increasing economic performance and competitiveness.	Results of this paper demonstrated that focusing on different phases of greening regarding SC and green SC increase economic performance and competitiveness.
Green et al. [137]	Manufacturing organizations	159	Plant-level managers	Stakeholder theory	Internal environmental management, green information systems, environmental cooperation with suppliers, environmental cooperation with customers, environmental monitoring of suppliers, environmental monitoring of customers, environmental performance; and organizational performance.	The main objective of this study is to explore the relationship between GSCM, environmental management and organizational performance.	Need to implement environmental collaboration and monitoring practices regarding the SC partners.	Results of this paper found that monitoring practices and environmental collaboration enhanced the organizational and environmental performance.

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Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Lee et al. [138]	Electronics industry	223	Operations/supply chain managers	Resource dependence theory	GSCM practice, business performance, operational efficiency, employee satisfaction and relational efficiency.	The main goal of this paper is to examine the relationship of practices of GSCM and organizational performance by moderating effect of operational efficiency, employee satisfaction and relational efficiency.	Need to focus on supplier perspective in investigating the weaknesses of SME for enhancing SME suppliers' green management capabilities.	Results of this paper found that there was a direct relationship between GSCM practices and business performance, there was significant indirect relationship between GSCM and business performance by incorporating of relational efficiency and operational efficiency.
Green et al. [139]	Manufacturing organizations	159	Manufacturing managers	RBV	Internal environmental management, green information systems, green purchasing, cooperation with customers, eco-design, investment recovery, environmental performance, economic performance, operational performance and organizational performance.	The main purpose of this study is to explore the influence of GSCM on performance.	Need to explore the relationship between GSCM and performance.	Results of this paper found that adoption of GSCM practices improved the economic and environmental performance and had a positive influence on operational performance and operational performance improved organizational performance.
Lee et al. [140]	ISO 14001 manufacturing firms	119	Managerial positions	None	Environmental performance, greening the supplier and competitive advantage.	The main aim of this article is to explore the relationship among three factors including environmental performance, greening the supplier and competitive advantage.	Need for a clear study to identify and confirm the structural relationships among environmental performance, greening the supplier and competitive advantage.	Findings of this paper showed that there was a positive and significant relationship between green supplier, environmental performance and competitive advantage, and there was a significant and positive between environmental performance and competitive advantage; however, environmental performance had a partial mediating effect between competitive advantage and green supplier.
Villanueva-Ponce et al. [141]	Industrial sectors	206	Purchasing managers	Contingent theory	Traditional attributes, green product design, green attributes, financial profits and corporative image.	The main purpose of this paper is to investigate the relationship among traditional attributes, green product design, green attributes, financial profits and corporative image.	There is lack of company awareness related to potential benefits of environmental attributes and regulations regarding the selection of supplier.	Results of this paper demonstrated that companies enhance their corporative image and profits of environmental attributes based on supplier selection criteria for improving the quality of production process.
Gimenez and Sierra [142]	Manufacturing sector	109	purchasing and supply Managers	RBV, Transaction Cost Theory, social network theory	Supplier assessment, collaboration with suppliers and environmental performance.	The main objective of this paper is to explore the relationship between Supplier assessment, collaboration with suppliers and environmental performance.	There is lack in the literature regarding comparison of the influence of various governance mechanisms which firms can modify to green suppliers and enhancing of environmental performance.	Results of this paper found that supplier collaboration and assessment had a positive and significant influence on environmental performance.
Hollos et al. [143]	Industrial companies	70	Senior purchasing managers and executives	Resource dependence theory and the resource-based view	Strategic orientation, sustainable supplier co-operation, green practices, social practices, cost reduction and operational performance.	The main purpose of this paper is to examine the relationship between sustainable supplier co-operation and performance.	Few previous studies have focused on an economic perspective regarding sustainability.	Findings of this paper indicated that there was positive relationship between sustainable supplier co-operation and performance, and only there was the positive and significant relationship between green practices and economic performance.
Abareshi and Molla [144]	Transport and Logistics firms	279	Managers	Absorptive capacity	Green logistics knowledge assimilation, green logistics knowledge transformation, green logistics knowledge acquisition and green logistics performance.	The main objective of this study is to examine the role of absorptive capacity in implementation green logistics practices on the green logistics performance.	Few previous studies focused on green logistics practices in logistics and transport firms.	Results of this paper found that improving green logistics knowledge exploitation was the important factor for enhancing green logistics performance.

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Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Tachizawa et al. [145]	University	71	Purchasing Managers	Institutional Theory	Drivers' mimetic coercive normative, monitoring, collaboration and environmental performance.	The main objective of this paper is to explore the interrelationships among green SCM, environmental drivers and performance.	There is a lack in previous studies regarding non-coercive and coercive derivers have influence on GSCM approaches.	Findings of this study showed that non-coercive and coercive derivers have diverse implications regarding green SCM, in addition, monitoring cannot enhance the performance, also there was direct relationship between collaboration and performance and there was indirect relationship between monitoring and collaboration.
Hsu et al. [146]	EMS ISO 14001 –certified firms	125	Managers	Strategic choice theory	Eco-reputation strategic orientation, eco-innovation strategic orientation, green purchasing, green manufacturing, green packaging and reverse logistics.	The main objective of this study is to develop the theoretical framework to predict the relationship between sustainable supply chain initiatives and reverse logistics outcome and the relationship between eco-innovation and eco-reputation orientation strategies and sustainable supply chain initiatives.	Need to focus on the critical role of eco-reputation and eco-innovation strategic orientations in deploying sustainable supply chain initiative programs.	Results of this paper indicated that there was a positive relationship between sustaining firms' SC initiatives and the individual sustainable supply chain initiative components, and there was a positive relationship green packing and green manufacturing and firms' reverse logistics outcomes, also there was no significant relationship with reverse logistics.
Hsu et al. [147]	ISO 14001 certified organizations	569	Senior manager	Institutional theory	Regulatory measures, customer pressures, competitor pressures, socio-cultural responsibility, green supply chain drivers, green purchasing, design for environment and reverse logistics.	The main objective of this study is to explore the motivate drivers to adopt green SCM for measuring by the second order construct to the implementing of the firm's green SC initiatives.	Although the important environmental sustainability in emerging economics is clear regarding economic benefits, study of the drivers that impact green SC initiatives in a developing economy is still an under-researched area.	Results of this paper found that green SCM drivers had a positive relationship with green purchasing, also the SCM driver had a positive impact on design for the environment, and the green SCM driver had a positive influence on reverse logistics initiative.
Kirchoff et al. [148]	Manufacturing firms	367	Supply chain managers	Resource-based and strategic choice theories	Environmental orientation, supply chain orientation, green SCM, cost efficiency, customer effectiveness and environmental differentiation.	The main purpose of this study is to use two theories including RBV and strategic choice for better understanding of SC orientation, environmental orientation and strategic orientation on green SCM practices.	While previous studies confirmed the positive relationship green SCM and firm performance, there are some questions remain regarding how firms configure the design green and their organizations to attain enhanced performance, particularity in lighting of a constantly changing business environment.	Results of this study found that integration of SC orientation, environmental orientation had a positive relationship with green SCM practices such as firm performance.
Pazirandeh and Jafari [149]	Nordic multinationals companies	97	Logistics managers	None	Sustainability strategy, Greening transport operations, Greening Transport procurement and Logistics efficiency.	The main objective of this article is to evaluate the relationship between sustainability strategy, greening the transportation activities logistics efficiency and logistics effectiveness.	The lack of previous studies regarding the relationship logistics performance, sustainable strategy and greening the transportation activities.	Results of this study demonstrated that there was significant relationship between all relationships such as sustainability strategy to greening transport procurement, sustainability strategy to greening transport operations, greening transport procurement, logistics efficiency and logistics effectiveness greener transport procurement and logistics performance, greening transport operations and logistics efficiency and logistics effectiveness.

Table A1. Breakdown of articles based on green and sustainable SCM.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Ateş et al. [150]	Manufacturers	96	Purchasing manager and environmental manager	Contingency theory	Environmental performance, internal investments, external investments, proactive environmental strategies, customer pressure and organisational commitment.	The main objective of this paper is to examine the effect of proactive environmental strategy on environmental performance by mediating role of environmental investments.	There is a lack in previous literature regarding the impact of proactive environmental strategy on environmental performance in relationship between environmental management and SCM.	Findings of this paper showed that a proactive environmental strategy served higher environmental investments. There was a mediating of environmental investments in the relationship between environmental performance and proactive environmental strategy, also there were positive relationship between proactive environmental strategy, customer pressure and organizational commitment.
Lee [151]	Supplying firms	207	CEO or the senior manager	Social capital theory	Green SCM, structural social capital, supplier's environmental performance, relational social capital and supplier's operational performance.	The main objectives of this article is to investigate the relationship between green SCM operational and environmental performance with incorporating social capital theory.	There is a lack in previous studies regarding of social capital in relationship between green SCM and operational and environmental performance.	Results of this paper found that green SCM contributes to operational and environmental performance through social capital theory.
Yu et al. [152]	Automotive manufacturers	126	General managers or directors	Stakeholder theory	Internal GSCM, GSCM with customers, GSCM with suppliers, operational flexibility, delivery, product quality and production cost	The main objective of this article is to examine the relationship between integrated green SCM and operational performance.	There is a lack in previous studies regarding the integrating of three main dimensions including Internal GSCM, GSCM with customers and GSCM with suppliers with effect on operational performance dimensions.	Results of this article show that there was a significant and positive relationship between integrated green SCM and operational performance.
Amann et al. [153]	Public sector	281	EU member	Inducement contribution theory	Policy goals inclusion in the tender, policy goals inclusion in offers and policy goals achievement through the award.	The main purpose of this article is to present the relationship between sustainability policy goals including in public procurement tenders and offers and their achievement through contract award.	There is a lack in the literature regarding the sustainability policy in public procurement.	Findings of this article show that public procurement was more effective in influencing socially responsible goals than environmental goals.
Gopal and Thakkar [154]	Automobile industry	103	Supply chain managers	None	Sustainable supply chain practices, sustainable supply chain enablers, supply chain performance, sustainable supply chain inhibitors, economic indicator, environmental indicator and social indicators.	The main goal of this article is to analysis the relationship between sustainable supply chain management practices and sustainability performance.	Little attention has been paid to the relationship between sustainable supply chain and organizational performance.	Findings of this paper found that there was a correlation between sustainable supply chain practices and supply chain performance, there was positive relationship between social, environmental and economic performance.
Khaksar et al. [155]	Cement industry	103	Managers	None	Green supplier, green innovation, environmental performance and competitive advantage.	The main objective of this paper is to examine the relationship between green innovation, green supplier, competitive advantage and environmental performance.	There is a lack in previous literature regarding Green supplier, green innovation, environmental performance and competitive advantage.	Findings of this paper showed that there was a significant and positive relationship between green innovation, green supplier and environmental performance.

