The Tourism Industry Orienteering Towards the Achievement of SDGs at the Country Level

Tiziana Crovella[1], Buhyan Miraj Ahmed[2], Vincenzo Campobasso[1], Teodoro Gallucci[1], Annarita Paiano[1, *]

[1]Department of Economic, Management and Business Law, University of Bari Aldo Moro, Bari, Italy

[2]School of Economics, Guangdong University of Finance and Economics, Guangzhou, China

Email address:

tiziana.crovella@uniba.it (Tiziana Crovella), ahmed.miraz@qq.com (Buhyan Miraj Ahmed),
vincenzo.campobasso@uniba.it (Vincenzo Campobasso), teodoro.gallucci@uniba.it (Teodoro Gallucci),
annarita.paiano@uniba.it (Annarita Paiano)

[*]Corresponding author

Abstract: The 17 Sustainable Development Goals (SDGs) have been developed by UN in 2015 with the aim to achieve a sustainable balance by 2030. Among these, 8 and 12 SDGs contain several indicators to analyze the level of sustainability implementation in tourism sector. Particularly, this industry has experienced a steady growth in demand, yet causing environmental and social impacts. For this reason, this study aims to assess at country level three standard frameworks (Tourism Satellite Accounts – TSA, System of Environmental-Economic Accounting – SEEA and Tourism Gross Domestic Product – TGDP) involved in 8 and 12 SDGs. Particularly, the methodology, based on Goal Question Metric (GQM) approach, consisted into a general goal, four research questions and six metrics for evaluating the sustainability implementation at country level and the investigation period was 2016-2019 and it referred to 156 world countries. Moreover, through TGDP per country, according to 8.9.1 indicator, and TSA and SEEA, according to 12.b.1 indicator, the authors analyze the level of sustainability achieved at country level. The results showed that tourism industry was receiving particular attention from countries, but there is a need for greater awareness at the country level to disclose the instruments implemented and the levels of sustainability achieved.

Keywords: Sustainable Tourism, Sustainable Development Goals, Goal Question Metric Approach, Tourism Gross Domestic Product, Tourism Satellite Accounts, Economic and Environmental Accounting System

1. Introduction

Nowadays, achieving sustainable development is among the most pressing challenges facing humanity. Among the different sectors of economy, sustainable tourism is emerging recently [1, 2]. This kind of tourism concerns achievement of economic goals, environmental and social assessment with the aim of mitigating environmental, social and economic impacts [3] and plays a strategic role in achieving the Sustainable Development Goals (SDGs) of 2030 Agenda [4].

Economically, the global tourism industry, accounting for 10% of GDP and 10% of employment, is a driving force for economic, social development, and cultural heritage protection [5], sometimes contributing to sustainable development through economic redistribution. Conversely, environmentally, tourism generates significant adverse effects like environmental pollution, increased demand for fossil fuels, and energy intensity [6]. Consequently, given the economic, environmental and social significance of tourism and its growth, unsurprisingly that UN considered this industry in 2030 Agenda, the global reference framework based on the SDGs under resolution 70/1 [7]. The aims of the SDGs are to measure progress globally towards achieving long-term sustainable and inclusive development, balancing economic, social, and environmental sustainability, and focusing on inclusivity, shared prosperity, and shared

responsibility [8]. Within this global agreement signed by 193 countries of the UN, that contains 17 goals, 169 targets and 230 indicators, the authors identified two goals, 8 and 12, allowing to assess the sustainability of the tourism industry.

Notably, 8 SDG titled "Decent work and economic growth" aims to promote sustainable and inclusive economic growth and work [8]. This goal is oriented towards developing and implementing policies for a sustainable tourism creating jobs and promoting local culture and products. Instead, 12 SDG titled "Responsible consumption and production", aims to undertake a sustainable consumption and production, focusing on practices that accelerate towards sustainability [8].

Particularly, goal 8 contains 8.9 target, whose aim is to measure the level of elaboration and implementation of the countries policies that promote sustainable tourism, create jobs respecting local culture and products.

Whereas, goal 12 also includes target 12.b, whose indicators allow for the identification of the development and implementation tools of monitoring the impacts of development for sustainable tourism.

Specifically, the authors presented an innovative assessment based on GQM approach, usually built for ICT and the software metric analysis, on tourism and sustainability through the use of SDGs indicators and the most commonly statistical standard such as TSA, SEEA, TGDP (as percentage of GDP).

This paper is organized as follows. In Section 2, literature review and relevant information on theoretical framework was introduced; in Section 3, study design, including the purposes, research questions and research protocol adopted were provided; then, in Section 4, results and discussion based on deduction elements were presented. Finally, the conclusions describe future research and address the threats/opportunities of this study.

2. Literature Review

2.1. State of the Art

The concept of sustainable development of tourism has been discusses considering it as a human activity. It has most commonly measured using sustainable development indicators [9]. Furthermore, it has been underlined that the increase in disposable income in developing countries leads to a remarkable growth of tourism despite the global hardships and crises affecting these countries [10].

Indeed, tourism contributes significantly to global economic growth, although it has some negative aspects related to environmental, economic, and socio-cultural elements [11].

Since 2015, year of publication 2030 of Agenda, there are only three studies in the existing literature that have used 8.9.1 and 12.b.1 indicators to estimate country capacity to implement SDGs and demonstrate how they are achieving those goals. Zhao et al. [12] highlighted that in China tourism had contributed to promoting economic growth (SDG

indicator 8.9.1) by increasing TGDP from 1.9% to 7.1% (1996-2006). Conversely, the Ministries of Finance, Sustainable Development and Tourism of Montenegro introduced 8.9.1 indicator only in 2019 [13]. These two publications used a local observation scale, instead the effects of microplastic in marine environment have been analyzed through SDGs at global level. Moreover, a recent study by Arzoumanidis et al. [14] underlined that UN some of the SDGs make specific reference to the design and implementation of policies for the promotion of sustainable development, such as 8.9, and the implementation of tools for monitoring sustainability impacts such as 12, both at country level.

Notwithstanding, the sustainability in tourism issue has been assessed mostly at destination level, for touristic site, rather than at country level.

2.2. Sustainable Tourism at Global Level

Globally, the interest in an innovative tourism industry, that promoting a responsible, sustainable and accessible tourism for inclusive growth, has been confirmed by recent studies by Azivov [15]. However, a few years after the UN 2030 Agenda, it emerged that the tourism sector was responsible for more than 10% of the world's economic growth and, despite this data, there are no easily applicable sustainable management criteria to contribute upon reaching SDGs [16].

