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The Impact of Green Innovation on Sustainability Performance in Travel Agencies and Hotels: The Moderating Role of Environmental Commitment

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Abstract *Today, one of the challenges facing many enterprises in all sectors is to minimize negative impacts on the environment and to be greener. This has led the private sector to make performance sustainable. Green innovation is one of the tools used by enterprises in the tourism industry to achieve sustainability performance. This research aims to study the impact of green innovation and its types (green product innovation, green process innovation, green technological innovation and green organizational innovation) on sustainability performance at travel agencies and hotels as tourism enterprises in Egypt and the moderate role of environmental commitment in the relationship between green innovation and sustainability performance. To achieve the objective of this study, data were collected from 218 managers working in travel agencies and hotels in Egypt through a questionnaire. Questionnaires are analyzed through Regression-based Partial Least Squares Structural Equation Modeling (PLS-SEM) by using Smart PLS 3.21. The results show that green innovation and its four types including green product innovation green process innovation, green technological innovation and green organizational innovation have a positive influence on sustainability performance. The results also revealed that environmental commitment playing a moderate role in the relationship between green innovation and sustainability performance. These results hold important implications theoretically and practically for travel agencies and hotels.*

Keywords: *Green Innovation, Sustainability Performance, Environmental Commitment, Travel Agencies, Hotels*

INTRODUCTION

Tourism is one of the most important sectors contributing to global economic growth and one of the main drivers of the transition to a green economy (OECD, 2013). At present, innovation has attracted the attentiveness of many researchers and business owners. Tourism has grown steadily to become one of the fastest growing sectors in the world. This explains that tourism is a phenomenon that depends heavily on innovation, so the tourism industry has focused on the innovation concept to reinforce its productivity (Razavindravelo, 2017). Tourism innovation is one of the priority subjects in most tourist destinations. Therefore, tourism innovation must be considered as one of the important processes of any tourist enterprise (Mothe and Thi 2010; Cosma et al., 2014). "Green" is not just a color but is a concept for the social justice, eco-friendly, economic development, and healthy (Hieu & Rašovská, 2017). Simula et al. (2009), Sarker (2012) and Bossle et al. (2016) revealed also that words such as green, greener, environmental, ecology and sustainability are becoming more common words to describe everything that is environmentally friendly or has less impact on the environment.

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Green innovation in tourism industry is the direct reflection of green innovation in the economy, environmental civilization, and the relationship between tourism and the environment (Liu et al., 2018). Green innovation has emerged since the late 1990s (Sezen & Çankaya, 2013) and has also grown in academia and practice likewise (Schiederig et al., 2011). Green innovation has become one of the most important strategic tools to sustain tourism resources and make tourism environment-friendly, in addition to the transformation of tourist destinations towards green destinations by preserving the environment of these destinations from degradation (Kemp & Foxon, 2007; Sezen & Çankaya, 2013; Fei et al., 2016; Liu et al., 2018). Green innovation is not only about improving the environment, but it also extends to the development of processes, products, services, organizations, technologies, and marketing in order to achieve environmental benefits by reducing the negative impacts on the environment resulting from tourism activities (Oltra & Saint Jean, 2009).

Based on the above, this research addresses green innovation and its role in sustainability performance. Theoretical studies dealt with green innovation and its importance in travel agencies and hotels in a very limited way, so the importance of research, in theory, is to reduce the gap in previous studies related to green innovation and sustainability performance in travel agencies and hotels.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Green Innovation and Sustainability Performance

Although there is no common definition among researchers for the concept of green innovation (Carrillo-Hermosilla et al., 2010), many researchers have agreed to exist more than one synonym for green innovation and are used interchangeably to denote the same concept. These synonyms are sustainable innovation, ecological innovation, and environmental innovation (Halila & Rundquist, 2011; Angelo et al., 2012; Hojnik, 2017). Reid and Miedzinski (2008) stated that green innovation is any solution offered at any stage of product or service life cycle to include a significant improvement in resources while reducing environmental impact. Green innovation can also refer to all kinds of innovations that contribute to the creation of new processes, products or services to minimize damage to the environment and prevent degradation and at the same time, maximizing utilization of natural resources (Leal-Millán et al., 2017). OECD (2013) defined green innovation from a tourism business view as the innovation that minimizes the impact of tourism activities on the environment or optimizes the use of tourism resources by providing radical improvements beyond traditional types of innovation. Based on the above, green innovation in tourism business can be defined as a set of new or modified practices, processes or services that contribute to reducing the negative impacts of tourism activities on destination environment in order to preserve the natural resources from deterioration to achieve sustainable tourism development.

