Economic and Environmental Satellite Accounting of Tourism: A proposed Framework

Contributed paper

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Summary: Tourism Satellite Accounts (TSAs) have progressed notably in recent years providing a linkage between the supply and demand of tourism products and following a consistent framework which sets the TSAs alongside national accounts. Nevertheless, the TSAs, as they stand, do not reflect the full costs and benefits to society, as environmental and social inputs and outputs are not taken into account. This paper has as its main objective to propose a framework for the integration of economic and environmental satellite accounts for tourism and its application to the case of the UK. The framework presented will be an expansion of previous studies as it will explore not only the environmental outputs of tourism activity but also the inputs associated with the activity.

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INTRODUCTION

The increasing attention the statistical and economic analysis of the tourism sector has received has had as one of its main outcomes the development of the Tourism Satellite Account (TSA) framework. The TSA framework has provided countries with a consistent framework based on current systems of national accounts, where a link between the supply and demand of tourism products and services can be established. The TSA is nowadays a widely accepted framework for the measurement of tourism statistics measuring the size of economic sectors that are not defined as industries in national accounts.

TSAs are used to provide measures of the contribution of tourism to GDP and employment, tourism consumption, tourism investment and tax revenues. Nevertheless, the resulting framework only allows for a limited study of the tourism sector, as its focus is on the direct economic relationship between tourism demand and the suppliers of tourism products and services.

Tourism, however, as a sector of the economy mainly reliant on natural resources, should extend the study of the economic activity as to include sustainable criteria to ensure its long- term survival. Thus, this paper has as its main objective to propose a framework for the integration of economic and environmental satellite accounts for tourism by extending the Social Accounting Matrix (SAM) framework to include environmental accounts and the tourism sector.

The inclusion of environmental accounts and the examination of tourism, separately from other economic industries, would offer a broader view of the benefits and costs of the tourism activity (environmental, social and economic) and their relationship with the rest of the economy. The integration of environmental, social and economic accounts would then show for example, not only the environmental outputs of tourism such as air pollution and waste, but also the environmental inputs that are necessary for the development of the economic activity such as water consumption and land use, as well as being able to portray the relationship of those inputs and outputs with the rest of the economy through a multiplier analysis.

The paper will discuss first the costs and benefits of tourism and some of the methods used to measure them independently, followed by some of the methods used for their integration. Then, the SAM framework will be examined and its relevance for the study of the interrelationships between the environment and the economy will be discussed. After this, the application of the framework to the case of the UK will be considered and, finally, some concluding remarks and future work will be discussed.

TOURISM BENEFITS AND COSTS AND THEIR MEASUREMENT

Tourism activities bring about economic, environmental and social benefits and costs; nonetheless, there seems to be an inclination to emphasize mainly on the economic benefits and the environmental and social costs of the activity. Furthermore, their study has focused to a great extent on analysing them separately without considering any feedbacks both benefits and costs have within the tourism activity and with the rest of the economy.

Besides the well known economic benefits such as creation of jobs, receipt of foreign income, expansion of infrastructure and leisure activities, some of the economic costs associated with tourism include leakages (for example when tourism services and products suppliers are owned by foreigners), seasonal unemployment, and inflation. Similarly, with regards to the environment and society, tourism not only implies costs such as pollution, competition of resources, crowding and increase of crime, it also brings about environmental

and social benefits, ranging from supporting the maintenance of the current natural, cultural and historical environment, to the development of regeneration and restoration projects. However, the make up of the interactions between these costs and benefits will differ across economies and, consequently, any solutions proposed for the upkeep or improvement of environmental and social conditions should also reflect that.

Tourism utilises natural raw materials in the provision of goods and services to tourists (the resource function), for example to develop infrastructure, and provide transport. It also uses the services from nature, as tourists arriving to a specific destination will get pleasure from the landscape offered by the country, and from other aspects of nature such as flora and fauna (the service function). This reliance on nature increases the risks attached to the depletion of resources, degradation of environmental services, and overuse of environmental sink functions. Thus, it can be observed that the inputs from the environment as well as its outputs would also help to shape the tourism activity.

