

Session 4

**QUALITY OF TOURISM:
COMPETITIVENESS, SUSTAINABILITY AND SEASONALITY**

**Tourism and sustainability:
macro-accounting approach for measuring
the links between tourism and environment**

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TOURISM AND SUSTAINABILITY: MACRO-ACCOUNTING APPROACH FOR MEASURING THE LINKS BETWEEN TOURISM AND ENVIRONMENT

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Introduction

What information is needed for describing the interrelationships between the economy and the natural environment in the tourism sector? which kind of tool would support the integration of environmental aspects in developing policies for the tourism sector? How could such information be better structured?

The *International Recommendations for tourism statistics 2008* (IRTS2008, United Nations and WTO) underlines that the measurement of the links between tourism's activities and social, economic and environmental fields should be considered a high priority.

In particular, the IRTS2008, focuses on the measurement of the links between tourism and natural environment. It recommends two different approaches: generating indicators for analysing, monitoring or evaluating the environmental implications of tourism development in specific areas; defining a macro-approach at national level combining the economic and environmental information included in satellite account.

The IRTS2008 maintains that both macro-accounting and indicator approaches can be used for measuring the links between tourism and the natural environment.

A macro-approach has been chosen in the Italian research work referred to in the present paper, which in fact is focuses on the implementation of hybrid environmental flow accounts. Therefore, the present paper implements an accounting framework to link elements of the Tourism Satellite Account (TSA)¹ with environmental accounts : socio-economic aggregates derived from the TSA describe the contribution of the tourism sector to the economy, while environmental consequences of tourism activities can be measured in a consistent way by means of emission accounts according to the SEEA. In this way relevant statistical information can be provided to support decision making processes, thus contributing to answer fundamental questions such as those addressed.

The paper presents the first implementation of the IRTS2008 tourism sustainability recommendations. In particular it corresponds to one specific option considered in those recommendations: to incorporate tourism as a specific set of industries and consumers within environmental hybrid flow accounts of the SEEA. Actually it is proposed, as a way of doing that, to integrate hybrid environmental flow accounts specific for tourism and elements of the TSA in a single accounting framework.

This would enable to identify e.g. the areas where policy interventions would be most appropriate.

The methodological approach used in this paper has been evaluated by the Unites Nations as the first study at international level dealing with the evaluation of the sustainability of the tourism activities; because of this, it has been quoted in the new release of System of Environmental-Economic Accounting (SEEA)Applications and Extension.

¹ The United Nations Statistics Division, the Statistical Office of the European Communities, the Organization for Economic Co-operation and Development and the World Tourism Organization [2008], *2008 Tourism Satellite Account: Recommended Methodological Framework (TSA: RMF 2008)*, Brussels/Luxembourg, New York, Paris. From now on this publication is referred to as TSARMF2008.

1. Tourism and sustainability

Tourism is considered as an ambivalent phenomenon, «since it can contribute positively to socio-economic and cultural achievement, while at the same time it can contribute to the degradation of the environment and the loss of local identity»². Due to the specific features that distinguish it from other economic sectors, in the literature it has been recognized as necessary to adopt an integrated approach to tourism, that links the economic and employment consequences with the environmental and social implications of tourism activities, as well as their direct and indirect effects on the territory, at regional and global level.

In this sense, the availability of environmental, economic and social information has become essential in order to analyse the different aspects of tourism sustainability.

Planning processes taking into account sustainability imply much more than the conventional economic planning used in the past. A wide access to the relevant information is needed, where the core information is no longer just economic but also environmental³ and social data. Current limits on available information on e.g. environmental aspects should not discourage the use of such information, nor should justify lack of action, the issue being rather to identify the most appropriate information for the analysis⁴. Also, it is crucial to promote an open dialogue involving public administrations, the general public and stakeholders, including producers and consumers⁵.

A sustainability-oriented knowledge base in order to be effective, should be built on the representation of concrete and measurable phenomena, thus allowing a proper definition of objectives in decision-making processes. In this respect, the identification of environmentally sensitive flows, such as environmental driving forces and pressures, actually represents an essential and relevant element for clearly defining the sustainability strategies.