Another study developed at national level reports conclusions consistent with the theoretical foundations on economic growth: on the one hand, it confirms the negative effect on population and well-being, and on the other, reveals a positive impact of technological improvement on the prospect of green growth, particularly in the tourism sector [17].

2.3. Sustainable Tourism at Country Level

In a past study it emerged that the expansion of tourism creates pressures and a much higher environmental cost than the benefits for companies and host destinations. The relationship between tourism and environmental sustainability is not one-way: the expansion of tourism resulted in an environmental degradation of the destination [18]. Other authors have highlighted, at country level, the lack of a univocal approach to assess the impact of the development and innovation in tourism sector in terms of sustainability objectives [15]. Specifically, among developed areas, Europe is the most important tourism market that enjoys a rich tradition and unique cultural diversity that attracts around 41% of international tourism revenues and ranks first in terms of TGDP. Despite everything, tourism is not yet a priority goal at European Level in terms of sustainability [19]. Conversely, the reduction of global greenhouse gas emissions in emerging economies such as Vietnam will depend heavily on roadmap development and directed policies [20]. Therefore, one of the missions of the SDGs is to support the economic, social, and sustainable growth of non-perfectly balanced regions to reduce the

economic and social disparities which also affect tourism [21].

2.4. Sustainable Tourism in the Economic, Social and Environmental Indicators

Tourism is a phenomenon studied for many years by scholars: there are some studies [18, 22, 23] that focused on the observation scales (global, national or by destination) and others [24-26] analyzed economic, social and environmental aspects. Particularly, the relationship retrieved in past studies [17] highlighted that the population interacts with wealth and technology to determine society's environmental impact. Therefore, it is significant to involve decision problems in a multi-criteria analysis using a goal planning model that considers all variables (such as the Goal Question Metric approach), even those not strictly linked to sustainability. In particular, tourism development must simultaneously consider economic, social and environmental objectives [27]. For this reason, Sun and Highan proposed a comprehensive environmental assessment system based on carbon generated by and in terms of carbon footprint, economic impact of carbon and progress in decarbonization [28].

Moreover, it must be noted as many authors investigated the contribution of the potential variation factor of GDP. Furthermore, it should be noted that many authors investigated the contribution of the potential change factor of GDP rather than of the TGDP [29].

Also, it should not be forgotten that in any case the sustainable development of tourism is commonly measurable using sustainable development indicators [9]. However, starting from the indicators of the SDGs, State et al. used the Delphi method to analyze the role of tourism applying a level of analysis based on a framework [30]. Notably, State et al identified a group of nine countries (Russia, China, Mexico, Brazil, India, Indonesia, Argentina, Turkey, and Saudi Arabia) to analyze as the trend of GDP at current prices affects the SDGs achievement in general, without focus the TGDP stated in the SDG 8 [30].

On this basis and following the past literature, this analysis focuses on SDGs 8 and 12. Particularly, the paper focuses on the indicators 8.9.1 and 12.b.1 as empirical elements to assess the level of sustainable tourism achieved at country level by conducting a critical analysis and verifying the relationship with economic development. In particular, the authors expect to display the current situation, challenges and opportunities of using the indicators associated with SDGs for researchers and professionals from the public and private sector in the field of sustainable tourism. To this purpose, this study is replicable for the methodology and provides a comprehensive analysis to understand and describe the level of sustainability in tourism achieved, at the country level.

This analysis has carried out at country level according to the 2030 Agenda Goals. In fact, UN promoted sustainable tourism, worried about the scarcity of water resources, avoided desertification, drought and prevented environmental disasters at country level [7]. Therefore, the paper analyzes the implementation level of sustainability tools in the tourism sector at the country level using economic, environmental and touristic standard involved in the Sustainability Development Goals (UN SDGs). Particularly, the Tourism Satellite Account (TSA) and the Economic and Environmental Accounts System (SEEA) are the main statistical standards identify for measuring awareness of sustainability in countries: TSA is an international statistical standard used to measure the economic growth of tourism at country level [31, 32]; SEEA is an integrated framework of economic and environmental data which provides an overall view of the interactions between the economy and the environment designed by UN Secretariat [33, 34].

The methodology used was the Goal Question Metric (GQM) approach theorized by Basili et al. which allows to assess, through two indicators (8.9.1 and 12.b.1) declared within of SDGs 8 and 12, the level of the adoption of sustainability tools [35].

This paper combines secondary data collection from TSA and SEEA, deductive reasoning based on GQM and critical analysis. Particularly, this paper provides new methodological insights because GQM approach has used for the first time for analyzing the sustainability in tourism, through SDGs. Particularly, GQM, a software metrics approach, has been promoted for the analysis in Information Communication Technology (ICT) and not for management application. Moreover, as indicated in Scopus platform "Document Search", there aren't study in this field (using "Goal Question Metric Methodology AND SDG AND tourism").

3. Methodology

In this section the authors described, in the first stage, the theoretical framework of sustainable tourism and derived the research questions from literature review. Moreover, at the end of this section the authors presented the GQM approach used in Figure 1. Subsequently, the authors declared the indicators and accounts used such as TGDP and SEEA.

3.1. Theoretical Framework and Research Questions

Considering that general goal of this study concerns the assessment of the level of sustainable tourism awareness at country level, the authors used a research method (Figure 1) based on a Goal Question Metric (GQM) approach, theorized by Basili et al., for built the sub goals of the analysis [35]. This GQM defines a measurement model on three levels:

a) Conceptual level (the general goal),

b) Operational level (the several questions that consist of in a set of questions is used to define the models of the object of study and what it must focus on in order to achieve a specific objective,

c) Quantitative level (metrics) that represents a set of model-based metrics is associated with each question with the intent to answer in a measured way [35].

Particularly, the use of GQM method for an analysis that deals with sustainability in tourism represents a term of originality of this paper because this kind of methodology

born with the aim to test some hypotheses with software in ICT using a logical method.

Moreover, considering the past literature, in GQM the target can be declared an it includes general goal and sub goals [36]. General goal ensures the influencing factors analysis of sustainable tourism and some sub goals, according to the general goal, descript the relationship among factors of influence.

