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Ecological Footprint as A Tool for Planning Towards Sustainable Tourism: A Case Study of Egypt

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Abstract *The paper is trying to discover the use of ecological Footprint tool with regard to sustainability in tourism. Besides, to developing and testing this tool as planning for conceptualizing and developing sustainable tourism. Furthermore, the aim of this research is to critically examine the theoretical base of the ecological footprint, issues its calculation, to account Ecological footprint and bio capacity of Egypt so as, A survey approach was implemented to collect data from tourism experts from Egypt using a completed questionnaire technique as an interview. However,the result revealed that, EF is an indicator and a tool for sustainable tourism although EF is not enough to measure sustainability it is an indicator for sustainable tourism in Egypt.*

Keywords *Sustainable Tourism, Ecological Footprint, Tool, Egypt, Bio Capacity*

INTRODUCTION

Human demand on ecosystem services continues to increase, and there are indications that this demand is outpacing the regenerative and absorptive capacity of the biosphere. As a result, the productivity of natural capital may increasingly become a limiting factor for the human endeavor. Therefore, metrics tracking human demand on, and availability of, regenerative and waste absorptive capacity within the biosphere are needed to track minimum sustainability conditions. (Ewing, 2010) Hence, tourism resources can maintain, develop and innovate for future generations.

For this reason, sustainable development is now widely promoted as a holistic concept that aims to integrate social, economic and cultural policies to ensure high-quality growth in the context to which it is applied (Reid and Schwab, 2006). Such as tourism activities which require high quality to highlight. Sustainable tourism development is "a commitment to improving the quality of human life while living within the carrying capacity of supporting ecosystems" (IUCN/UNER/WWF, 1991). It seems unlikely that there exists one single measure of sustainable development, which is capable of capturing sustainability (Hanley, Moffatt, Faichney & Wilson, 1999). Sustainability comprises four dimensions - environmental, social, economic and institutional (UNDPCSD, 1996a, b, 2002).

However, there is a big confusion about sustainability. Yet, most would agree that as a necessary condition for sustainability, biological resources may not be consumed faster than they can be regenerated. The challenge is how to test this condition. (Wackernagel, Wermer, Goldfinger, 2007).

In fact, tools for monitoring the progress towards sustainability are only useful if they build on an explicit definition of sustainable tourism development (Holmberg, Lundqvist, Robèrt, and Wackernagel, 1999). In the meantime, World Tourism Organization (2004) offers the following definition of sustainable development: Sustainable tourism development guidelines and management practices are applicable to all forms of tourism in all types of destinations, including mass tourism and the various niche tourism segments. (WTO, 2004). In other words, 'Sustainable tourism' has become one of the keywords in the debate on environmentally integrated tourism development, largely a result of the insight that the environmental consequences of this rapidly growing industry can no longer be disregarded (Hunter and Green, 1995).

For the relationship between sustainability and the ecological footprint, it is clear that with documented declines in the biophysical state of the planet, there is an urgent need to develop indicators of sustainable development (United Nations Environment Programme, 2002). The ecological

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footprint has been identified as a quantifiable sustainable development indicator to assess and monitor sustainable development performance (Wackernagel and Rees, 1996; Chambers et al., 2000; Charlton, 2002). In essence, a calculated ecological footprint represents the amount of land required for the provision of natural resources and absorption of wastes for a specified population (Chambers et al., 2000). It follows that the ecological footprint is a tool to reach the index sustainable tourism.

Nevertheless, there is little common understanding across the various academic disciplines on how sustainability can be developed. (Folke et al., 1994) and there is a little indication that current sustainability initiatives are effective at reversing the ecological trends (Wackernagel, 1994).

Currently, the Footprint of international tourism is allocated to the country in which the tourist is traveling. Since tourism is generally regarded as an export sector of the economy, this represents a methodological inconsistency. As the Footprint of a nation is defined as the demand on regenerative capacity placed by the activities of the residents of that nation, the Footprint of tourist activities should be allocated instead to the origin country of the tourist. This inconsistency could prove significant for small nations with well-developed tourism infrastructure. (Kitzes, J., Galli, A., Bagliani, M., Barrett, J., Dige, G., Ede, S., Erb, K-H., Giljum, S., Haberl, H., Hails, C., Jungwirth, S., Lenzen, M., Lewis, K., Loh, J., Marchettini, N., Messinger, H., Milne, K., Moles, R.,Monfreda, C., Moran, D., Nakano, K., Pyhälä, A., Rees, W., Simmons, C., Wackernagel, M., Wada, Y., Walsh, C., Wiedmann, T., 2009).