Therefore, tourism sustainability implies an integration of the natural, cultural and human environment. In other words, it is necessary to establish an interconnection between the elements causing such integration in order to define a holistic approach of the issue⁶ identifying, in particular, the proper way to link the data on the tourism performance in terms of economic results and employment and the data on the environmental and social implications of that performance.

² World Conference on Sustainable Tourism [1995], *Charter for sustainable tourism*, Lanzarote.

³ The importance of participating in the environmental policy appears for the first time within the *United Nations Conference on Environment and Development* of Rio de Janeiro Conference from 1992 where *Principle 10* of the *Rio Declaration* points out that higher efficiency can be achieved in environmental management through the participation of all interested citizens at the various levels, and through access to the environmental information held by public authorities.

However, in order to allow citizens' wider participation in the policies adopted in the territory, we have to consider a collection and dissemination of information allowing to improve the knowledge on the environmental, economic and social strengths and weaknesses of economic activities, among which an essential role is held by those specific to the tourism sector.

Therefore, the "after Rio" was defined by an awareness of the need to review the environmental information access mechanisms and, at the same time, of the absolute need to increase the efforts towards producing high quality information. The effort made for the concrete implementation of *Principle 10* led to the adoption of the *Convention on access to information, public participation in decision-making and access to justice in environmental matters*, signed in the Danish town of Aarhus in 1998.

⁴ "In line with the precautionary principle, lack of knowledge must not become an excuse for lack of action or for ill-considered action. Risk and uncertainty are a part of life. The role of science and research is to help identify the nature of the risks and uncertainties we face, so as to provide a basis for solutions and political decisions. Policy makers have a responsibility to manage risk effectively, and to explain its nature and extent clearly to the public". Commission of the European Communities [2001], *A Sustainable Europe for a Better World: A European Union Strategy for Sustainable Development*, Brussels.

⁵ Cfr.: Anzalone M., *Environmental accounting as a planning support tool - potential applications in the sustainable tourism field*, paper of the 2009 International Conference on Tourism and Workshop on Sustainable Tourism within High Risk Areas of Environmental Crisis" held at the Studiorum Universitas Messinae; Costantino C., Anzalone M., Tudini A., *Hybrid environmental flow accounts for tourism*, material used for section on Tourism of SEEA 2012 Extensions and applications, Draft version prepared for the London Group meeting on Environmental Accounting London, UK, 12-14 November, 2013

