

FACTORS PREDICTING ENVIRONMENT-FRIENDLY CONSUMER BEHAVIOR: REDUCING PLASTIC CONSUMPTION IN OMAN

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Abstract

Environment-friendly behavior is the need of the hour. The United Nation's Sustainable Development Goals (SDGs) have placed a collective burden on countries around the globe to undertake measures to safeguard the planet by starting with their own territories and water bodies. The Sultanate of Oman is an example of a country where there is top-down participation in environmental initiatives. Nevertheless, it appears that the initiatives have to be current and on-going, accompanied by stringent monitoring and evaluation. In this context, the present study undertakes a scoping review of literature related to the factors that influence environment-friendly behavior in different individual and social contexts. The use of the Theory of Planned Behavior (TPB), a popular theoretical framework in recent studies on environment-friendly behavior, to identify the factors of environment-friendly behavior was utilized as the basis for the review. A set of 50 empirical studies from 2012-till February 2022 were included in the scoping review. Academic and managerial implications are offered based on the findings. Overall, it could be seen that despite considerable research in the area, environmental awareness was a significant contributor to environment-friendly behavior and the study recommends governmental, public and private attention to increasing environment-friendly behavior among citizens.

Research paper

Keywords: Theory of Planned Behavior, Oman, Consumer Behavior, Environment-Friendly Behavior Factors

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Introduction

The launch of the Sustainable Development Goals (SDGs) by the United Nations (UN) in 2015 resulted in their wide adoption by corporations and governments in an endeavor to enhance their sustainability (Walker, 2021). The SDGs were the outcome of the United Nations Conference on Sustainable Development (UNCSD), also known as Rio+20 which took place in June 2012 in Rio de Janeiro, Brazil (UN General Assembly, 2012). One of the principal drivers underlying the SDGs is the pervasive plastic pollution across the globe which affects global terrestrial, freshwater, and marine ecosystems (Borrelle et al., 2020). After entering the environment, plastics endlessly disintegrate into more and more minute particles termed microplastics (MPs) which are less than 5 mm in size (Hartmann et al., 2019). Due to poor disintegration as well as unsustainable manufacture, usage, and discarding, plastics and MPs have developed into a grave danger, spanning boundaries, to both natural ecosystems and human well-being (Napper et al., 2021; Pinheiro et al., 2021; Vethaak and Legler, 2021; Wang et al., 2021).

The global production of plastic in 2019 exceeded 360 million metric tons (PlasticsEurope, 2021). This number, however, is anticipated to double in the next 20 years (Lebreton and Andrady, 2019). There is significant variance in the usage of plastic across the globe, ranging from 100 kg/person per year in the West (e.g., North America) to 20 kg/person per year in Asia (Nara, 2018). The principal concern with the usage of plastics concerns their effect on human well-being and the environment when discarded (Borrelle et al., 2020; Karbalaei et al., 2018). Recovery and recycling of discarded plastic takes place only in a small proportion, leading to leakage of plastic and pollution in the environment (Barboza et al., 2018; Clayton et al., 2021; Dana et

al., 2022) as much of the discarded plastic winds up in landfills or unlawful dumping sites (Clayton et al., 2021). An estimated 14 million tons of plastic winds up in the ocean annually, with plastic constituting 80% of all marine debris discovered not only in surface waters but also deep-sea sediments (International Union for Conservation of Nature [IUCN], 2021). The source of much of this waste is consumer plastics which have been designed solely for single-use (Schnurr et al., 2018).

While the COVID-19 pandemic caused a surge, perhaps unavoidable, in the production of such plastics in the form of personal protective equipment (PPE), masks, and disposable gloves (Leal Filho et al., 2021), the monthly consumption of single-use plastics escalated to almost 69 billion units (Kalina and Tilley, 2020; Salamzadeh, A., & Dana, 2021, 2022; Kawamorita et al., 2020, 2022; Pereira et al., 2021; Hameed et al., 2021; Rahman et al., 2021; Dheer & Salamzadeh, 2022). This surge in plastic pollution has caused the pressure as regards plastic waste handling to increase in developing countries which were already struggling in this regard before the pandemic commenced (Parashar and Hait, 2021). A further contributor was the increased quantity of plastic utilized for packaging by e-commerce and food delivery due perhaps to the limited availability of bio-based plastics (Parashar and Hait, 2021; Silva et al., 2021). However, the greatest contributor to plastic pollution in the past two years has been medical waste which has increased by 370% in the pandemic (Klemeš et al., 2020; Parashar and Hait, 2021). Countries have had to respond to this by revoking or postponing bans on the use of single-use plastics while allowing the use of PPEs, resulting in rigorous and even exacerbated challenges as regards effective management of waste whilst generation of plastic waste has escalated during the pandemic (Parashar and Hait, 2021).

The Problem of Plastic Consumption in Oman

Even prior to the pandemic, the Persian Gulf and Gulf of Oman have been reported to be particularly susceptible to man-made and environmental pollution due to the vast land surrounding them (Ghayebzadeh et al., 2020). These two water bodies are presently among the most polluted marine settings due to the discharge of industrial pollutants and wastes from petroleum, transport of crude oil, refineries, offshore petrochemical plants, oil and gas facilities, all of which are a source of grave risk to the local ecosystems (Ghayebzadeh et al., 2020). Research evidence indicates that these pollutants include solid wastes, especially plastics. Various field studies and reports highlight that most of the region's coastal areas suffer from plastic pollution (Aliabad et al., 2019; Kor and Mehdinia, 2020; Naji et al., 2017, 2018).

The annual amount of plastic waste generated in the countries (Iran, Iraq, Kuwait, Saudi Arabia, Qatar, Bahrain, the UAE, Oman, and Pakistan) surrounding the Persian Gulf and the Gulf of Oman has been estimated to be nearly 12000 kilotons (Kt; Abdallah et al., 2018; Abdulredha et al., 2017, 2020; Al-Maaded et al., 2012; Al Sabbagh et al., 2012; Das et al., 2019; Hadidi and Omer, 2017; Hoorweg and Bhada-Tata, 2012; Kaza et al., 2018; Khayamabshi, 2016; Yadav and Samadder, 2018; Ouda et al., 2016; Palanivel and Sulaiman, 2014).