In order to achieve the general goal, the authors derived the following research questions according to the existing literature.

Particularly, rejecting more partial approaches of analysis that consider the focus at the tourist destination level, Pulido-Fernández et al. envisaged an empirical study with the aim of establishing whether environmental sustainability affects the growth of tourism using a country-level analysis also following the Crompton methodology [18, 37]. Starting from this past approach, the authors declared the firs research question (RQ1).

RQ1: What is the level of implementation of indicators 8.9.1 and 12.b.1 at country level in order to declare the implementation of sustainable tourism?

Furthermore, there are important links between sustainable tourism development and economic development policies. However, analyzing the multiple and integrated influences on economic activities, such as tourism, requires holistic approaches to development and policy implementation to understand overall sustainability [38, 39]. Starting from the above literature, the authors decided to analyze the possible link between economic development and tourism modelling the second research question (RQ2).

RQ2: What is the linkage among economic development and sustainable tourism starting from the two SDGs indicators involved in the research?

However, as Balas and Abson highlighted in their past study, in the sustainability assessments of tourism, the indicators are not linked to sustainability objectives such as SDGs, and also the involvement of stakeholders is not widely implemented in the selection processes of the indicators themselves [40]. This non-use of standardized indicators leads to the impossibility of comparing the results. Then, starting from this assumption, the authors built the third research question (RQ3) with the aims to know the reason of these indicators non-implementation.

RQ3: What are reasons for the non-implementation of TSA and SEEA the country level?

Finally, considering another study by [41] Kuc-Czarnecka et al. in which they tested the interaction among SDGs indicators [41], the authors prepared the fourth research question (RQ4) for this paper with the aim to examine the interactions between two SDGs.

RQ4: What is relationship between SDGs 8 and 12?
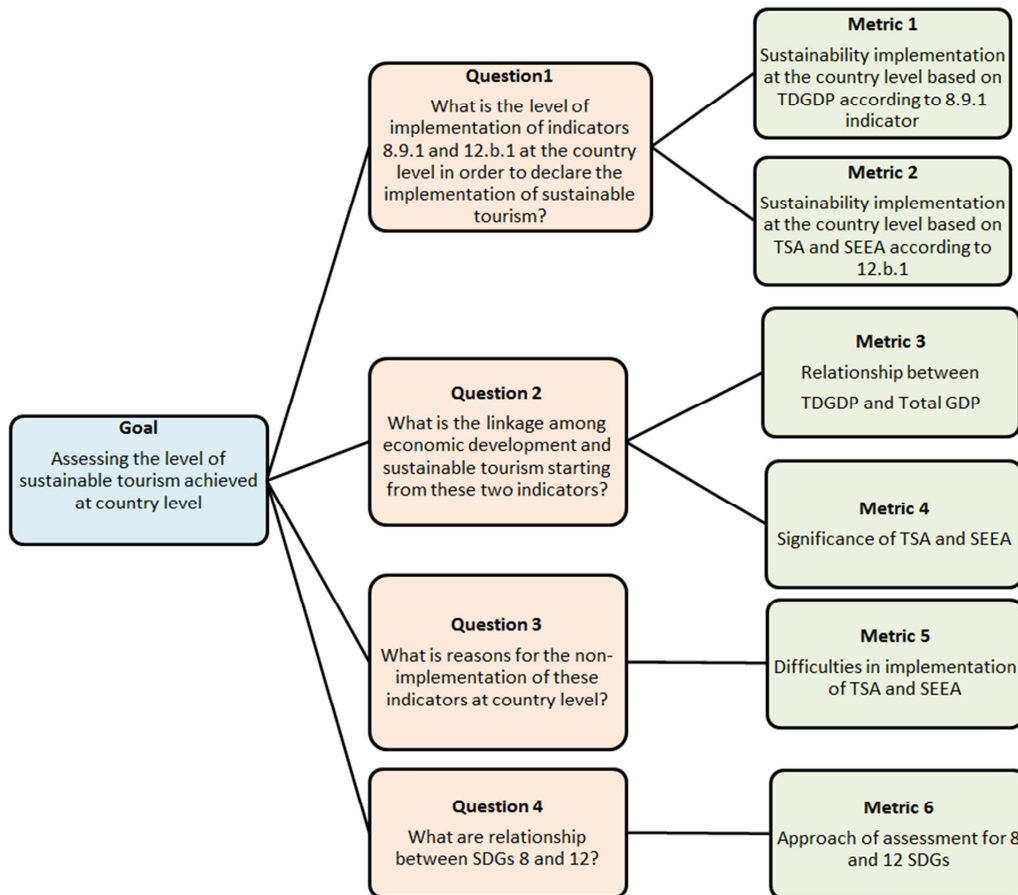
Source: Authors' elaboration.

Figure 1. *GQM Methodology diagram.*

3.2. Indicators and Tourism Accounts Involved

Afterwards declaring the general goal and the sub goals according to the GQM method, the authors included the metrics that represent the quantitative level. In this phase, a set of model-based metrics is associated with each question with the aim to address the relative issues. Particularly, considering that UN developed several indicators for SDGs, the authors focused on:

(1) indicator 8.9.1 based on TGDP as a percentage of total GDP. This indicator, contained in Target 8.9 for SDG 8, aims to promote sustainable tourism policies, new jobs and awareness of local culture and products. This represents metric 1;

(2) indicator 12.b.1 based on TSA and SEEA. This indicator, contained in 12 SDG, aims to implement standard accounting tools for monitoring the economic and environmental sustainability of tourism at country level [42]. This represents the metric 2.

In this study, the authors used several indicators, table and accounts with the aim to address the RQs. Particularly, the indicators/statistical framework used are:

1) TGDP (also known as Tourism Direct Gross Domestic Product);

2) GDP, considering that TGDP is a percentage of GDP, used only as a term of comparison so it does not represent a main element of the analysis;

3) national economic account is the Economic and Environmental Accounting System, (SEEA);

4) standard account tools (TSA).

