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The Impact of Sustainable Waste Management and Domestic Tourism on Environmental Pollution in Erbil Governorate

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Abstract: Research analysing the impact of sustainable waste management and domestic tourism on environmental pollution has not been given due attention irrespective of them being clearly connected. Such examinations are instrumental for generating scientific information for minimizing environmental pollution induced by domestic tourism activities and fostering the effectiveness of sustainable waste management practices. The study uses structural equation modelling to analyse connections linking sustainable waste management and domestic tourism with environmental pollution. Examinations were conducted using questionnaire data collected from a random sample of 138 Kurdish nationals who visited Erbil Citadel, Sami Abdulrahman Park, Gali Ali Bag, Shanidar Cave and Sakura Park at the time the research was conducted, and such was done with the aid of Smart PLS. Results established from the study showed that sustainable waste management is instrumental in enhancing the effectiveness of environmental protection programs aimed at reducing environmental pollution. Additionally, sustainable waste management programs were discovered to be having positive effects on domestic tourism. On the other hand, domestic tourism had significant positive effects on environmental pollution. Lastly, the study exhibited that sustainable waste management has positive moderating effects on the relationship between domestic tourism and environmental pollution. This present study contributes significantly to existing studies as it provides suggestions needed to foster and enhance sustainable waste management by eradicating environmental pollution caused by the neglected effects of domestic tourism.
Keywords: Environmental Pollution, Moderating Effects, Sustainable Waste Management, Tourism

INTRODUCTION

Global efforts are increasingly being devoted to making sure that the world remains a clean, safe, attractive and enjoyable habitat. Such has seen concepts like sustainable waste management being brought into the picture to deal with rising solid waste levels. The World Bank estimates that 0.74kg of worldwide solid waste is generated per person and 2.01 billion tonnes of solid waste annually and is expected to increase to 3.40 billion by 2050 [1]. (World Bank, n.d). It becomes an exciting query to note that any waste management discrepancies can lead to severe environmental pollution, especially when care is not taken to address issues leading to pollution. Hence, the integration of sustainable waste management becomes instrumental in dealing with environmental pollution [2,3,4].

Meanwhile, domestic tourism is one of the most vital economic activities whose prevalence offers substantial economic and social benefits. The benefits of domestic tourism are widely documented in various academic studies and include inter alia income creation and retention [5], income security [6], and a stronger sense of belonging [7]. However, there are huge empirical voids regarding the adverse effects of domestic tourism and such effects are still yet to be extended to broader environmental pollution and sustainable waste management subject matters [2]. Besides, pollution generated from domestic tourism activities can strain efforts to contain environmental pollution and this calls for studies to examine this issue and assess its implications on sustainable waste management.

Iraqi Kurdistan is widely famous for its mountainous features like Qandil mountains, Mount Nisir, Hamrin Mountains, Sinjar Mountains, and the Zagros with the highest point being 3,611 m (11,847 ft) point known as "black tent" or locally as Cheekha Dar [8]. The attractiveness of Kurdistan is further enhanced by rivers like the Tigris River, the Little Zab and the Great Zab. The geographical map of Kurdistan is shown in Figure 1. Climate conditions are conducive for tourism activities because Iraqi

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Kurdistan is much wetter and cooler than the rest of Iraq because of its altitude and latitude [8]. Temperatures in Kurdistan can average between 9°C and 11°C in winter and 35 °C and 45°C in summer [9].

Erbil city dominates other Kurdistan governorates in terms of domestic tourism levels and projected domestic tourist levels for Erbil are set at 1,874,841, Sulaiymaniah 1 281 111 and Dohuk 1 281 111 [10]. Many novel concerns are widely evident in cities like Erbil in the Kurdistan Region of Iraq where domestic tourism levels play vital economic and social roles but have not been dully acknowledged academically. Besides, waste management challenges are a prominent feature in Erbil and are expected to worsen significantly, due to limited waste collection and treatment capacity (see Figures 1 and 2), and its growing population growth that increased from 5.4 million in 2016 to 8.8 million [11]. Additionally, this study focuses on Erbil, Kurdistan because related domestic tourism studies about Kurdistan are limited to economic effects [12], perceptions and attitudes [13] and tend to neglect the non-economic effects of domestic tourism on the environment. Figure 2 graphically exhibits notable environmental pollution challenges linked to concerns in Erbil.