Of these, the Sultanate of Oman contributes only 317 Kt (Das et al., 2019; Palanivel and Sulaiman, 2014). However, the management of solid waste in the country has been acknowledged to be a challenging matter due to the limited availability of land and detrimental effects on public and environmental health (Zafar, 2018). The solid waste generated daily in Oman is approximately 5000 tons, 69.45% of which is organic waste, 15% is inorganic

waste, and the remaining 16% is recyclable waste (Umar, 2022). While research indicates that Omanis know how to segregate their solid waste and also confirm that they will cooperate in waste segregation, the matter of reducing and recycling solid waste in Oman continues to be a challenge (Umar, 2022). The Director of Community Affairs and Environmental Awareness of the Environment Society of Oman (ESO) drew attention to the “extreme” use of plastic bags in the country which was further intensifying the issue of plastic wastage (Koe, 2018). At that time, the daily consumption of plastic bags was in the range of 75000-80000 in a single store of a supermarket chain. Consequently, the Omani Ministry of Environment and Climate Affairs reported the formulation of regulations related to plastic bag usage (Koe, 2018). Moreover, there is considerable attention to reducing the number of plastic bags utilised and to increasing the awareness of Omani citizens regarding the adverse impacts of plastics to the environment, in general, and to marine and human life, in particular (Koe, 2018). A recent initiative inaugurated in 2021 is the ban on single-use plastic bags (NS Packaging, 2021). *(Details of some of the environmental policies in Oman are provided in Appendix A).*

Nevertheless, the readiness of the individual consumer or household in participating in different facets of environment-friendly behavior is a matter that continues to be investigated by researchers across the globe. In the case of Oman also, such a scrutiny would be of use as ascertaining the factors that influence individuals, in general, to participate in environment-friendly behavior would help the country plan fresh initiatives and augment existing ones to reduce or control the pollution to the environment. The aim of this paper is therefore to report the findings of a scoping review of relevant literature published up until February 2022 with empirical evidence pertaining to

factors determining environment-friendly behavior. Since the Theory of Planned Behavior (TPB; Ajzen, 1991) has found considerable usage in understanding the factors inspiring different environment-friendly behaviors (Yuriev et al., 2020), the scoping review will focus on studies which utilize this theory.

The History of Sustainability

Historically, there is evidence that the civilized world has always been aware of the concept of sustainability. Van Zon (2002), for instance, highlights that though the words ‘sustainable’ and ‘sustainability’ first appeared in the Oxford English Dictionary only during the latter part of the 20th century, equivalent phrases in French (*durabilité* and *durable*), German (*Nachhaltigkeit* and *nachhaltig*), and Dutch (*duurzaamheid* and *duurzaam*) have been in use for centuries. Even in early recorded civilization, philosophers such as, Plato, Strabo, Columella, Pliny the Elder, Cato, and Varro, appear to demonstrate awareness of degradation of the environment, and also recommend sustainable practices to preserve the earth’s eternal youth observing that evil effects can be lessened with care (Van Zon, 2002).

In later centuries, commencing with the 16th century and progressing into the 18th century, the adverse effects of industrial activities such as, mining and woodcutting, on wildlife and resource shortages, resulted in the stimulation of fresh style of thought in favoring the responsible utilization of natural resources to preserve them for future generations (Van Zon, 2002). In the 18th century, the consumption of resources by an increasing population gave rise to fresh concerns. In this regard, Thomas Robert Malthus, published his

famous “Essay on the principle of population as it affects the future improvement of society” in 1798 where he affirmed that population growth had to be limited as it was likely to overtake the production of food (Van Zon, 2002). Many similar essays were published in the 19th century such as, W. Stanley Jevons’s “The coal question” in 1866, John Stuart Mill’s “Principles of political economy” in 1848, George Perkin’s Marsh’s “Man and nature” in 1864, and Alfred Russell Wallace’s “Our wonderful century” in 1898. In the first half of the 20th century, scientists such as, Gifford Pinchot, G. A. Brender a` Brandis, F. M. Jaeger, Thorstein Veblen, A. C. Pigou, Egbert de Vries, William Vogt, Henry Fairfield Osborn, and K.W. Kapp, among others, wrote calling for sustainable development (Van Zon, 2002).

The middle of the 20th century saw even greater endeavors towards sustainable development. Rostow (1960) highlighted that a country typically progresses through five levels of economic growth: “: (1) Traditional society, (2) preconditions for take-off, (3) take-off, (4) drive to maturity and (5) age of mass consumption” (Long et al., 2018, pp. 267). An assumption here is that natural resources are essential and vital for economic development (Rostow, 1960). Another assumption is that economic success can be attributed to good governance, robust institutions, and open markets, as found in high-income nations. On the other hand, lower-income countries can be assumed to be undeveloped because these things are absent, or due to the presence of fraud, bureaucracy, and inefficiency (Rostow, 1960).

A little later, in the 1970s, a group of distinguished scientists and economists, known as the Club of Rome, published their “The limits to growth”. In this, the authors concluded: “If the present growth trends in world

population, industrialization, pollution, food production, and resource depletion continue unchanged, the limits to growth on this planet will be reached sometime within the next one hundred years. The most probable result will be a rather sudden and uncontrollable decline in both population and industrial capacity” (Meadows, 1972, pp.23). This report has been regarded as the “key moment in the transformation of disparate anxiety about environmental problems into more focused discussion of an alternative to present-day society” (Kenny, 1994, pp.229). However, this report generated a debate regarding the desirability or possibility of economic growth at high rates (Rostow, 1978) especially with regard to the damage to the natural environment (Du Pisani, 2006).

At this juncture, the term “sustainable development” came into being. Around the same time, sustainability was featured in many of the principles accepted by the 1972 United Nations (UN) Conference on the Human Environment indicating the realization that the focus of development should not be limited to societal and economic matters, but also sustainable matters associated with the usage of natural resources (Du Pisani, 2006).

The 1980s saw the popularization of the principle of sustainable development. One of the significant activities in this decade was the report of the UN’s Brundtland Commission (the World Commission on Environment and Development), “Our common future” in 1987. The principal focus of this report was human interests and needs and hence it concluded that while economic development was vital, a switch to sustainable development was required (Du Pisani, 2006).