3.2.1. Tourism Gross Domestic Product (TGDP)

Starting from the per capita GDP that was chosen as an essential factor that directly affects the density of national wealth and, in turn, some authors [21] declared that it is influenced by tourist activity. Mainly, this indicator represents the percentage of gross value added generated by industries for domestic tourism including taxes and levies. This indicator is based on the TSA adopted by the UN Statistical Commission and developed by UNWTO, OECD, and EUROSTAT. Conversely, the general GDP is the leading percentage measure of national production and represents the total value of products and services within the production perimeter of the System of National Accounts (SNA) [43]. The methodology for calculating TGDP agrees with the TSA according to the recommended Methodological Framework (TSA: RMF) in 2008 [44].

$$\text{Here, TGDP, as a proportion of total GDP (in \%), is calculated by } (tgdp/gdp) \times 100 \qquad (1)$$

$$\text{TGDP in growth rate is also calculated by } [(tgdp\_t/(tgdp\_{(t-1)}))-1] \times 100 \qquad (2)$$

These equations (1) and (2) describes the metric 3 as relationship between GDP and TGDP.

3.2.2. Economic and Environmental Accounting System

The 12.b.1 SDG indicator also covers the implementation of standards for measuring the environmental aspects of tourism. In particular, UNWTO developed 12.b.1 - Serie indicator SEEA with the aim of quantifying the information that each country must report under a single value. The SEEA accounts analyzed are water and energy flows, greenhouse gas emissions and solid waste accounts, as these accounts are mentioned explicitly in the Measuring Sustainability of Tourism (MST) statistical framework. Hence, the authors made observations for indicator 12.b.1, concerning the implementation of standard accounting tools to monitor tourism's economic and environmental aspects by world countries in the period 2016-2019 [45]. The queries system regarded data from the TSA tables and SEEA.

Particularly, scores from 0 to 7 were given to the economic aspect of tourism sustainability, where 0 corresponds to no implementation and 1 to 7 to the kind of TSA adopted. Regarding the environmental issue of tourism sustainability, scores are in the range 0-4, where four indicate that all SEEA accounts considered and mentioned above are filled in for the reporting year [45]. Through TSA and SEEA data observations the authors address the metric 4. Moreover, the metrics 5 concerns the barriers in implementation of TSA and SEEA.

3.2.3. Standard Accounting Tools

Through the data that describes the degree of implementation in the countries, the TSA tables and the SEEA respond to these metrics (from 3 to 5).

3.3. Dataset

Concerning the TSA can be seen, as UNWTO indicated, as a set of several kinds of summary tables [46]:

1) Summary Table 1 on inbound tourism expenditure,
2) Summary Table 2 on domestic tourism expenditure,
3) Summary Table 3 on outbound tourism expenditure,
4) Summary Table 4 on internal tourism expenditure,
5) Summary Table 5 on production accounts of tourism industries,
6) Summary Table 6 on internal supply and tourism consumption,
7) Summary Table 7 on work in tourism industries.

Conversely, in terms of SEEA, that describe the show the preparedness of countries to implement tools to monitor sustainable development impacts in sustainable tourism, UNWTO (2023) indicates four table accounts:

1) SEEA Table 1 water flows,
2) SEEA Table 2 energy flows,
3) SEEA Table 3 GHG emissions,
4) SEEA Table 4 solid waste [47].

Moreover, concerning TGDPs data, the total number covered only 26 countries from 2008 to 2019, whereas data of the other countries are due. As underlined by UNSTATS [48]

the different countries already are working to implement TSA in their policies and, probably, data on the suggested indicators could become available in the future. Particularly, as indicated in OECD platform [49] the most countries that declared the TGDO are concentrated in Europe and the last update was in 2019 (Croatia, Slovenia, Czech Republic, Luxembourg, Slovak, Romania, Austria, Norway, France, Spain). Furthermore, the novelty of this study consists in the observation, through 8.9.1 and 12.b.1 indicators and a mixed method based on GQM, of the level of sustainability of tourism at country level and the relationship with the other economic indicators (such as GDP and TGDP). Therefore, the authors carried out this study using TGDP, TSA and SEEA, to fill the gap due to lack of scientific studies based on GQM that have dealt with UN SDGs indicators among which 8.9.1 and 12.b.1. In practical/scientific implication, the authors provided some observations on the level of sustainability of tourism achieved at the country level, on the relationship with others economic indicators and on methodology based on GQM.

4. Results

This study presented an original, empirical and methodological note based on GQM, a metric software approach, with the aim to analyze the link between tourism and sustainable development (this is the general goal on GQM) investigating the effects of tourism of countries using the GQM methods. This kind of study observed the achievement of some objectives included in 2030 Agenda, starting from four research questions and six metrics.

In this section the authors presented the main findings achieved in this analysis. Firstly, the authors recognized 1,248 observations (156 countries in 8 columns in Table 1) for Indicator 12.b.1, concerning the period 2016-2019 [45]. A first limitation concerns data observed: on OECD platform the latest uploaded data are from 2019.

Particularly, table 1 shows the different accounting models adopted by 156 world countries observed. In the first four columns titled "account TSA", the authors collected data in terms of implementation tools to monitor the economic aspects of tourism sustainability, over four years (from 2016 to 2019). The information inserted in this TSA columns are numbers from 0 to 7: particularly, the number from 1 to 7 indicate the Accounting Tables implemented and 0 none table implemented by countries.

In the second four columns titled "account SEEA" the authors collected data in terms of implementation tools to monitor the economic aspects of tourism sustainability, over four years (from 2016 to 2019). The information inserted in this SEEA columns are numbers from 0 to 4: particularly, the number from 1 to 4 indicate the Accounting Summary Tables implemented and 0 none table implemented by countries.

Table 1. Accounting tools (TSA and SEEA) implemented in different countries of the world.