Figure 1. Environmental pollution in Erbil prompting health concerns and undermining the attractiveness of domestic tourist destinations (Source: Authors, 2021)

Figure 2. Municipal solid waste (MSW) disposal problems in Erbil (Source: Aziz, 2018)

Nevertheless, environmental pollution still remains a notable challenge undermining sustainable waste management and environmental protection initiatives. A considerable number of studies highlight that such a challenge is linked to limited research covering all the vital subject matters triggering environmental pollution and undermining sustainable waste management [3,4,14]. It is to the researchers' attention that domestic tourism is one of the pivotal areas capable of fostering both environmental

protection and sustainable waste management initiatives. However, only a few existing studies examine the impact and moderating effects of connecting sustainable waste management and environmental protection initiatives with domestic tourism activities. Furthermore, sustainability by definition is a process that helps create a vibrant economy and a high quality of life, while respecting the need to sustain natural resources and protect the environment [15]. Portney contends that it expresses the principle that future generations should live in a world that the present generation has enjoyed but has not diminished [16]. Though both sustainable waste management, environmental protection initiatives and domestic tourism precepts are embodied in these definitions, the statistical significance and moderating effects are still yet to be developed further. Given such concerns, the study, therefore, seeks to answer the following questions:

1) Can the rising environmental pollution levels be significantly blamed on the surging domestic tourism figures?
2) How significant are the policy interactional connections between domestic tourism, environmental pollution and sustainable waste management?
3) How significant can sustainable waste management strategies be used to effectively reduce domestic tourism's effects on environmental pollution?

The study is instrumental in demonstrating the vitality of examining domestic tourism's environmental effects queries to enhance understanding of the connection between domestic tourism and environmental pollution. Moreover, insightful practical suggestions are obtainable when sustainable waste management practices are integrated into such examinations. Policy interventions are relevant as they can in turn yield health co-benefits through the improvement of air quality and the attractiveness of tourist destinations. More so, adequate waste management policies need to consider the impact of pollution on human health. This present study contributes significantly to existing studies as it provides suggestions needed to foster and enhance sustainable waste management by eradicating environmental pollution caused by the neglected effects of domestic tourism.

LITERATURE REVIEW

The term waste is used to describe items or things individuals and companies no longer have use for and intend to dispose of or have discarded [17]. Examples include things like household rubbish, discarded electronic devices, discarded cars, packaging items, wastes from manufacturing activities, sewage sludge, etc. both the provided definition and examples denote that any daily activity is capable of generating different forms of waste products. The adverse effects of waste products are significantly evident in various academic studies linking such effects to health problems [14], environmental pollution and degradation [4], economic costs [18], and other social [3]. Waste management involves collecting, sorting, treating, and recycling wasted products and when properly facilitated providing a source of energy and resources [19].

It is vital to note that not all waste management strategies are cost-effective, environmentally friendly and socially acceptable. Hence, the introduction of the concept of sustainable waste management is presumed to be instrumental in dealing with such problems [2]. Consequently, waste managers are increasingly compelled to develop and maintain sustainable systems that are practically implementable, environmentally effective, acceptable by society, economically and financially affordable. Integrating domestic tourism activities with sustainable waste management programs can be the key to effectively and efficiently reducing environmental pollution and its related adverse effects. Calls to adopt and implement sustainable waste management practices in domestic tourism activities are instrumental, especially when challenges are being observed with ordinary waste management practices. For instance, Aziz and Jwan reckon that recycling waste products is a challenge on its own and most European countries are struggling to deal with low recycling rates [20].

Pandey and Shukla questioned the sustainability of landfilling as a waste management practice citing that is connected to severe disposal charges [21]. Despite this, Pujara et al. assert that landfills tend to cause an increase in high external costs [22]. The repercussions of such actions are unformidable when the benefits of sustainability are not integrated with domestic tourism activities to deal with environmental pollution problems. A study by Nanda and Berruti highlighted that other waste management strategies like mechanical-biological treatment can prove to be undesirable when financial costs are brought into perspective [23]. However, thermal treatment of solid waste is beneficial in circumstances where mechanical-biological treatment and landfilling methods prove to be

environmentally unfriendly. Extending the subject matter of sustainable waste management to domestic tourism and environmental pollution is one of the instrumental efforts required in enhancing the attainment of Sustainable Millennium Development Goals (MDGs). For instance, contemporary examinations highlight that sustainable waste management can be the key to enhancing energy [6] and income generation, especially among socially and economically disadvantaged individuals [14].