Subsequent UN conferences and declarations have focused on clearly extrapolating and defining goals related to sustainable development. For example, the 1992 United Nations Conference on Environment and Development (UNCED, also known as the Rio de Janeiro Earth Summit and Climate Change Convention) resulted in the world community adopting the UN Framework Convention on Climate Change (UNFCCC) (Ogola, 2022). The subsequent summits and declarations in 2000 (the United Nations Millennium Declaration, MDG), 2002 (World Summit on Sustainable Development known as Rio+10, Agenda 21, known as the Johannesburg Plan), 2005 (World Summit on Social Development), and 2012 (United Nations Conference on Sustainable Development (UNCSD) or Rio+ 20, SDGs) resulted in the adoption of Millennium Development Goals (MDGs) and subsequently the MDGs were integrated into Sustainable Development Goals (SDGs). The development goals permit the systematic monitoring of the implementation of sustainable development using indicators. Moreover, they permit the comparison of outcomes across nations and periods (Keitsch, 2018).

In the context of Oman (Figure 1), the country's overall ranking in terms of its SDG-related performance is 73 (out of 165 nations). Moreover, the country's performance is not consistent as the status is stagnant (for three SDGs), decreasing (for one SDG), moderately improving (for eight SDGs) for most of the SDGs and only two (Quality Education and Decent Work and Economic Growth) are on track or maintaining SDG achievement (Sustainable Development Report, 2021).

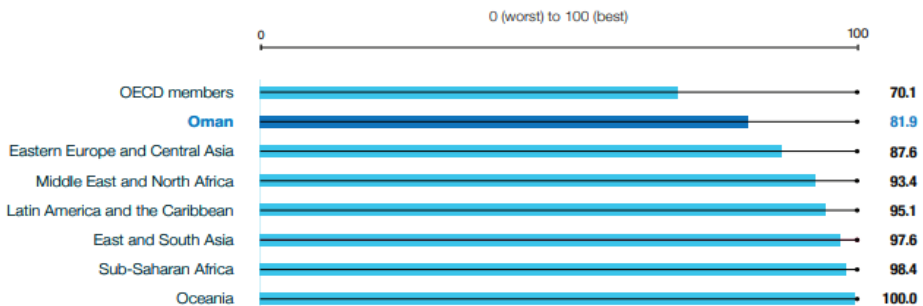
Figure 1. SDG Dashboard and Trends - Oman



Source: Sustainable Development Report, 2021, pp. 356

Moreover, with regard to the International Spillover Index and measures based on consumption focus on adverse effects on loss of biodiversity, scarcity of water, and other impacts to the environment generated by high-income nations by means of consumption and trade, Oman has demonstrated a positive trend (Figure 2). However, Oman’s score (81.9) is far below the regional score (93.4) indicating there is a significant need for the country to improve the management and protection of its environment.

Figure 2. International Spillover Index – Oman



(Sustainable Development Report, 2021, pp. 356)

Theory of Planned Behavior

Consumer behavior has been studied extensively resulting in the identification of five significant approaches related to consumers' decision-making. These five approaches namely, economic man, psychodynamic, behaviorist, cognitive, and humanistic, provide alternate models and consumers and place emphasis on the necessity of examining different perspectives (Foxall, 1990). In the *economic man* approach, a consumer has to have knowledge of all available options for consumption to behave rationally from an economic perspective. In addition, they must have the capacity to accurately assess each alternative and be on hand to choose the ideal strategy (Schiffman and Kanuk, 2007). However, this approach is not perceived to be a practical description of consumer decision-making, as they do not always have sufficient time, information, or motivation to make a perfect decision and other influences such as social associations and principles which are less rational, act on them (Simon, 1997). Moreover, consumers often pursue satisfactory choices in contrast to ideal choices as explained by Satisficing Theory (Simon, 1997), or Prospect Theory (Kahneman and Tversky, 1979) which involve limited logic (Simon, 1991).

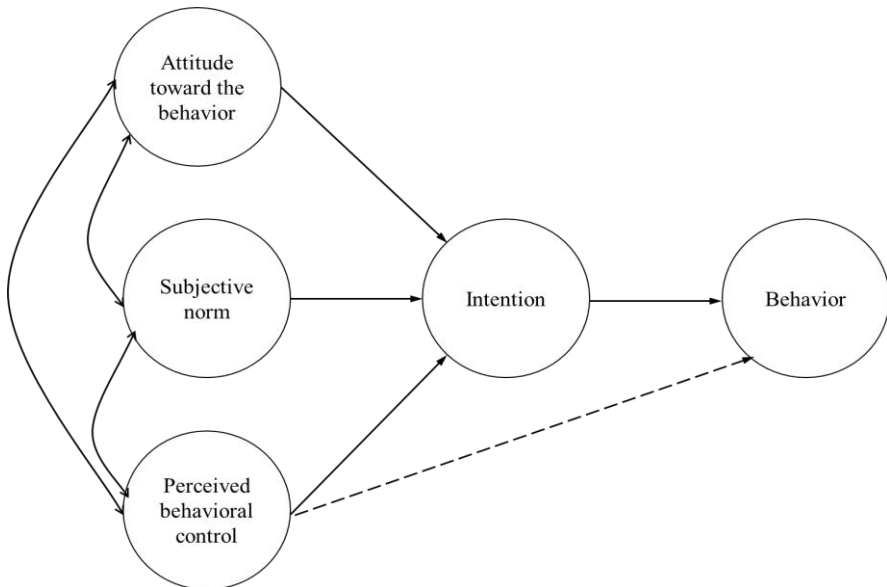
The second approach, *psychodynamic* approach, submits that behavior is regulated by biological influence through urges or innate forces which operate beyond mindful thought (Arnold et al., 2010). In the *behaviorist* approach the underlying philosophy is that external events influence behavior. Moreover, all things done by humans, including feelings, thoughts, and actions can be considered to be behavior. Theories related to this approach include classical conditioning (Pavlov), introspective methods (Watson), and operant conditioning (Skinner) (Bray, 2008).

