

## Bibliometric Analysis Of Sustainable And Green Consumption Research From 1974 To 2019

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**Abstract:** The past decade witnessed the resurgence of sustainable consumption due to the strong support offered by companies, consumers, institutions, and society. Nevertheless, examination of sustainable consumption via bibliometric and network analyses is absent from the vast literature. In order to bridge this gap, a bibliometric analysis was performed on all publications related to sustainable consumption in the Scopus database for the period of 1974-2019. Upon analyzing 2352 articles, several parameters were determined, namely the trends in publications, the most popular journals, the productive countries of the most important countries, most of the studies cited and the list of keywords for further description (psychosocial factors). From the selected 160 journals, articles were most-frequently published in Sustainability Switzerland, while the Journal of Consumer Marketing ranked first for total citation. The emergence of sustainable consumption topic was spread across 120 countries and 159 academic institutions. This present study discovered that the United States dominated publication production, whereas Universität Göttingen in Germany was the most productive institution. Upon further systematic analysis using VOS viewer, 5333 keywords were listed. The top four clusters of psychosocial determinants were discussed in light of social norm, attitude, environmental concern, and perceived value. Building on the outcomes retrieved from this analysis, researchers may better plan their studies and contribute better insights of their empirical investigations.

**Keywords:** Bibliometric Analysis, Psychosocial Determinants, Sustainable Consumption, VOS Viewer.

### 1. Introduction

Excessive exploitation of natural resources has led to severe repercussions and damages (Chen & Chai, 2010). Some of these environmental adversities include global warming, increased pollution of the atmosphere and the disappearance of endangered flora and fauna (Chen & Chai, 2010). Besides, the growing consumption of goods and services worldwide has turned into headlines upon reaching an alarming rate.

Surprising and interestingly, the past decade had witnessed the resurgence of interest in matters related to sustainability (Mittelstaedt et al., 2014), partly due to the full support offered by companies, consumers, institutions, and society (Gershoff & Frels, 2015). A number of multinational corporations have also taken part by constructing global positioning strategies to understand the global cultural identity across nations (Strizhakova & Coulter, 2013). Simultaneously, the nexus of sustainability has motivated researchers from the marketing domain to probe into this topic and address issues related to climate change, consumption, and behavior. As depicted by Lunde (2018), research work pertaining to sustainability published in the marketing literature has expanded in a substantial manner.

Despite the large amount of specific sustainable consumption studies that has been published, broader trends in the prevalence and scope of sustainable consumption research have remained untapped. Past studies have looked into the topic of sustainability consumption by placing focus on fair-trade labelling (Ruggeri et al., 2019) and sustainable luxury marketing (Athwal et al., 2019). In order to bridge the gap, this present study quantitatively analyzed trends in sustainable and green consumption research. In order to meet this objective, a systematic mapping was performed to analyze the sustainable and green consumption literature published between 1974 and 2019 via bibliometric approach. The contributions of this study are as follows:

1. How is the distribution of paper publication over time (evolution)?
2. What journals have published most of these papers?
3. Which country/institution has mostly dominated the publication?
4. What is the current topic/trend studied in this area?

5. What are the psychosocial determinants that lead to the current trend?

The rest of this paper is structured as follows: Section 2 describes sustainable and green consumption. Next, Section 3 describes the databases and software employed as part of the methodology. In Section 4, the results and findings retrieved from the basic bibliometric analysis and VOS viewer software are elaborated. Meanwhile, Section 5 depicts the psychosocial determinants that lead to sustainable and green consumption, whereas the final section presents the conclusion and the limitations of this study.