Geographical area	ACCOUNT TSA				ACCOUNT SEEA			
	2016	2017	2018	2019	2016	2017	2018	2019
Albania	0	0	0	0	0	0	0	0
Algeria	0	0	0	0	0	0	0	0
Andorra	0	0	0	0	0	0	0	0
Anguilla	0	0	0	0	0	0	0	0
Antigua and Barbuda	1	1	1	1	0	0	0	0
Argentina	6	6	6	6	1	1	1	1
Armenia	0	0	0	0	0	0	0	0
Australia	7	7	7	7	4	4	3	3
Austria	6	6	6	0	2	2	1	0
Bahamas	0	0	0	-	0	0	0	-
Bahrain	0	7	7	0	0	0	0	0
Bangladesh	0	0	0	0	0	0	0	0
Belarus	7	0	7	0	1	1	1	1
Belgium	6	0	0	0	2	2	2	0
Belize	0	0	0	0	0	0	0	0
Bermuda	7	7	7	7	0	0	0	0
Bhutan	0	0	0	3	0	0	0	0
Bolivia (Plurinational State of)	0	0	0	-	0	0	0	-
Bonaire, Sint Eustatius and Saba	0	0	0	0	0	0	0	0
Bosnia and Herzegovina	0	0	0	0	0	0	0	0
Botswana	7	0	0	0	0	0	0	0
Brazil	3	3	3	3	1	1	0	0
British Virgin Islands	0	0	0	0	0	0	0	0
Brunei Darussalam	7	0	0	-	0	0	0	-
Bulgaria	4	4	0	0	2	2	2	0
Cabo Verde	0	0	0	0	0	0	0	0
Cambodia	0	0	0	-	0	0	0	-
Cameroon	0	0	0	0	0	0	0	0
Canada	7	7	7	7	2	2	0	0
Cayman Islands	0	0	0	0	0	0	0	0
Central African Republic	0	0	0	0	0	0	0	0
Chile	5	5	5	5	0	0	0	0

Geographical area	ACCOUNT TSA				ACCOUNT SEEA			
	2016	2017	2018	2019	2016	2017	2018	2019
China	0	0	0	0	0	0	0	0
China, Hong Kong	5	5	5	2	1	1	1	1
China, Macao	4	4	0	-	0	0	0	-
Colombia	7	7	7	7	4	4	3	0
Costa Rica	7	7	0	0	2	2	0	0
Côte d'Ivoire	0	0	0	0	0	0	0	0
Croatia	6	0	0	0	4	4	4	3
Cyprus	0	0	0	0	2	2	2	0
Czechia	7	7	7	7	2	2	2	0
Denmark	7	7	7	0	4	4	3	1
Dominica	0	0	0	0	0	0	0	0
Dominican Republic	0	0	0	0	0	0	0	0
Ecuador	7	0	0	0	0	0	0	0
Egypt	0	0	0	0	0	0	0	0
El Salvador	5	5	5	5	0	0	0	0
Estonia	0	0	0	0	2	2	2	0
Eswatini	0	0	0	0	0	0	0	0
Ethiopia	0	0	0	0	0	0	0	0
Fiji	0	0	0	0	3	3	3	3
Finland	5	5	5	0	2	2	2	0
France	3	3	3	0	4	3	1	0
French Guiana	0	0	0	0	0	0	0	0
French Polynesia	0	0	0	0	0	0	0	0
Gambia	0	0	0	0	0	0	0	0
Georgia	0	0	0	0	0	0	0	0
Germany	0	0	0	0	3	2	2	0
Ghana	0	0	0	0	0	0	0	0
Greece	0	0	0	0	1	2	0	0
Guam	7	0	0	0	0	0	0	0
Guatemala	0	0	0	0	4	4	4	-
Guinea	0	0	0	0	0	0	0	0
Honduras	6	6	6	-	0	0	0	-
Hungary	7	7	0	0	2	2	2	0
Iceland	5	5	5	3	2	2	2	0
India	0	0	0	0	0	0	0	0
Indonesia	6	6	6	6	2	2	2	0
Iran (Islamic Republic of)	0	0	0	0	0	0	0	0
Iraq	0	0	0	0	0	0	0	0
Ireland	0	0	0	0	2	2	2	0
Israel	5	5	5	0	0	1	0	0
Italy	0	7	0	0	2	2	0	0
Jamaica	4	4	4	0	0	0	0	0
Japan	7	7	7	0	0	0	0	0
Jordan	7	0	0	0	0	0	0	0
Kazakhstan	7	7	7	0	2	2	2	0
Kyrgyzstan	0	0	0	0	0	0	0	0
Lao People's Democratic Republic	2	2	2	2	0	0	0	0
Latvia	5	5	0	0	2	2	2	2
Lebanon	0	0	0	0	0	0	0	0
Lesotho	0	0	0	0	0	0	0	0
Libya	0	0	0	0	0	0	0	0
Liechtenstein	0	0	0	0	0	0	0	0
Lithuania	7	7	7	0	2	2	0	0
Luxembourg	7	0	0	0	3	3	3	0
Madagascar	0	0	0	0	0	0	0	0
Malawi	0	0	0	0	0	0	0	0
Malaysia	7	7	7	7	0	0	0	0
Maldives	1	1	1	-	0	0	0	-
Mali	0	0	0	0	0	0	0	0
Malta	0	0	0	0	2	2	2	0
Martinique	1	1	1	1	0	0	0	0
Mauritius	0	7	0	0	0	0	0	0
Mexico	7	7	7	7	3	3	3	3
Micronesia	0	0	0	0	0	0	0	0
Monaco	0	0	0	0	4	4	4	3
Mongolia	0	0	0	0	1	0	0	0