The *cognitive* approach ascribes behavior (action) detected to intrapersonal cognition. The individual is perceived to be a processor of information (Ribeaux and Poppleton, 1978). Moreover, the influence of the environment and the individual's experience in society is factored in (Stewart, 1994). Cognitive models have been found to be more suitable in the scrutiny of ethical purchasing behavior for two reasons. First, behavioral models cannot accommodate the complexity of such activity. Second, the largely vicarious facets of the advantages of ethical consumption necessitate far-reaching intrapersonal evaluation (Bray, 2008).

Cognitive models can be categorized into two significant categories: analytical models and prescriptive models. Analytical models offer a framework of the principal components that allegedly explain consumer behavior. Such models identify many influencing factors and indicate the wide associations among factors influencing decision-making in consumers. These models typically view consumer decision-making as a process involving recognition of the problem, search for information, evaluation of alternatives, and evaluation of choices and outcomes. Examples of such models include the Theory of Buyer Behavior (Howard and Sheth, 1969) and the Consumer Decision Model (Blackwell et al., 2001). On the other hand, prescriptive models offer frameworks or principles to classify the structure of consumer behavior. Such models embrace the sequence in which components must appear and specify the impact that should be witnessed on the basis of certain fundamental elements. These models, consequently, are beneficial in situations where practitioners assess different stimuli which can be altered or highlighted to obtain a certain response from a consumer. The Theory of Reasoned Action

(Fishbein and Ajzen, 1975) and the Theory of Planned Behavior (Ajzen, 1991) are the most widely referenced examples of prescriptive models. Of these, the Theory of Planned Behavior (TPB) has been extensively utilized to study individual behavior. The premise underlying this theory is the argument that the behavior of an individual originates from his/her intention and “perceived behavioral control” (PBC) (Ajzen, 1991). The TPB has evolved, assessed, and honed over the years. Ajzen (1991) observed that it “traces attitudes, subjective norms, and perceived behavior control to an underlying foundation of beliefs about the behavior” (pp. 206). According to this model (Figure 3), behavior is best predicted by intention and can thus be purposefully designed. The TPB embraces three significant factors: subjective norms (SN), attitude regarding the behavior, and perceived behavioral control (PBC) (Ajzen, 1991; Ajzen, 2005; Ajzen and Albarracin, 2007).

Figure 3. The Theory of Planned Behavior



Source: Ajzen, 1991, pp. 182

Since its development in the past century, the TPB has been utilized frequently to comprehend the factors influencing several environmental behaviors including, saving water (Lam, 2006), recycling of waste (Echegaray and Hansstein, 2017), conservation of energy (Allen and Marquart-Pyatt, 2018), the usage of alternative transportation (Muñoz et al., 2016), and low consumption of carbon (Jiang et al., 2019). The theory has also been used to investigate employees' pro-environmental behaviors (e.g., Blok et al., 2015; Boiral et al., 2015; Greaves et al., 2013; Yuriev et al., 2020).

Methodology

The approach utilized in this article is the scoping review methodology. This approach was chosen because in contrast to a traditional literature review, a scoping review offers a useful alternative to provide clarification as regards a theory or concept (Munn et al., 2018). A scoping review is a technique commonly utilized to “map the literature on a particular topic or research area and provide an opportunity to identify key concepts; gaps in the research; and types and sources of evidence to inform practice, policymaking, and research” (Daudt et al., 2013, pp. 8). It is also described as an approach to knowledge synthesis that deals with an “exploratory research question aimed at mapping key concepts, types of evidence, and gaps in research related to a defined area or field by systematically searching, selecting, and synthesizing existing knowledge” (Colquhoun et al., 2014, pp. 1293-1294). In addition, a scoping review pursues findings that are extensive and in-depth rather than being limited by a delimited research problem and rigid conditions for eligibility and quality. Further, it is not limited by specific search parameters, selection of studies, or criteria for inclusion/exclusion. In addition, it is

an iterative process which ensures a thorough coverage of probable material. Once a researcher's understanding of the literature has been enhanced, this can be followed by refinement of search terms, performance of more sensitive searches, and repetition of the process to ensure the inclusion of all applicable literature (Arksey and O'Malley, 2005).

Some features of systematic and scoping reviews are similar in that they both ensure that research evidence is collected, assessed, and presented in a rigorous and consistent manner (Arksey and O'Malley, 2005; Levac et al., 2016). Consequently, the nature, objectives, and research questions of a study form the basis for the selection of the method of review (Gough et al., 2012). In the context of the present study, the scoping review approach was deemed to be most pertinent methodology to improve the understanding of the factors that predict environment-friendly behavior in consumers, in general, and also with specific reference to consumers' behavior as regards plastic usage. The decision to use the scoping review over other forms of review can be summarized as follows:

- The aim of the paper is to identify the different factors influencing environment-friendly consumer behavior. Hence, a scoping review was suitable as the theory of planned behavior has been extensively utilized in studies to determine how the theory is utilized in such studies.
- A scoping review concentrates on one or more general research questions. Hence, it can offer a common understanding of the concept being researched and a wide-ranging synthesis of the issues and gaps in present research.
- A scoping review offers greater flexibility as it does not rigidly enforce constraints on the search keywords, identification and selection of studies

(Arksey and O'Malley, 2005). Consequently, it was an advantageous approach for the paper due to the researcher's lack of familiarity with the various environmental aspects studied using the theory of planned behavior.

Identification of research question

The research questions used to inform the study are as follows:

- What is known from the literature about the factors determining environment-friendly behaviors?

Search strategy

An essential facet of performing a literature search is to formulate a search strategy that enhances the efforts of the researcher to collect the studies most pertinent to the matter being researched. Having a reliable and well-defined search strategy can safeguard the resources, time, and efforts of a researcher. A search strategy encompasses identification of bibliographic databases, keyword selection, and criteria for inclusion and exclusion of studies.

Identification of bibliographic databases

The study utilized different databases to search for research literature such as, ScienceDirect and Google Scholar. While the former is a database of multi-disciplinary articles covering research in various fields including science, medicine, technology, humanities, and social sciences, the latter is a web search engine that indexes the metadata or full-text of academic literature from various disciplines. Using this combination of databases, the researcher was able to explore and access articles from several 27 peer-reviewed and

popular journals in management and related disciplines such as, the *Journal of Environmental Psychology*, *Journal of Environmental Management*, *Journal of Cleaner Production*, *Journal of Business Research*, *Journal of Retailing and Consumer Services*, *Journal of Hospitality & Tourism Research*, *Journal of Environmental Psychology*, *Journal of Innovation & Knowledge*, *Renewable Energy*, *Applied Energy*, to name a few. Of the journals, only two (Frontiers in Sports and Active Living and Water) were not included in the Scopus Preview.