The impact of waste management on environmental pollution are widely documented in academic research [4,14,18,19,24]. As such studies highlight that waste management is vital for reasons ranging from health reasons [2], enhancing energy [6] and income generation, especially among socially and economically disadvantaged individuals [14]. However, it is imperative to establish that the benefits of waste management are not limited to these benefits and more benefits can be tested when sustainability is connected to other subject matters. Implementing sustainable waste management practices is instrumental in developing practically implementable, environmentally effective, acceptable by society, economically and financially affordable strategies capable of dealing with environmental pollution induced through domestic tourism activities. Miao reckons that the amount of solid waste dumped by tourists is significantly reduced by adopting sound waste management practices [25]. Therefore, this study seeks to extend Miao's ideas and apply them in the context of domestic tourism in Erbil, Kurdistan, where academic coverage is still at the infancy stages. Thus, the following hypothesis will be used for accomplishing such a purpose;

- **H_1:** Sustainable waste management practices have a significant positive effect on environmental protection.

The integration of sustainable waste management practices with domestic tourism is a rare phenomenon that is still yet to be explored in academic studies. The integration of these two precepts is instrumental in providing detailed insights into how organisations and stakeholders can enhance the attractiveness and sustainability of tourism destinations. Kiš et al. state that the potential capacity to continuously attract huge numbers of tourists can be enhanced by eradicating problems like pollution [2]. It is empirically fit at this stage to argue that sustainable waste management practices are vital for developing and sustaining domestic tourism. Such can be expressed in the form of a hypothesis as follows;

- **H_2:** Sustainable waste management practices have a significant positive effect on domestic tourism.

It is widely accepted and demonstrated that domestic tourism is responsible for some of the major issues triggering environmental pollution [26,27-29]. Such entails that there is a positive interaction between domestic tourism and environmental pollution as tourists can dump solid waste like plastic bags, containers and biodegradable foodstuffs living the places littered. By the same principle, this study suggests that domestic tourism destinations in Erbil, Kurdistan will observe similar problems, especially at a time when domestic tourism figures are rising [13]. However, this has been lacking empirical support and this study seeks to validate such observation by proposing the following hypothesis:

- **H_3:** Domestic tourism has a positive effect on environmental pollution.

As outlined in the introductory part of this study, the moderating effects of sustainable waste management on the relationship between domestic tourism and environmental pollution still require empirical examination. Prajapati et al. assert that efforts to curb environmental pollution can be enhanced by introducing sound and effective waste management practices [19]. The potential capacity to boost efforts capable of minimizing environmental pollution are highly feasible [9]. However, little attention is often given to identifying such practices. Consequently, this study argues that sustainable waste management practices have positive moderating effects on the relationship between domestic tourism systems and environmental pollution as denoted by the following hypothesis;

- **H_4:** Sustainable waste management practices have positive moderating effects on the impact of domestic tourism on environmental protection programs aimed at curbing environmental pollution.