Geographical area	ACCOUNT TSA				ACCOUNT SEEA			
	2016	2017	2018	2019	2016	2017	2018	2019
Montenegro	0	0	0	0	0	0	0	0
Montserrat	0	0	0	0	0	0	0	0
Morocco	6	6	6	6	0	0	0	0
Mozambique	6	6	6	6	0	0	0	0
Myanmar	1	1	1	1	0	0	0	0
Namibia	2	2	0	0	0	0	0	0
Nepal	0	0	0	0	0	0	0	0
Netherlands	5	5	5	5	4	4	4	1
New Caledonia	0	0	0	0	0	0	0	0
New Zealand	6	6	6	4	1	1	1	0
Niger	0	0	0	0	0	0	0	0
Nigeria	0	0	0	-	0	0	0	-
North Macedonia	0	0	0	-	0	0	0	-
Norway	6	6	6	0	2	2	2	2
Oman	6	6	6	6	0	0	0	0
Pakistan	0	0	0	0	0	0	0	0
Palau	2	2	2	-	2	0	0	-
Panama	0	0	0	0	0	0	0	0
Paraguay	0	0	0	0	0	0	0	0
Peru	0	0	0	0	0	0	0	0
Philippines	7	7	7	7	1	1	1	1
Poland	0	0	0	0	4	2	3	0
Portugal	7	7	2	0	2	2	2	0
Puerto Rico	7	7	7	6	0	0	0	0
Qatar	7	7	7	0	0	0	0	0
Republic of Korea	0	0	0	0	0	0	0	0
Republic of Moldova	0	0	0	0	0	0	0	0
Réunion	0	0	0	0	0	0	0	0
Romania	7	7	0	0	2	2	1	0
Russian Federation	0	0	0	0	2	2	1	0
Samoa	0	0	0	0	2	1	0	0
Sao Tome and Principe	0	0	0	0	0	0	0	0
Saudi Arabia	0	0	0	0	0	0	0	0
Serbia	0	0	0	0	1	1	1	0
Sierra Leone	3	0	0	0	4	4	4	4
Singapore	0	0	0	0	0	0	0	0
Sint Maarten (Dutch part)	0	0	0	0	0	0	0	0
Slovakia	7	7	0	0	2	2	2	0
Slovenia	0	7	0	0	2	2	2	0
South Africa	7	7	7	0	2	1	0	0
Spain	7	4	4	0	3	3	3	1
Sri Lanka	0	0	0	-	0	0	0	-
State of Palestine	4	4	4	0	0	0	0	0
Sweden	5	6	6	6	2	2	2	1
Switzerland	0	0	0	0	2	2	2	0
Syrian Arab Republic	0	0	0	0	0	0	0	0
Thailand	7	7	7	7	0	0	0	0
Togo	0	0	0	0	0	4	0	4
Turkey	0	0	0	0	2	2	2	0
Uganda	7	0	0	0	0	0	0	0
Ukraine	0	0	0	0	0	0	0	0
United Arab Emirates	0	0	0	0	0	0	0	0
United Kingdom and Northern Ireland	7	7	0	0	2	2	2	0
United States of America	7	7	7	0	0	0	0	0
Uruguay	5	5	5	5	0	0	0	0
Uzbekistan	3	3	3	3	0	0	0	0
Vanuatu	0	0	0	0	0	0	0	0
Vietnam	5	5	5	5	0	0	0	0

Source: Authors' elaboration on data UNSTATS (2022) [45].
*nature of data: Country data, reporting type: Global

Hence, through the Account TSA columns, the authors evaluated the kind of TSA considered by a single country in Table 1. However, in 2019, 78% of 156 countries analyzed that haven't communicated the TSA adoption, and 89% of these haven't considered information for the SEEA (metric 5).

The reasons, which represent the metric 5, may also be linked to a non-homogenization between the statistics

collected at the country level and the compilation of surveys for the UN, as well as a non-implementation of the tools [47, 50]. These reasons can be the possible difficulty of implementing the TSA and SEEA at national level, the difficulty of collecting data and sharing it.

The most common TSA implemented is employment in tourism industries. The countries that consider this indicator are Australia, Belarus, Bermuda, Botswana, Brunei Darussalam, Canada, Colombia, Costa Rica, Czechia, Denmark, Ecuador, Guam, Hungary, Japan, Jordanian, Lithuania, Kazakhstan, Malaysia, Luxembourg, Philippines, Portugal, Puerto Rico, Qatar, Romania, Slovakia, South Africa, Spain, Thailand, Uganda, United Kingdom, and the USA.

Furthermore, in terms of the SEEA, these others four columns (Table 1) provided an evaluation of equal water flows (Summary Table 1), energy flows (Summary Table 2), GHG emissions (Summary Table 3), and solid waste (Summary Table 4). This analysis highlights that few tools are implemented to assess the impacts on tourism in terms of water consumption, energy, GHG emissions, and solid waste produced.

It is pointed out that not all countries with TSA also have SEEA too because awareness of environmental impacts is lower than that of economic accounting. Generally, in most cases, the countries confirmed the same TSA in the 4 years analyzed (e.g., Australia, Colombia, and Salvador). Whilst, over the years, some countries (e.g., Australia, Colombia, and Germany) changed the associated information of SEEA, demonstrating a slight evolution in this sense. On the other hand, other countries, like Sierra Leone, are careful with sustainability information and have not adopted TSA, or Switzerland, which focused only on economic data. These considerations reveal the importance that the implementation of the TSA and the SEEA has at the country level, especially in relation to the policies adopted by these countries.

For the total number of TGDP growth rates reported, the data is updated to 2019 and there are many missing values. These considerations are involved in the metric 3.

Particularly, the global TGDP as percentage of GDP (Table 2):

Table 2. TGDP (% of GDP) 2008-2019.

Country	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Australia	2.905	2.825	2.693	2.724	2.834	2.853	2.953	3.084	3.062	3.103	3.104	2.585
Austria	5.196	5.121	5.439	5.434	5.405	5.387	5.392	5.341	5.336	5.379	5.451	5.587
Belgium	-	-	-	-	-	-	-	-	1.895	-	-	-
Chile	3.249	3.319	3.246	3.157	3.455	3.136	3.105	3.398	3.642	3.540	3.296	3.314
Costa Rica	-	-	-	-	4.340	4.576	4.490	4.571	4.851	-	-	-
Croatia	-	-	-	10.153	-	-	-	-	11.250	-	-	11.823
Czech Republic	2.559	2.637	2.511	2.518	2.724	2.847	2.712	2.733	2.896	2.908	2.882	2.876
Egypt	-	5.621	6.266	-	4.771	3.870	4.258	-	-	-	-	-
Estonia	4.209	4.686	4.548	4.396	4.341	4.780	5.464	-	-	-	-	-
France	-	-	7.271	7.530	7.553	7.518	7.478	7.322	7.095	7.223	7.333	7.470
Iceland	-	3.522	3.443	3.694	4.183	4.690	5.491	6.455	8.187	8.020	8.077	8.077
India	-	3.785	3.738	3.744	3.759	-	-	-	-	-	-	-
Indonesia	4.700	4.170	4.060	4.000	3.960	4.020	4.130	4.310	4.651	4.675	4.912	4.966
Japan	1.874	1.832	1.705	1.678	1.724	1.776	1.664	1.821	1.944	1.970	1.945	1.986
Korea	-	-	-	-	-	-	-	-	-	-	-	2.482
Luxembourg	-	-	-	-	-	-	1.303	1.219	1.308	1.318	1.306	1.210
Malta	-	-	5.906	-	-	-	-	-	-	-	-	-
Mexico	8.107	8.160	8.017	7.908	7.950	8.183	8.063	8.179	8.019	8.025	7.944	8.002
Morocco	-	6.921	7.127	6.917	6.911	6.588	6.690	6.444	6.598	6.811	6.934	7.119
Norway	3.014	3.326	3.235	3.370	3.325	3.339	3.321	3.546	3.802	3.680	3.386	3.576
Peru	-	-	-	3.551	3.616	3.707	3.784	3.860	3.860	3.860	3.860	3.863
Philippines	5.645	5.807	6.204	6.799	7.045	7.229	7.537	8.208	8.588	-	-	-
Poland	2.170	1.588	1.590	1.782	2.101	1.299		1.175	-	-	-	-
Romania	-	-	-	1.820	1.862	1.936	1.957	2.402	2.770	2.787	2.909	2.981
Saudi Arabia	-	-	-	-	-	-	-	-	-	-	-	3.789
Slovak Republic	2.893	2.579	2.432	2.568	2.738	2.300	2.108	2.529	2.628	2.560	2.679	2.784
Slovenia	-	4.788	-	-	4.819	-	4.847	4.942	-	5.287	-	5.397
South Africa	3.039	2.899	2.927	2.777	2.881	3.289	3.364	2.876	2.935	2.607	2.733	3.726
Spain	10.241	9.852	10.309	10.520	10.786	10.763	10.950	11.060	11.340	12.140	12.223	12.435
Sweden	2.270	2.354	2.166	2.230	2.345	2.287	2.255	2.650	2.737	2.601	2.598	2.440