### **An Overview of Sustainable and Green Consumption**

There is a range of definitions concerning sustainability in the marketing domain. Some scholars clarify sustainability in light of environmental concept, while others explain based on a more holistic spectrum by incorporating the triple bottom line (profit, people, planet) (Brundtland, 1987; Elkington, 1994). The definition of sustainability can be defined as maintaining the situation which may harm the environment for future generations or safeguard the environment and society (Brundtland, 1987). Fundamentally, worldviews play a crucial role in shaping lifestyles and (de Vries & Petersen, 2008; Johnson et al., 2011). As users begin to realize the uprising consumption issues, they play an important role in driving sustainable development and growth (Fien & Tilbury, 2002). Practicing sustainable consumption focuses on the buying and use of less-impact products, including eco-friendly products, recycled and/or reduced packaging and low energy consumption (Muster, 2012; Dong, 2018).

The strategies implemented to market green and sustainable products need to be more distinct, when compared to marketing non-green products and services (Groening et al., 2018). Moreover, the belief that consumers will drive for sustainable development through their actions in all areas of their lives gives consumers a crucial role as agents of social change (Balderjahn et al., 2013). Consumers are the main focus of many environmental issues and are frequently asked to contribute to the preservation of the planet through display of more environment-friendly attitudes and behavior via being activists (Almeida et al., 2001) or by embracing sustainable consumption (Paço, 2015; Armstrong et al., 2016). In so doing, a deeper understanding of environmental attitudes and sustainable lifestyles is important, since the worldviews in which they can be opposed are relevant. It helps us to put environmentally friendly attitudes and sustainable lifestyles into a broader and more holistic historical-cultural sense (Hedlund-de Witt et al., 2014).

## **2. Methodology**

In order to perform the bibliometric analysis, the first step is to select accessible databases based on their suitability and significances of using one or another. After extracting the research publication information, one needs to design the bibliometric analysis style based on the suitability of the topics. Several analytical software programs, such as VOSviewer, offer strong and relevant support, as well as graphical description about the publication trends.

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### **Database Selection**

The output of this systematic analysis was gathered from Scopus database, mainly because this database provides a comprehensive view of massive research publications, along with analysis of citation since 1996. The analysis undertaken in this study incorporated the scientific, multidisciplinary and international literature database developed by Elsevier in November 2004. The bibliographic information of the articles focused directly on the analyzed parameters filtered by type of document, distribution based on subject category, language of publication, output of publication, authorship, patterns of publication, and the most frequently cited article. The keywords used for the analysis were developed from the meaning of sustainable consumption adopted by (Muster, 2012; Dong, 2018). The keywords, finalized on 20th April 2020, are present in Figure 1.