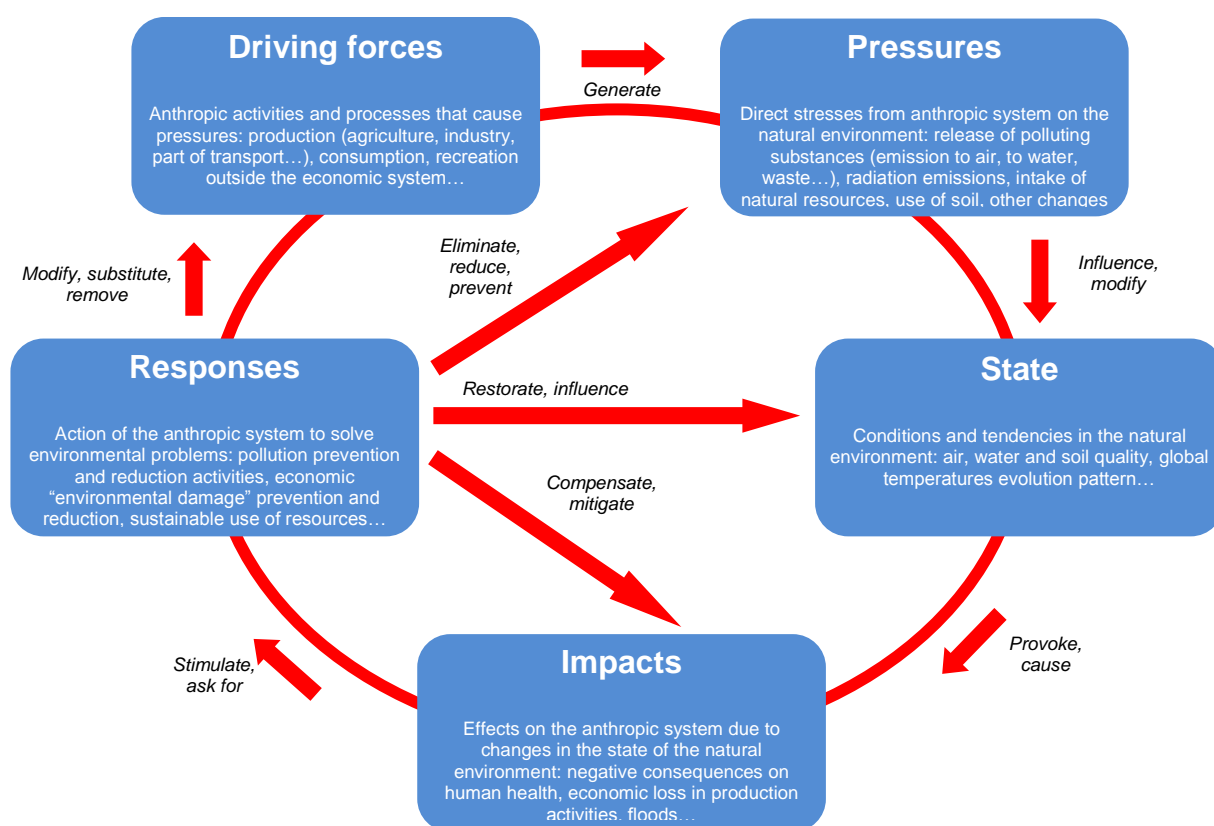
⁶ «Creating the right balance between the welfare of tourists, the needs of the natural and cultural environment and the development and competitiveness of destinations and businesses requires an integrated and holistic policy approach where all stakeholders share the same objectives». Commission of European Communities [2007], *Agenda for a sustainable and competitive European tourism*, Brussels.

2. The interaction between the economy and the environment

The inclusion of the environmental aspects in the decision-making processes inevitably implies a widening of the information base underlying the decision-making strategies. The need to explain the relation between the economy and the environment is based on the awareness that the economic system representation based on the circular flow of income – model of the economy showing flows of goods and services and factors of production between firms and households – exclusively regulated by the money factor, is no longer appropriate for highlighting the complexity of the factors – among which the environmental one – interacting within this system⁷.

To describe the interactions between society and environment, it seems more appropriate to mention the conceptual representation provided by the DPSIR model⁸ (Driving forces-Pressures-State-Impact-Response – fig. nr.1). Adopted by the European Environment Agency, the DPSIR model has become over time an essential benchmark both for describing the relations between the two systems and for understanding which level of the economy-environment causal chain requires intervention on activity planning.

Fig.nr. 1 - The DPSIR model and the economy-environment interaction circuit



Source. Elaboration from Costantino C., Falcitelli F., Femia A., Tudini A. [2004]

The DPSIR model explains the causal circuit between economy and the environment. The system envisaged by this model starts from the assumption that human's activities (*Driving forces*), including those related to the tourism industry, due to their importance and impact, generate *Pressures* on the natural environment through the release of polluting substances, for instance (emissions to air, waste production) or the irrational use of natural resources in the production process (intake of natural resources, use of soil). Such pressures imply changes (*State*) of the natural environment (for example in terms of water or air quality reduction or global influence on temperature trends), and may generate negative effects (*Impacts*) both on the actual natural environment (biodiversity loss, floods, landslides), and on the social-economic system (economic loss in the production activities and the need for local administrations

⁷ Cfr. AA.VV, a cura di Falcitelli F. e Falocco S., [2008] *Contabilità ambientale*, Bologna, Il Mulino.

⁸ Extension of the PSR model developed by OECD.

to put an end to environmental deterioration through recovery and safeguarding interventions) and on the human system, considering that natural system changes may have harmful effects on human health. In their turn, economic activities' impacts require an anthropic system *Response*. Such responses are the activities of prevention and reduction pollution and the damages caused thereby, both through actions intended to directly influence the economic activity-related production and consumption means (therefore directly acting on the first chain link, *driving forces*) in view of eliminating/reducing pressures on the natural system, and by directly restoring the environmental functionalities compromised by the state changes.