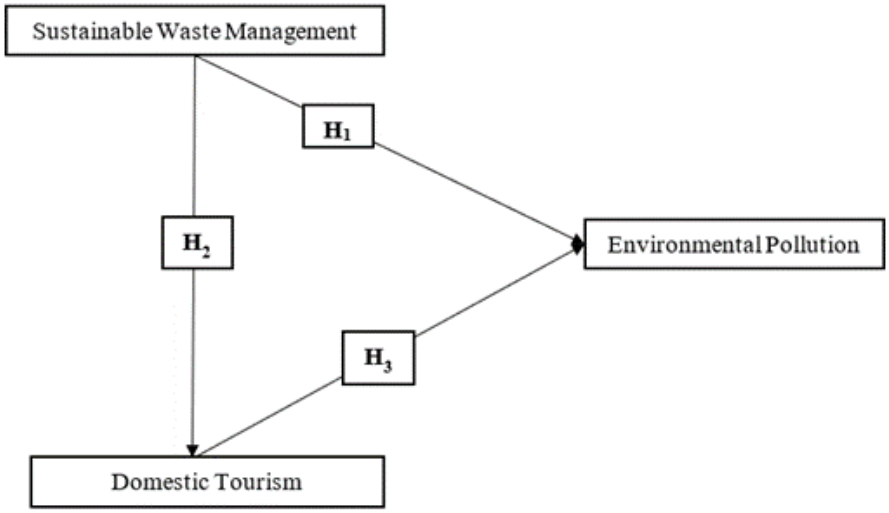

Figure 3. Conceptual model

METHODOLOGY

Research Approach

Although a few studies have considered the impact of waste management on environmental pollution [4,14], only a few considered the relevance and significance of sustainability on such a connection [2]. It is also to the best of our knowledge, a study similar to ours on domestic tourism has not been undertaken before in Kurdistan. Other studies used generic qualitative methods that do not consider sustainable waste management's moderating effects on environmental pollution [30,31-32]. As a result, the study used the Structural Equation Modelling approach in analysing the impact of domestic tourism on environmental pollution moderated by sustainable waste management. SEM is vital for analysing structural connections between the model variables [33]. Furthermore, Sarstedt, Ringle and Hair reiterate the importance of using SEM citing that it is vital for establishing both mediating and moderating effects [34].

Data analysis procedures

The initial process involved determining the variables' factor loading using factor analysis [34]. Then study proceeded to use the selected variables with factor loadings of at least 0.70 in conducting validity and internal consistency tests [34]. Eventually, a structural model was estimated and the extent to which the model is capable of answering questions related to the impact of domestic tourism on environmental pollution was moderated by sustainable waste management using model fitness tests. Smart PLS was used to conduct the entire data analysis procedure.

Data collection

The data was collected using a questionnaire that was developed using related empirical studies about domestic tourism and environmental pollution [35,36] and sustainable waste management [25]. Both variables had an equal number of 15 variable elements that were measured using a 5-point Likert scale (1=strongly disagree, 2=disagree, 3=not sure, 4=agree, 5=strongly agree).

Population and sampling procedures

Due to limitations posed by Covid 19 the study was restricted to a confined random sample of five major domestic tourism destinations in Erbil, Kurdistan (Erbil Citadel, Sami Abdulrahman Park, Gali Ali Bag, Shanidar Cave and Sakura Park). Such tourist destinations have unique historical and attractive scenes that draw huge numbers of domestic and international tourists. Furthermore, severe efforts have been taken to contain rising pollution levels in such places. 150 questionnaires were equally distributed among domestic tourists who visited these five major tourist destinations at the time the research was conducted.

RESULTS

The results were collected from 146 domestic tourists in Erbil, Kurdistan who visited Erbil Citadel, Sami Abdulrahman Park, Gali Ali Bag, Shanidar Cave and Sakura Park at the time the research was conducted. The tourists were composed of 86 male tourists and 60 female tourists. 33 tourists had bachelor's degrees, 48 master's degrees, 19 PhD degrees, 46 other qualifications. 41 tourists were between 18-25 years, 39 tourists were between 26-33 years, 18 tourists were between 34-41 years, and 35 tourists were between 42-49 years, 13 tourists were 50 years and above. 128 tourists agreed that AIS is significantly important for reducing environmental pollution while 18 tourists contrasted with this idea.

Factor analysis

Our study results showed that all the variables had factor loading above the minimum stipulated standard of 0.70 [34]. Therefore, the variables elements were considered valid in explaining the impact of domestic tourism and sustainable waste management on environmental pollution (see Table 1).

Table 1. Factor analysis results

Variable elements	Factor loadings	Variable elements	Factor loadings	Variable elements	Factor loadings
DT 1	0.781	SWM 1	0.700	EP 9	0.770
DT 2	0.771	SWM 11	0.752	EP 10	0.793
DT 3	0.833	SWM 12	0.732	EP 11	0.744
DT 4	0.750	SWM 13	0.807	EP 12	0.742
DT 5	0.709	SWM 14	0.807	EP 14	0.760
DT 8	0.700	SWM 15	0.702		
DT 9	0.722				
DT13	0.675				

Where DT = Domestic Tourism; SWM = Strategic Waste Management; EP = Environmental Pollution

The variables' discriminant validity was determined using the Fornell-Larcker criterion. Table 2 shows that the diagonal correlation values are greater than their respective underneath correlations coefficients values [34]. Hence, it was inferred that there was discriminant validity among the variables, domestic tourism, sustainable waste management and environmental pollution.