Source: Authors elaboration on data OECD (2023) [49].
Values: estimated value, forecast value, provisional data.

Table 1 shows significant differences among countries. Morocco, in Africa, has consistently maintained a high TGDP, instead the change in Africa has been represented by the TGDP in Egypt. In Latin America countries, which keep a high TGDP, Mexico has always maintained a high TGDP, Peru and Costa Rica have recorded low TGDPs since 2011. Asian countries, which had been on a gradual upward trend until 2016, has since declined rapidly. As a result, Asian countries is now lower than Oceania, which had previously been the lowest region globally. This is because data for the Philippines, which maintains the highest TGDP in Asia, has not been recorded since this period.

The highest TGDP value was recorded by Spain in 2019 equal of 12.435% of country GDP. Instead, the lowest value was recorded by Poland in 2015 with 1.175%. Moreover, observing all data in Table 2, it emerged that TGDP has a value between 1.00% and 12.40%. The table also shows that many countries have not communicated the values, so the fields are empty.

Therefore, comparing the TGDP and the GDP (metric 3) of Spain and Poland, the two countries with the highest and lowest rate of TGDP, respectively, emerged that: Spain presents 1.39 trillion $ of GDP in 2019 and a TGDP equal of 12.435%. Hence, tourism accounts 1,71 billion $. Polonia presents 477.11 billion $ of GDP in 2015 and a TGDP equal of 1.175%.

Hence, tourism account 5.60 billion $. Therefore, observing Table 2, it can be seen the percentage relationship between tourism and economic growth, between 1.00% and 12.40%.

5. Discussion

The significance of TSA (metric 4) is revealed by the fact that they are included in the national bank account structure, which provides a consolidated view of the government's cash resources. The SEEA, on the contrary, present environmental and economic data in an integrated form with the aim of providing useful information for defining policies and programs. Therefore, these two statements answer RQ2, based on the linkage among economic development and sustainable tourism and, metric 4 about the relationship between two indicators, TGDP and GDP.

However, the effect of tourism is twofold: has a negative impact on host communities [51-53] and is one of the most important generators of economic growth (about 10% of world GDP comes from tourism) and of employment (9% of the world population is engaged in tourism). For this reason, reducing the negative impacts of tourism sector practices must be a significant driver [54]. However, according to Zhang (2016), in an emerging but economically and socially backward tourist region, considering the economy first and then the environment could be both appropriate and viable practice (this is the case for countries with an TSA and SEEA equal to zero).

The results showed that countries that adopt sustainable models towards reducing the consumption of fossil fuels and the separate collection of waste are also ready for the circular economy [54].

The finding of this study is useful for the tourism literature, in term of original study that use the GQM method for analyze the sustainability in tourism according some UN indicators. Moreover, this study underlined the integration of socio-economics metrics or indicators in order to provides insights to improve sustainability assessments in tourism sector [55]. Particularly, this study concerns policy implementation respect to the environmental impact and sustainability, mostly for those countries that show the result of SEEA = 0. Particularly, this study can be useful for the countries that meet difficulties in implementation of TSA and SEEA, as focused with metric 5 and RQ3.

Considering Spain and Poland (Table 2), the two countries with the highest and lowest rate of TGDP, and observing these two countries in Table 1 emerged that:

a) Spain declared the implementation of 4 and 7 TSAs and 1 and 3 SEEA,

b) Poland declared none TSA implementation, conversely 2, 3 and 4 SEEAs.

In particular, TSA 4 and TSA 7 underline that the Spanish policies adopted towards tourism as an engine of growth in employment and expenditure. These policies also address the SDG 8. Moreover, through 1 and 3 SEEAs declared, Spain observes water consumption and carbon emissions. These other policies address SDG 12.

Furthermore, Poland that declared only SEEAs looks like a country towards a sustainable production and consumption, as in SDG 12. As matter of fact, the implementation of tools on energy flows, GHG emissions and solid waste declare its sustainable tourism policy.

Therefore, despite sustainable tourism is a subject much analyzed also in scientific research, in practical terms the implementation remains difficult [56].

It is also true that in some countries (Table 1) the frameworks to capture, aggregate, and report on the full economic, social and environmental impact of tourism lack. In Slovakia, conversely, tourist destinations play a more significant role in achieving SDGs because must measure progress and progressively improve their performance [9]. Also, for Arab countries, tourism represents an essential contribution to the economy and sustainability: Oman, for example, has a strategic geographical position and a great tourist potential in terms of culture, climate, and natural environment [57].

Generally, Eastern European countries have higher values for the SDG 8 indicators. Therefore, these countries, having lower and GDP-weighted wages, can find an opportunity for growth in tourism and reach higher shares of TGDP within the EU [58]. These kinds of observation address, in general, the RQ1 and in particular refers to metric1 1, 2 and 6.