Table A2. Breakdown of articles based on CSR.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Zhu et al. [166]	Chinese national state-owned enterprises (CNSOEs)	100 Chinese national state-owned enterprises (CNSOEs)	General managers	Stakeholder theory	Organizational governance, Human rights, Labor practices, The environment, Fair operating practices, Consumer issues, Community involvement and development, Supply chain and Political responsibility.	Developed the new framework based for CSR and social and financial performance improvement based on stockholder theory.	There is a lack in previous studies regarding the CSR practices model in developing countries.	Findings of this paper showed that labor practices, community involvement and development, supply chain and political responsibility had a positive relationship with social performance and all CSR practices had the positive relationship with financial performance.
Kang et al. [165]	Hotel industry	200	Customers, employees and managers	Stakeholder theory	Corporate Social Responsibility, Financial dimensions, Customer dimensions, Business dimensions, Learning & Growth dimensions.	Investigated the relationship between CSR and business performance by using Sustainability Balanced Scorecard.	There is a need to refine the suitable for relationship between CSR and CFP.	There is a significant relationship between CSR and business performance in three groups by using balance score card.
Gallardo-Vázquez and Sanchez-Hernandez [167]	Medium and big firms	67	Managers	Theory of resources and capabilities	Corporate Social Responsibility, Performance and Competitive success.	The main aim of this paper is to examine the relationship between CSR, competitive success and firm performance.	Need to define the overall scale of CSR dimensions in the specific regional level.	Findings of this paper showed that there was the significant, direct and positive impact on relationship between CSR, competitive success and mediating effect of performance.
Ağan et al. [164]	Manufacturing firms	314	Managers	None	CSR to Environment, CSR to Media, CSR to Employees, CSR to Customers, Partnership with NGOs, Supplier Evaluation, Incentives, Direct Involvement, Financial Performance and Competitive Advantage.	The main objective of this paper is to examine the relationship between CSR, firm performance and environmental supplier development.	There is a limitation of literature regarding environmental supplier development.	The findings of this study demonstrated that CSR is positively related to environmental supplier development and that environmental supplier development had the positive relationship between competitive advantage of the participating firms and financial performance.
Zhu and Zhang [168]	Manufacturing industry	146	Senior manages	Institutional theory	Community involvement and development, charity-related CSR, fair operating practices, consumer issues, labor practices, employee rights, competitive, coercive and normative.	The main goal of this paper is to evaluate the drivers and practices of CSR.	Need to evaluate the drivers and practices of CSR in developing countries.	The results of this paper indicated that high internal CSR value enhances most CSR practices, mimetic, coercive, normative and coercive drivers motivate CSR practices.
Laguir et al. [169]	Public firms	83	Managers	Agency theory	CSR social dimension, CSR governance dimension, economic dimension and environmental dimension.	The main objective of this paper is to examine the different activities of CSR influence on corporate tax aggressiveness.	In previous studies, comparatively little attention has been paid to the link between CSR and corporate tax aggressiveness.	Results of this study demonstrated that social dimension of CSR had a negative relationship with tax aggressiveness, and economic dimension of CSR impact on tax aggressiveness positively.
Reverte et al. [163]	Manufacturing and non-manufacturing	133	Managers	Theory of Resources and Capabilities	Social dimension of CSR, economic dimension of CSR, environmental dimension of CSR, innovation, financial performance and non-financial performance.	The main purpose of this paper is to analyze the relationship between CSR and organizational performance by mediating impact of innovation.	There is a lack in previous studies regarding non-financial performance and innovation in relationship of CRS and performance.	Results of this article found that there was the significant and positive relationship between CRS, innovation and organizational performance.
González-Rodríguez et al. [170]	University	1600	Students	Schwartz's human values theory	Self-transcendence, conservation, self-enhancement and openness to change.	The main aim of this paper is to develop drivers that influence consumers and entrepreneurs' perception of corporate social responsibility.	There is a need to determine the negative factors which are related to corporate image may to have a negative impression and perception, and thus influence their behavior.	Results of this study found that human values impact on human perceptions of corporate social responsibility, consumer perceptions of corporate social responsibility mediate the relationship between entrepreneurs' perceptions of CSR and human values and significant differences can be found in consumers' and entrepreneurs' perceptions of CSR with respect to the cultural environment.

Table A3. Breakdown of articles based on renewable and sustainable energies.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Seetharaman et al. [173]	Energy industry	106	People related to energy in industry such as managers	-	Environmental Concerns, Inadequate Customer Relationships, Technology Innovation Deficiencies, Unstructured Business Process, Lack of Societal Awareness, Performance Instability, Regulatory Policy Issues, Complex Operation, Economically Unsustainable, Business and Technology Strategies Unaligned, Talent Shortage	Investigated the relationship between internal and external forces on renewable energy business.	There is a need for more focus on renewable energy market to achieve more competitive advantage.	Results of this paper found that there is negative direct effect between External Forces and Renewable Energy and Positive Indirect Effect between internal Forces and Renewable Energy and Positive Direct Effect between External Forces and Internal Forces.
Huang, Lo [175]	Wind power industry	100	Dataset	-	Policy construct, social construct, technical construct ,environmental construct, economic construct	Used SEM and fuzzy cognitive map for identify the limitations regarding to wind power development.	There is a lack in previous studies regarding the correlation between the factors which impact on development of wind power.	Findings of this paper showed that policy barriers can be as the main challenge in development of wind power and other obstructions.
Böttcher and Müller [174]	German automotive suppliers	108	Manager	None	Energy management system, low carbon production, low carbon logistics, carbon performance and economic performance.	The main goal of this study is to examine the influence of energy management systems on manufacturing firms' operation practices, economic and carbon performance.	Need to place an emphasis on energy management systems in relationship among manufacturing firms operation practices, economic and carbon performance.	The findings of this paper demonstrated that energy management had a positive impact on the adoption of logistics practices and low carbon production and an indirect relationship on economic and carbon performance, and there was no direct relationship between energy management system and carbon performance.
Khorasanizadeh et al. [178]	Residents	221	Citizens	Unified Theory of Acceptance and Use of Technology	Performance expectancy, effort expectancy, social influence, facilitating conditions, behavioral intention and purchase decision.	The main goal of this paper is to investigate important factors which play significant roles in successful adoption of light-emitting diodes-based lighting in Malaysia.	Few previous studies focused on adoption of new energy-efficient technologies which decrease of ongoing damage to the environment.	The results confirmed that, Effort expectancy; Performance expectancy, Facilitating conditions Social influence and Behavioral intention were the main factors in adoption of light emitting diodes-based lighting.
Chou et al. [176]	Residential buildings	270	Consumers	Unified theory of acceptance and use of technology (UTAUT), TAM and Innovation Diffusion Theory (IDT)	Behavioral intention to use, attitude towards behavior, perceived expected usefulness, perceived expected ease of use, perceived risk, user expected satisfaction, social influence/norms, program contents/features, technological complexity, privacy/safety concern and energy tariff/cost.	The main goal of this paper is to examine the differences and similarities in consumer adoption regarding the understanding of smart meters across.	Need for an understanding of consumer perception, intention and expectation regarding affect smart meter adoption behavior.	Results of this paper found that usefulness perception of consumers', risks of smart meters and ease of use influenced consumer acceptance in Taiwan, Korea and Indonesia, privacy and safety were not the main concerns for Taiwan consumers, in Vietnam perceived risk had no significant relationship with consumer adoption of smart meters.
Lin and Syrgabayeva [179]	Consumers	45	Consumers	Theory of reason action	Knowledge about renewable energy, environmental concern, environmental belief, attitude toward renewable energy and willingness to pay more for renewable energy.	The main purpose of this paper is to examine the knowledge mechanism of consumers on the intention pay more for renewable energy.	Need to develop renewable energy regarding environmental concern in developing countries.	Results of this study found that concerns of consumers regarding renewable energy had a positive influence on attitudes and improving their environmental beliefs and increasing their willingness to pay more for renewable energy.
Böttcher and Müller [177]	Automotive suppliers	159	Senior manager	None	Stakeholder pressure, competitiveness expectations, low-carbon products, low-carbon production, low-carbon logistics, carbon performance and economic performance.	The aim of this paper is to investigate the determinants of measures used by German auto-motive suppliers to cut carbon emissions, and their impact on performance.	There are challenges and opportunities in world manufacturing companies to measuring the reduce carbon emissions.	Results of this study found that there was a positive impact on carbon and indirect impact on economic performance.