Although performance is a common term at all levels (Diana, 2014), sustainability performance as a new term has been ignored and only limited studies have addressed it (Büyüközkan & Karabulut, 2018). Sustainability performance refers to the ability of an organization or company to meet the needs of existing stakeholders without infringing on the needs of future stakeholders (Dyllick & Hockerts, 2002). Sustainability performance is also the performance of any entity in all dimensions of sustainability that includes the positive or negative economic, environmental and social impacts (Schaltegger & Wagner, 2006; Büyüközkan & Karabulut, 2018). Several studies categorized sustainability performance into three dimensions; environmental performance, economic performance and social performance (Heng et al., 2012; Varsei et al., 2014; Hourneaux et al., 2018; Abbas and Sagsan, 2019; Banihashemi et al., 2019; Li et al., 2019; Trianni et al., 2019; Eikelenboom & Jong, 2019). Economic performance refers to the organization's ability to maximize its profits and achieve its financial goals while using a minimum of raw materials and reducing production costs (Govindan et al., 2013; Musawir et al., 2017; Bhattacharya et al., 2019). Yusuf et al. (2013) indicate that social performance is the organization's ability to improve the quality of society and preserve it without neglecting the environmental aspects. On the tourism level, Franzoni (2015) believes that social performance is the best use of tourism enterprises for environmental resources while respecting the social and cultural authenticity of the host community and preserving the natural and cultural heritage. Bhattacharya et al. (2019) define environmental performance as organization's responsibilities towards the environment during their operations.

There are many researchers have dealt with the relationship between innovation and enterprise performance. They emphasized that innovation, generally, is one of the main factors that positively affect enterprise performance (Gunday et al., 2011; Karabulut, 2015; Chen, 2017). Hieu and Rašovská (2017) and Kneipp et al. (2019) emphasized that green practices which include green innovation enhance effectively business performance. Chiou et al. (2011) explored that green innovation has a positive influence on sustainability performance of enterprises. Tseng et al. (2013) also emphasized that green product innovation has positively impact on sustainability performance. Consequently, we propose the following hypothesis:

H1. Green innovation has a positive influence on sustainability performance.

Green Product Innovation and Sustainability Performance

In this context Changkai (2010) suggests that tourism product innovation is to promote sustainable tourism industry and development to make it a fundamental driving force. Ilg (2019) defined green product innovation as new or improved services or goods that have a less environmental impact than their counterparts. Kemp and Foxon (2007) and Brasil et al. (2016) indicated that green product innovation in tourism involves tourism products and services that have witnessed radical changes through environmental improvements such as, changes in eco-designs, adding sustainable technologies, waste and water management, using renewable energy. Dangelico and Pujari (2010) clarified that green product innovation has become a necessary result of the interaction between innovation and sustainability. They also illustrated that green product innovation is one of the factors that contribute to achieving quality of life, increasing growth, achieving environmental sustainability. In the same context, Ar (2012) and Cheng et al. (2014) indicated that innovation is the major determinant of sustainability and green product innovation has positively influence on performance for both enterprises and countries. Tang et al. (2017) were found that green product innovation positively predict enterprise performance. Alsughayir (2017) and Ma et al. (2018) emphasized that green product innovation has a significant influence on enterprise's performance. Eryigit and Özcüre (2015) stated that green product innovation reduces environmental damage and thus contributes to the sustainability of enterprises. Saudi et al. (2019) indicated that green product innovation have a positive impact on the two dimensions of sustainability performance, environmental performance and economic performance. Chiou et al. (2011) and Tseng et al. (2013) were found that green product innovation has positively effect on sustainability performance. Therefore, we propose the following hypothesis:

H1a. Green product innovation has a positive influence on sustainability performance.