The relationships between tourism and the environment include damage done to the environment by tourism and by the industries supporting tourism production, reliance of tourism on natural resources and environmentally beneficial effects of tourism. It is worth noting at this point that the natural and cultural environment of a tourism destination would have changed even without human intervention. Moreover, the negative and rapid changes brought by human intervention do not come only from tourism. These changes can come from urban settlements, and other activities such as farming and forestry. Furthermore, even within the negative changes brought about by the tourism activity, not all are related to a high number of visitors (for example, erosion and pollution of resources); according to Wight (1998) most of the environmental damage is caused by lack of plans, policies and action to prepare for economic growth.

The development of theories such as Climate Change and Global Warming, along with the growing environmental awareness of the population, have intensified the pressure put into sectors of the economy to implement sustainable development policies and objectives. Tourism activity depends on the natural and cultural resources of countries more so than other economic activities, thus the importance of determining their relevance within the tourism industry. However, even though it is desirable to recognize the influence that both natural and cultural resources have on tourism, this paper will mainly focus on the environmental aspects.

In order to determine how successful sustainable policies and objectives are, or can be, several methods and frameworks have been designed, such as sustainable indicators and the ecological footprint.

An indicator is a measurement or value used to show the progress towards achieving a specific outcome. Indicators can take a quantitative (a statistic) or qualitative (a state) form. An important characteristic of indicators which distinguish them from basic data, is their capacity to portray a meaning besides their value; for example, a body temperature of 39º not only represents this but also the fact that the person is ill (Ceron and Dubois, 2003).

The development and use of sustainability indicators started with the adoption of the Agenda 21; this document, ‘calls on countries at the national level, as well as international, governmental and non-governmental organizations to develop and identify indicators of sustainable development that can provide a solid basis for decision- making at all levels’ (UN, 2001a). The UN (2001a) has developed a core set of 58 indicators available for all countries to use. So far, several countries, institutions and organisations have published their own set of environmental, economic and social indicators (for a review of global sustainable indicators see IISD, 2008), however, there has been some criticism regarding sustainable indicators. Since the indicators comprise a mix of statistics expressed independently in

different units of account, they fail to provide an overall picture of sustainability and welfare trends. It is also unclear how indicators might be linked to the objectives set by governments, and the nature of trade-offs between indicators (Munday and Roberts, 2006). Sustainable indicators have been developed specifically for the tourism sector (Miller, 2001, and Gallego-Galan and Moniche-Bermejo, 2005).

Another method that has aimed to analyse the relationship between several environmental variables is the ecological footprint (EF). The EF was developed to measure how much ecological capacity humans use to sustain themselves. It estimates the area of the earth's surface required to support a given human population (Wackernagel and Yont, 1998). EF analysis portrays the 'demands on natural resources in terms of an estimated hypothetical equivalent land/sea (biosphere) area, with the size of the footprint (referred also as 'appropriated carrying capacity') for a given population and for a specified time period (normally a year)' (Hunter and Shaw, 2007). Ecological footprints are expressed in standardised units of biologically productive areas, termed global hectares (gha). The EF is estimated by comparing the total area necessary to support an activity, with the population of the study area. The EF can then be compared with a 'fair-share value' which is the global average area of productive land/sea space available annually on a per capita basis (Hunter and Shaw 2007, Munday and Roberts, 2006). The 'fair-share value' is considered the maximum footprint allowance before depriving future generations or those now living in other parts of the world (Munday and Roberts, 2006: 540).

Nevertheless, EF has also been surrounded by debate including its policy applications (Munday and Roberts, 2006) and analytical reliability (Ferguson, 1999; van den Bergh and Verbruggen, 1999; Wackernagel, et al., 2005). The EF has also been applied specifically for the study of tourism sustainability, with Gössling, et al. (2002) being one of the first studies of this type and Hunter and Shaw (2007) use the example of the Seychelles for their study.

INTEGRATION OF ECONOMIC AND ENVIRONMENTAL ACCOUNTS OF TOURISM

Further progress to account for the benefits and costs that environmental resources provide to the economy/society has been achieved in the form of environmental valuation. The valuation of natural resources is composed of three kinds of value, the first, the use value, is the value measured by the market price of the resource; the second, the option value, reflects the value people place of a future ability to use the environment; and the third, the non use value, reflects the value placed on improving or preserving resources that have no commercial value (Tietenberg, 2000).