Table 2. Discriminant validity

	DT	SWM	EP
DT	0.744		
SWM	0.702	0.773	
EP	0.599	0.725	0.745

Where DT = Domestic Tourism; SWM = Strategic Waste Management; EP = Environmental Pollution

Cronbach's alpha test was used to determine the reliability of the three model variables and values exceeding 0.70 were established. This denoted that all the variables were highly reliable {DT (0.744), SWM (0.702) and EP (0.599)}. Additionally, Rho_A (DT=0.887; SWM=0.869; EP=0.845) and composite reliability (DT=0.908; SWM=0.899; EP=0.882) were above 0.70 indicate that the constructs were reliable [34]. Furthermore, average variance values were above 0.50 and this shows that the variables had the required construct validity levels (see Table 3) [34].

Table 3. Construct reliability and validity

	Cronbach's alpha	Rho_A	Composite reliability	Average variance
DT	0.844	0.887	0.908	0.553
SWM	0.865	0.869	0.899	0.597
EP	0.839	0.845	0.882	0.555

Where DT = Domestic Tourism; SWM = Strategic Waste Management; EP = Environmental Pollution

Model fitness tests were conducted using NFI, Chi-square, D_G, D_ULS and SRMR methods. Firstly, the NFI values were above 0.70, the Chi-square value of 317.739 was significant, D_G and D_ULS were lower than the related confidence interval and while the SRMR value exceeded 0.080 [34]. Both results shown in Table 4 demonstrate that the estimated SEM perfectly fitted.

Table 4. Model fit summary

	NFI	Chi-Square	D_G	D_ULS	SRMR
Saturated model	0.726	317.74*	0.640	1.512	0.085
Estimated model	0.726	317.74*	0.640	1.512	0.085

*Where **SRMR**= Standardized Root Mean Square Residual; **d_ULS** = the squared Euclidean distance) and **d_G** = the geodesic distance.*

Path analysis was applied as part of the procedures carried out to ascertain the structural connections between domestic tourism, sustainable waste management and environmental pollution. The results shown in Figure 4 shows that sustainable waste management practices have a significant positive effect of 0.563 on environmental protection programs aimed at reducing environmental pollution leading to the acceptance of hypothesis 1. Such findings align with Miao's propositions suggesting that environmental protections are significantly effective and efficient when structured according to sustainability guidelines [25]. Additionally, sustainable waste management practices are known to be practically implementable, environmentally effective, acceptable by society, economically and financially affordable [19].

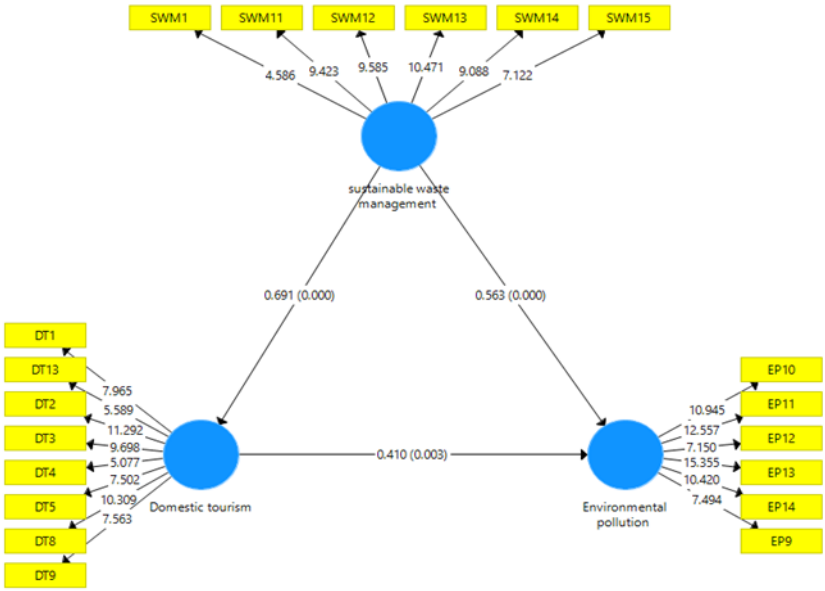

Figure 4. Path analysis

The results also denoted that sustainable waste management practices are vital for enhancing developing and sustaining tourist destinations by curbing pollutions and other environmental harms. This concurs with arguments laid forth by Kiš and others asserting that pollution is another key obstacle capable of undermining the attractiveness of domestic tourist destinations [2]. Consequently, such a study calls for the implementation of sustainable waste management practices. Hence, we accepted hypothesis 2 asserting that sustainable waste management practices have a significant positive effect on domestic tourism

The study reaffirmed the existence of positive interaction between domestic tourism and pollution of 0.410. Such observations are widely neglected academically and suggest that tourists can discard waste materials in the form of plastic bags and other biodegradable and non-degradable products. Thus,

the validity of hypothesis 3 cannot be disputed in this case as studies consider that rising tourist numbers are another cause stirring increased cases of pollution [26,27-29].