Obviously, sustainability and sustainable tourism are a target and an urgent requirement for all nations to preserve resources for future generations. This is the call of the sustainability of any right of future generations to enjoy the resources of the environment. As a result, tools must be used to reach the sustainability and measurement verification. Therefore ecological footprint use as a vital tool to measure sustainability and not to skip bio capacity estimated for each country.

LITERATURE

EF A Tool for Sustainable Tourism

Sustainable tourism refers to ability of a system to continue and maintain a production Level or quality of life for future generations. Furthermore, the drive toward sustainability in the 21st century will require a 21st century tool to measure our progress. The Ecological Footprint Accounts are one such tool. (Redefining progress, 1997)To, sustain and maintain tourism.

Ecological footprint analysis is a tool that has been identified for use as an index to measure progress towards the goal of sustainable tourism development, converting consumption and waste production into units of equivalent land area (Wackernagel and Rees, 1996). Ecological Footprint Accounts utilize advances in data collection and communication to transform sustainable tourism from an unclear concept into a measurable goal. (Redefining progress, 2002).

In other words, the ecological footprint accounts measure people's demand on nature. This demand includes both the resources and the wastes produced. These resources are obtained from forests, cropland, fisheries, grazing land, and other ecosystems. The built environment compromises the land's ability to provide biological resources. (Wackernagel and Kristin, 2010)

As a result, the ecological footprint has been identified as a quantifiable sustainable tourism development indicator to assess and monitor sustainable tourism performance (Wackernagel and Rees, 1996; Chambers et al., 2000; Charlton, 2002).

EF A Tool for National Security

In the 21st century, national ecological deficits are becoming an ever-increasing liability to the competitive position of national economies. This is particularly true as world trade eliminates or diminishes the importance of national industry protections and as costs of using limited resources or emitting waste increases. (Redefining progress, 2002)

Furthermore, the ecological footprint has thus been described as a powerful indicator for communicating sustainable tourism issues to the wider community. (Wackernagel and Rees, 1996; Chambers et al., 2000; Charlton, 2002).

Rees (2000) identified the popular understanding of the ecological crisis as, a prerequisite to any politically viable solution, and as a crucial aspect for achieving progress towards sustainability in tourism activities. Therefore, the ecological footprint focuses on resource consumption and waste assimilation patterns, and allocates ecologic impacts to these patterns, it is one of a few sustainability indicators that consider the interrelationships between the socio-economic and ecological dimensions of sustainable tourism. (Nichols, 2003)

fact, if ecological footprints are measured in terms of per capita, the goal is to compare consumption and lifestyles (Waskey, 2010). However, National Ecological Footprint accounts are applied directly as a communication and policy tool. (WWF 2006, von Stokar et al 2006)

Thus, Ecological Footprint Accounts reveal the tradeoffs involved. This allows national governments and their

agencies to evaluate risks and formulate better policy. (Redefining progress, 2002).

In consequence, it is clear that the ecological footprint since it is linked to the consumption of resources and their impact on the environment it is also linked to the social, political and economic dimensions. So, sustainable tourism is also achieved through social, political, environmental and economic indicators.

Bio Capacity

Bio capacity, or the supply side of the equation, is the complement of the Footprint, or the demand side. A nation's total Bio capacity is the sum of its bio productive areas, also expressed in global hectares (gha). Each bio productive area transform into global hectares by multiplying its area by the appropriate equivalence factor and the yield factor specific to that country:

Bio capacity (gha) = Area (ha) * Equivalence Factor (gha/ha) * Yield Factor (-) (Monfreda, Wackernagel, Deumling, 2004), the bio capacity (BC) represents the bulk of the biosphere's regenerative capacity. It is a total of the production of various ecosystems in a certain area (e.g. of arable land, pasture, forest, productive sea), some of it may also consist of built up or corrupted land. The earth's BC increases with a larger biologically productive area and with a higher productivity per unit area. (WWF, 2005).