There are several methods of environmental valuation, which can be divided into two categories, direct and indirect. Direct methods include Market Price, Simulated Markets and Contingent Valuation; indirect methods include, Travel Cost, Hedonic Property Values, Avoidance Expenditure and Contingent Ranking (Tietenberg, 2000 and Harris, 2002).

Furthermore, there has also been interest in the development of new indicators that could have universal appeal such as GDP or the Human Development Index. There have also been attempts to modify GDP. The GDP measures the output made in the domestic economy and consists of the value added as a result of the production process within an economy. Nevertheless, the issue of the inadequacy of the GDP as a measure of progress has been covered frequently, as it is regarded that a higher growth measurement does not necessarily mean an improvement in aggregate welfare. Furthermore, it also fails to account for environmental degradation and resource depletion (Tietenberg, 2000). Thus, one way to modify GDP to account for the environment is to estimate an economic value for natural capital depreciation, and subtract this estimate from it. It is worth noting that this approach focuses again only on the environmental costs of economic activity. The issues discussed

above, however, imply the monetary valuation of natural resources, which can raise questions about the appropriateness of the methods used considering that placing a value on environmental resources is a complex matter. An alternative to avoid potential any problems that monetary valuation could pose is to account for the environment in physical terms too.

An alternative approach to include the environment in national income accounts is the use of satellite accounts. The United Nations has already published guidelines for the development of integrated economic and environmental satellite accounts (referred to as SEEA) as part of the System of National Accounts. The SEEA brings together economic and environmental information in a common framework to measure the contribution of the environment to the economy and the impact of the economy on the environment. The accounts modify the SNA aggregates 'to treat natural resources as capital in the production of goods and services to record those sources and to record implicit transfers needed to account for the imputed cost and capital items' (UN, 2001b). The data obtained from the SEEA can be used for different kind of analysis, Input-Output analysis being one of them.

The SEEA framework includes additional elements that are needed to supplement the SNA concepts with data in physical terms on environmental cost and capital, or to amend the SNA concepts by valuing the physical data and incorporating the values in environmentally adjusted concepts of cost and capital. There are two types of additional elements. The first group records the effects of economic activities on non-produced natural assets such as air, water and virgin forests that are not included as economic assets in the SNA. The second group includes elements for the use of non-produced natural assets by depletion and degradation, and for other accumulation of non-produced natural assets, which covers the transfer of natural assets to and between economic uses. These two groups can be interpreted in physical as well as monetary terms (UN, 2001b). This framework can be further adapted to reflect tourism data taken from the TSA, Constantino and Tudini (2005) and Blake, et al. (2007) have carried out work on this area.

Nevertheless, the SEEA also faces criticism just as other forms of monetary valuation of the environment. The monetary valuation as mentioned before can be done using different methods; the SEEA does not have to comply with only one of them thus presenting a mix of methodologies which would affect the results presented and the interpretation of such results. Additionally, there could be the misconception that because environmental variable expressed in monetary terms, a comparison with other monetary variables could be made (Werner, 1999).

The quest for a more complete approach to measure sustainability has lead to the combination of methods to measure sustainability. Turner, et al. (2007), adopted a multi-region input-output accounting framework as a method of calculating ecological footprints. Their work focused on input-output techniques to estimate the environmental impacts embodied in trade. With regards to tourism, Jones and Munday (2004) examined the effects of tourism spending within the framework of a regional Input-Output table augmented with a TSA. This work was further extended by the authors where information from a TSA was combined with information from environmental satellite accounts and an input-output framework to explore selected environmental effects of different types of tourism consumption (Jones and Munday, 2007).

THE EXTENDED SOCIAL ACCOUNTING MATRIX

A further approach that has received increased attention, as a tool for the measurement of sustainability, is environmental accounting. The basis of environmental accounting reside on the 1993 System of National Accounts (1993 SNA), which is a conceptual framework designed to establish the international statistical standard for the measurement of the market

economy (UN 2001b). However, this system is not adequate for the purpose of measuring sustainable development and to that effect, the SNA can be extended as to "broaden the traditional accounts to include important sectors of non-market activity" (Nordhaus, 1999: 46).

Two of the frameworks used for environmental accounting are the National Accounting Matrix including Environmental Accounts (NAMEA) and the Social Accounting Matrix (SAM). NAMEA accounts connect economic and environmental indicators thus allowing for comparisons across different industries and household activities, and SAMs explain the interrelationships between economic and social statistics by including information on labour and households statistics (Kee and Haan 2004), and can be extended to include environmental indicators too.