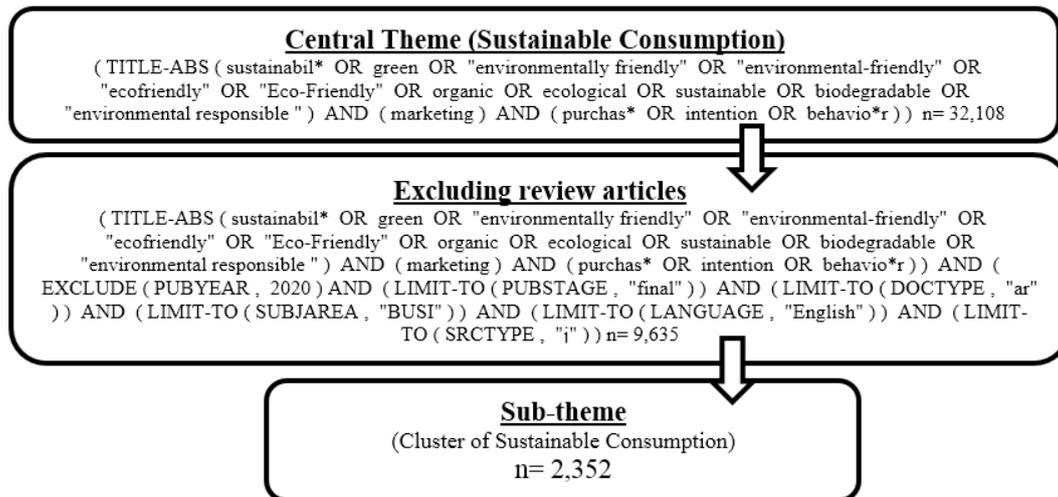


Figure 1. Flowchart of the key strings strategies

### Bibliometric Analysis

Bibliometric methods have been commonly used to provide a systematic map of information structure in a given literature stream (López-Fernández et al., 2016) or journal (see Laudano et al., 2019; Marzi et al., 2017). Luque Martínez (1995) stated that bibliometric analysis, as a collection of data defined in a consistent sequence, allows easy access to ensure that the information given can be modified and used at any time on different criteria. A systemic study incorporates scholars, organizations, regions, and countries' scientific activities to define patterns. Nevertheless, a paper's validity also relates to the suitable selection of the foundation, as it must address the study area adequately (De Granda-Orive et al., 2013).

### Software Selection

The latest tools for networking analysis such as VOSviewer (van Eck and Waltman, 2013) can efficiently extract massive visualization data sets, and execute graphical analysis with broader options. This research used VOSviewer Version 1.6.2 (a software to visualize bibliometric analyzes, initials VOSviewer refers to similarity proximity; (van Eck and Waltman, 2013) and Microsoft Excel to chart both co-authorship and co-occurrence in conjunction with countries and keywords.

## 3. Results and Discussion

This section presents the performance analysis that focused on the subsequent pieces of information; evolution of publication trends, set of journals with the most publications, the most productive countries, the most cited studies, and a list of keywords to describe the emerging sub-themes. By using the VOSviewer software, a mapping strategy was devised to explore keywords and co-authorship by countries. Comprehensively, this study assessed the network of highly cited and published articles in the sustainable consumption area, hence initiating a proposed future research agenda described in the following sections.

### Evolution of Publications

Following the progress of Scopus databases, the general sustainable consumption research has developed rapidly since the past four and a half decades, with massively accelerating article outputs and citations (see Figure 2). The publication trend is classified into four stages for better view and synthesis of the evolution of sustainable consumption. The introduction and growth stages took place in 1974-2008 and 2009-2019, respectively.

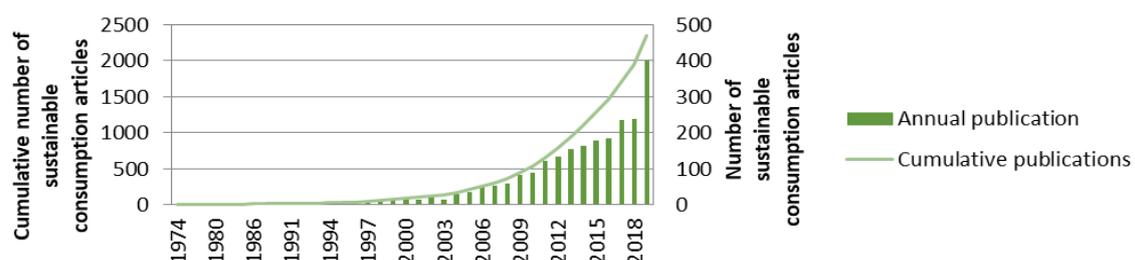


Figure 2. Revolution of sustainable consumption research

This systematic analysis blanketed a period of 45 years, which included the oldest accessible paper in Scopus dataset published in 1997. Although the sustainable consumption paper was published in late 1970s, it was unavailable online. Sustainable trends were noted in 1980. Sustainability was primarily discussed in conjunction with corporate social responsibility in the 1980s and 1990s. Nevertheless, a major change has been identified since the late 1990s in terms of who drive the sustainable business practices. Many consumers had started to believe in the mid and late 1990s that it is their duty to purchase and consume in a way that protects the environment and society (Roberts, 1995). This concept is supported by Shetzer et al., (1991); Stisser (1994), which initiated sustainability as one of the most significant consumer issues on the market in the last few decades. In the advent of the millennium years, awareness related to sustainability, as response to the increasing pollution and destruction, further flourished the publication of this research area (Joshi & Rahman, 2015; Sun & Ko, 2016). More researchers have begun paying attention to this topic entailing a vast range of fields. In addition, most countries adopt common green product requirements with the world (UNDP, 2020). Studies on sustainable consumption escalated drastically from 2016 to 2019. In recent decades, customers and researchers concentrate on the need for long-lasting sustainability creative goods (McMeekin & Rothman, 2012; Kumar, 2018). The increasing standard of living and migration have altered the lifestyle and consumption of many (Price Waterhouse Coopers, 2013).