Table A4. Breakdown of articles based on green and ecological innovation.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Albort-Morant et al. [189]	Spanish automotive components' manufacturing sector	112 firms	Top executives	Open innovation theory	Dynamic capabilities, Sensing Capability, Learning Capability, Integrating Capability, Coordinating Capability, Green Innovation Performance, Relationship learning capabilities, Information sharing capability, Joint sense making capability and Knowledge integration capability.	The main purpose of this paper is to examine the relationship Dynamic capabilities with green innovation performance with mediate effect of Learning Capability.	Few previous papers have focused on the antecedents of green innovation performance such as different capabilities.	Results of this paper found that there were positive and significant direct and indirect effects among capabilities on green innovation performance. In addition; relationship learning capabilities can mediate the relationship between capabilities and green innovation performance.
Chan et al. [191]	Industries in China	250	Operations managers	Contingency theory	Pressure of environmental regulations/policies, Green product innovation, Cost efficiency, Firm profitability and Environmental dynamism	The goal of this study is to explore the influence of green production innovation on the relationship between firm performance and pressure of environmental regulations and moderating impact of environmental dynamism on relationship od performance and green production innovation.	There is a lack in the literature regarding the mediating influence of green product innovation between firm and pressure performance.	The outcomes of this article found that there is a positive relationship between pressure of environmental regulations and green product innovation, cost efficiency and firm profitability. Also, there is a moderating effect of environmental dynamism on the relationship of green product innovation, firm profitability and cost efficiency.
Zailani et al. [183]	Malaysian automotive supply chain industry	153	Managers	Institutional theory	Environmental regulations, marketing demand, firms' internal initiatives, green product innovation, green process innovation, economic performance, environmental performance and social performance.	The main goal of this paper is to examine the green innovation adoption determinants its influence on firm performance.	Need to explore the GII determinants for firms in the automotive supply chain.	Results of this paper found that market demand, environmental regulations and firm internal initiatives had the positive relationship with green innovation initiatives, and GIIs had a positive relationship with sustainable performance.
Segarra-Oña et al. [192]	Manufacturing and service firms	6253	Managers	Absorptive capacity theory	Knowledge manufacturing, operational manufacturing, knowledge service and operational service.	The main goal of this study is to examine the sustainable innovations in service and manufacturing firms.	There is a need to emphasize innovation, knowledge and sustainability to gain competitive advantage.	Findings of this paper showed that there was no difference in the assimilate knowledge, firms acquire and knowledge-intensive firms excel to transform their ability to eco-innovate.
Chen et al. [190]	Taiwanese manufacturing industry	3	CEOs or the managers of environmental, marketing, HR, manufacturing, or R&D departments	Grounded theory	Environmental leadership, environmental culture, environmental capability, the pressure of the environmentalism of investors and clients, the pressure of environmental regulations, proactive green innovation and reactive green innovation.	The main objective of this paper is to examine origins two kinds of green innovation including reactive and proactive innovations.	Need to emphasize green innovation as the important tools for sustainable development in manufacturing industries.	Findings of this paper showed that environmental culture, environmental leadership, environmental capability, the environmentalism of investors and clients and environmental regulations can generate green innovation.
Kam-Sing Wong [193]	Electronics firms operating	203	R&D project leaders	Green innovation theory	Green innovation, green product innovation, green process innovation, green product competitive advantage and green new product success.	The main objective of this paper is to examine the impact of green product innovation and product process innovation on green new product success and product competitive advantage.	There is a gap in the literature regarding green innovation theory and concerning the relationship among factors of green innovation causal chain.	Results of this paper demonstrated that process innovation and green product had a positive effect on green new product competitive advantage and green new product success.

Table A4. Breakdown of articles based on green and ecological innovation.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Abdullah et al. [194]	Manufacturing companies	153	CEOs and managers	Stakeholder theory	Environmental resources, attitudinal and perception, business practices, technical, poor external partnership, insufficient information, lack of government support, lack of customer demand , environmental commercial benefit, product innovation, process innovation and system innovation.	The main objective of this study is to explore the external and internal barriers to green initiatives.	There is a need to explore the barriers of green innovation in Malaysia's manufacturing industry in the developing phases and the significant negative environmental impacts.	Findings of this paper showed that some barriers such as green attitude and perception, insufficient information, environmental commercial benefits poor external partnerships, business practices and lack of customer demand had a negative relationship with green process innovations.
Segarra-Oña et al. [195]	Automotive companies	223	Managers	None	Market information sources, process orientation, product orientation and eco-orientation.	The main findings of this paper are the analysis of the relationship between market information sources, process orientation, product orientation and eco-orientation.	Few previous studies have been focused on the eco-innovating in the automobile industry.	Results of this paper found that there was a positive relationship between importance of market information sources product and process orientation, also there was a significant positive relationship between product and process orientation, and environmental orientation.
Chen and Hung [196]	Manufacturing companies	237	Customers	Social capital theory	Relational capital, structural capital, cognitive capital, knowledge sharing and innovation performance.	The main purpose of this study is to explore the relationship between environmental collaboration and green innovation.	There is a need for attention to be paid to sustainability and collaborative green innovation in developing countries.	Results of this study found that there was a positive relationship between cognitive capital and structural capital, cognitive capital and relational capital, and relational capital was the significant role in green management and increased innovation.
Lin et al. [197]	Vehicle industry	233	Retailers, wholesalers, and firms selling components	RBV theory	Market demand, green innovation, environmental performance and firm performance.	The main purpose of this study is to investigate the relationship between market demand, firm performance, environmental performance and green innovation.	There is a gap in the literature regarding market demand, green innovation, environmental performance and firm performance.	Results of this paper found that there was a significant relationship among all variables expect for market demand and environmental performance.
Pedersen et al. [198]	Swedish fashion industry	492	Managers	Stakeholder theory	Financial performance, business model innovation, corporate sustainability performance and organizational values.	The main purpose of this article is to explore the relationship financial performance, business model innovation, corporate sustainability performance and organizational values.	Few previous studies explore how the dominant business logic of the organization is related to financial performance and corporate sustainability.	Findings of this article indicated that companies with innovative business models were related to corporate sustainability, also there was a positive relationship financial performance and organizational values.

Table A5. Breakdown of articles based on green and sustainable HRM.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Kalamas et al. [204]	Canadian urban area	263 consumers	Consumers	Theory of planned behavior (TPB)	Corporate responsibility, Government responsibility, God/higher power and Natural earth-cycle	This paper examines how external attributions affect pro-environmental behaviors of consumers.	Need to study the understanding of consumers' allocation regarding the environmental responsibility related to external forces.	Results of this paper found that; analytical ways for government and corporations to improve the pro-environmental efforts.

Table A5. Breakdown of articles based on green and sustainable HRM.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Wan et al. [208]	Four shopping malls and two railway stations	246 people	Customers	Theory of planned behaviour	Attitude, Subjective Norm, Perceived Behavioural Control, Moral Norm, Consequences Awareness, Perceived Policy Effectiveness and Behavioural Intention.	Investigated the moderating effect of perceived policy effectiveness regarding to recycling intention.	Need to better understand the recycling intention in Hong Kong.	Results of this study found that there are negative relationships between the perceived policy effectiveness between subjective norm and recycling intention, also between recycling intention and consequences awareness.
Zhan et al. [205]	Manufacturing industry	172 respondents	Students	-	Mindset and attitude, Leadership and management, Employee involvement, Integrated approach, Tools and techniques, Guanxi, Environmental performance and Business performance.	Evaluated the relationship between lean and green practices and organizational performance by moderation effect of guanxi.	Need to focus on the green and lean practice to attain sustainable development to enhance organizational performance in China context.	Results of this study indicated that there was a positive relationship between green and lean practices and improve organizational performance.
Chin et al. [209]	oil palm smallholder planters	327	smallholders	Theory of Planned Behaviour	Perceived production benefit, Perceived environmental benefit, Perceived ecological impact, Attitude, Subjective norm, Perceived behavioural control and Intention.	Explore smallholder planters' intention for supply available residues of oil palm in the plantations based on TPB theory.	There is a lack of understanding of planters regarding supply oil palm biomass in Malaysia.	Findings of this paper showed that there is a positive relationship among smallholder planters' intention and perceived behavioural control, subjective norm, attitude and perceived environmental benefit and perceived production benefit.
Wan and Shen [206]	Hong Kong Telecommunications Limited	263	Hong Kong residents	Theory of planned behaviour (TPB)	Perceived provision of facilities, Perceived naturalness, Perceived accessibility, Attitude, Perceived usefulness, Subjective norm, Perceived behavioural control, Behavioural intention and Behaviour.	The objective of this article is to find the relationships between urban green spaces attributes and urban green space use with mediating effect perceived usefulness attitude, and perceived behavioural control.	There is a lack in previous studies regarding urban green space which did not consider the three factors including perceived usefulness attitude, and perceived behavioural control.	The findings of this article showed that perceived usefulness attitude, and perceived behavioural control have a mediating effect in relationship between the behavioural intention to use urban green space. In addition; urban green space does not influence behaviour indirectly with attitude factors and perceived behavioural control.
Chiu et al. [210]	Ecological zones of the island	328	Tourists	Value-attitude-behavior theory	Environmentally responsible behavior, Perceived value, Activity involvement and Satisfaction.	Investigated the antecedents of tourist behaviour for outline of environmentally responsible behavior.	Need to explore the level of environmentally responsible behavior which can change results of eco-travel experience.	Findings of this paper showed that activity involvement, satisfaction and perceived value can encourage tourist environmentally responsible behavior and perceived value can influence environmentally responsible behavior directly, while involvement and satisfaction had partial mediation.
Zhang et al. [211]	Industrial Manufacturing firms	187	Vice-president	Institutional theory (INT)	Energy conservation strategy, Concrete operations for energy conservation, Environmental concern of senior manager, Coercive pressure, Normative pressure, Mimetic pressure and Financial cost.	The main aim of this paper is to examine the relationship between practices of firm energy conservation and external pressure with moderating effect of managers' environmental concerns.	There is a need to examine how environmental managers' concern can influence external pressure and an organizations environmental practices.	Findings of this study showed that senior manager's environmental concerns had a significant role in between firms' energy saving factors and the external pressures like mimetic and normative pressures. Although the senior manager's environmental concerns had a positive effect on the energy conservation strategy there was no direct effect on the concrete operations of energy conservation.
Ramayah et al. [212]	University	200	Students	Theory of Planned Behaviour (TPB)	Environment awareness cost of recycling, attitude, convenience, recycling behaviour and subjective norm.	The main goal of this paper is to investigate the recycling behaviour determinations in Malaysia.	Due to lifestyle in the Malaysia urban area there are some waste problems which need to be considered.	Results of this study found that environmental awareness had a significant relationship to attitude towards recycling and attitude and social norms had the significant relationship with recycling behaviour and finally cost of recycling and convenience were not significant reasons for recycling.