Table 5. Moderating effects

	Coefficient	Probability value
DT --> SWM --> EP	0.283	0.003

*Where **DT** = Domestic Tourism; **SWM** = Strategic Waste Management; **EP** = Environmental Pollution*

The novel suggestions revealed in this study about sustainable waste management moderating the impact of domestic tourism on environmental protection programs aimed at curbing environmental pollution are evidently valid. This is because Table 5 shows that sustainable waste management significantly moderates domestic tourism's effects on environmental pollution by 0.283. This can be attributed to the effective capacity of waste management programs to reduce pollution and external costs incurred in eradicating pollution. Table 6 provides a summary of the tested hypotheses results and inferred decisions.

Table 6. Summary of hypothesis results

Hypothesis	Result	Decision
H_1: Sustainable waste management practices have a significant positive effect on environmental protection.	0.000	Accept
H_2: Sustainable waste management practices have a significant positive effect on domestic tourism.	0.000	Accept
H_3: Domestic tourism has a positive effect on environmental pollution	0.000	Accept
H_4: Sustainable waste management practices have positive moderating effects on the impact of domestic tourism on environmental protection programs aimed at curbing environmental pollution.	0.003	Accept

DISCUSSIONS AND CONCLUSIONS

The study was aimed an analysis the impact of domestic tourism and sustainable waste management on environmental pollution. This followed a series of practical and academic observations denoting that domestic tourism is one of the pivotal areas that capable of fostering both environmental protection and enhancing the effectiveness of sustainable waste management initiatives. However, studies did not dully acknowledge the policy connections and the moderating effects of such connections that were still yet to be developed further. Hence, our study are initially novelty and originality are embedded in attempts made to address such issues. The other key objective of this study was to determine how significant can waste management strategies sustainably reduce domestic tourism's effects on environmental pollution. Insights provided in this study calls for tourist destination managers to introduce sustainable waste management programs capable of avoiding and/or reducing pollution. This encompasses providing disposable bags and refuse collection bags around the whole area. Such programs and efforts are cost-effective, easily acceptable by society and environmentally friendly as they can be recycled.

Though related studies provide insight into the possible connection linking environmental pollution to domestic tourism [37,38,39], validating the nature and significance of such an interaction had been empirically sidelined. Consequently, our study findings demonstrated that the rising environmental pollution levels be significantly blamed on the surging domestic tourism figures. This is because the established findings exhibited that there is a significant positive interaction between domestic tourism and environmental pollution. Besides, such findings mirrors academic observations made in previous studies contending that domestic tourism activities causes tourists to litter places by discarding waste products and foodstuffs[26,27-29]. Therefore, this study contributes to the strategic development of waste management practices harnessing both corporate and governmental level initiatives aimed at eradicating rising waste pollution and environmental degradation problems.

Surprisingly, our model tests revealed that significant structural connections are linking domestic tourism, environmental pollution and sustainable waste management. Such connections have been academically sidelined by related studies [26,27-29,37-39]. In that regard, our findings are essential for guiding sustainable waste management policies trivial for regulating environmental pollution through encouraged adoption of sustainable and environmentally friendly approach to domestic tourism. Thus,

our findings underscore the environmental protection action groups and regulatory authorities to devise environmental protection measures aimed at reducing environmental pollution on a solid platform encompassing both sustainable waste management programs and domestic tourism activities. Such is in line with sustainability guidelines putting a high demand for environmental protection measures so as to safeguard the environment for future generations [40]. Of paramount importance, are the findings that have been uncovered through our study showing that sustainable waste management has significant positive moderating effects on the connection linking domestic tourism with environmental protection programs aimed at curbing environmental pollution. This represents a major scientific contribution of applying structural equation modelling technique in addressing environmental pollution issues triggered by domestic pollution and how waste management practices can be crucial in alleviating such issues.

The study findings significantly contributes towards improving existing studies because they instrumentally demonstrate the vitality of examining domestic tourism's environmental effects queries to enhance understanding of the connection between domestic tourism and environmental pollution. As a result, policy interventions are relevant as they can in turn yield health, economic, social and environmental benefits through improvement of air quality and the attractiveness of tourist destinations. Most importantly, it provides suggestions needed to foster and enhance sustainable waste management by eradicating environmental pollution caused by the neglected effects of domestic tourism.