Green Process Innovation and Sustainability Performance

Green processes innovation can be defined as the applying of new ideas that lead to production processes adoption or management practices to create less negative environmental, socio-cultural and economic impacts (Chen, 2011; Dahan et al., 2017). Dong et al. (2014) and Cheng et al. (2014) stated that green process innovation is directly linked to process activities and the introduction of new technologies in production processes, thereby reducing cost and improving service efficiency. In the tourism industry, Dincer et al. (2017) argue that the tourism product is quite complex, so tourism services can be part of green product innovation and also part of the green process innovation. Brazil et al. (2016) noted that green process innovation help to improve products and has positive influence on enterprises performance. Küçükoğlu and Pınar (2015) explain that green process innovation not only decreases negative impacts of enterprises on the environment, but also make the companies to be better. Eryigit and Özcüre (2015) stated that green process innovation reduce the environment damages and achieve enterprise sustainability. In this context, Ma et al. (2017) emphasized that green process innovation support influence of enterprises and improve its sustainability. From another hand, Tang et al. (2017) indicated that green process innovation positively predict enterprise performance. Chiou et al. (2011) and Tseng et al. (2013) found that green process innovation as a part of green innovation has positively effect on sustainability performance. Hence, we propose the following hypothesis:

H1b. Green process innovation has a positive influence on sustainability performance.

Green Technological Innovation and Sustainability Performance

Green technology innovation has recently received great attention from business as well as tourism (Xiea et al., 2019), because it is important in supporting business and tourism in the transition towards sustainability (Buijtendijk et al., 2018). Tseng et al. (2013) define green technological innovation as introducing new green technologies to develop tourism products and services and make them green. The main area of green technological innovation in tourism regards the use of information and communication technologies (ICT) which covers the whole tourism industry including transportation, accommodation and sightseeing (Korres, 2008). In this regard, Ruggieriand and Calò (2018) see ICT as an innovative way to support the efforts of tourism business managers to achieve sustainability. Atalay et al. (2013) indicated that technological innovation has positive effect on enterprise performance, while Umar et al. (2016) prove that there is a significant positive relationship between technological innovation and green or sustainability performance. Consequently, the following hypothesis is proposed:

H1c. Green technological innovation has a positive influence on sustainability performance.

Green Organizational Innovation and Sustainability Performance

Green organizational innovation is an important determinant of green innovation and is also known as management green innovation (Armbruster et al., 2008; Kesidou & Demirel, 2012). Green organizational innovation is a composite of both green innovation and managerial innovation (Ma et al., 2017). Brasil et al. (2016) defined green organizational innovation as the introduction or application of new programs, techniques or administrative measures within tourism business. Tariyan (2016) noted that green organizational innovation includes not only recycling, reuse, and product life cycle assessment, but also include the ability of tourism institutions to formulate and implement green projects, redesign products and improve services according to any new environmental standards or trends. Ma et al. (2017) added that green organizational innovation focuses on green management practices such as energy management, environmental management, and quality management. Chiou et al. (2011) and Tseng et al. (2013) found that green organizational innovation has positively influence on sustainability performance. Eryigit and Özcüre (2015) stated that green organizational innovation help enterprise to achieve sustainability. Therefore, the following hypothesis is proposed:

H1d. Green organizational innovation has a positive influence on sustainability performance.

The Moderating Role of Environmental Commitment

Suasana and Ekawati (2018) showed that commitment to the environment is one of the important tools for business owners and enterprises to make their businesses green and contribute to preserving the environment. Hirunyawipadaa and Xiong (2018) define environmental commitment as the enterprise's ability to integrate environmental issues and practices into its strategy to reduce the negative impacts of its activities and conserve the natural environment. They found that environmental commitment has a positive effect on enterprise performance. Li (2014) found also that green innovation practices have a positive effect on enterprises' environmental performance. He reveals also that commitment moderate the relationship between green innovation practices and financial performance.

On the other hand, Suasana and Ekawati (2018) found that there is a positive relationship between green innovation and environmental commitment. This means that a high level of commitment to the environment will lead to the high level of green innovation performance. In the same context, Mushtaq et al. (2019) found that the enterprise that is committed to preserving the environment and has innovative green practices will have a competitive advantage in achieving market gains. This indicates that there is a good relationship between green innovation and environmental commitment. Consequently, we formulate this hypothesis:

H2. Environmental commitment has a positive influence on sustainability performance.