As a result, the capacity of ecosystems is to produce useful biological materials and to absorb waste materials generated by humans, using current management schemes and extraction technologies. "Useful biological materials" are defined as those used by the human economy. (Kitzes, Galli, Rizk, Reed and Wackernagel. 2008). It then becomes a relationship between bio capacity which preserve resources and sustainable tourism which maintain these resources to the future generations.

It is also obvious that, in many countries, the demand for ecological capacity exceeds its available biologically productive area. These nations are running a national ecological deficit. In this case, the country's area alone cannot provide sufficient ecological services to satisfy its population's current patterns of consumption. (Redefining progress, 2002). To keep tourism resources or nature in prime condition.

Ecological Footprint and Bio Capacity In Egypt

The National Footprint Accounts quantify annual supply of and demand for ecosystem products and services in a static, descriptive accounting framework. It provides the advantage of monitoring in a combined way the impacts of anthropogenic pressures that are more typically evaluated independently (climate change, fisheries collapse, land degradation, land use change, food consumption, etc.). However, as with most aggregate indicators, it has the drawback of implying a greater degree of addictively and interchangeability between the included land use types than is probably realistic (Ewing & et al., 2010). The Ecological Footprint examines the amount of natural resources required to support a specific type of behaviour, business, or process. (Wackernagel & Rees, 1996). Although Ecological Footprint analyses have been performed at scales ranging from single products to the world as a whole, nation-level Ecological Footprint assessments are often regarded as the most complete. National Ecological Footprint accounts are applied directly as a communication and policy tool (WWF 2006, von Stokar et al 2006), and data extracted from these accounts often serve as a starting point for smaller-scale analyses(Chambers et al 2000, Lewan and Simmons 2001, Wiedmann et al 2006b). Country -level Footprint assessments have been completed for many nations, with some nations analyzed multiple times under different methods. (Wackernagel and Rees 1996, Bicknell et al 1998, Fricker 1998, Simpson et al 2001, van Vuuren and Smeets 2000, Ferng 2001, Haberl et al 2001, Lenzen and Murray 2001, 2003, McDonald and Patterson 2004, Monfreda et al 2004, Bagliani et al 2005, Medved 2006, WWF 2006).

In the fact, the most widely used methodology for national Footprint accounting today is Global Footprint Network's National Footprint Accounts, developed and maintained by Global Footprint Network and its 75 partner organizations. These reference accounts cover more than 150 nations and extend from 1961 through 2003 (WWF, 2006). The ongoing process of improving the quality and accuracy of these accounts is over seen by Global Footprint Network's National Accounts Review Committee, with research contributions solicited from the global community of Footprint researchers (Global Footprint Network, 2007a).

While, the concept of sustainable tourism in Egypt is still only an objective, not a process, or an outcome. Limitations of present processes intervention methods and outcome audits are still not clear. Which tool is more reliable, more measurable and more effective? That is also not defined yet. The Egyptian government is using different tools to measure and monitor the environmental performance such as EIA (Environment Impact Assessment- adopted by the ministry of Environment), SEA (Strategic Environmental Assessment adopted by Egyptian Environmental Affairs Agency EEAA) and finally the Production of Wealth tool adopted by the local authorities. The Ecological Footprint tool is not adopted yet by any of the official agencies or authorities. (Sallam, 2001)

To reach an appropriate way for calculating Ecological Footprint and bio capacity, there are two methods to calculate them. First, they should cover six land use types: cropland,

Equation 1

Calculation of Ecological Footprint of Consumption for Egypt:

EFc= Efp + EfI - EFE

1.66=1.29+0.47-0.09

Where:

EFC = Footprint of consumption associated with product or waste.

EFP = Footprint of production associated with product or waste.

EFI = Footprint of imports associated with product or waste.

EFE = Footprint of exports associated with product or waste.

Bio per person = 0.62

Next export EF= -0.37

grazing land, fishing ground, forestland, built-up land, and the uptake land to accommodate the carbon Footprint. (WWF, 2000). Second, Ecological footprint and Bio capacity is determined by two factors: area of biologically productive land or water and the productivity of that area, measured by how much it yields per hectare. In recent years, however, the area of land under cultivation has been increasing rapidly, and humanity is utilizing increasingly large areas of land for single plant species and intensive agriculture-leaving less land undisturbed. (Ewing, Moore, Gold!nger, Oursler, Reed, and Wackernagel, 2010)