Limitations and suggestions for future studies

Due to limitations posed by Covid 19, which in turn restricted the use of a large sample size, future studies are implored to incorporate other tourist destinations and a large number of participants. Additionally, innovative changes in the demand for tourism products and services caused by Covid 19 demand the integration of the innovation variable in related future examinations.

REFERENCES

[1] World Bank, n.d, Trends in Solid Waste Management. web page: https://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html retrieval date: 04.06.2022.

[2] Kiš, D., Jovičić, N., Kalambura, S. and Guberac, V., 2021, Sustainable Waste Management and the Impact of the Tourism Sector on Environmental Pollution. *Agric. Consp. Scie.,* Vol. 86(3), 271-276.

[3] Ngoc, U.N. and Schnitzer, H., 2009, Sustainable solutions for solid waste management in Southeast Asian countries. *Waste Manag.,* Vol. 29(6), 1982-1995.

[4] Skenderovic, I., Kalac, B. and Becirovic, S., 2015, Environmental pollution and waste management. *Balkan J. of Hea. Scie.,* Vol. 3(1), 2-10.

[5] Mbaiwa, J.E., 2017, Poverty or riches: who benefits from the booming tourism industry in Botswana?. *J. Contemp. Afric. Stud*, Vol. 35(1), 93-112.

[6] Webster, C. and Ivanov, S., 2014, Transforming competitiveness into economic benefits: Does tourism stimulate economic growth in more competitive destinations?. *Tour. Managt.,* 40, 137-140.

[7] Khayrulloevna, A.M., 2020, The substantial economic benefits of tourism. *Academy,* Vol. 3 (54).

[8] Hamadamin, A., 2021, The Directions of Tourists' Destinations in Rwandz and Soran Districts in Kurdistan, Iraq between 2013-2018. web page: https://www.techniumscience.com/index.php/technium/article/view/4418 retrieval date: 04.06.2022.

[9] Mzuri, R.T., Mustafa, Y.T. and Omar, A.A., 2021, Land degradation assessment using AHP and GIS-based modelling in Duhok District, Kurdistan Region, Iraq. *Geoc. Inter.,* 1-19.

[10] Rasul, A., Dewana, A.A.H. and Saed, S.M.N., 2019, Multi-Model Tourist Forecasting: Case Study OF Kurdistan Region of Iraq. *Tour. and Travel.,* Vol. 2(1), 24-34.

[11] Jangiz, K., Kurdistan Region's population growth rate lower than Iraq: statistics office. web page: https://www.rudaw.net/english/kurdistan/03112021 retrieval date: 04.06.2022.

[12] Ahmed, Y.A., 2016, Economic Evaluation of the Domestic and International tourism market in the Kurdistan region. *AL-dananeer*, Vol. 1(9), 166-185.

[13] Harun, R., Chiciudean, G.O., Sirwan, K., Arion, F.H. and Muresan, I.C., 2018, Attitudes and perceptions of the local community towards sustainable tourism development in Kurdistan Regional Government, Iraq. *Sust.,* Vol. 10(9), 2991.

[14] Yang, H., Ma, M., Thompson, J.R. and Flower, R.J., 2018, Waste management, informal recycling, environmental pollution and public health. *J Epide. Comm. Hea.,* 72(3), 237-243.