### The Top 10 Most Productive Journals on Sustainable Consumption

In this systematic analysis, the citation frequencies of documents were determined to identify the main articles within the domain of sustainable consumption, which covered general products and a direct focus on consumer behavior. Broadly, this study analyzed the sustainable consumption studies published across 160-wide range of journals between 1974 and 2019. For that purpose, this study used ranking provided in the Scopus database arranged based on the number of publications, number of citations, and cite score. To retrieve additional information, reports about the most cited articles, frequency of citations, and name of publishers were combed through. The purpose of providing the list of references is to detect core articles that had influenced the literature of sustainable consumption.

**Table 1.** The top 10 most productive journals on sustainable consumption area

No.	Journal	No. of publication	No. of citation	CiteScore 2018	The most cited article	Times cited	Publisher
1	Sustainability Switzerland	84 (3.59)	361	3.01	Green Marketing as the source of the competitive advantage of the business	30	Multidisciplinary Digital Publishing Institute (MDPI)
2	British Food Journal	44 (1.88)	978	2.08	Organic milk: Attitudes and consumption patterns	152	Emerald
3	Journal of Cleaner Production	42 (1.78)	888	7.32	A novel mixed method smart metering approach to reconciling differences between perceived and actual residential end use water consumption	94	Elsevier
4	Acta Horticulturae	29 (1.24)	75	0.27	Predicting cut flower consumers' taste and preference for consumers' preference based selection	9	International Society for Horticultural Science
5	Journal of Consumer Marketing	28 (1.19)	2707	2.17	Environmental segmentation alternatives: A look at green consumer behavior in the new millennium	588	Emerald
6	Journal of Business Research	21 (0.90)	1267	5.32	Investigating the role of the physical environment in hedonic service consumption: An exploratory study of sporting events	291	Elsevier
7	Social Marketing Quarterly International	21 (0.90)	273	1.03	Choosing effective behavior change tools	78	SAGE
8	Journal of Consumer Studies	20 (0.86)	766	2.11	Gender differences in Egyptian consumers' green purchase behaviour : The effects of environmental knowledge, concern and attitude	181	Wiley-Blackwell
9	Journal of Sustainable Tourism	18 (0.76)	558	4.06	The determinants of hotels' marketing managers' green marketing behaviour	115	Taylor & Francis
10	Journal of Global Fashion Marketing	17 (0.73)	102	0.80	Understanding fashion consumers' attitude and behavioral intention toward sustainable fashion products: Focus on sustainable knowledge sources and knowledge types	16	Taylor & Francis

Table 1 shows the prominent journals that predominantly focused on sustainable consumption. Based on the ranking provided by Scopus, the Sustainability Switzerland had the most publications at 84. Next, the Journal of Consumer Marketing recorded the highest number of citations at 2707. Additionally, this journal achieved the highest citation frequency (588) for the article entitled 'Environmental segmentation alternatives: A look at green consumer behavior in the new millennium'. Despite gathering the total citation counts from the Scopus database, they need not necessarily indicate the quality of an article; but measured its impact or visibility.

**Publication Distribution of Countries/Territories and Institutes**

This analysis of retrieved articles represents the accumulation of publications that was derived from 120 countries and 159 academic institutions (see Table 2). Based on the burgeoning line of the ranking of report syntheses from the Scopus database, it is interesting to note that the United States led the number of publications on sustainable consumption with the most independent and international institution collaborations. The total number of publications was 576 (71 percent of single country production), and this was followed by Universität Göttingen in Germany that recorded the most productive academic institution with 17 publications. The other top two contributors to the evidence were the United Kingdom and New Zealand with 63.68 percent and 44.97 percent of articles distribution, respectively. These contributions remained fairly stable over time.