On the other hand, the Egyptian Ministry of Environment aims to test the EF tool in measuring environmental performance to assists the local authorities in reviewing whether their strategies and plans are effective in reducing environmental impact or not. Providing a feedback link to decision-making processes in developing is an approach to

Table 1: Egypt Total Footprint by Land use Type, 2007

Country/Region	Population [millions]	Ecological Footprint of Production [gha per person]	Ecological Footprint of Imports [gha per person]	Ecological Footprint of Exports [gha per person]	Ecological Footprint of Consumption [gha per person]	Biocapacity [gha per person]	Net Exports of Ecological Footprint [gha per person]
Egypt	80.06	1.29	0.47	0.09	1.66	0.62	-0.37
	Total Ecological Footprint [gha per person]	Cropland [gha per person]	Grazing Land [gha per person]	Forest Land [gha per person]	Fishing Grounds [gha per person]	Carbon Footprint [gha per person]	Built-up Land [gha per person]
Egypt	1.66	0.63	0.06	0.14	0.05	0.62	0.17
[gha per person]	Total Biocapacity [gha per person]	Cropland [gha per person]	Grazing Land [gha per person]	Forest Land [gha per person]	Fishing Grounds [gha per person]	Built-up Land [gha per person]	
Egypt	0.62	0.43	0.00	0.00	0.02	0.17	
Country/Region	Population	Ecological Footprint	Total Ecological Footprint	Biocapacity	Total Biocapacity		
Egypt	+ 181%	+ 45%	+ 308%	- 31%	+ 92%		

Source (Ewing, Moore, Gold!nger, Oursler, Reed, and Wackernagel, 2010)

implementing EF on communities. (Sallam, 2001) So as to reach sustainability in tourism.

Most countries in Africa have total Footprints of production lower than their bio capacity, indicating that the domestic harvest and emissions quantities are within the bounds of what their ecological resources can provide. However, this is not true of all African countries. Egypt shows the greatest percentage ecological overshoot, with a total Footprint of production twice as large as its bio capacity. Footprint in Egypt is more than 150% larger than bio capacity comparing the Ecological Footprint of consumption with domestic bio capacity. However, the bio capacity in Egypt is between 0-50 % larger than footprint comparing the Ecological Footprint of consumption within each country's boundaries with globally available bio capacity. (Ewing, Moore, Gold!nger, Oursler, Reed, and Wackernagel, 2010, p35/40)

Equivalence Factors

In order to combine the Ecological Footprints or bio capacities of different land use types, a second coefficient is necessary. Equivalence factors convert the areas of different land use types, at their respective world average productivities, into their equivalent areas at global average bio productivity across all land use types. Equivalence factors vary by land use type as well as by year. The rationale behind Equivalence factors' calculation is to weight different land areas in terms of their capacity to produce resources useful for humans. (Ewing, Moore, Gold!nger, Oursler, Reed, and Wackernagel. 2010)

Equivalence factors are used to convert world-average land of a specific type, such as cropland or forest, to global hectares. Global hectares are defined as hectares with world-average biological productivity, or ability to produce useful goods and services for humans (Kitzes et al., 2009).

As such, equivalence factors are currently calculated using suitability indexes from the Global Agro-Ecological Zones model combined with data on the actual areas of cropland, forest land, and grazing land area from FAOSTAT (FAO and IIASA Global Agro- Ecological Zones 2000 FAO Resource STAT Statistical Database 2007). The GAEZ model divides all land globally into five categories, based on calculated potential crop productivity. All land is assigned a quantitative suitability index from among the following (Kitzes et al., 2008; Ewing et al., 2008):

- Very Suitable (VS) – 0.9
- Suitable (S) – 0.7
- Moderately Suitable (MS) – 0.5
- Marginally Suitable (MS) – 0.3
- Not Suitable (NS) – 0.1

The equivalence factor calculation assumes that the most productive land is put to its most productive use. The calculations assume that the most suitable land available will be planted to cropland, the next most suitable land will be under forest, and the least suitable land will be grazing area. The equivalence factor is calculated as the ratio of the average suitability index for a given land type divided by the average suitability index for all land types. (Kitzes, Rizk, Reed and Wackernagel. 2008)

In addition, the Ecological Footprint Atlas 2010 calculated per person Footprint of consumption by land use type, 2007 from these element as Cropland 0.36, Grazing land 0.06, Forest land 0.14, Fishing Grounds 0.05, Carbon Footprint 0.62, Build up land 0.17.(Ewing , Moore, Gold!nger, Oursler, Reed, and Wackernagel. 2010)

According to suitability index, and EF Atlas 2010 the current situation in Egypt, which describes value of cropland is 0.36, forest land is 0.14, and grazing land is 0.06. As a result, Egypt is the most suitable land or very suitable (VS) - 0.9. Hence, total Footprint equal values of cropland + forest land + grazing land + fishing grounds + carbon footprint =1.66. Consequently, Egypt as a destination has natural environment for tourism activities and sustainable tourism.