However, the quantitative and qualitative analysis of the environment-economy implications, conceptually described through the application of the DPSIR model, requires the representation of economic and environmental facts by means of a common reference framework, in order to allow the interpretation of their relation.

The search for a balance taking into account also the environment becomes therefore increasingly complex: «*the complexity consists in the fact that attention is no longer limited to the interaction and interdependence between the various economic and social actors, but is expanded to the system of relations between the actual actors and the environment*»⁹.

3. Tourism sustainability and statistical information

The importance of good knowledge on the tourism sector is recognised in the presentation of principles and objectives in the *Lanzarote Charter* developed at the 1995 World Conference on Sustainable Tourism. More recently, The *Agenda for a sustainable and competitive European tourism* (2007)¹⁰ has indicated some of the themes to be approached in the near future in the field, including: on the one hand, the importance of a constant monitoring activity, necessary for analysing the impacts of tourism activities; on the other, the need to reduce risks to a minimum - where there is uncertainty about the outcomes of certain activities - by means of a complete assessment of tourism development implications, in order to avoid, in line with the precautionary principle, damage to the environment or the society.

But, how does appropriate information on the tourism sector facilitate the elaboration of sustainability strategies? In the European Commission's *Action for more sustainable European tourism* it is recommended to follow a number of stages for developing a sustainable tourism strategy and action plan¹¹; these are mainly:

- defining a political mandate able to ensure the accurate involvement of all interlocutors interested in producing sustainability policies;
- drawing up a knowledge framework allowing the accurate assessment of all the elements of interest for the tourism activities;
- defining strategic options to adopt;
- action planning, necessary for clarifying the involved resources amount and typology;
- preparing instruments and activities for monitoring the actions taken for the periodical review of the adopted strategies.

⁹ Freely translated from AA.VV, *Contabilità ambientale*, cit., p. 10.

¹⁰ Cfr. the Commission of the European Communities [2007] – COM(2007) 621 final – *Agenda for a sustainable and competitive European tourism*, Brussels. In the Communication it is emphasised that “Creating the right balance between the welfare of tourists, the needs of the natural and cultural environment and the development and competitiveness of destinations and businesses requires an integrated and holistic policy approach where all stakeholders share the same objectives”. According to the Commission, “a number of challenges proper to the tourism sector will have to be addressed. These mainly include sustainable conservation and management of natural and cultural resources, minimising resource use and pollution at tourism destinations including the production of waste, managing change in the interests of the wellbeing of the community, reducing the seasonality of demand, addressing the environmental impact of transport linked to tourism, making tourism experiences available to all without discrimination, and improving the quality of tourism jobs – also by addressing the issue of employment of illegally staying third country nationals in the framework of the Commission migration policy. Ensuring that tourists as well as the local communities where tourism services are offered are safe and secure is a further challenge and also a basic condition for a successful development of tourism”.

¹¹ The document *Action for more sustainable European tourism* is the Report of the Tourism Sustainability Group (TSG), set up by the European Commission in 2004. It's worth mentioning that the already mentioned *Agenda for a sustainable and competitive European tourism* is very much based on this report, which was delivered by the TSG in 2007.

Among the stages listed above, the second and last ones are related to information issues. In particular, the European Commission's *Action for more sustainable European tourism* highlights the importance of preparing and monitoring environmental¹², economic and social information not only for intervention planning but also for monitoring and reviewing, when necessary, the adopted policies. It also underlines the aspects that are considered particularly important for drawing up a knowledge framework: current levels of tourism, number of enterprises, employment supported, visitor facilities and services, environmental conditions (air, water), relative contribution of tourism to the economy. All these elements are of interest for making assessments concerning the tourism sector inspired by a holistic approach.