Keyword selection

A wide-ranging literature review necessitates the development of an inventory of search terms appropriate to the topic of study. A robust inventory of research keywords will facilitate the comprehensiveness of the search, helping the researcher retrieve useful information from a broad variety of electronic databases while lowering the number of unrelated outcomes. In each selected database, the basic search term was *Theory of Planned Behavior (TPB)*. This was paired with other terms to restrict search findings: *consumer behavior*, *environment*, and *plastic*. These search terms were utilized in line with the objective of the paper which is to identify the factors determining environment-friendly behavior, in general, and usage of plastic, in particular. Another reason for their selection was their applicability in a general global context and also in country-specific contexts which makes the findings useful for the Omani context.

Criteria for inclusion and exclusion

Inclusion and exclusion criteria lay down the specifications for including or excluding publications from the scoping review. These parameters were established prior to the review to confirm the impartial handling of all articles. The criteria to include an article in this review are as follows:

- Article should have been published after 2012. Although the SDGs were introduced in 2015, an earlier year was selected to determine if research interest in environment-friendly behavior had increased only after the introduction of the SDGs.
- Article should deal with the use of TPB to determine the factors influencing individuals' behavior in various environmental contexts.
- Article is academic in nature.

The criteria to exclude publications from the scoping review were as follows:

- Article is not written in English.
- Researcher could not obtain the full-text of the article.
- Article is not academic in nature. That is, non-academic articles, such as white papers and informal reports were excluded from the study.

Limitations

Some limitations must be acknowledged due to their probable impact on the outcomes of this review. First, the language of the studies included in the review was limited to English. Second, only a few keywords were selected to hasten the review process. Third, a single reviewer was involved in the search for and selection of articles. These facets have restricted the number of studies included in the review and also permitted some element of researcher bias in the selection.

Results

The search for relevant articles resulted in the selection of 50 studies for further consideration in the scoping review. Scrutiny of the selected studies revealed that environment-friendly behavior had been studied across the world with the largest number found in East Asia (17) Europe (11), and other locations (22). Asia had the highest representation with 32 studies. China and Taiwan were the countries with the highest number of studies (seven each) (Table 1). The absence of studies from the Middle East, despite the presence of governmental interventions, seem to indicate a lack of research attention to highlight the actual status of environment-friendly behavior in the region.

Table 1. Studies by Region

Region	Count	Studies
Africa	1	Oteng-Peprah et al. (2020)
East Asia	17	Ohtomo and Ohnuma (2014); Chen and Tung (2014); Wang et al. (2014); Teng et al. (2015); Chen (2016); Sun et al. (2017); Hsu et al. (2017); Wan et al. (2017); Chang and Chou (2018); Wang et al. (2018); Hua and Wang (2019); Liu et al. (2019); Ahmad et al. (2020); Chan et al. (2020); Wang and Lin (2020); Hwang et al. (2020); Wang et al. (2021)
Europe	11	López-Mosquera and Sánchez (2012); Greaves et al. (2013); Niaura (2013); López-Mosquera et al. (2014); De Leeuw et al. (2015); Botetzagias et al. (2015); Blok et al. (2015); Liobikienė et al. (2016); Arı and Yılmaz (2017); Oztekin et al. (2017); Braksiek et al. (2021)
International	2	Mancha and Yoder (2015); Mufidah et al. (2018)
North America	3	Kim et al. (2013); Han (2015); Gibson et al. (2021)

South Amer- ica	2	Borges et al. (2014); Echegaray and Hansstein (2017)
South Asia	6	Paul et al. (2016); Yadav and Pathak (2016); Taufique and Vaithianathan (2018); Verma and Chandra (2018); Hameed et al. (2019); Khan et al. (2019)
South- east Asia	7	Ho et al. (2014); Maichum et al. (2016); Lin et al. (2017); Tan et al. (2017); Wong et al. (2020); Ting et al. (2020); Liao et al. (2021)
West- ern Asia	1	Alzubaidi et al. (2021)

These studies were published in 27 diverse journals with *Sustainability* leading with seven articles followed by the *Journal of Cleaner Production* with six, the *Journal of Environmental Psychology* with four, the *Journal of Environmental Management and Resources, Conservation and Recycling* with three each. *Asian Journal of Business Research, Energy Policy, International Journal of Hospitality Management, Journal of Business Research, and Journal of Retailing and Consumer Services* had two articles each. The majority of the articles used a Quantitative approach with only one article using a combination of observation and questionnaire. The selected articles had been published in 2021 (5), 2020 (7), 2019 (4), 2018 (5), 2017 (8), 2016 (5), 2015 (6), 2014 (6), 2013 (3), and 2012 (1). In addition, it could be seen that the research interest in environment-friendly behavior had increased only after the introduction of the SDGs as 40 papers were published after 2015 whereas only 10 had been published in the period 2012-2014. The popularity of the TPB could thus be seen in the context of environment-friendly behavior (Table 2). Again, the absence of studies in the Middle East where the collective social environment could be a significant factor in influencing the behavior of consumers could be observed.

Table 2. Studies by Journal and Year

Journal	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Asian Journal of Business Research									1	1	2
Climatic Change									1		1
Ecological Economics					1						1
Energy Policy						1	1				2
Environment, Development and Sustainability						1					1
Environmental Communication			1								1
Environmental Research, Engineering and Management		1									1
Environmental Science and Pollution Research								1			1
Frontiers in Sports and Active Living										1	1
Heliyon									1		1
International Journal of Hospitality Management		1	1								2
Journal of Business Research									1	1	2
Journal of Cleaner Production				1	2	1	2				6
Journal of Environmental Management	1		1						1		3
Journal of Environmental Psychology		1		2		1					4
Journal of Hospitality & Tourism Research				1							1
Journal of Retailing and Consumer Services					1	1					2
Livestock Science			1								1
Natural Hazards						1					1
Resources, Conservation and Recycling			1	1				1			3
Sustainability					1	1	2	1	2		7
Sustainable Energy Technologies and Assessments										1	1
Tourism Management				1							1
Tourism Management Perspectives								1			1
Transportation			1								1
Waste Management						1					1
Water										1	1
Total	1	3	6	6	5	8	5	4	7	5	50