Finally, Ecological Footprint Standards 2009 require that Footprint studies specify the limitations of the assessment. In particular, the Standards emphasize that the Footprint is not a complete indicator of sustainability, and needs to be accompanied by complimentary indicators. (Ewing , Moore, Gold!nger, Oursler, Reed, and M. Wackernagel. 2010.) and therefore is not sufficient enough to evaluate sustainable tourism.

METHODOLOGY

Due to the innovation of tourism sector, EF is becoming a new approach and new tool to sustainable tourism. Accordingly, the Research aims to 1) define the concept of EF. 2) Understand the role of the EF as a tool towards planning for sustainable tourism. In addition to, the research attempts to answer the following question: 1) to what extent the Ecological Footprint is an important tool for Egypt as a destination 2)To measure the value of EF and bio capacity of Egypt, to reach the main target which is achieving sustainable tourism. By not to exceed the maximum of them. To achieve the objectives of this study, the research methodology depends on conducting a well-structured questionnaire which, was designed and distributed to 35 Egyptian tourism experts as an interview.

The purpose of this qualitative interview research is to document EF usefulness as judged by decision makers. The survey was conducted in April/May/June-2012. Such research requires tapping in people's experiences and conceptions and examining the meanings that they attached

to these experiences. Furthermore, to measure people's support of the tool and perspective on sustainable tourism and test the understanding of the participant toward tourism and EF as a supported tool for sustainability for tourism. A series of questions was developed gradually moves from more general statements to more specific ones.

The interview was simply structured .The questionnaire contained 18 closed ended questions. It was divided into three sections. The first section focused on basic information like a short personal profile of the participant. This profile documented formal educational background, familiarity with sustainability, job responsibility towards sustainable tourism and the familiarity with Ecological Footprint concept. The second part was questions on the utility of Ecological Footprint concept, how it is useful for sustainability. This included the understanding of the interviewer of sustainability and their support for EF tool, Assess the possibility of relying on the concept of the ecological footprint. The final section regards to evaluate how reliable the Ecological Footprint concept is.

cover the dominant perspectives of people who participated in the interview, the study hired a group of decision makers and a range of different scientific Specialization in tourism. A total 35 people for the interview were participant, only five of them were not able to join the interview.

On the other hand, the analysis employed descriptive statistics to provide an excess of information. Frequencies, means and standard of deviation were computed using the Statistical Package of the Social Science (SPSS, Version 16.0). Moreover, T-test paired Sample was considered where it is univariate test of significance. It is used to compare between the sample mean and the respondents answers (Hair, Bush & Ortinau, 2003).

RESULTS AND DISCUSSION

For the purposes of this research, the first section of the interview dealt with the interviewer's awareness of sustainability as a concept and understanding.

Table (2) indicated that all of the samples were familiar with the term sustainability Moreover, the mean was also positive value 1.00 of and the std. error of mean and deviation recorded non-existent because 100% of the respondents recognized sustainability.

Around (86%) of the sample read books or articles about sustainable tourism .This means that the vast majority of participants had a great idea of sustainable tourism as a concept, principals and goals. In addition, around (13.4%) didn't read books or articles.

Furthermore, the previous results discuss that the largest percentage of the sample realized the concept of sustainable tourism and they were familiar with it but they didn't implemented in their community or work.

In order to measure the understanding of sustainability the participants were been asked about Participating in activities towards achieving sustainability in tourism & hospitality. About (23.3%) participated in tourism activities which achieving sustainability in tourism & hospitality with a positive mean value. However (76.7%) of the sample did not participate in any program related to sustainability in tourism and hospitality.