H3. Environmental commitment moderates the relationship between green innovation and sustainability performance.

Based on the above, researchers propose the theoretical framework and research hypotheses as shown in Fig. 1.

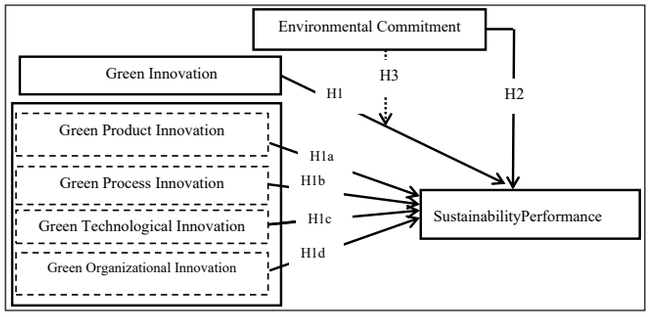

Fig. 1: Theoretical Framework and Research Hypotheses

METHODS

Sample and Procedures

The researchers collected data through a questionnaire to test the hypotheses of the research. The questionnaire was designed electronically on Google forms and distributed via LinkedIn. Basak and Calisir (2014) said that LinkedIn is one of the most important social networking sites that are used for professional purposes and includes a huge number of workers in various businesses and also in travel agencies and hotels. Dusek et al. (2015) added that the use of social media networks such as LinkedIn helps researchers in collecting data from the research population that spread across wide geographical areas and are difficult to access, as well as facilitating the distribution of the questionnaires to the search sample.

The questionnaire was distributed on a random sample of 600 managers working in travel agencies and hotels in Egypt during December 2019. Total responses received were 223 responses with a response rate of 37.17%, 5 of them were invalid and 218 responses were valid for statistical analysis. Manfreda et al. (2008) believe that the response rate in online questionnaires is less than through traditional means with 11%, and its low response is not considered critical. Hence, this response rate is considered relatively acceptable. Table

1 shows that there is a big difference in the number of male managers (93.6%) compared to (6.4%) of female managers. In this context, Elbaz and Haddoud (2017) emphasized that males are more dominant in the labor market than females in Middle Eastern countries. Most of the managers are young people between 35 years and less (46.8%), followed by 36-45 years (34.4%). As for education, most proportion of the managers has a bachelor degree (74.3%), followed by master degree (11.9%). The table also shows that most of the managers in the sample have more than 15 years of experience (44.5%). This contributes to obtaining accurate responses. Moreover, most of the managers working in the hotel sector (61.5%) and 38.5% of them working in travel agencies.

Table 1: Profile of Sample

No.	Items		Percent
1	Gender	Male	93.6
		Female	6.4
2	Age	35 and less	46.8
		36-45 year	34.4
		46-55 year	15.6
		More than 55 year	3.2
3	Education	Bachelor	74.3
		Diploma	8.7
		Master	11.9
		PhD	1.4
		Other	3.7
4	Experience	5 years and less	10.6
		5-10 years	27.1
		11-15 years	17.9
		15 years and more	44.5
5	Place of Work	Travel agencies	38.5
		Hotels	61.5

The Measurement Instruments

Research variables were measured based on previous studies to ensure data validity. Green innovation and its dimensions (green product innovation, green process innovation, green technological innovation and green organizational innovation) were measured using 16 items adopted from Chiou et al. (2011); Wong (2012); Ma et al. (2017); Huang and Li (2018); Lin and Chen (2018) and Chu et al. (2019). Sustainability performance was measured using 9 items extracted from Govindan et al. (2013); Lin et al. (2013); Li (2014); Musawir et al. (2017) and Tasleem et al. (2019). Finally, Environmental commitment was measured using 6 items depending on studies of Kim et al. (2015); Su et al. (2017); Carrillo-Higueras et al. (2018) and Wang et al. (2018). A 5 Likert scale was used from 1= strongly disagree to 5= strongly agree.