quences (three studies), moral norm (eight studies), perceived moral obligation/moral obligation (three studies), moral reflectiveness (one study), beliefs (ethical/behavioral/normative/control/descriptive) (eight studies), environmental awareness (two studies), motivation (two studies), gender (one study), sport (one study), intrinsic religious orientation (one study), environmental concern (nine studies), environmental knowledge (four studies), effectiveness of enforcement (one study), cultural dimensions (one study), political affiliation/ideology (one study), perceive sacrifice (one study), habit (one study), facilitating conditions (one study), and past behavior (one study). Figure 5 depicts the word cloud generated from the key words in the studied intention/behavior. The considerable use of facets such as, moral norm and beliefs, indicate that researchers believed that the surrounding cultural environment had a significant impact on consumers' environment-friendly behavior.

Figure 5. Key words in studied intention/behavior



Source: Word cloud generated using WordSift.org

It was found that the environment-friendly behavior studied was related to plastic bag usage (five studies), recycling (six studies), conservation (ten studies), participation in pro-environmental programs (two studies), green products/practices/hotels (15 studies), and environmental/ pro-environmental attitudes/intentions/behavior (11 studies) (Table 3). Thus, it could be observed that there was a wide variance with regard to the behaviors/intentions studied as well as the variables utilized in the investigations. It was surprising to note that plastic bag usage which is perhaps a significant cause of harm to the environment was not studied more frequently. Nevertheless, on the whole, the selected variables were found, in general, to explain the intention to adopt a certain environment-friendly behavior or to behave in an environment-friendly fashion.

Table 3. Categories of environment-friendly behavior studied

Category	Count of Studies	Studies
Environment-friendly behavior	9	Niaura (2013); Kim et al. (2013); De Leeuw et al. (2015); Blok et al. (2015); Taufique and Vaithianathan (2018); Liu et al. (2019); Hwang et al. (2020); Braksiek et al. (2021); Alzubaidi et al. (2021)
Environment-friendly behavior intentions	2	Greaves et al. (2013); Ahmad et al. (2020)
Green products	9	Wang et al. (2014); Paul et al. (2016); Liobikienė et al. (2016); Maichum et al. (2016); Yadav and Pathak (2016); Hsu et al. (2017); Mufidah et al. (2018); Hameed et al. (2019); Liao et al. (2021)
Plastic use	5	Ohtomo and Ohnuma (2014); Ari and Yılmaz (2017); Sun et al. (2017); Chang and Chou (2018); Ting et al. (2020)
Pro-environmental programs	2	Lin et al. (2017); Chan et al. (2020)
Recycling	6	Oztekin et al. (2017); Echegaray and Hansstein (2017); Wan et al. (2017); Khan et al. (2019); Oteng-Peprah et al. (2020)
Green behavioral intentions	1	Mancha and Yoder (2015)
Green hotel stay	4	Chen and Tung (2014); Han (2015); Teng et al. (2015); Verma and Chandra (2018)
Pro-environmental behavior	1	Ho et al. (2014)
Park Conservation	2	López-Mosquera and Sánchez (2012); López-Mosquera et al. (2014)
Energy Conservation	5	Chen (2016); Tan et al. (2017); Wang et al. (2018); Hua and Wang (2019); Wang et al. (2021)
Water conservation	2	Wang and Lin (2020); Gibson et al. (2021)

Grassland conservation	1	Borges et al. (2014)
Green practices	1	Wong et al. (2020)

The participants in the studies were varied with a higher number of studies (24) focusing on consumer behavior with a smaller number (ten) focusing on citizens' environment-friendly behavior (Table 4).

Table 4. Types of participants

Parti- pants	Count of Studies	Studies
Citizens	10	López-Mosquera and Sánchez (2012); Ho et al. (2014); López-Mosquera et al. (2014); Botetzagias et al. (2015); Chen (2016); Lin et al. (2017); Wan et al. (2017); Wang et al. (2018); Chan et al. (2020); Gibson et al. (2021)
Consumers	24	Kim et al. (2013); Ohtomo and Ohnuma (2014); Chen and Tung (2014); Wang et al. (2014); Paul et al. (2016); Liobikienė et al. (2016); Maichum et al. (2016); Yadav and Pathak (2016); Ari and Yılmaz (2017); Sun et al. (2017); Tan et al. (2017); Hsu et al. (2017); Echegaray and Hansstein (2017); Chang and Chou (2018); Taufique and Vaithianathan (2018); Verma and Chandra (2018); Mufidah et al. (2018); Hameed et al. (2019); Hua and Wang (2019); Khan et al. (2019); Hwang et al. (2020); T'ing et al. (2020); Alzubaidi et al. (2021); Liao et al. (2021)
Farmers	2	Borges et al. (2014); Wang and Lin (2020)
House- holds	2	Oteng-Pepurah et al. (2020); Wang et al. (2021)
Sports club members	1	Braksiek et al. (2021)
Students	2	De Leeuw et al. (2015); Mancha and Yoder (2015)
Tour- ists/Travel- ers	5	Han (2015); Teng et al. (2015); Liu et al. (2019); Ahmad et al. (2020); Wong et al. (2020)
University community	2	Blok et al. (2015); Oztekin et al. (2017)
Workplace	1	Greaves et al. (2013)
Youth	1	Niaura (2013)

The findings from the various studies resulted in the articulation of many implications. An attempt was made to sift the key words utilized in these implications (see Figure 6). It could be observed that a few patterns were repeated in the implications. These pertained principally to building or increasing awareness regarding environment-friendly activity in the studied populations while recognizing the actively supporting role of the government and other agencies in this regard.

Figure 6. Key words in implications



Source: word cloud generated using WordSift.org

Conclusions

This study has helped identify some of the different factors that determine environment-friendly behavior in individuals through the use of a scoping review of articles published between 2012 and 2022 which utilized the Theory of Planned Behavior (Ajzen, 1991). It could be seen that there is a substantive body of work exploring such factors and that the TPB is a popular theory in this context. Nevertheless, it could also be seen that studies scrutinizing behavior associated with usage of plastic bags specifically were limited and only five of the studies scrutinized in the scoping review placed emphasis on this area (Ohtomo and Ohnuma, 2014; Arı and Yılmaz, 2017; Sun et al., 2017; Chang and Chou, 2018; T'ing et al., 2020).