Table (4) referred to the highest percentage of respondents who chose (sometime) and (no) in conflicting ideas of sustainable tourism with work responsibilities, which explains the dispersion in the understanding of sustainable tourism, with a high std. deviation value. However, only 6.7% of the sample realized the meaning of sustainable tourism and the relationship between it and work responsibilities.

Table2: Familiarity with "Sustainability"

Question N1	Frequencies		Total	Mean	Std.Error of Mean	Std. Deviation
	Yes	No				
Familiar with the term "sustainability"	100%	----	100%	1.00	.000	.000

Table 3: Reading Books or Articles About Sustainable Tourism

Question N2	Frequencies		Total	Mean	Std.Error of Mean	Std. Deviation
	Yes	No				
	86.7%	13.4%	100%	1.13	0.063	0.346

Table 4: Participating in Activities Towards Achieving Sustainability in Tourism & Hospitality

Question N3	Frequencies		Total	Mean	Std.Error of Mean	Std. Deviation
	Yes	No				
	23.3%	76.7%	100%	1.77	0.079	0.430

Table 5: Conflict of Sustainable Tourism with Work Responsibilities

Question N4	Frequencies				Total	Mean	Std. Error of Mean	Std. Deviation
	Yes	sometime	rarely	No				
	6.7%	56.7%	6.7%	30%	100%	2.60	0.183	1.003

Furthermore, the previous results discuss that the largest percentage of the sample realized the concept of sustainable tourism and they were familiar with it but they didn't implemented in their community or work.

The second section of the interview dealt with the Ecological footprint's concept, nature consumption, and usefulness.

In an attempt to link the ecological footprint with sustainable tourism, Participants were asked about the Ecological Footprint principles and concept but the highest percentage was no (83.3%). Although all participants have a high educational background, but they didn't hear about ecological footprint principles and concept. Also around 16.7% hear about Ecological footprint and its principles.

Regarding the resource reduction, about (86.7%) of the participants agreed that, industrialized countries need to massively reduce their resource consumption to become sustainable. Therefore, it is obvious that sustainability concept was clearer than ecological footprint.

In order to measure the understanding of ecological footprint, the participants decided that the nature was being overused (63.3%). In addition, they realized the ability of the concept to illustrate systemic effects and connection between human uses of nature's services. The others, were between (Don't know) 13.3% and (no) 23.3%. Clearly, when nature is being overused, this will lead to ecological imbalance.

Table 6: Hearing About the Ecological Footprint Principles and Concept

Question N5	Frequencies		Total	Mean	Std.Error of Mean	Std. Deviation
	Yes	No				
	16.7%	83.3%	100%	1.83	0.069	0.379

Table 7: Industrialized Countries Need to Massively Reduce Their Resource Consumption.

Question N6	Frequencies		Total	Mean	Std.Error of Mean	Std. Deviation
	agree	disagree				
	86.7%	13.3%	100%	1.13	0.063	0.346

Table 8: Nature is Being Overused

Question N 7	Frequencies			Total	Mean	Std.Error of Mean	Std. Deviation
	Yes	Don't know	No				
	63.3%	13.3%	23.3%	100%	1.60	0.156	0.855

Table 9: Maintaining Nature's Capacity to Renew and Reproduce is A Necessary Requirement for Achieving Sustainable Tourism.

Question N8	Frequencies		Total	Mean	Std.Error of Mean	Std. Deviation
	Yes	No				
	70%	30%	100%	1.30	0.085	0.466

Table 10: Usefulness of The Ecological Footprint Concept

Question 9	Frequencies					Total	Mean	St. error of mean	St. deviation
	Very useful	Useful	marginally useful	Not useful	Don't know				
The general public to understand the sustainability dilemmas in tourism	36.7%	36.7%	6.7%	-----	20%	100%	2.30	0.272	1.489
Individuals to reconsider lifestyle or business decisions	26.7%	36.7%	16.7%	-----	20%	100%	2.50	0.262	1.432
Community activists in their sustainability campaigns to make their point more effectively?	33.3%	30%	------	-----	36.7%	100%	2.77	0.324	1.775
Planning departments and municipalities as a planning tool	36.7%	36.7%	------	-----	26.7%	100	2.43	0.298	1.633
Political decision-making as a sustainable tourism indicator	23.3%	43.3%	6.7%		26.7%	100	2.63	0.282	1.542
Students and scholars to generate positive choices for sustainability	20%	60%	-----	6.7%	13.3	100	2.33	0.232	1.269

Table (9) indicated that, about 70% 0f the participants agreed that preserving nature's capacity was a requirement for achieving sustainable tourism. However, 30% of the respondents didn't believe that.