A SAM presents the SNA accounts in a matrix which establishes the linkages between a supply and use table and institutional sector accounts; a SAM also focuses on the role of people in the economy which may be reflected by extra breakdowns of the household sector and a disaggregated representation of labour markets (UN 2001b). The creation of a SAM can reveal complex economic linkages and how changes in one or more elements of the matrix are related to other elements.

SAMs are considered an extension of an Input-Output (I-O) table as they incorporate, to the I-O table, information on labour and households in the system of national accounts. This provides a more complete picture as it includes the effects on employment and income distribution (for a complete review of the construction of SAMs see Keuning and De Ruijter, 1988 and Round, 2003). Furthermore, the SAM is a flexible framework which allows for the inclusion of environmental indicators.

The possible link between social economic and environmental aspects makes an extended SAM a valuable tool in the measurement of progress towards sustainability. There has been previous work regarding environmental SAMs (Martinez de Anguita, 1999: Rodriguez Morilla, et al., 2006) and SAMs for the analysis of tourism (Wagner, 1997), although this study did not include tourism as part of the SAM. Wagner's study compiled a regional SAM and then related the results to a tourism activity dominant in that region. To our knowledge, there has not been work done considering both extensions to date.

Thus, this paper will approach the development of an extended SAM (ESAM) to include environmental indicators and to consider tourism as a specific industry. The resulting framework should then portray a more complete economic, social and environmental structure of the economy, and, at the same time represent the interrelationships between the tourism industry with the environment and the rest of the economy too.

A basic SAM framework assembles information regarding income, expenditure and financial flows of an economy, in monetary terms. The data needed for its compilation usually is obtained from Input-Output tables, National Accounts, and Households income and expenditures information. The data collected is shown in successive rows and columns in a matrix and is flexible enough to integrate and reconcile different data sets for consistency.

The information gathered would then show the economic flows related to production activity and consumption as well as the subsequent distribution and redistribution of these flows. The grayed area in table 1 comprises those rows and columns forming a basic SAM.

Several steps will be required in the structure of the proposed ESAM. The first step will be the compilation basic SAM information as mentioned above. Then, the next step will be to separate from the economic industries data, the information related to tourism industries, data which would be taken out from Tourism Satellite Accounts (TSA) (columns 3a and 7a).

The last step will be the incorporation of environmental data, expressed both in monetary and physical terms, through the inclusion of two extra matrices. One of these matrices (rows 9, 10 and 11) would show the flows of natural resources used as inputs or the residuals that have been reabsorbed, treated and reused within the economy and the environment; in other words, showing the use of natural resources in the productive system. The second matrix (columns 9, 10 and 11) would include residuals discharged either for reuse or back to the natural environment, for example emissions, pollution, wastewater, etc.

The ESAM framework would then facilitate the provision of data to extend an initial input output analysis into a SAM multiplier analysis. The multiplier analysis initiates with the division of the SAM into endogenous and exogenous sectors. For example, production and environmental accounts would be considered endogenous while exports are considered exogenous. The multiplier analysis will then assess the effects on the economy of changes in elements that are exogenous to the economy model. In other words, it will show "how a unit change in any element of the exogenous accounts will affect the endogenous accounts" (Kim 1993:83).

So, for example, if international tourists (exports) visit natural areas (environment), they will spend money within the local economy. These expenditures will generate additional economic activity inside the economy. Thus, a multiplier analysis will show the changes brought by each Pound Sterling spent by tourists within the UK.

Furthermore, the multipliers obtained from the analysis can also be divided into direct and indirect effects. The direct effects fall in two situations: the first group of direct effects captures economic transfers between one variable (a production activity) and another similar variable (other production activity) within endogenous accounts. These effects are known as transfer, own or intragroup effects. The second group captures the interactions among and between the sets of endogenous accounts, for example, the interaction between production to private income. These effects are known as cross-effects, open loop or extragroup effects.

The indirect effects capture the outcome of an exogenous shock: first on one of the endogenous variables, then passes the shock to a second endogenous variable, and finally returns to the original endogenous variable. For example, the indirect effect of a tourist purchasing a bus ticket would be the impact on the transport sector derived from the increase in household income that increases purchases of goods and services. These effects are known as closed-loop, circular or intergroup effects (Kim, 1993; Martinez de Anguita, 1999; Gooroochurn, 2002).