The highlights presented from this scoping review reveal the paucity of peer-reviewed literature in Asia, in general, and in the Middle East, in particular, that engages with the matter of plastic bag usage from a general individual perspective. Surprisingly, this indicates that the majority of the TPB-based studies published after 2012 have focused largely on other aspects of environment-friendly behavior such as, recycling, conservation (water and energy), or green products/practices/hotel stays, rather than explicitly dealing with plastic usage in particular.

While the studies included in the scoping review had diverse objectives and scope, their outcomes revealed that the factors of the TPB, either on their own or in combination with additional variables, was successful in predicting the studied intention to behave in an environment-friendly manner or the behavior itself.

Implications

The findings of the study lead to some implications which are worth consideration, from academic and managerial perspectives. From an academic perspective, firstly, it could be seen that there is considerable use of an extended TPB model to study environment-friendly behavior. It is evident thus that there are several opportunities to pursue other extensions to the TPB model which may be even more effective in explaining the intention of an individual to behave in an environment-friendly manner and the influences on the behavior itself. Secondly, it could be seen that the categories of environment-friendly behavior explored in the literature were quite specific which indicates that deeper investigations of these can be pursued using different extensions of the TPB model. Thirdly, it could be seen that different segments

of the population have been covered in the studies (e.g., students, households, families, individual citizens, etc.). This implies that the TPB, suitably extended, can be utilized to explain the influences on different kinds of persons as regards their intention to engage in different kinds of environment-friendly behavior. A future researcher could consider the prospect of a longitudinal study to evaluate the impact of certain factors on the intention of individuals to participate in environment-friendly behavior over different time periods.

From a managerial perspective, it could be inferred that while different policies and initiatives have been implemented in Oman to help regulate the pollution to the environment (see Appendix A), there is a need to persist with refining and reframing these policies in line with the changing social contexts. For instance, the use of social media and opinion leaders could be increased to ensure that the public continues to receive relevant information or communication related to the benefits of environment-friendly behavior. A national environment ‘mascot’ or ‘role model’ could be identified who can be the face of a campaign to promote environment-friendly behavior, in general, and reduced plastic bag usage, in particular. The Omani government could also continue to fine-tune and refine policies related to protection of the environment and consumer impacts on the environment through the use of plastics by engaging with other governments in the region and globally.

Limitations and Future Research

The study, however, is not without limitations. First, the scoping review was limited by the involvement of a single reviewer in the article search and selection process. Second, only two databases were used in the search,

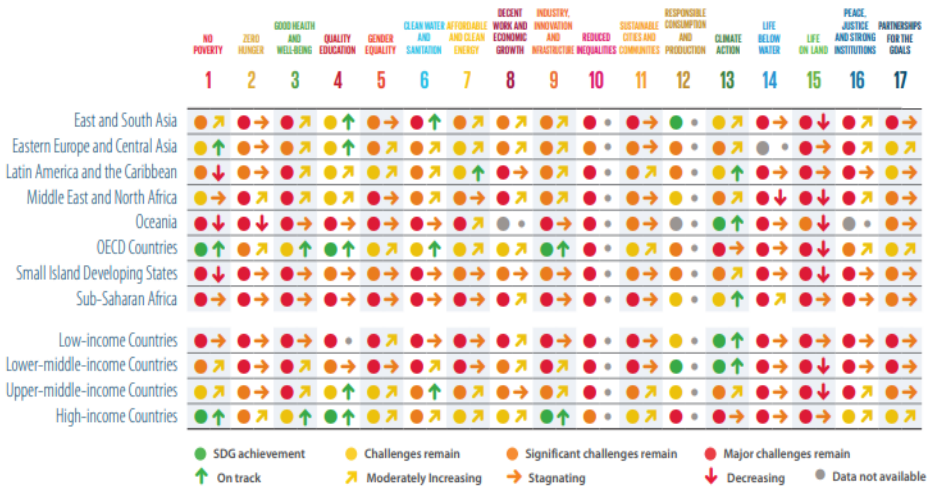
one an academic database and the other a generic database. This perhaps resulted in the overlooking of some studies which could have augmented the understanding of the effectiveness of TPB in understanding the influences on environment-friendly behavior. In addition, the use of ScienceDirect and Google Scholar rather than Scopus Preview (<https://www.scopus.com/sources.uri>) to identify papers directly may have resulted in the inclusion of some non-Scopus-indexed journals. Moreover, since the sole researcher had to review 50 articles single-handedly, some insights may have been overlooked. Future researchers can extend this scoping review to provide deeper insights on the topic in consideration.

Implications for Asian Business

Across the globe, countries and governments have signified their commitment to fulfilling the Sustainable Development Goals (SDGs) formulated by the United Nations. Asian countries also have committed to participating in this regard. The present study revealed that there is relatedly considerable research effort to attempt to understand the factors that may promote environment-friendly behavior among the people. However, scrutiny of the recent Sustainable Development Report (2021) reveals that East and South Asia, Central Asia, and the Western Asian countries (included in the Middle East) have a considerable challenge ahead of them with regard to meeting the SDGs. It can be seen that the whole Asian continent is falling short on meeting environmental goals and their associated targets. For example, with specific regard to Goal 14 which is to “*Conserve and sustainably use the oceans, seas and marine resources for sustainable development*” and the related target 14.1 which stipulates: “*By 2025, prevent and significantly reduce marine*

pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution” (Walker, 2021, pp. 1), it can be seen from Figure 7 that the different Asian regions have major challenges. At present it appears that they are in danger of being unable to meet this very important goal which will safeguard the regions’ marine resources and by extrapolation, its land resources also.

Figure 7. SDG Dashboards by region



Source: Sustainable Development Report 2021, pp. 31

The present study therefore has significant implications for business all across Asia since it is apparent that immediate and also on-going initiatives are required to address the challenges to the environment. Also, it is evident that the initiatives cannot be limited to governmental stakeholders who may be involved in the higher-level policy formation, execution, and monitoring. Instead, it is the individual student/ consumer/tourist/household/farmer who have to exhibit the intention to behave in an environment-friendly manner and also exhibit the behavior.