As a result, there is close a relationship between Ecological Footprint and sustainable tourism. However, sustainable tourism as a concept is clear than EF concept and EF as a tool maintaining nature's capacity reduce their resource consumption. In addition national ecological deficits increase liability to the competitive position of national economies, as a result, EF is a tool for national security.

The third section, which evaluate how reliable the Ecological Footprint concept is

In order to measure the usefulness of the Ecological Footprint concept for:

- The public appreciated that the ecological footprint concept was very useful and useful to understand the sustainability (36.7%). On the other hand (20%) of sample did not know and (6.7%) decided that it was marginally useful for the public to understand the sustainability dilemmas.
- The individuals to reconsider lifestyle or business decisions. About (36.7%) of the sample believed, that ecological footprint concept was useful and very useful with the same percent (26.7%) for the individuals to review their lifestyle or business decision. Furthermore, they pointed out that EF tool is only useful for evaluating their lifestyle if they taken into account the concept in the first place.
- Community activists in their sustainability campaigns to make their point more effectively. As regards to help community activities, around (33.3%) of the participants pointed out that it was very useful and the other (30%) saw it useful to make their point more effectively. Despite community's understanding of the ecological footprint concept, however (36.7%) of the sample didn't know. This means that they did not participate in sustainability campaigns for tourism.

There is no doubt that, population growth becomes vicious circle for sustainable tourism. Therefore, in Egypt, the community should change their lifestyle to achieve it.

- Planning departments and municipalities as a planning tool. A percentage of (36.7%) of the sample decided that, it was very useful and the same percentage to useful. Because they understood the importance of the ecological footprint as a tool for planning in departments and municipalities. The other part of the sample did not know (26.7%).
- Political decision-making as a sustainability indicator for tourism. On the political side, found that, around (23.3%), (43.3%) and (6.7%) were very useful, useful and marginally useful of the sample. They decided that, the ecological footprint for Egypt played an important role as a sustainability indicator for political decision – making. EF was an essential indicator for the decision-maker to achieve sustainable tourism. While (26.7%) of the sample did not know.
- Students and scholars to generate positive choices for sustainability. About (20%), (60%) of the sample thought that, ecological footprint concept was useful for the student and scholars to continue sustainability. In addition students and scholars could do research to create opportunities for the community to be a sustainable one. However, (6.7%) believed that, it was not useful and (13.3%) didn't know.

In addition, there are many observations on this table, which were represented in the vast majority of responses that were referring to useful and very useful, all mean values were positive, the values of St. Error of mean and std. Deviation were less than one.

The third section of the interview discussed the evaluation of the reliability of the concept of the ecological footprint, the possibility of becoming a sustainable community, and finally using ecological footprint in the future.

Table (11) indicated that, about (20%) (Absolutely) and (43.3%) (To a large extent) of the sample believed that ecological footprint concept displayed humanity's demands on the nature. Nevertheless, more than a quarter (30%) did not know the relationship between ecological footprint and nature productivity.

Concerning the possibility of becoming a sustainable community, (70%) of the sample agreed that the community could be largely a sustainable one also (16.7%) chose exactly. However, (6.7%) believed that, the community could not sustain ever and the other (6.7%) didn't know.

For changing the view for Sustainable tourism, around (43.3%) thought that, this questionnaire changed their point of view on sustainable tourism. This is a positive result for

Table 11: The Ecological Footprint Concept Demonstrates Humanity's Competing Demands on Nature Productivity.

Question N15	Frequencies					Total	Mean	Std.Error of Mean	Std. Deviation
	Absolutely	To a large extent	barely	Not at all	Don't know				
	20%	43.3%	---	6.7%	30%	100%	2.83	0.292	1.599

Table 12: The Possibility of Becoming A Sustainable Community

Question N16	Frequencies				Total	Mean	Std.Error of Mean	Std. Deviation
	Exactly	Largely	Not at all	Don't know				
	16.7%	70%	6.7%	6.7%	100%	2.17	0.186	1.020

Table 13: Has This Questionnaire Change Perspective on Sustainable Tourism

Question N 17	Frequencies		Total	Mean	Std. Error of Mean	Std. Deviation
	Yes	No				
	43.3%	56.7%	100	1.57	0.092	0.504