ANALYSIS AND RESULTS

Measurement Results

The study tested all variables scale for their validity and reliability. For testing the reliability, composite reliability and Cronbach's alpha were used. AVE (Average Variance Extracted) was used to test the convergent validity. Table 2 shows that all values of composite reliability and Cronbach's alpha were higher than the minimum limit of 70% (Hair et al., 1992). Additionally, Table 2 depicts that the value of AVE was more than 0.71 which is higher than the minimum value of convergent validity (0.5 or higher) (Hair et al., 2014).

Table 2: Composite Reliability, Cronbach's Alpha, AVE and VIF

Constructs	Composite Reliability	Cronbach's Alpha	AVE
Green Innovation (GI)	0.801	0.784	0.713
Environmental Commitment (EC)	0.893	0.837	0.733
Sustainability performance (SP)	0.877	0.843	0.756

AVE's square roots were tested to assess the validity of the variables. AVE's square roots should be greater than a couple of variables correlation, as shown in bold type along the diagonal in Table 3 (Hair et al., 2014). For example, the correlation between green innovation and environmental commitment was 0.847, which is less than the respective squared roots of AVE of green innovation (0.914) and environmental commitment (0.894). In this vein, Table 3 illustrates that the AVE's square roots for all latent variables are larger than the highest correlations with any other variables.

Table 3: Squared Roots of AVE

	Green Innovation (GI)	Environmental Commitment (EC)	Sustainability Performance (SP)
Green Innovation (GI)	0.914		
Environmental Commitment (EC)	0.847	0.894	
Sustainability performance (SP)	0.779	0.754	0.922

Note: Bold values indicate the square roots of AVE.

Table 4 shows that X^2/df = 1.875, GFI = 0.962, CFI = 0.976, NFI = 0.975, TLI = 0.981, and RMSEA = 0.002. All these values fell within the recommended ranges showed in Table 4.

Table 4: Model Fit Summary for the Research Model

Fit Index	Ranges	Model
X^2/df	1-3	1.875
Goodness-of-fit index (GFI)	More than 0.90	0.962
Comparative fit index (CFI)	More than 0.95	0.976
Normed Fit Index (NFI)	More than 0.90	0.975
Tucker-Lewis index (TLI)	More than 0.95	0.981
RMSEA	0.05-0.08	0.002

Structural Relationship Model

Table 5 shows the path coefficients (β), C.R, and the Sig. of the model. It can be showed from Table 5 that green innovation has a significant and positive effect on sustainability performance (β = 0.646, $p < 0.01$) with *C.R.* value 17.180. Table 5 also show that four types of green innovation including green product innovation (β = 0.575, $p < 0.01$), green process innovation (β = 0.719, $p < 0.01$), green technological innovation (β = 0.680, $p < 0.01$) and green organizational innovation (β = 0.728, $p < 0.01$) have a positive influence on sustainability performance. In addition, Table 5 indicated that environmental commitment affects significantly and positively sustainability performance (β = 0.751, $p < 0.01$) with *C.R.* value 20.208.

Regarding the moderated role of environmental commitment in the relationship between green innovation and sustainability performance; Table 5 revealed that green innovation has a significant positive effect on sustainability performance in the presence of environmental commitment (β = 0.682, $p < 0.01$) with *C.R.* value of 15.440 was obtained. This result indicates that the effect of green innovation on sustainability performance in the presence of environmental commitment is higher than the direct effect of green innovation on sustainability performance (β = 0.646), which mean that environmental commitment helps increasing the effect green innovation on sustainability performance (See also Fig. 2).

Table 5: Path Coefficient, C.R., and Sig.

Path	Path Coefficient	C.R.	Sig.	Result
GPT → SP	0.575	10.374	0.000	Supported
GPS → SP	0.719	15.254	0.000	Supported
GTC → SP	0.680	13.697	0.000	Supported
GOR → SP	0.728	15.698	0.000	Supported
GI → SP	0.646	17.180	0.000	Supported
EC → SP	0.751	20.208	0.000	Supported
GI × EC → SP	0.682	15.440	0.000	Supported

Note: GPT = Green product innovation, GPS = Green process innovation, GTC = Green technological innovation, GOR = Green organizational innovation