Table A5. Breakdown of articles based on green and sustainable HRM.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Zareie and Jafari Navimipour [213]	University	330	Students	Theory of reasoned action (TRA)	Environmental attitudes, environmental awareness, environmental values, public information, environmental skills and environmental responsibility.	The main objective of this paper to examine the influence of The electronic environmental knowledge on the people environmental behaviors.	There is lack in previous papers regarding the main shortcomings in the issues of public understanding and environmental awareness.	Findings of this paper found that; there are positive relationship between environmental attitudes, environmental awareness, environmental values, public information, environmental skills, environmental responsibility and environmental behaviors.
Wan et al. [207]	Four shopping malls, Two railway stations	198	Customers	Theory of Planned Behaviour (TPB)	Attitude, Subjective norm, Perceived behavioural control, Moral norm, Consequences awareness, Perceived policy effectiveness, Behavioural intention, Direct behaviour, Indirect behaviour	The main goal of this paper to developed the new model of recycling attitude and behaviour for finding the relationship between recycling behaviour and perceived policy effectiveness.	Few studies focused on the relationship between TPB and NAM and recycling intentions.	Results of this paper demonstrated that, recycling intention is affected by moral norms, perceived behavioural control, subjective norms, awareness of consequences and perceived policy effectiveness. Also self-reported recycling behaviour and support had influence by recycling intention.
Jiménez-Parra et al. [214]	Two Spanish universities	1529	Students	Theory of Planned Behavior	Attitude towards purchasing a remanufactured laptop, Subjective Norm, Motivations, Marketing Mix Variables and Purchase Intention.	The main objective of this study is to explore the main key drivers in the consumers' behavior related to remanufactured products.	There is a lack of literature review regarding the market for products recovery, consumers' acceptance, markets promotions, marketing strategies.	Findings of this paper showed that consumers had a favorable attitude towards in remanufacturing products, respect for clean environment, and a positive consideration of the opinion of their close social environment when making a purchase.
Larrán Jorge et al. [215]	SME's	481	Managers or middle managers	Theory of resources and capabilities	Environmental performance, competitive performance, image and reputation.	The main goal of this study is to analyze the environmental performance and environmental competitive.	There is a lack in previous studies regarding environmental performance and environmental competitive.	The findings of this paper showed that environmental performance had a significant, direct and positive impact on competitive performance and mediating effects of rational and image marketing.
Yusof et al. [216]	Architectural, engineering, and contracting firms	375	Board	None	Energy efficiency, Waste management, Involvement, Project environmental behaviour.	The main purpose of this study is to examine, the relationship between environmental and the environmental behaviour of professionals.	Need to consider energy consumption and reduction of waste generation in construction projects.	Results of this paper found that waste management practices and energy efficiency had a positive relationship with the environmental behaviour of practitioners during project implementation.
Wang and Wu [217]	Residents	775	Households	Theory of emotion	Pride, Respect, Guilt, Anger, intention of resisting non-energy conserving household appliances, intention of purchasing energy conserving household appliances; switch regular brand specialize in purchasing and pay more money.	The purpose of this paper is to examine the influence of respect, guilt, anger and anger on consumers' intention of sustainable consumption choice of household appliances.	Few previous studies have emphasized the influence of different emotions on specific sustainable consumption behavior.	Findings of this paper showed that there was a positive relationship between guilt, pride and purchasing energy conserving household appliances and resisting non-energy conserving household appliances, anger only has a positive relationship with the latter and pride had a significant relationship with four emotions and resistance behavior mediated the influence on guilt, pride and respect on the purchase behavior.
Carmona-Moreno et al. [218]	Spanish chemical firms	94	CEOs	Institutional theory	Pollution prevention, environmental human resource management, competitive advantage in costs and competitive advantage in differentiation.	The main goal of this paper is to explore the moderating influence of environmental HRM on relationship between competitive advantages of cost and firms' environmental management practices.	There is need to emphasize the role of environmental HRM for increase economic performance by involving of pollution prevention technologies.	Findings of this study showed that firms which focused more on environmental HRM practices get more advantage in costs and differentiation derived from the pollution prevention technologies implementation.

Table A5. Breakdown of articles based on green and sustainable HRM.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Wan et al. [219]	University	205	Students and Staffs	Theory of planned behaviour	Attitude, subjective norms, perceived behavioural control, awareness of consequences, moral norm, convenience and recycling intention.	The main purpose of this study is to investigate the role of recycling attitudes and behaviour of university students and staff members for enhancing environmental policies and recycling facilities in the university campus.	Need to emphasize user-friendly and convenient recycling scheme in universities.	Results of this paper found that behavioural intention with regard to recycling affected by the subjective norms, convenience, awareness of consequences, attitude, perceived behavioural control and the moral norms.
Tien-Shang Lee [220]	Largest firms	195	Managers	Stakeholder and CSR theories	Instrumental motives, political motives, corporate environmental responsibility, environmental product policy and environmental performance.	The main aim of this article is to analyze the relationship of corporate motivation, environmental responsibility, environmental performance and the adoption of environmental product policies.	Need to emphasize environmental responsibility in various business environments regarding the implementation of an environmentally oriented policy.	Findings of this paper showed that environmental performance had a direct relationship with political motives and instrumental motives, and indirect influence on environmental performance, instrumental motives had a marginal impact on environmental performance and environmental responsibility, and a marginal impact of political motives on environmental performance.
Kim et al. [221]	Restaurants chain	413	Seniors and non-seniors	None	Environmentalism, green consumerism, conserving resources, trust, healthy food choices and emotional loyalty.	The main aim of this paper is to examine the relationship between sustainability, lifestyle of health, trust, healthy food choices and emotional loyalty and moderating role of between non-seniors and seniors in restaurants.	Need to focus on sustainability, lifestyle of health, trust, healthy food choices and emotional loyalty and moderating role of between non-seniors and seniors in restaurants.	Results of this paper indicated that the senior market segment is different from the non-senior market segment. The influence of lifestyle, health and sustainability on healthy food choices is stronger for non-senior diners and the lifestyle of health and sustainability on emotional loyalty and trust for seniors and non-seniors.
Paillé et al. [222]	Manufacturing firms	151	Top management team members, chief executive officers, and frontline workers	Stakeholder theory	Strategic human resource management, organizational citizenship behaviour toward environment, internal environmental orientation and environmental performance.	The main objective of this study is to explore the relationship between strategic human resource management, organizational citizenship behaviour toward environment, internal environmental orientation and environmental performance.	Few previous published studies have addressed the role of strategic human resource management, organizational citizenship behaviour toward environment and internal environmental orientation to improve their environmental performance.	Findings of this paper showed that organizational citizenship behavior had the full mediation of relationship between environmental performance and strategic human resource management also that internal environmental had a moderate effect on strategic human resource management and organizational citizenship behavior.
Ahmad et al. [223]	University	230	Students	Theory of Planned Behavior and The Theory of Reasoned action	Attitude, moral norms, subjective norms, convenience, recycling cost, time and recycling behaviour.	The main objective of this paper is to explore respondents' behaviors regarding the recycling for identification of the factors which impact their behaviors.	Need to emphasize the understanding of how recycling behaviors are determined by one's social values, demeanor and perception of recycling behavior.	Results of this paper found that there were positive relationships between environmental awareness and attitude, extent of knowledge regarding recycling with attitude, extent of concerns for community with attitude, previous recycling behaviour with attitude, attitude with recycling behaviour, social norms with recycling behaviour, and morals norms with recycling behaviour.
Dögl and Holtbrügge [224]	Manufacturing and service companies	215	Managers and CER experts	Signaling theory	Green strategy & culture, green technology & products, green recruitment & evaluation, environmental reputation and employee commitment.	The main purpose of this article is to examine the relationship between employee reputation, corporate environmental responsibility and employee commitment.	Little attentions has been paid to the important role of corporate environmental responsibility for employer attractiveness and employee commitment.	Results of this paper found that there are positive relationship between environmental reputation, green technology & products, green strategy & culture, green communication and green recruitment & evaluation and in turn employee commitment.