Despite the top three ranking have been manipulated by European and American region, the presence of Asian countries (India, China and Malaysia) was noted in the top 10 list. The ranking portrays that the emergence of sustainable trend is across developed and developing countries, which is in line with that asserted by (Bendell & Kleanthous, 2007). This reflects that consumers have begun taking into account both materials and processes in their purchase (Snyder, 2010; Powell & Zwolinski, 2012; de Klerk et al., 2019).

**Table 2.** The top 15 most productive countries and academic institutions in sustainable consumption

No.	Country	TPc	SCP (%)	The most productive academic institution	TPi
1	United States	576	71	The Ohio State University	15
2	United Kingdom	234	63.68	Sheffield University Management School	11
3	Australia	149	44.97	Deakin University	7
4	India	145	86.21	Amity University, Noida	5
5	Germany	114	62.28	Universität Göttingen	17
6	China	108	51.85	Sun Yat-Sen University	5
7	Italy	92	64.13	Parthenope University of Naples	7
8	Malaysia	92	69.57	Universiti Malaysia Sabah	12
9	Taiwan	80	85	National Kaohsiung University of Science and Technology	7
10	Canada	77	58.44	The University of British Columbia	6
11	South Korea	74	50	Yonsei University	10
12	Spain	60	55	Universidad de Zaragoza	5
13	Netherland	57	45.61	Wageningen University and Research Centre	16
14	Sweden	42	42.86	Sveriges lantrbruksuniversitet	8
15	New Zealand	41	39	University of Otago	8

**Distribution of Country (based on VOSviewer)**

The 120 countries that generated studies on sustainable consumption were grouped into 12 world regions (clusters): North America, Central America, North Africa, Eastern Europe, Oceania, South America, South Asia, Middle-east, Western Europe, Southeast Asia, East Asia and Sub-Saharan Africa. The cluster analysis identifies the knowledge based on diversity in an aggregate way. Papers that belonged to the same cluster were closely related to a group on the basis of their common references, thus suggesting that a cluster reflects a stream of research on similarity basis (van Eck & Waltman, 2010).

Based on Figure 3, the United States had immensely contributed to publications with 54 international collaborations and 225 strong linkages. Consumers in developing countries have been aware of their consumption choices, albeit to a lesser extent (Ramayah et al., 2010; Quoquab & Sukari, 2017), as reflected by the rising number of articles publication. India, with 145 publications, mostly developed international collaboration with the United States and Australia with eleven and three articles, respectively. Malaysia produced 92 articles; six and four articles with Australia and the United States, respectively. Articles with international collaboration were more prevalent in recent years as they promote more significance due to sharing of ideas and workload. Some developing countries, such as China, India, and Brazil, seemed to benefit greatly from such international cooperation.