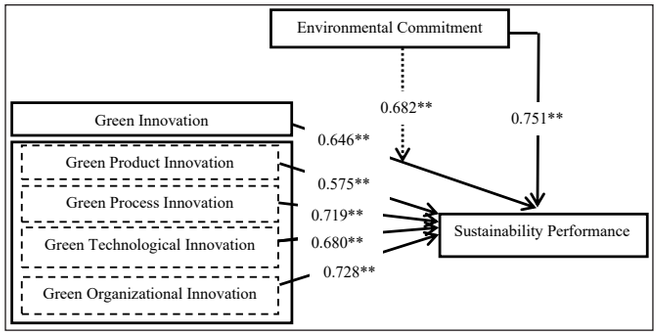

Fig. 2: The Path Coefficient Results

DISCUSSION AND CONCLUSION

This study aims to set a model to explain the relationship between green innovation and sustainability performance in travel agencies and hotels. This model aims to interpret the impact of green innovation in its four types, which include green product innovation, green process innovation, green technological innovation and green organizational innovation on sustainability performance. In addition, the model explores the relationship between green innovation and environmental commitment and the moderating role of environmental commitment in the relationship between green innovation and sustainability performance. We found that there is a positive effect of green innovation on sustainability performance. This means that whenever travel agencies and hotels turn to green innovation practices, this improves their sustainability performance.

This finding is consistent with studies of Hieu and Rašovská (2017) and Kneipp et al. (2019). The results show that there is a positive impact of green product innovation, green process innovation and green organizational innovation on sustainability performance. This result was consistent with Chou et al. (2011) and Tseng et al. (2012). The results are also consistent with the study of Umar et al. (2016) which indicated that there is a positive impact of green technology innovation on sustainability performance. Sezen and Çankaya (2013) agreed with the results for green process innovation and confirmed that there is a positive impact of green process innovation on sustainability performance, but they not agreed for green product innovation and indicated that there is not a significant effect of green product innovation on sustainability performance.

The results showed that the effect of green process innovation and green organizational innovation in travel agencies and hotels on sustainability performance is stronger than the impact of green product innovation and green technological innovation. This can be explained that green process innovation and green organizational innovation are more evident in travel agencies and hotels as organizational

enterprises, but green product innovation and green technological innovation are limited because travel agencies and hotels provide relatively stable service. The results agreed with Suasana and Ekawati (2018) that green innovation has a positive impact on environmental commitment and also agreed with Hirunyawipadaa and Xiong (2018) that environmental commitment has a positive impact on sustainability performance. The results were also consistent with the study of Mushtaq et al. (2019) that environmental commitment contributes to increasing the impact of green innovation on sustainable performance, which confirms the moderate role of environmental commitment.

This study explored important results and contributed theoretically and practically about the importance of green innovation and its types (green product innovation or green process innovation or green technological innovation and green organizational innovation) and their positive influence on sustainability performance. Not only that, the study also explored the moderate role of environmental commitment in improving the impact of green innovation on sustainability performance. These results were applied to the tourism industry in Egypt. Accordingly, the study recommends the owners and managers of travel agencies and hotels in Egypt to adopt green innovation policies and practices to improve sustainability performance. The adoption of green innovation practices contributes to achieving the financial goals of tourism and hotel enterprises and increasing their profitability, as well as preserving the tourism destination environment from deterioration and ultimately supporting the local community.

The study also recommends that local governments encourage travel agencies and hotels and make them aware of the need to commit to the environment in order to implement green innovation practices successfully and reach the highest performance for sustainability. Although these results were applied on travel agencies and hotels operating in Egypt, these results can be generalized to countries that have similar conditions with Egypt.

LIMITATIONS AND FURTHER RESEARCH

This study, like any study, contained a set of limitations that researchers faced. The most prominent of these limitations is that the field study relied on the distribution of questionnaires to managers of travel agencies and hotels in Egypt. This travel agencies and hotels were spread over wide geographical areas in Egypt, which requires a long time, great effort and high cost. To overcome this limitation, researchers used online questionnaire via LinkedIn and send it to managers of travel agencies and hotels to save time and cost. For further research, researchers can investigate for differences between travel agencies and hotels in applying green innovation, as well as investigate the moderate role of environmental commitment in the relationship between green innovation types and sustainability performance. In the future, researchers can also explore green innovation's impact on environmental, economic, and social performance in tourism enterprises.

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