For Vietnam, the travel and tourism industry accounts for about 10% of the country's GDP. And many other developing but resource-rich countries, especially Asian countries, have developed the resource extraction sector to promote the country's social, economic, and tourism development [59]. Vietnam is constantly changing the policies and legal framework to facilitate the implementation of regulation and enforcement of these policies. In this regard, the approval of the National Action Plan on SDGs represents another important step in this direction [59]. The 2030 Agenda can be considered a temporary solution for achieving the SDGs in these countries. Moreover, the choice of a complete set of indicators and their correct connection to the many SDGs represents the starting point of an assessment of the achievement of sustainability [60].

The relationships between economic, ecological, and tourism development were also confirmed by Pimonenko et

al. (2021) [61]. The drop-in greenhouse gas emissions has led to an increase in tourists and, as a result, has resulted in a growth in GDP, especially in Ukraine and the Visegrad countries. However, without innovation in finance and insurance, without integrated marketing, management, administration, health, socio-cultural, environmental plans, it will be difficult to achieve the SDGs in tourism [15].

Conversely, emerging countries must develop measures and adopt national strategies for the implementation of the 2030 Agenda. These considerations address, in general, the RQ1 and in particular metrics 1 and 2. To do this, each country must establish a committee of experts and regulate its market through a rigorous system of monitoring and continuous evaluation of the achievement of the SDGs [62]. Latvia also experienced an ever-increasing share of tourism services and GDP growth. However, the growth trend of the tourism sector has negative aspects that include increasing pressure on special protection territories [63].

Tourism always plays a relevant role among other industries and contributes significantly to Thailand's GDP. For this reason, the government of Thailand is recommended to increase overall logistics performance and the use of renewable energy and ecological performance in their tourism sector [64].

In Kenya, tourism is an important economic sector capable of significantly contributing to the national GDP and the achievement of the country's SDGs [65].

The attraction of investments and tourism development indirectly influences Romania's GDP, increasing the growth rate and the number of people employed in these sectors [66].

Considering the weight of tourism and transport on the GDP, Croatia - which is a country with a tourist and cruise vocation - is particularly subject to economic trends and global security issues that favor or limit travel [67]. The results suggest that, in general, the European eastern countries show better values for SDGs concerning both employment and the wage gap. These results answer the RQ2.

However, the results show that income inequality increases environmental degradation regarding carbon emissions [68]. The three domains, urbanization, economic globalization and income levels, unfortunately increase ecological degradation in Africa [66]. Therefore, it is clear that economic growth can be sustainable and green [17].

Finally, the countries examined in this study have the necessary characteristics to achieve the SDGs, but they should undertake more decisive policy implementation paths. However, the positive contribution of tourism to sustainable development and mitigation of potential negative effects on the economy can be exploited by activating solid partnerships and decisive action by all actors in the supply chain in line with the 2030 Agenda for sustainable development.

Furthermore, in scientific literature, it has been highlighted that climate change will represent a growing barrier to tourism contributions to the SDGs [69]. Indeed, the harms associated with tourism are greater than the benefits on economic growth [70]. For this reason, the reorientation of

global development towards green growth is also needed to allow green countries to attract more tourists [61]. Besides the research findings, the adoption a national low-carbon development strategy is a policy that help achieve SDGs [29]. These results address the RQ1.

However, according Wang et al. (2021) [10] the adoption of clean technologies and use of renewable energy could mitigate CO_2 emissions related to tourism industry. The findings correlate with the SDG 8 and SDG 12 as underlined also in the past by Wang et al. (2021) [71].

In conclusion, this kind of replicable assessment methodology helps countries and all stakeholders to evolve the tourism industry towards sustainability as in the SDGs. However, the data gap doesn't allow for many comparisons although considering that several countries are already working to implement TSA/SEEA in their policies and TGDP communication, the data on indicators covered in this study will be more comprehensive in the future as underlined by UNSTATS (2023) [48].

6. Conclusion

This study boosts to improve the tourism research to support sustainability policies and businesses more significantly and, practically, pushes towards the analysis of interdependence between SDGs indicators for the analysis of the level of sustainability.

This interdisciplinary approach provided a replicable analytical methodology to judge different objectives and criteria for making decisions in sustainable tourism development and achieving the sustainability levels contained in the SDGs.

Methodologically, this study also provides an alternative way to address the problems of (non) sustainability helpful in formulating future tourism policies and better management of tourist destinations for tourism stability and sustainable development. Per capita GDP highlights economic growth and it is also the main trigger for tourism and its sustainability.

It is also necessary to strengthen awareness of the fabric of tourism businesses and public administrations to promote stable and dignified employment, reduce the current gender wage gap, and respond to gender equality plans.

Socially, the role of well-developed countries is also fundamental as they have more elements of tourist attraction, generate a higher TGDP, but at the same time generate greater environmental impacts, such as CO_2 emissions and waste production. This critical information is useful in establishing the trajectory of a sustainability journey for destinations to move on a path of emissions mitigation. Furthermore, if political measures are not put in place to reduce the incidence of conflicts, economic growth in these countries could suffer setbacks and affect the achievement of the SDGs.

This study boosts governments and public decision-makers, especially of countries that have 0 value in TSA and SEEA data, to pursue possible technological installations to increase further the use of renewable energy and green services in their tourism sector.

Finally, according GQM approach, the study significantly supports reflective community participation and national and local institutional changes to impact the performance of community-based partnerships. Just keep in mind that is enough to look at the relationships between TGDP and GDP, between 8.9.1 and 12.b.1 of SDGs, to understand that there are strictly interdependent development processes that influence the achievement of sustainability in tourism at a country level.

In conclusion, this paper has also bridged the gap in the scientific literature by providing a methodological proposal on the analysis of sustainable tourism through two indicators of the SDGs associated with tourism and analyzed in parallel at country level (a general purpose, 4 RQs and 6 metric). Moreover, the future application can assess the level of implementation of others tools at country level for a general overview of the sustainability in tourism.

Credit Statement

T. Crovella: Conceptualization, Data curation, Methodology, Investigation, Resources, Software, Data analysis, Writing – original draft.

B. Miraj Ahmed: Data curation and Investigation.

V. Campobasso: Writing – review & editing

T. Gallucci: Writing – review & editing

A. Paiano: Writing – original draft, Formal analysis; Supervision.

ORCID

Crovella: Orcid https://orcid.org/0000-0002-0451-5576

Miraj Ahmed: Orcid https://orcid.org/0000-0001-9321-972X

Gallucci: Orcid https://orcid.org/0000-0003-4453-4269

Paiano: Orcid https://orcid.org/0000-0001-7718-538X

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