The study's findings indicate that norms (personal and social) have been scrutinized in environment-friendly intentions and behavior. Additionally, various perceptions are considered such as, consumer effectiveness, ease of use, effectiveness of enforcement, environmental quality, moral obligation, power, sacrifice, usefulness. Other individual aspects that were detected include altruism, anticipated regret, attitude, ascription of responsibility, awareness (of consequences, environmental problems), behavioral beliefs, control beliefs, personality, environmental concern, environmental awareness, environmental knowledge, to name a few.

In this light, the study presents some recommendations to enable Asian businesses to conduct business in an environment-friendly manner. These are as follows:

- Sponsor government initiatives to help consumers increase their awareness of the environment and the factors that endanger the environment. For example, the excessive use of single-use plastics.
- Support governmental initiatives to clear the backlog of discarded single-use plastic caused due to the COVID-19 pandemic
- Design marketing campaigns to increase consumer awareness of the environment. These can include the use of famous role-models, opinion leaders, or influencers, who can convey the message to the public through their own visible lifestyles.
- Sponsor/support research which investigates the impact of certain factors such as, ethics, religious background/convictions, social or family influence, on a person's intent to participate in environment-friendly behavior.

Appendix A: Environmental Initiatives in Oman

"Oman believes that the social, economic and environmental issues cannot be separated, and this is what sustainable development means."

Government statement on sustainability in general

A clear overall policy for environmental protection in Oman has been defined by a series of royal decrees and ministerial decisions since the 1980s. Table A1 lists some of Oman's legislations and regulations related to the environment. Ministerial Decision (MD) no. 17-93 which pertains to the management of solid non-hazardous waste was the first to deal with disposal of non-hazardous waste which, it could be assumed, includes plastic bags. However, the chief framework statute which lays down harsh consequences for the emission of pollutants to the environment and effluent discharge, both on land and at sea, is the "Law for the Protection of Environment and Prevention of Pollution" (Royal Decree [RD] 114-2001) (Government of Oman, 2020). This statute clearly designates the definitions and general provisions of items in its scope (e.g., environment protection, environment pollution, environmental damage, environmental pollutants, waste, etc.); basic rules and principles to ensure the safety of the Omani environment; and penalties (RD 114-2001). Nevertheless, it is apparent that there is no regulation focusing entirely on the problem of plastic pollution in its different manifestations, especially plastic bags utilized by consumers.

Table A1. Oman – Environmental Legislations and Regulations (Government of Oman, 2022)

#	Strategies and Policies
	Environment laws and ministerial decisions
1	Issuing the Law on the Conservation of the Environment and Prevention of Pollution (114/2001)
2	Issuing law on Protection of sources of potable water from pollution Royal Decree No. (115/2001)
3	Issuing the Law on Nature Reserves and Wildlife Conservation (6/2003)
4	Issuing the Law of Handling and Use of Chemicals (46/95)
5	Issuing the Maritime Law (35/81)
6	Establishment of Turtles Reserve (25/96)
7	Amendment of some conditions of the Law of Establishment of National Parks and Natural Protected Areas
8	Issuing a Decision on the Territorial Sea, the Continental Shelf and the Exclusive Economic Zone (15/81)
9	Establishment of Al Demaniyat Islands Nature Reserve (23/96)
10	Oil and Gas Law (Royal Decree No. 42/74)
11	Ministerial Decision No 159/2005 on discharge of liquid waste in the marine environment
12	Ministerial Decision No. 118/04 on the Control of Air Pollution
13	Ministerial Decision No. 79/94 on the Control of Noise Pollution in Public Places
14	Ministerial Decision No. 18/93 on the Management of Hazardous Waste Hazardous and chemical waste
15	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal
16	Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade
17	Stockholm Convention on Persistent Organic Pollutants (POP) Stop of chemical weapons use
18	Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and Destruction Climate change and Ozone
19	United Nations Framework Convention on Climate Change
20	Kyoto Protocol to the United Nations Framework Convention on Climate Change
21	The Vienna Convention for the Protection of the Ozone Layer, The Montreal Protocol on Substances that Deplete Ozone Layer Biosafety
22	Convention on Biological Diversity
23	Protocol on Biosafety Marine protection
24	United Nations Convention on the Law of the Sea
25	IMO conventions (IMO)
26	1973 International Convention for the Prevention of Pollution from Ships as amended by the protocol of 1978 (POL 73/78)
27	Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter
28	1969 International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties
29	1992 Protocol of Amendment to the International Convention of 1969 on civil liability for damage caused by oil pollution (Civil Liability Convention-CLC 92) Others
30	United Nations Convention to Combat Desertification (UNCCD)
31	Convention on preservation of wildlife and natural habitats in the Gulf Cooperation Council

Apart from governmental programs, non-governmental organizations (NGOs) such as, Environment Society of Oman (ESO) have also commenced various projects to safeguard the environment such as, recycling campaigns, recycling training campaigns, usage of eco-friendly bags, and eco-friendly bags distribution campaign. ESO is Oman's first and only environmental NGO and was founded in 2004 by Omanis. One project of ESO, which is extremely relevant in the context of the present study, is the Project Plastic Bags. The objective of this project, which commenced in May 2006, is to “reduce the use of plastic bags throughout the Sultanate” (ESO, 2012). The components of the project are as follows:

- Educate staff at retail shops on the environmental effects of plastic bags and how to pack bags in order to reduce the quantities used
- Educate consumers on the environmental effects of plastic bags
- Educate children on the harms of plastic bags
- Put together a document for relevant government authorities to be able to regulate the use of plastic bags

Accordingly, ESO has been conducting several campaigns to increase the awareness of consumers with regard to the dangers to the environment due to the usage of plastic bags. The following action items are disseminated to the public during the campaigns.

- “Begin to use re-usable bags
- Say ‘No Thank you, I don't need a plastic bag’ when offered one
- Design and print awareness posters
- Create education packages or small talks to give to management or staff at retail shops

- Promote this campaign through meetings and correspondence with retail shop management
- Talk about the campaign and educate your family, friends and colleagues” (ESO, 2012)

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