Nevertheless, the SAM framework (and consequently the ESAM) is not free of criticisms. Santos (2001) groups the criticisms already made by other authors in two: the first group relates to the information being defined in terms of flows, and the second group relates to "hidden" flows where a part considered substantial for an economic activity is not considered (for example, farmer's production used to feed their own families).

Other criticisms derive from the inconsistencies in timing, treatment and definition between data sources. Even though these discrepancies can not be easily eliminated, there are several methods, such as cross-entropy and the Stone-Byron methods (see Round, 2003), to reconcile data. However, there is a problem as many discrepancies could still remain.

On the other hand, there is an advantage derived from the integration of various data sets; as this detection of gaps and inconsistencies would precisely provide feedback for the compilation of original data resulting in the improvement of the overall quality of statistic information (Santos, 2001). At the same time, this feedback would result in a more careful assembly of data and therefore reducing the need to rely on reconciliation methods.

Further criticisms come from the Input-Output side of the framework; as a result, criticisms made to Input-Output models also apply to an extent to the SAM framework. Dwyer, et al. (2004) evaluated the limitations of input-output analysis, arguing that economies are general equilibrium systems in which overall balance must be preserved and therefore, a partial model such as the input-output model becomes insufficient. Nevertheless, the authors acknowledge that input-output models can be seen as an interim measure and highlight that the inadequacy of such models lies on the estimation of the net impact on an economy resulting from changes in tourism expenditure.

Nonetheless, an ESAM framework has great potential for the measurement and observation of economic, environmental and social variables and their interrelationships. Even more importantly, the flexibility of the ESAM also allows incorporating country-specific features, therefore being able to reflect the structure of an economy, their classification of institutions, production factors, activities and the like (Santos, 2001). More importantly, the ESAM framework can provide a more comprehensive measurement of the relationships between the environment, society and economy than that achieved through other methods.

Table 1 Extended SAM framework

				Expenditures (Outlays)												
				National Economy										Environment		
						Institutions										
				Production (Industries)	**Factors of Production**	**Households**		**Corporations**	**Government**	**Capital**	***Rest of the World***		**TOTAL**	**National**	**ROW**	**Total**
							Tourism expenditure					**Tourism**				
				1	2	3	3a	4	5	6	7	7a	8	9	10	11
Incomes (receipts)	***National Economy***	**Production (Industries)**	1	Intermediate Consumptions on domestic products		Household consumption on domestic products	Household consumption on tourism products (Outbound)		Government consumption on domestic products	Investment expenditure on domestic goods (Gross capital formation)	Exports of Goods and Services	Non resident Tourism Consumption	Total demand	Discharge of residuals	Exports of residuals	Total of residuals
		Factors of Production	2	Value added							Net factor income received from abroad		Total factors income			
		Institutions **Households**	3		Labour Income to Households	Property Income and current transfers		Property Income and current transfers	Property income and current transfers		Property Income and current transfers from ROW		Total households income	Discharge of residuals		Total of Households Residuals
		Institutions **Corporations**	4		Corporations operating surplus	Property Income and current transfers		Property Income and current transfers	Property Income and current transfers		Property Income and current transfers from ROW		Total corporations income	Discharge of residuals		Total of Corporation Residuals
		Institutions **Government**	5			Property Income and current transfers		Property Income and current transfers	Property Income and current transfers	Indirect taxes on capital goods	Property Income and current transfers from ROW		Public revenue	Discharge of residuals		Total of Government Residuals
		Institutions **Capital**	6			Households savings		Corporations savings	Government savings		Capital received from abroad		Total Saving			
	Rest of the World		7	Intermediate imports		Imports of goods and services + property income + current transfers to ROW		Property income+ current transfers to ROW	Imports of goods and services + property income+ current transfers to ROW	Imports of capital goods + capital transfers to ROW			Payments to ROW	Imports of residuals		Residuals absorbed
	TOTAL		8	Total Output	Total payments to factors	Total outlay of households		Total outlay of corporations	Total outlay public sector	Total investment	Revenues from ROW			Total discharge of residuals (for reuse and return to nature)	Total of Residuals transferred	
	National Environment		9	Consumption of natural resources		Consumption		Consumption	Consumption		Exports		Resource depletion			
	Rest of the world Environment		10	Imports of natural resources		Consumption		Consumption	Consumption				International Resource depletion			
	Total		11	Total use of natural resources		Total household use of natural resources		Total corporation use of natural resources	Total government use of natural resources		Total					

DATA COMPILATION

For the compilation of the ESAM, in general there would be four key sources of data: Use and Supply tables, household income and expenditure information, the Tourism Satellite Account, and Environmental Accounts. The UK being a good example where there is readily available data. Following the example of the UK, we will examine briefly the potential sources of data for the implementation of the ESAM framework.