Table A5. Breakdown of articles based on green and sustainable HRM.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Cegarra-Navarro et al. [225]	Pharmaceutical industry	225	Seller	Theory of green committees	Technical dimension, administrative dimension, social dimension, customer capital and green communities.	The main objective of this study is to investigate the relationship between environmental management, customer capital and green communities	Little attention has been paid to the relationship between environmental management, customer capital and green communities	Results of this paper found that customer capital had a positive relationship with environmental knowledge, also environmental knowledge impact of customer capital with mediation with, customer capital and green communities.
Kim et al. [226]	Hotels	172	General managers	RBV and institutional theory	General managers environmental commitment, hotels' environmental management capabilities and hotels' involvement in environmental practices.	The main purpose of this study was to investigate the relationship between environmental commitment of general managers and environmental management capabilities and involvement of hotel in environmental practices.	Need for involvement of individual people in hotels in involvement of environmental practices and understanding of hotel managers regarding to environmental management.	Results of this study found that general managers' environmental commitment influenced hotels' involvement regarding environmental practices directly and indirectly with involving environmental capabilities.
Castellanos-Verdugo et al. [227]	Tourism	520	Tourists	TPB	Eco-tourist site perceived value, ecotourism knowledge, attitudes towards ecotourism, eco-tourist satisfaction and behavioral intentions.	The main purpose of this study is to explore the relationship between Eco-tourist site perceived value, ecotourism knowledge, attitudes towards ecotourism, eco-tourist satisfaction and behavioral intentions.	There is a lack in previous literature regarding ecotourism knowledge and attitudes towards ecotourism.	Results of this study show that there was a positive relationship between ecotourism knowledge and the perceived value of the eco-tourist site, the value of the tourist site perceived by the tourist impact on attitude of the tourist towards ecotourism, also the perceived value of the tourist site impacts on the satisfaction of the visitor and finally there was a relationship between the satisfaction and the future behavioral intention of the visitor.
Gonul Kochan et al. [228]	University	327	Students	Theory of Reasoned Action	Attitude toward e-cycling, perceived norms, awareness of consequences, perceived convenience, e-cycling intention and e-cycling behavior	The main objective of this study is to use the theory of reasoned action for identify of e-cycling behavior determinants.	There is a lack in the literature of e-cycling regarding behaviors and intention of students in university campus.	Results of this study indicated that there was a positive relationship between moral norms and attitudes and e-cycling behavior, also, perceived convenience, the higher awareness of consequences and more the e-cycling lead to more involvement in e-cycling.
Kura [229]	Public sector	171	Employees	Transformational leadership theory, TPB	Transformational leadership, environmental concern and green behaviour at work.	The main objective of this paper is to investigate the mediating effect of environmental concern between green behaviour and environmentally specific transformational leadership.	Little attention has been paid to the relationship between environmental concern, green behaviour and environmentally specific transformational leadership	Results of this paper found that there was a significant positive relationship between transformational leadership and environmental concern and positive direction with green behaviour, and environmental concern is mediated between green behaviour at work and environmentally specific transformational leadership.
Ulubeyli [230]	Cement manufacturers	267	Managers	Resource-based theory	Rivalry among existing competitors, threat of new entrants, bargaining power of buyers, bargaining power of suppliers, threat of substitutes, human resource strategy, energy strategy, raw material strategy environmental performance.	The main purpose of this study is to examine the influence of five industry forces on implementation input-based competitive strategies and environmental performance.	Lack of previous studies regarding the integrating of industry forces and input-based techniques to measuring environmental performance.	Findings of this study paper showed that there was a positive relationship between plants and energy strategy, also there was a positive relationship between energy strategy and the lower threat of new entrances.

Table A5. Breakdown of articles based on green and sustainable HRM.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Llach et al. [231]	Restaurants	374	Firm's general manager	Institutional theory	Competitors, institutional support, cleaner practices, cleaner performance, market success factors and financial performance.	The main goal of this paper is to examine the relationship among competitors, institutional support, cleaner practices, cleaner performance, market success factors and financial performance.	There is a lack in the literature regarding adoption of cleaner production and financial and competitiveness.	Findings of this paper showed that there was a positive relationship between institutional support and cleaner practices, and no relationship between cleaner practices and competitors.
Thieme et al. [232]	University	467	Students	TPB	Environmental concern for wildlife, environmental concern for waste, environmental concern for energy, environmental involvement, willingness to pay more and sustainable behaviors.	The main objective of this study is to examine the relationship between environmental concern, sustainable behaviors, environmental involvement and willingness to pay more.	There was a gap in previous studies regarding environmental involvement and willingness to pay more in the relationship between environmental concern and sustainable behaviors.	Results of this study indicated that there was the mediating effect in the relationship between willingness to pay more and environmental involvement, environmental concern and sustainable behaviors.
Iniesta-Bonill et al. [233]	Tourism	187	Tourists	Institutional theory and Stakeholder theory	Economic sustainability, cultural sustainability, environmental sustainability, satisfaction and perceived value.	The main purpose of this study is to examine the relationship between perceived sustainability, satisfaction and perceived value of tourists.	There is a lack in previous studies regarding how perceived sustainability influence on tourist perception based on market orientation perspective.	Results of this study found that there was a positive relationship among all variable and all hypotheses supported.
Castaneda et al. [234]	Consumers	1044	Consumers	Social capital theory	Social capital, knowledge of environmental issues, pro-environmental attitudes, perceived eco-capability and eco-behaviour.	The purpose of this study is to examine the effects of social capital within a community on the adoption of consumer eco-behaviour or environmentally sustainable behaviour of consumers.	The study extends the BPM by offering a social capital view as a more nuanced explanation of consumer eco-behaviour.	The results suggest the substantive influence of social capital on environmental knowledge, pro-environmental attitudes and eco-capability. Both knowledge and attitudes have positive effects on eco-capability, which in turn positively shapes eco-behaviour.
Guerci et al. [235]	Manufacturing and service companies	74	HR Managers and SC Managers operating	Stakeholder theory	Customer pressure, regulatory stakeholder pressure, green hiring, green training and involvement, green performance management and compensation and environmental performance.	The main purpose of this article is to examine the relationship between green HRM practices, customer pressure, regulatory stakeholder pressure, and environmental performance.	There is a lack in previous studies regarding customer pressure and regulatory stakeholder pressure in relationship between green HRM and environmental performance.	Findings of this paper showed that there was a positive and significant relationship between customer pressure and regulatory stakeholder pressure and environmental performance, also there was positive relationship between compensation, involvement, green performance management green training and environmental performance.

Table A6. Breakdown of articles based on environmental information technology and systems.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Schniederjans and Hales [245]	Manufacturing and service organizations	247	Top and middle management	Transaction cost economics theory	Computing, Collaboration, Economic performance and Environmental performance.	The main goal of this paper is to investigate the influence of cloud computing on environmental and economic performance by mediation effect of collaboration.	There is a need to optimize and balance environmental and economic performance to decrease the business impact on natural environment.	Outcomes of this paper found that collaboration did not have an influence on environmental performance, and partially mediates the relationship between economic performance and cloud computing. Moreover, there is a direct effect between computing and economic and environmental performance.
Koo, Chung [246]	Smart green technology devices	100	Customers	Motivation theory and reference group theory	Social influence, Media influence, Perceived enjoyment in a smart green IT device, Perceived environmental problem, Saving money, Legislative pressure, Perceived usefulness in a smart green IT device and Continued use of a smart green IT device.	Examined the perceived usefulness determinants of smart green IT device for decrease electricity consumption.	Very few previous studies have been done about green IT devices, social norms, motivational values and usage from the individual consumer's perspective.	Results of this paper found that intrinsic motivations had a significant relationship with the perceived usefulness and extrinsic motivations had a strong relationship with the perceived usefulness of this device. In addition, perceived usefulness had strong relationship with the continued use of a smart green IT device and reference group partially can moderate this relationship.
Wang et al. [247]	Manufacturing	151 Chinese firms	Managers and executive	Natural resource-based theory	IT technical infrastructure flexibility, IT personnel skills IT-business alignment, Environmental orientation and Environmental performance.	The goal of this paper to examine the relationship between IT and environmental performance with moderator role of environmental orientation.	There is a need in the literature for a better understanding of the role of IT as solution for environmental sustainability.	Findings of this paper showed IT-business alignment and IT personnel skills can enable us to combine IT in the environment and this can lead to strong orientation to environmental sustainability.
Gholami et al. [242]	Service and manufacturing organizations	405	Managerial positions	Institutional theory	Attitude, coercive pressure, environmental performance, future consequences, mimetic pressure, pollution prevention, product stewardship, sustainable development	Examined the perception of senior managers in relationship between green IS and environmental performance.	Few previous papers place an emphasis on the adoption of green IS in organization for reduce the environmental influence.	Findings of this paper showed that the coercive pressure impact of attitude toward green IS and does not influence mimetic pressure. In addition, there is a positive significant relationship between attitude, green IS adoption and future consequences consideration and green IS adoption had a significant relationship with environmental performance in the long term.
Akman and Mishra [244]	public- and private-sector	182	Professional	Technology Acceptance Model	Perceived ease-of-use, subjective norms, level of awareness, perceived usefulness, attitude toward and actual system usage.	The main goal of this paper is to examine the role of green information technology in IT professionals in private and public sectors.	There are few studies regarding the green information technology.	Findings of this paper showed that there is diversity among establishments from public- and private-sectors in the impact of the PEU on PU and on the ATU; TAM is important for private-sector establishments excluding the relations between the PEU and ATU and PEU and PU.
Meacham et al. [248]	US manufacturing organizations	159	Managers	Resource-based theory	Green information systems, information sharing and environmental performance.	The main objective of this article is to explore the influence organization's capability to share information with focus on green information system for enhancing environmental performance.	There is a need for manufacturing companies to improve their green information systems capability and information sharing to improve environmental performance in companies.	Results of this study found that green information systems had a partial mediator relationship between environmental performance and supply chain information sharing.

Table A6. Breakdown of articles based on environmental information technology and systems.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Ryoo and Koo [243]	Manufacturing firms	77	Managerial positions	RBV	Green practices-IS alignment, green practice-manufacturing coordination, green practices-marketing coordination, environmental performance and economic performance.	The main purpose of this paper is to develop a model based on these variables for green practices-IS alignment, green practice-manufacturing coordination, green practices-marketing coordination, environmental performance and economic performance.	There is a lack in the literature regarding studies that addressed business value of green information systems.	Findings of this paper showed that there was a positive relationship between green practices-IS, green practices-marketing coordination and alignment green practices-manufacturing coordination, and green practices-marketing coordination and green practices-manufacturing coordination were significant predictors for environmental performance, while green practices-IS alignment had an indirect relationship with environmental performance by incorporating green practices-marketing coordination and green practices-manufacturing coordination.
Molla and Abareshi [249]	Organizations	176	CIOs/IT managers	Motivational theory	Eco-efficiency, eco-responsiveness, green IT and IT for green, eco-effectiveness and eco-legitimacy.	The main purpose of this article is to examine the relationship between motivation of organizational eco-sustainability and green information technology adoption and information technology for green IT.	There is a lack in previous studies regarding the organizational eco-sustainability motivation and adoption of green information technology and information technology.	Findings of this paper showed that eco-effectiveness and eco-efficiency help technologies to enhance the energy efficiency of information technology infrastructure and decrease information technology related to emissions. In addition, information systems decreased travel.