Table 14: Using the Ecological Footprint Concept During the Next Year

Question N 18	Frequencies			Total	Mean	Std.Error of Mean	Std. Deviation
	Yes	No	Don't know				
	33.3%	6.7%	60%	100	2.27	0.172	0.944

Table (15) T-test

		N	correlation	sig
Pair1	Question5 Question 9	30	0.397	0.030
Pair2	Question11 Question 16	30	0.537	0.002

Table 16: T-test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% confidence Interval of the Difference				
				Lower	Upper			
Pair1 Question5 Question 9	-.467-	1.383	.252	-.983-	.050	-1.848-	29	.075
Pair2 question11 Question 16	.600	1.499	.274	.040	1.160	2.192	29	.037

the research. However, (56.7%) of the sample did not think so.

Regarding, the use of ecological footprint during the next year. Around 33.3% of the respondents would use the concept in the next year. Nevertheless, a small segment of society would not use the concept (6.7%). However, the vast majority of the respondents did not know (60%).

In order to examine T –Test paired sample in table (16) between:-

- Questions (5) & (9) people in the sample which hearing about the Ecological Footprint/ usefulness of EC for the public to understand the sustainability dilemmas for tourism. The value of t is (-1.848-) and its (2-tailed) significance was (0.075). The result was consistent with the null hypothesis (.075 was much higher than 0.05). Therefore, the difference between the two levels was not significant.
- Questions (11) & (16) Community activists in their sustainability campaigns to make their point more effectively/ The possibility of becoming a sustainable community. The value of t 2.192and its (2-tailed) significance was (0 .037). The result was hypothesis (0.037) was below (0.05). Thus, the difference between the two levels was significant.

T –Test paired sample table (18) between:-

- Questions (14) & (15) the relationship between students and scholars to generate positive choices for sustainability/ The Ecological Footprint concept demonstrates humanity's competing demands on nature productivity. The value of t (-1.559-) and its (2-tailed) significance was (0 .130). The result was hypothesis (0.130) was above (0.05). Subsequently, the difference between the two levels was not significant.
- Questions (13) & (16) Political decision-making as a sustainability indicator / the possibility of becoming a sustainable community. The value of t (2.138) and its (2-tailed) significance was (0 .041). The result was hypothesis (0.041) below (0.05). Accordingly, the difference between the two levels was significant.

CONCLUSION AND IMPLICATION

There is close relationship between Ecological footprint and sustainable tourism. Ecological footprint is a tool and indicator for sustainability in tourism activities. It supports the flow of resources and ecological sustainability. As controlled Ecological footprint leads to environmental sustainability. In an increasingly resource constrained world, accurate and effective resource accounting tools are needed

Table 17: Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Question14 & Question15	30	.266	.155
Pair 2	Question 13 & Question 16	30	.632	.000

Table 18: Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Question 14 - Question15	-.500-	1.757	.321	-1.156-	.156	-1.559-	29	.130
Pair 2	Question 13 - Question 16	.467	1.196	.218	.020	.913	2.138	29	.041

if nations, cities and companies want to stay competitive. The Ecological Footprint is one such resource accounting tool, designed to follow human demand on the regenerative and absorptive capacity of the biosphere. (Ewing, Reed, Galli, Kitzes, and Wackernagel, 2010). Tourism demand is a part of the human demand on environmental resources to achieve sustainable tourism.

As a result, the Egyptian Ecological footprint exceeded the limit of bio capacity, which documented in Atlas 2010. Although the ecological footprint tool for sustainable tourism but it is not being used properly. Moreover, the strategy of EF is not adopted from the responsible authorities in Egypt. What confirms this that, the part of the sample, which did not hear about the concept of EF, and the other part, which did not use it, although they are in responsibility for the environment and sustainable tourism development.

Moreover, Footprint is not a complete indicator of sustainability, and needs more complimentary indicators. Therefore, is not sufficient enough to evaluate sustainable tourism.

This study recommends that there is a need to measure and control the EF so as not to exceed the rate of bio capacity in the environment and to achieve sustainability. Therefore, ecological footprint is a valuable tool for sustainability, but it has not received enough attention until now due to the lack of available information for calculation. Considering that, there are other tools for measuring sustainable tourism should take into consideration.

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