In the UK, the Office for National Statistics (ONS) holds the Use and Supply tables and Environmental Accounts. The national accounts, through the Use and Supply tables, provide data regarding the production industries of the economy (123 industries). Some of the relevant data to be incorporated in the ESAM are: intermediate consumption by industry group (cell 1,1), final consumption expenditure by institutions (cells 1,3; 1,4; 1,5), the gross value added (and its components) (cell 2,1), gross capital formation (cell 1,6), imports (cell 7,1) and exports (cell 1,7).

Information regarding household income and expenditures can be taken from the data provided by the ONS such as the Family Expenditure Survey, and by the HM Revenue & Customs such as the Personal Income data. The data can be broken down by types of households and sectors. The household information will provide data regarding the amount of income earned by household type and the way it is spent across the economy.

The tourism data can be derived from the TSA. The UK's TSA was published in 2004 and contains data for the year 2000. Some of the relevant data includes the supply and use of tourism related industries of other tourism related industries, tourism consumption (intermediate and final), tourism investment, tax returns and employment. In table 1, two columns have been added to illustrate the household expenditure on tourism products (cell 1,3a) and the consumption of tourism by non residents (cell 1, 7a).

Finally, with regard to the environment, the framework can examine the inputs from the environment into the economy in the form of the consumption of natural resources such as water extraction and consumption and energy consumption (row 9) and the outputs in the form of the release of residuals, for example: waste, wastewater and air pollution such as carbon dioxide emissions (column 9).

CONCLUDING REMARKS

The measurement of tourism activity has been carried out to account for the economic impacts of the activity, such as the TSA, and recently to account for environmental impacts as well. The recent interest in issues such as climate change and sustainability has highlighted the need of more complete measures that do not only take into account the social, economic and environmental outcomes separately but to determine the relationships between them.

The aim of this paper has been to propose an extended SAM as a framework for the integration of economic and environmental accounts for tourism. The application of this framework would result in the measurement of the interrelationships between environmental, economic and social variables with a specific focus on tourism. The framework in this way will expand previous work undertaken in the area of measurement of tourism sustainability, as it includes not only environmental outputs of tourism activity, such as the degradation of the environment, but also the inputs associated, such as water extraction and consumption.

It is expected that the analysis of the ESAM would provide further insights into the interaction between natural resources and economic activity. The data required would provide information to account for the benefits from the tourism activity, the rest of the economy, and the environment. Even more, it would also allow the analysis of the costs of tourism activity, for example examining how tourism is related to income distribution, and to environmental waste such as greenhouse gases.

Furthermore, its structure can be modified as to introduce the different complexities of each economy interested in its application. This is a particularly significant advantage of this framework as the results derived from the analysis of a particular ESAM would be adequate for the economy in question. Thus supporting the set up of policies that would be adequate for each individual case rather than just following international policies that do not account for the differences in economic structure, economic development and the different social and environmental needs. The understanding of how economies are interrelated with society and the environment specifically will be of more benefit to the further and sustainable development of economies rather than focusing on reducing only the negative environmental costs associated with tourism or any other economic activity.

It is acknowledged that an ESAM framework offers a static and fixed view of an economy; however, the ESAM also represents a stepping stone towards future work where a dynamic framework integrating economic, environmental and social variables could be developed. Furthermore, a fully developed ESAM can be used in a general equilibrium analysis, indicating also another potential use of this framework.

Other future work needed in this area is the development of guidelines for the application of an ESAM. SAMs are not intended for international comparison therefore further work is required in the analysis of potential issues that could be faced when adopting this type of framework for the analysis of tourism sustainability. The UK is a good example of an economy with extensive data available for the application of this framework. Future work is also needed to analyse the case of the UK and to offer insights to other countries for the application of this framework.

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