Table A7. Breakdown of articles based on green and sustainable operation management.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Campón-Cerro et al. [261]	rural tourism destinations	464 rural tourists	Rural tourists	Expectancy disconfirmation theory	image, quality, value, attribute satisfaction, overall satisfaction, loyalty	Investigated the role of loyalty for sustainable advantage and identify the loyalty factors for understanding of destination loyalty.	There is a need to examine sustainable strategies such as loyalty for rural tourism destinations.	Findings of this paper showed that quality, destination attribute satisfaction and image were the direct antecedents for loyalty in the rural tourism destination.
Sheu [265]	Electronic products	237 consumer	Consumers	Resource dependence theory	Government intervention, power shifts (countervailing power, bargaining power), relationship quality improvement (joint action, relationship quality) and green channel performance.	Examined the influence of government intervention on green channel performance with mediating effects of relationship quality improvement and channel power shifts.	There is a need for anew conceptual model regarding government intervention, relationship quality improvement in in producer–retailer green channel dyads.	Findings of this paper showed that there is a positive relationship between government intervention and green channel performance.
Blohmke et al. [262]	Private sector	data set of 47 countries	Senior-and middle level managers	Environmental policy theory	Green Advocacy, Awareness, Governance Capacity, international environmental governance and national environmental policy.	Evaluated the determinants of environmental policy on international environmental governance and national environmental policy.	Need for analysis of interaction among environmental policy determinants.	Finding of this study demonstrated that government capacity and green industry advocacy have positive impact on environmental policy.

Table A7. Breakdown of articles based on green and sustainable operation management.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Gelhard and von Delft [266]	Chemical firms	99	Top-level managers	Dynamic resource-based theory (DRBT)	Strategic flexibility, Value chain flexibility, Customer integration and Sustainability performance.	Investigated the relationship among strategic flexibility and sustainability performance with mediating effect of customer integration and value chain flexibility.	Previous studies did not consider the important role of organizational capabilities for attain superior sustainability performance.	Results of this paper showed that customer integration and value chain flexibility can be a mediation between strategic flexibility and sustainability performance.
Fraj et al. [267]	Spanish hotels	232	hotels' environmental manager or hotel director	Theory of Dynamic Capabilities	Learning orientation, Proactive environmental strategy and Organizational competitiveness.	The main aim of this article is to examine the relationship among organizational capabilities, competitive and proactive environmental strategies.	There are few previous papers that explore the relationship between environmental and organizational capabilities with competitive performance.	Results of this paper found that there is a relationship between innovation and proactive environmental strategy organizational competitiveness. In addition, learning orientation does directly predict organizational competitiveness
Prud'homme and Raymond [268]	Hotel industry	473	Customers	-	Customer intentions, Customer satisfaction, Hotel selection criteria, Responsible behaviors, Age, Gender, Education, Purpose, Length	The main objective of this paper is to examine the relationship between sustainable development, customer satisfaction and customer intention in the hotel industry.	There is a lack of previous studies focusing on customer satisfaction in sustainable development.	Results of this paper found that there is a positive relationship between customer satisfaction and sustainable development practices with different levels of satisfaction in hotels' ownership and size.
Lai and Cheng [263]	University	266	Students	Theory of planned behavior	Perceptions, attitudes, problems, responsibility, willingness and behavior.	The main aim of this study is to investigate the influence of undergraduate students regarding green marketing practices and their attitude toward the environment, their environmental responsibility and their perceived environmental problem seriousness.	Few previous studies have focused on perceptions of students in green marketing practices.	Results of this paper found that there is a strong relationship between perceived environmental responsibility and green products purchase willingness, also there is no relationship between perceived seriousness of environmental problems and undergraduate students' green product purchase willingness and there are significant relationships between students' willingness to purchase green products and their green purchase behavior.
Jabbour et al. [269]	Brazilian electronic sector	100	Managers	None	Internal environmental management, Green purchasing, Cooperation with customers, Eco-design, Investment recover and Maturity of environmental management	The main objective of this study is to examine the relationship between GSCM and the maturity levels of environmental management.	There is a lack in the literature regarding the relationship between GSCM and the maturity levels of environmental management.	Findings of this paper showed that the maturity level of environmental management impacted on the adoption of GSCM.
Luzzini et al. [264]	Ten European and North American countries	383	Procurement executives	Resource-Based Theory (RBT)	collaborative capabilities, sustainability commitment, and performance	The purpose of this paper is to examine the relationship between sustainability commitment, collaborative capabilities and performance.	There is a lack in previous studies in relation to sustainability commitments on the development of collaborative capabilities for supply functions and purchasing on sustainability performance.	Findings of this paper showed that there is a link between sustainability commitment and collaborative capabilities, cost performance and social and environmental performance.
Murovec et al. [270]	Companies in Slovenia	269	Chief executive office	Conventional economic theory	Financial incentives, Tax measures, Regulation and non-market instruments, Past environmental investments, Perception of costs, Importance for customers and firm performance.	The main goal of this paper is to examine the environmental technologies for increasing policy application.	Need for more quantitative evidence regarding the environmental technologies.	Findings of this study indicated that past environmental investments and policy measures were important to firm performance and customers and had a positive impact on environmental investments.

Table A7. Breakdown of articles based on green and sustainable operation management.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Jabbour et al. [256]	ISO 9001-certified companies	62	Owners/top managers	Ecological modernization	Environmental practices, operational performance, human/organizational aspects, green performance, Technological aspects and market performance.	The main objective of this paper is to investigate the relationship between GPD practices on firm performance such as market, environmental and operational aspects.	There is a lack in the literature regarding the GPD in Brazil.	Results of this paper found that GP practices affected firm performance and technical aspects.
Maniatis [271]	Shoppers	253	Green shoppers	Schwartz's theory	Knowledge of environmental issues, knowledge of environmental solutions, knowledge of ecological, labeling, knowledge of environmental benefits, knowledge of economic benefits, commitment to environmental protection, commitment to wastage reduction, commitment to cost reduction, commitment to health benefits, presence of ecological labels, presence of environmental certification, presence of non-polluting ingredients, presence of recyclable packaging, opportunity for cost reduction, nice and clean appearance.	The main objective of this paper is to examine the impact of general awareness, commitment to green products.	There is a lack regarding structural constructs and study of how they interact with consumers' green dimensions.	Results of this study indicated that the selected indicators reflected the impact of general awareness and commitment to green products.
Reuter et al. [272]	Multinational industrial companies	71	Purchasing managers	Stakeholder theory	Sustainability prevalence in supplier selection, cost prevalence in supplier selection, shareholder orientation, public orientation, customer orientation and formalization of ethical culture.	The main objective of this paper is to examine the relationship between stakeholder orientation, sustainability and cost prevalence in process of supplier selection.	There is concern about companies regarding understanding how purchasing managers impact on stakeholder in process of supplier selection.	Results of this paper found that shareholder orientation had a negative impact on sustainability prevalence in the process of supplier selection, and also public orientation had a positive relationship with sustainability prevalence.
Chekima et al. [273]	Customers	405	Male and female customers	Theory of planned behavior (TPB) and Value Orientation Theory	Environmental knowledge, Environmental advertising, Green purchase intentions, Man–nature orientation and Long-term orientation.	The main goal of this paper is to investigate the relationship between cultural values, environmental advertising environmental knowledge and determine the moderating effect of education level, income level and gender on consumers' green purchase intentions.	There is a lack in previous studies regarding examining the effectiveness of forming a positive attitude and encouraging consumers' intentions to buy green products.	Results of this article found that environmental advertising and cultural values were the main influences in building green purchase intentions, although environmental knowledge is not significantly related to green purchase intentions. Also, the results show that gender and education level had a significant positive moderation effect while income did not.
Hanim Mohamad Zailani et al. [274]	EMS ISO 14001—certified manufacturing firms	132	Firms	Institutional theory	Regulation and incentive, eco-design, customer pressure and environmental performance outcome.	The main aim of this paper is to examine the relationship among eco-design, government regulations and incentives, customer pressures and environmental performance.	Little attention has been paid regarding external institutional drivers which help firma to adopt internal proactive environmental strategies.	Results of this paper found that external institutional drivers directly and indirectly impact of firm's environmental performance through its internal proactive environmental strategy.