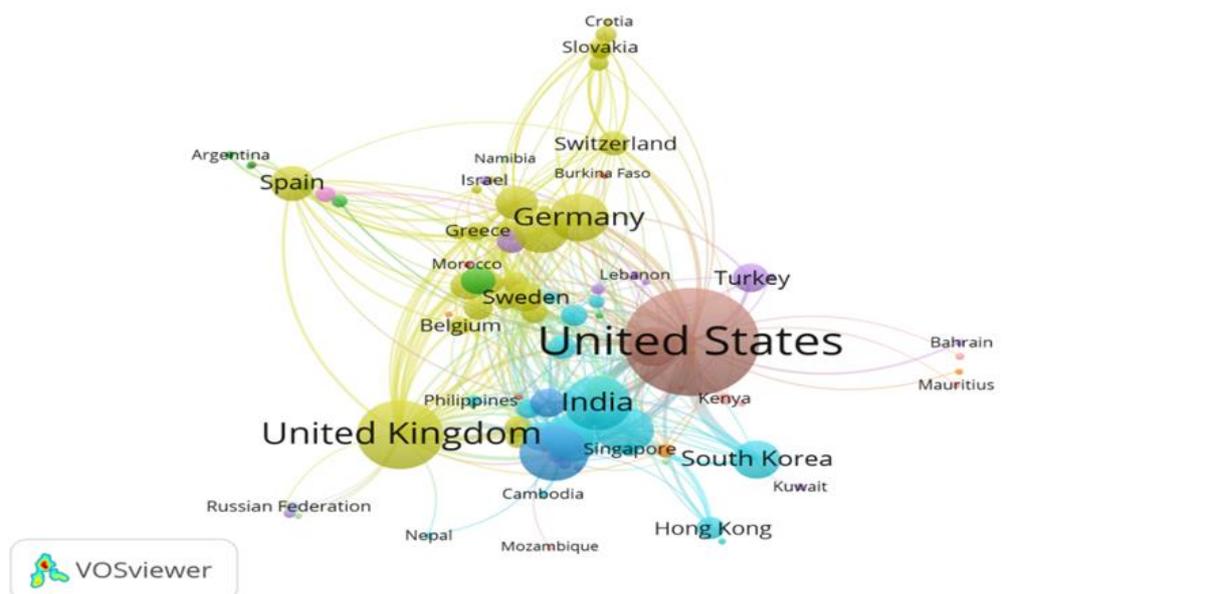


Figure 3. A bibliometric map based on co-authorships with network visualization mode

### Distribution of Keywords

A keywords analysis was performed to detect the sustainable consumption trends and frontiers. The keywords analysis in this study had been based on the keywords listed in the articles. As shown in Figure 4, the assessment of keywords involved 5333 keywords derived from 2352 papers. Using comprehensive bibliometric tools, clusters of existing and emerging research were identified for topological analysis, key research topic recognition, interrelationships, and patterns of collaboration. This systematic field mapping graphically shows the progression of publications over time, apart from defining areas of existing research priorities and possible potential research directions. The findings provide a detailed roadmap for further research into this area. Upon further review, the top four most frequently used keywords, which represent the research hot spots, are displayed by the accumulation of keywords. The most frequent keywords used were social norm (214 times), attitude (96 times), environmental concern (69 times), and green perceived value (50 times).