[15] Wilkinson, A., Hill, M. and Gollan, P., 2001, The sustainability debate. *Int. J. of Oper. & Prod. Managt.,*
[16] Portney, K.E., 2015, Sustainability. MIT Press.
[17] Meidiana, C. and Gamse, T., 2010, Development of waste management practices in Indonesia. *Eur. J. of Sci. Res.,* Vol. 40(2), 199-210.
[18] De Feo, G., De Gisi, S. and Williams, I. D., 2013, Public perception of odour and environmental pollution attributed to MSW treatment and disposal facilities: A case study. *Waste Managt.,* Vol. 33(4), 974-987.
[19] Prajapati, P., Varjani, S., Singhania, R.R., Patel, A.K., Awasthi, M.K., Sindhu, R., ... and Chaturvedi, P., 2021, Critical review on technological advancements for effective waste management of municipal solid waste-Updates and way forward. *Environ. Tech. & Innov.,* Vol. 23, 101749.
[20] Aziz, S. Q., & Mustafa, J. S. (2018, February). Thermal and Financial Evaluations of Municipal Solid Waste from Erbil City-Iraq. In *4th International Engineering Conference on Developments in Civil & Computer Engineering Applications, Erbil-Iraq* (pp. 86-97).
[21] Pandey, L.M.S. and Shukla, S.K., 2019, An insight into waste management in Australia with a focus on landfill technology and liner leak detection. *J. of Clean. Prod.,* 225, 1147-1154.
[22] Pujara, Y., Pathak, P., Sharma, A. and Govani, J., 2019, Review on Indian Municipal Solid Waste Management practices for reduction of environmental impacts to achieve sustainable development goals. *J. of Enviro. Managt.,* 248, 109238.
[23] Nanda, S. and Berruti, F., 2021, Municipal solid waste management and landfilling technologies: A review. *Envir. Chem. Lett.,* Vol. 19(2), 1433-1456.
[24] Kanhai, G., Fobil, J.N., Nartey, B.A., Spadaro, J.V. and Mudu, P., 2021, Urban Municipal Solid Waste management: Modeling air pollution scenarios and health impacts in the case of Accra, Ghana. *Waste Managt.,* 123, 15-22.
[25] Miao, S., 2018, Towards a circular economy: Household participation in sustainable municipal solid waste management in Chengdu, University of Twente, Master's thesis, China.
[26] Umukoro, G. M., & Agwu, P. A. (2018). Effect of Tourism Site Infrastructure on Visitor Patronage: A Study of Calabar Metropolis. *Cal. J. of Lib. Stud.-Cajolis,* 20(2), 98-107.
[27] Kimani, J., 2021, Effect of civil war on the perfomance of tourism industry in Africa. A critical literature review. *Int. J. of Mod. Hosp. and Tour.,* 1(1), 1-15.
[28] Filep, S., & Laing, J. (2019). Trends and directions in tourism and positive psychology. *J. of Trav. Res.,* Vol. 58(3), 343-354.
[29] Ghorbani, A., Danaei, A., Barzegar, S. M., & Hemmatian, H. (2019). Post modernism and designing smart tourism organization (STO) for tourism management. *J. of Tour. Plan. and Dev.,* Vol. 8(28), 50-69.
[30] Annepu, R.K., 2012, Sustainable solid waste management in India. Columbia University, Master thesis, New York.
[31] Chang, N.B., Shoemaker, C.A. and Schuler, R.E., 1996, Solid waste management system analysis with air pollution and leachate impact limitations. *Waste Managt. & Res.,* Vol. 14(5), 463-481.
[32] Henry, R.K., Yongsheng, Z. and Jun, D., 2006, Municipal solid waste management challenges in developing countries–Kenyan case study. *Waste Managt.,* Vol. 26(1), 92-100.
[33] Ramayah, T., Cheah, J., Chuah, F., Ting, H. and Memon, M.A., 2018, Partial least squares structural equation modeling (PLS-SEM) using SmartPLS 3.0. An updated and practical guide to statistical analysis (basic level, Second edition)
[34] Sarstedt, M., Ringle, C.M. and Hair, J.F., 2017, Partial least squares structural equation modeling. *Handb. of Mark. Res.,* Vol. 26(1), 1-40.
[35] Mirzaei, R. (2013). Modeling the socioeconomic and environmental impacts of nature-based tourism to the host communities and their support for tourism. Justus Liebig, School of Social Sciences, University of Giessen, PhD thesis.
[36] Solberg, A.M., 2017, Tourist perceptions of their environmental impacts in Tanzania. Kent State University, Doctoral dissertation.
[37] Díaz-Pérez, F. M., García-González, C. G., & Fyall, A. (2021). Accommodation, Seasonality and Domestic Tourism to National Parks: Implications for Environmental Policy. *Sust.,* Vol. 13(9), 5072.
[38] Peng, J., & Xiao, H. (2018). How does smog influence domestic tourism in China? A case study of Beijing. *Asia Pac. J. of Tour. Res.*, Vol. *23*(12), 1115-1128.

[39] Wang, J., Kim, J., Moon, J., & Song, H. (2020). The effect of smog-related factors on Korean domestic tourists' decision-making process. *Inter. J. of Envir. Res. and Pub. Hea.*, Vol. 17(10), 3706.
[40] Wilkinson, A., Hill, M. and Gollan, P., 2001, The sustainability debate. *Inter. J. of Oper. & Prod. Managt*., Vol. 21 (12), pp. 1492-1502.