Table A7. Breakdown of articles based on green and sustainable operation management.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Hong et al. [275]	Manufacturing units	711	Managers	None	Competitive market environment, strategic green orientation, integrated product development, supply chain coordination, green performance outcomes and business unit performance.	The main purpose of this paper is to examine the relationship between strategic green orientations, supply chain coordination integrated product development and green performance outcomes and business unit performance.	Need to understand strategic green orientation, products development practices and supply chain coordination.	Results of this paper found that commitment on strategic green orientation is very important for manufacturing firms and there was a positive relationship between integrated product development and supply chain coordination, and there was a direct relationship between strategic green orientations. The second hypothesis predicts a positive relationship between strategic green orientations and green performance outcomes.
Chen and Chang [276]	Manufacturing industry	152	CEOs or the managers	None	Environmental commitments, green intangible assets and green competitive advantages.	The main purpose of this paper is to investigate the relationship between environmental commitment, green competitive advantage and green intangible assets.	Few previous studies have focused on the impact of international environmental regulations and environmentalism of consumers on corporate competitive advantages.	Results of this study indicated that environmental commitments and green intangible assets had a positive relationship with green competitive advantages.
Blome et al. [257]	Services and manufacturing firms	114	Senior procurement professionals	Resource-based view, legitimacy theory and institutional theory	Market performance, financial performance, top management commitment, green procurement, green supplier development and supplier performance.	The main objective of this paper is to explore the relationship between market performance, financial performance, top management commitment, green procurement, green supplier development and supplier performance.	There is a lack in the literature regarding firm-level antecedents for green supplier development and green procurement which influence supplier performance.	Findings of this paper indicated that there was a positive relationship between buying firm's market performance and adoption of green procurement, also, there was no relationship between financial performance and green procurement, and top management commitment was the important factor regarding the green supplier development and green procurement. There was a mediation relationship between green procurement, supplier performance and green supplier development.
Lirn et al. [258]	Shipping companies and agencies	80	Managers	RBV	Green shipping management capability dimensions, namely, greener policy, greener ships, and greener suppliers, environmental performance and financial performance	The main objective of this paper is to identify the green shipping management capability and its impact on firm performance.	There is a gap in the literature regarding the relationship between firm performance and green shipping management	Results of this paper found that there was a positive and direct relationship between greener policy and greener suppliers and greener ships, also there was positive and indirect relationship between greener policy, greener suppliers, environmental performance and financial performance.
W. Clark et al. [277]	Manufacturing plants	257	Manufacturing managers	Market orientation theory	Market orientation, green purchasing, logistics performance.	The main objective of this paper is to developed the framework for market-oriented sustainability, green purchasing and logistics performance.	There is a lack of previous studies to develop and assess the mark-oriented sustainability framework.	Results of this paper found that there was a positive relationship green purchasing, market orientation and logistics performance.
Felix and Braunsberger [259]	Mexican population	242	Consumers	Marketing and consistency theories	Intrinsic religious orientation, environmental attitudes and green product purchases.	The objective of this paper is to examine the influence of intrinsic religious orientation on green product purchases and environmental attitudes.	Need to focus on consumers' environmentally-friendly attitudes and behaviors in developing countries.	Findings of this paper showed that there was a significant relationship between green product purchases and environmental attitudes.
Green et al. [278]	Manufacturing plants	225	Plant-level managers	Resource-advantage theory	Internal environmental management, investment recovery, green purchasing, market orientation, cooperation with customers, environmental performance and eco-design.	The main purpose of this paper is to examine the relationship between market orientation and green SCM practices and environmental performance.	There is a lack of previous study regarding environmental sustainability and market orientation.	Results of this paper showed that the market indicated a direct and indirect relationship between green SCM and environmental performance.

Table A7. Breakdown of articles based on green and sustainable operation management.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Tirado-Valencia et al. [279]	Local governments	142	Employee	Stakeholder and Legitimacy theories	Strategy and analysis, organisation profile, information parameters, governance, commitments and stakeholders' participation, economic-financial performance, budgetary information, economic information disclosed, social indicators, environmental initiatives and environmental resources consumption.	The main objective of this study is to examine the relationships between nature and amount of information and strategies and the government of city councils, and sustainability performance dimensions.	There is a lack in the literature regarding sustainability information in local government.	Results of this paper show that there was a positive relationship strategy. Moreover, the parameters of information and economic block, economic performance, and the strategy and dissemination of the parameters of the information were the important factors in social indicators. The strategy and the parameters of the information were determinant in environmental initiatives and investments.
Li et al. [280]	High-tech firms	256	Senior managers	Stakeholder theory and natural resource-based view	Environmental orientation, green product design, green purchasing, green manufacturing, green is, environmental performance and financial performance.	The main objective of this paper is to explore the relationship between green SCM capabilities and environmental and financial performance.	There is a need to devote attention to the environmental capabilities such as green SCM and environmental and financial performance measures.	Findings of this paper showed that there was a significant relationship between green SC processes, green product design, firms' financial and environmental performance, although, there was no direct relationship between green product design and financial performance.
Li et al. [281]	Export SMEs	305	Senior managers or middle managers	Stakeholder theory	Market-oriented environmental sustainability, knowledge integration, international buyer involvement and export market performance.	The main objective of this article is to investigate how export supplier's market-oriented environmental sustainability improves the business performance in organizations.	Few previous studies have devoted their attention to the strategic role of upstream suppliers.	Results of this study found that relational capacity of knowledge integration mediated the relationship between market-oriented environmental sustainability and business performance.
Stolz and Bautista [260]	Consumers	989	Consumers	Sustainability theory	Communication, placement, price-quality and consumer effort.	The main objective of this paper is to examine the relationship between environmental sustainability and purchasing consumer goods.	There is a lack in previous studies regarding the importance that older consumers attach to environmental image and buying consumer goods.	Findings of this study showed that there was significant relationship between price-quality and consumer effort, and no-significant relationship between communication, consumer effort placement and consumer effort. There was a partial relationship between the perception of price/quality significantly and consumer effort.
Chen and Hung [282]	Green consumers	406	Consumers	TPB	Attitude, subjective norm, perceived behavioral control, social impression, environmental ethics and beliefs, environmental consciousness and behavioral intention.	The main objective of this paper is to determine green product acceptance based on the theory of planned behavior and social impression, environmental ethics and beliefs, environmental consciousness and behavioral intention.	Few previous studies have used the theory of planned behavior for investigating environmental cognitions of individuals.	Results of this paper found there was a positive relationship between perceived behavioral control, the environmental ethics attitude, environmental consciousness of consumers and beliefs of consumers, but social impression consumers and subjective norms consumers had a positive and non-significant relationship to intentions towards using green products.
Yusof et al. [283]	Lake and river resorts	529	Guests	None	Resorts' environmental practices, Environmental knowledge, Environmental concern, Direct environmental behaviours, Indirect environmental behaviours and Tourists' loyalty.	The main purpose of this article is to examine the relationship between environmental knowledge, environmental concern, environmental behaviours of tourists, the environmental practices of resorts and tourists' loyalty.	Need to place more emphasis on environmental awareness, environmental knowledge and environmental behaviour.	Results of this paper demonstrated that there was a significant relationship between the resorts' environmental practices and tourists' loyalty, also environmental concern regarding direct environmental behaviours, and indirect environmental behaviours showed a positive relationship between the resorts' environmental practices and tourists' loyalty.

Table A8. Breakdown of articles based on green and environmental marketing.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Jabbour [296]	Industrial sector	95	Managers	-	Environmental training constructs and environmental management maturity.	Analyzed the relationship between environmental training and environmental management maturity.	There is a need to investigate which is environmental training with environmental management maturity due to the importance of environmental issues?	Results of this paper found that environmental training had a positive influence on environmental management maturity.
De Giovanni and Esposito Vinzi [290]	Manufacturing company	178 firms	Managers	Supply chain theory	Firm's Green Attitude, Green Supply Chain Management, Firm's Environmental and Economic Performance.	Examined the influence of external and internal of environmental management on firms' performance.	There is a lack in previous studies regarding empirical study related to external and internal of environmental management and firms' performance	Results of this paper found that the European Union's Emissions Trading System (ETS) should focus on internal Environmental Management, Internal environmental practices improve economic performance, and Supplier collaboration can slightly affect firms' performance.
Molina-Azorín, Tarí [297]	Spanish hotel	355	hotels' managers	Agency theory	Quality performance, Environmental performance, Differentiation competitive advantage and Costs competitive advantage.	The main objective of this article is to explore the relationship between quality and environmental management and the competitive advantage.	Most past papers have investigated the quality and environmental problems separately; there are few examples of previous papers regarding quality and environmental management simultaneously.	Outcomes of this article found that there are relationships between quality and environmental management and quality and environmental management with competitive advantage based on costs and differentiation items.
Martínez-Martínez et al. [291]	Hospitality sector	87 companies	CEO or owner of every business	-	Socialisation, Externalisation, Combination, Internalisation and business performance.	Investigated the role of SECL model mediated between the environmental knowledge and organizational performance.	Need to update and reuse the knowledge of the environmental in recent coming years.	Findings of this paper showed that time is an important factor for implementation of the SECI model in organizations operating.
Gotschol et al. [298]	Firms	240	Managers	-	Green production, GSCM, environmental performance and economic performance.	The objective of this study is to examine the relationship between environmental management and economic performance. This paper investigates whether environmental management is an economically sustainable business	Due to fails in most previous studies there is a need to examine the relationship between environmental management and economic performance.	Findings of this paper showed that environmental management had a positive relationship with economic performance as second order target.
Jabbour et al. [292]	Brazilian automotive companies	75	Production/operations managers	None	Human resources, operational performance, environmental management and lean manufacturing.	The main objective of this paper is to examine the impact of environmental management on operational performance by incorporating of human resource and lean manufacturing.	There are no studies related to environmental management, operational performance, human resources and lean manufacturing.	Results of this paper demonstrated that human resources had a significant relationship with environmental management, lean manufacturing influence on environmental management compared with operational performance and there was a positive relationship between environmental management and operational performance.
Hajmohammad et al. [299]	Canadian manufacturing plants	85	Managers	Natural resource-based view (NRBV)	Supply management, Lean management, Environmental practices, Environmental Performance, Plant size and Importance of environmental issues.	The main objective of this study is to propose a framework for relationship among environmental practices, supply and lean management and environmental performance.	Past studies emphasized the importance of lean and supply management as the determinants of environmental performance.	Results of this paper found that the impact of supply management and lean management increased environmental performance by mediating the role of environmental practices.