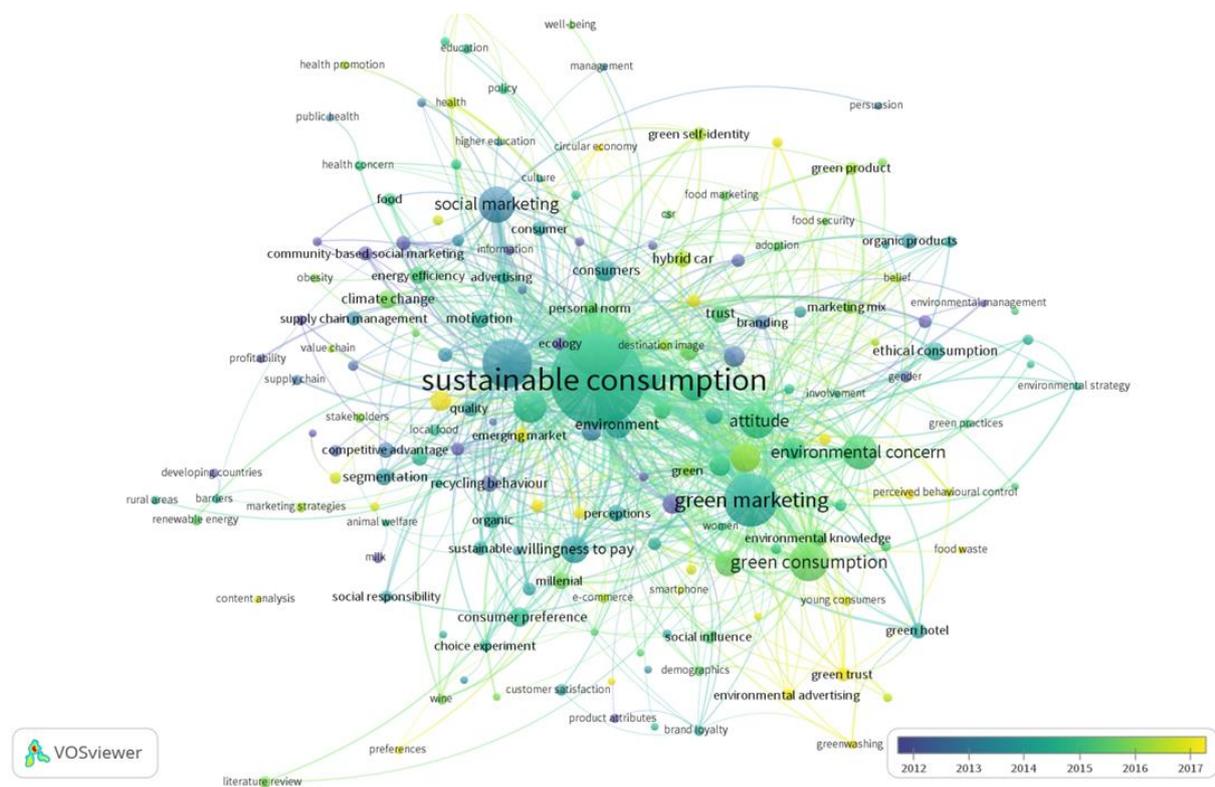


Figure 4. Most frequent keywords used in sustainable consumption research work

### **Sub-themes: The Psychosocial Determinants of Sustainable Consumption**

Consumer behavior is also known as the foundation of marketing in shaping consumers' aspirations and motivations (Truong & McColl, 2011). Consumers hold an important position as an agent for changes to some extent as they take on their role in "saving the planet". The changing values, beliefs and aspirations of people around the globe have led to a growing responsibility for sustainability (Jain et al., 2018). Approximately 80 per cent of customers under 35 had preferred sustainable alternatives (Hashmi & Muff, 2017). Transformation is undergoing with the increasing customer mind-sets, the concept of success and how the significant others view success. As global consumers and marketers become more socially and environmentally aware, these normative beliefs are expected to be reflected in the measurement scales (Dogan-Sudas et al., 2019). This review, hence, focused on the sub-themes related to the psychosocial determinants of sustainable consumption. Vizzotto et al. (2013); Cordeiro and Buchain (2020) claimed that psychosocial determinants refer to the influences from the social interaction that may change one's behavior. This very term is linked with the interplay of a mix of psychosocial factors, including cognitive, affective, and behavioral aspects, so as to facilitate better engagement and attachment (Nerurkar, 2016). Accordingly, the benefits to consumers from sustainable consumption are primarily psychological in nature. It helps them to feel good, besides facilitating personal growth, self-enhancement, and social interaction (Etzioni et al., 2004).

In line with this reasoning, the following sub-section discusses the psychosocial determinants that influence sustainable and green consumption. The analysis of 2352 manuscripts led to the emergence of four clusters of psychosocial determinants; social norm (214 times), attitude (96 times), environmental concern (69 times), and green perceived value (50 times). These factors were selected based on the occurrence or frequency used as keywords (see Figure 5).