Table A8. Breakdown of articles based on green and environmental marketing.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Xia et al. [293]	Manufacturing industry	533	Managers	Ecology theory	Green technology selection, firm performance and circumstance pressure.	The main goal of this paper is to investigate the relationship among, green technology selection, firm performance and circumstance pressure.	There is no comprehensive model for green technology selection in the current literature.	Findings of this paper demonstrated that there is a significant relationship between certain task-oriented circumstances and macro circumstances and green technology selection.
Sen et al. [300]	Manufacturing sectors	259	Managers	None	Environmental proactivity, operational performance, financial performance.	The main aim of this paper is to examine the relationship between environmental proactivity and financial performance.	Need to explore environmental management methods in manufacturing sectors leading to better financial performance in both the developing and the developed countries.	The results of this paper found that there is positive relationship between environmental proactivity and financial performance.
Hwang et al. [301]	Eco-industrial park	42	Experts	None	Resource circulation system development, ecological environment development and cooperative system development.	The main goal of this paper is to investigate the causal relationship of eco-industrial park development.	Need to focus on enhance eco-industrial park development based on sustainable development in environmental, social, and economic dimensions.	Findings of this paper showed that resource circulation system development had direct significant influences on eco-industrial park development; resource circulation system development had highly significant influences on the cooperative system development and had significant influences on eco-industrial park development.
Pondeville et al. [302]	Manufacturing companies	256	CEO or senior manager	Organizational theory	Environmental information system, formal environmental management control systems (EMCS), informal environmental management control systems, environmental management activities, perceived ecological environmental uncertainty and perceived stakeholder pressures.	The main aim of this paper is to investigate the important role of strategic and contextual development of environmental management control systems	Few previous studies focused on antecedents of corporate environmental management controls and environmental strategies.	Results of this article indicated that there was the strong relationship between the formal and informal EMCS and the environmental information system, positive relationship between development of the three EMCS and the degree of corporate environmental proactivity.
Thirupathi and Vinodh [303]	Automotive concept manufacturing organisations	70	Expert in automotive concept design and manufacturing	None	Economic prosperity, environment well-being, performance management, research and development, social well-being and sustainable manufacturing.	The main aim of this paper is to investigate between sustainability enablers such as social well-being, economic prosperity, environment well-being, research and development and performance management.	For competitive advantage, there is a need to focus on sustainable manufacturing practices in automotive component manufacturing organisations.	Results of this paper found that there was a significant relationship between sustainable manufacturing and R&D and there was significant interrelationship between research and development and sustainable manufacturing practice, also there was a significant interrelationship between social well-being and performance management.
Wu et al. [294]	Manufacturing firms	1453	Staffs	Theory of production competency Resource-Based View, and contingency theory	Formal EMS structure, tracking EMS performance, cross-functional cooperation, operational performance, EMS awareness, top management team's strategic perception and environmentally responsible suppliers.	The main aim of this paper is to investigate the role of core environmental management system (EMS) in sustainable competitive advantage.	Few firms have used EMS, although they know about EMS's benefits.	The findings of this paper showed that environmentally responsible suppliers cross-functional cooperation and top management team's strategic perception were the important factors for succeed implementation of EMSs.
Aras and Crowther [304]	UK industrial sector	80	Enterprises	Stakeholder theory and Resource-Based View	Innovation, environmental regulation and performance.	The main purpose of this paper is to examine the relationship between environmental regulation, innovation and performance.	There is a misunderstanding regarding the sustainable development in organization.	Results of this studies demonstrated that there was a positive relationship between environmental regulation and economic performance, and environmental regulation had a significant relationship between innovation and negative direction, and also there was a significant relationship between innovation performance and economic performance.

Table A8. Breakdown of articles based on green and environmental marketing.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Bagur-Femenias et al. [305]	Small service companies	448	Managers	Stakeholder theory and Resource-Based View	Environmental pressure, adoption of environmental practices, operational performance, competitiveness and firm performance.	The main goal of this paper is to examine the influence of the practices of decision to adopt environmental practices in small service companies.	It is important for the service industry to emphasize environmental practices.	Results of this article indicated that legal environmental and organizations related to the company location were the main incentive to adopt environmental practices, also there was a direct and positive relationship between adoption of environmental practices, competitiveness and improvement of operational performance.
De Giovanni [306]	Italian firms	240	Top-level executives	Stakeholder theory	External environmental management, internal environmental management, environmental performance, economic performance and social performance.	The purpose of this paper is to examine the influence of external and internal environmental management on economic, social and environmental performance.	Nowadays, focusing on environmental management is important for firms regarding society.	Results of this study found that internal environmental management was the successful driver for economic, social and environmental performance, and had a direct relationship with social and environmental performance and indirect relationship with economic performance. External environmental was not an effective driver and had a positive relationship with environmental performance, and indirect relationship with economic performance.
Kim and Lee [307]	Korean logistics and manufacturing companies	168	logistics MBA program and Logistics CEO	Stakeholder theory and RBV	Stakeholder pressure, eco-oriented culture and environmental logistics practices.	The main objective of this paper is to explore the relationship between environmental logistics practice, eco-culture and stakeholders pressure.	Little attention has been paid to relationship between environmental concern, eco-culture and stakeholders pressure.	Results of this study found that there was a significant relationship between stakeholders' pressure and environmental logistics practice and the mediating impact of eco-culture, and eco-culture full mediated the relationship between stakeholders' pressure and environmental logistics practice.
Wiengarten et al. [308]	Manufacturing organizations	522	Plant managers	None	Investments in quality practices, investments in lean practices, investments in environmental practices and operational supply chain performance.	The main objective of this article is to examine the relationship between environmental, quality and lean practices within the supply chain.	Need for more studies regarding the relationship between environmental, quality and lean practices in the context of SC.	Results of this paper demonstrated that quality, lean and environmental practices increased operational SC performance by incorporating pollution prevention, waste reduction, ISO 14001 and materials recycling.
Yu and Ramanathan [295]	Manufacturing firms	167	Manufacturing managers	Stakeholder theory	Stakeholder pressures, internal green management, green product/process design and environmental performance.	The main purpose of this paper is to explore This study explores stakeholder pressures, internal green management, green product/process design and environmental performance.	There is a need for more study of relationships among stakeholder pressures, internal green management, green product/process design and environmental performance.	Findings of this study showed that stakeholder pressures had a positive and significant influence on internal green management and there was a significant and positive relationship between internal green management and green product/process design. Two green operations practices had a positive and significant relationship with environmental performance.
Vinodh and Joy [309]	SMEs	50	Managers	None	Economic sustainability, environmental sustainability and social sustainability.	The main objective of this paper is to explore the relationship between three main aspects of sustainable development including economic, social and environmental sustainability.	Although sustainable manufacturing has improved, few previous studies have focused on the three main dimensions of sustainable development.	Results of this study showed that environmental, economic and social sustainability were important for development of sustainability in manufacturing.
Hajmohammad and Vachon [310]	Canadian plants	251	Plant managers	Organizational support theory	Safety practices, safety performance, environmental practices, environmental performance and financial performance.	The main goal of this study is to explore the direct and indirect influence of sustainable development on firm performance by involving of safety environmental culture.	There are limitations of the operations management literature to showing which managerial attention to employee safety actually improves environmental and financial performance.	Findings of this paper showed that safety culture had a relationship with safety, environmental and financial performance, and there was a relationship between safety culture and safety and environmental performance mediated by the level of implementing safety and environmental practices within plants.
Benitez-Amado et al. [311]	Large Spanish firms	63	Managers	Theory of dynamic and operational capabilities	IT infrastructure capability, talent management, operational environmental sustainability, firm performance, firm size, industry and quality management.	The main purpose of this paper is to investigate the influence of talent management and technology management on operational environmental sustainability.	Few attentions have been paid to talent management in relationship information technology and environmental sustainability.	Findings of this paper showed that IT infrastructure enhancing the talent management and can be an enabler for operational environmental sustainability to increase firm performance.

Table A8. Breakdown of articles based on green and environmental marketing.

Author(s) Year	Scope and Sample	Sample Size	Respondents	Related Theory	Variables	Study Purpose	Gap and Research Problem	Results and Outcome
Freise and Seuring [312]	Clothing industry	292	Management levels	None	Competitive differentiation, risk exposure of the supply chain, social risk, environmental risk	The main purpose of this paper is to analyze the relationship between internal and external risk, SC characteristics, management of environmental risk and management of social risk.	Few previous studies have paid attention to the importance of social and environmental risk factors in SC.	Results of this study found that pressure and incentives from stakeholders were the main drivers of social and environmental risk.
Jabbour et al. [313]	Industrial and manufacturing sectors	75	Operations and production managers	Ecological Modernisation theory	External barriers, internal barriers, green operational practices, green performance and operational performance.	The main purpose of this article is to explore the relationship between internal and external environmental management barriers on green operational practices and impact on the green and operational performance.	Need to emphasize internal and external barriers of environmental management for adoption of green operational practices.	Results of this article found that internal barriers were significant compared to external barriers regarding green and operational performance, green and operational performance had a direct relationship with green and operational performance, and internal barriers had an indirect relationship with operational and green performance, and size of firm does not have a significant relationship with green and organizational performance.
Koo et al. [314]	Manufacturing firms	121	Employees	Theories of coordination and green practices	Ecological responsibility, environmental sustainability orientation, green manufacturing coordination, green supply chain coordination, environmental performance and economic performance.	The main purpose of this study is to explore the relationship between responsibility, environmental sustainability orientation, green manufacturing coordination, green supply chain coordination, environmental performance and economic performance.	Few previous studies have focused on the significant role of coordination in relationship of ecological responsibility and environmental orientation.	Results of this paper found that there was a relationship between environmental performance and environmental sustainability orientation by mediating the role of green manufacturing coordination and green supply chain coordination.
Kuei et al. [315]	Manufacturing industries and service organization	113	Middle-line managers	None	Planning and enabling conditions for environmental quality, green training and operations, environmental quality controlling, awareness and understanding of environmental sustainability, using ISO 9000:2000 as a stepping stone, business results and operations competence and environmental quality.	The main goal of this paper is to identify the vital enablers for improvement of performance environmental management.	There is a need for more study to identify factors of performance environmental management.	Results of this study found that there was a positive relationship between adopting environmentally conscious operations, voluntary environmental standard approaches and overall performance, also it seems that voluntary environmental was more associated with overall performance.
Yu and Ramanathan [316]	Manufacturing firms	121	Manufacturing managers	RBV and natural-resource-based view (NRBV)	Marketing capability, operations capability, environmental management practices and environmental performance.	The main objective of this paper is to present an analysis of the relationship between functional capabilities in adopting environmental management practices and environmental performance.	There is a gap in previous studies regarding the influence of functional capabilities on implementing environmental management practices.	Findings of this paper showed that there was a significant relationship between marketing and operations capabilities and environmental management practices, which in turn leads to improved environmental performance. More specifically, this study finds that EMP fully mediates the relationship between marketing capability and environmental performance.

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