#### **Social Norm**

Both the Theory of Planned Behavior and the Theory of Reasoned Action are appropriate in describing consumers' environment-friendly purchases (Janmaimool, 2017; Groening, Sarkis & Zhu, 2018). One important variable refers to subjective norm, which reflects the social pressure that acts upon and guides behavior. Social pressure and reference group are a form of belief that helps one to make a final decision (Ajzen, 1991). This variable was adopted in several sustainable consumption studies. Upon galvanizing consumers' interest in this promising market, Han (2018) revealed that sustainable consumption in Korea was strongly influenced by both injunctive and descriptive norms. This result is in agreement with prior studies (see Kong et al., 2016; Han et al., 2017), which exposed that conformity is a main factor for those who belong to the collectivistic culture. In the standpoint of collectivism, people are concerned about the identity of their group significantly to display their loyalty (Hofstede, 2001).

#### **Attitude**

Attitude defined as a degree to which a person has a favorable or unfavorable assessment of the behavior of interest following a consideration about the outcomes of the behavior (Ajzen, 1991). Consumers nowadays have begun consuming sustainable products by responding to their own reasoning and intentions, including ecological concerns, safety and health concerns, as well as sustainability, but not resulting from social pressure. Hence, consumer behavior is driven by individual motivations given the early stage of maturity (Thøgersen & Zhou, 2012).

#### **Environmental Concern**

According to Maclnnis et al. (1991), knowledge is an important key and antecedent to receivers in order to chunk the obtained information easily. Chi & Zheng (2016); Evans & Peirson-Smith (2018) asserted that the lack of specific information needed would make promotional messages less effective in stimulating sustainable behaviors. Despite the high level of environmental awareness at present time, some customers are still reluctant to purchase sustainable products due to the skeptical perspectives related with their quality and aesthetic value. Therefore, it is crucial for businesses to focus on the aesthetic aspects and the credibility of the products (Kong *et al.*, 2016).

#### **Perceived Value**

Consumer values are associated with relatively stable conditions and beliefs, followed by strong motivational influence on consumers' purchasing behavior (Hofstede, 2001). One of the most popular theories adopted to

study value is the Consumption Value Theory (Sheth et al., 1991). This theory describes the consumer purchasing behavior (Hellier et al., 2003). Consumption values elucidate that consumers decide to purchase a specific product over another due to certain reason(s) (Sheth *et al.*, 1991). A valuable product can drive one's intention to consume it and willing to pay extra price (Jung & Jin, 2016). To date, instead of looking only at fabulous styles and trends, buyers have started considering a new direction for authenticity and sustainability (Kapferer & Michaut-Denizeau, 2014; Kumar, 2018). In fact, these real buyers are becoming more selective and concerned about the issues related to toxic materials, discharges, and pollution (Kong et al., 2016).

#### 4. Conclusion and Limitations

Based on the bibliometric review, a strong perspective is given regarding the global trends in sustainable consumption study patterns related to sediments between 1974 and 2019. The publications were extracted from the available Scopus database. Systematically, 2352 journal articles were analyzed to identify the evolution and trends of publication, the top most productive institutions, the top cited papers, countries, keywords, and the sub-themes of this emerging topic. The findings revealed that the annual publications accelerated drastically starting from the millennium years. Among the 160 journals assessed, most of the articles were published in Sustainability Switzerland. As for the total citation, Journal of Consumer Marketing ranked in the top position. The emergence of sustainable consumption topic was proven by the involvement of 120 countries and 159 academic institutions. The United States generated the most publications by producing 576 articles, 54 international collaborations, and 225 strong linkages. Next, Universität Göttingen in Germany appeared to be the most productive institution. Upon further systematic analysis of 5333 keywords, several sub-themes emerged based on the identified psychosocial determinants (social norm, attitude, environmental concern, and perceived value). These findings are useful to assess the strengths and gaps in the sustainable consumption domain, as well as to inform a comprehensive strategy in further advancing the field. Overall, the sustainable consumption field is growing and attaining maturity. Essentially, there is room to explore new psychosocial determinants linked with new sustainable products.

This study has some limitations. As this study only applied the Scopus database, potential scholars may suggest using other databases (e.g. Web of Science, Google Scholar) to perform a bibliometric analysis in order to achieve broader coverage of the journal. Additionally, future researchers may compare the results from other databases with those of this study.

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