The increasing demand for information on these aspects led to the emergence of a wide range of documents and contributions. However, this material is quite heterogeneous in terms of contents and data presentation, while appropriate quality of the data is required if a sound knowledge base is to be made available for the benefit of policy-makers and stakeholders as well as the general public.

In order to be efficiently used by policy-makers, citizens and stakeholders at the various responsibility and interest levels, the environmental information must meet, for example, precise quality requirements. In this sense, it is necessary to identify a common interpretation within the "*babele*" of released documents and available data. We need a common language, standard and clearly defined rules and, moreover, it is essential to develop instruments allowing an integrated and comparative reading of the environmental, economic and social system-related information.

In terms of sustainability, it becomes even more necessary to prepare statistic information for clearly showing the environmental implications of development

Good quality of data is assured within official statistics through the implementation of international standards.

Satellite accounting, within official statistics, is a specific tool that in principle best allows to integrate information on the environmental, the economic and the social systems, by focusing on the interrelationships between these three distinct spheres, thus resulting particularly suitable for dealing with tourism-related phenomena such as those considered e.g. in the *Agenda* mentioned above. One specific advantage of satellite accounting, in fact, is the possibility to link the data of satellite accounts – namely those on tourism and on the natural environment, in this case – to the economic aggregates of the core system of national accounts, by making use of common concepts, definitions and classifications.

In particular, the environmental accounting provides that range of additional information necessary for taking into account the interdependence between economy and the environment, including the related information and making it legible, in a comparative, integrated and standardized way. In this sense, by means of the information support provided as part of the decision-making processes, environmental accounting can significantly contribute to actually integrating the environmental dimension of businesses' and policy-makers' development programmes.

¹² The environmental information concept has indeed changed in time, with the evolution of the national and international legislation in the field of sustainable development. The environmental information notion first acquires legal expression in Directive 90/313/EC. The Aarhus Convention expands such definition and urges the Community Lawmakers to replace Directive 90/313/EC with Directive 2003/4/EC (acknowledged in Italy legal system only in 1997 with D.Lgs. n. 195/2005). The latter includes the objectives set by the *Convention on access to information, public participation in decision-making and access to justice in environmental matters* (Aarhus Convention), expanding their application field from the information access right to the more significant objective of ensuring that *«as a matter of course, environmental information is progressively made available and disseminated to the public in order to achieve the widest possible systematic availability and dissemination to the public of environmental information»*. Moreover, the Directive further widens the environmental information concept by also including all the information such as substances, energy, noise, radiation or waste, including radioactive waste, emissions, discharges and other releases into the environment, reports on the implementation of environmental legislation and the information concerning the state of human health and safety, including the contamination of the food chain, conditions of human life, cultural sites and built structures inasmuch as they are or may be affected by the state of the elements of the environment.

4. The International Recommendations for Tourism Statistics 2008

As already stressed, it is necessary to adopt an integrated approach to tourism, making a connection between the economic and employment consequences and the environmental and social implications of its activities.

About this, the International Recommendations for tourism statistics 2008 (IRTS2008, United Nations and WTO)¹³ underlines that the measurement of the links between tourism activities and social, economic and environmental field should be considered a high priority.

In particular, the IRTS2008 recommends two different approaches for measuring this connection: to generate indicators for analysing, monitoring or evaluating the environmental implications of tourism development in specific areas; to define a macro-approach at national level combining the economic and environmental information included in satellite account.

According to the *International Recommendations for Tourism Statistics 2008*, both macro-accounting and indicator approaches “have their potential and challenges for measuring at different territorial levels the links between tourism and the environment”¹⁴. Concerning the macro-accounting approach, in particular, the IRTS2008 underline that “the existence of both the Tourism Satellite Account and the System of Environmental and Economic Accounts (SEEA)”¹⁵ allows Countries where both international recommendations are being developed to estimate the links between tourism and the environment at the level of the national economy. This could be done in two ways:

- incorporating tourism as a specific set of industries and of consumers within the hybrid flow accounts of the Environmental Accounts¹⁶;
- “greening” the tourism GDP that is derived from the Tourism Satellite Account taking into consideration the cost of the degradation of the environment and the use of the natural capital by tourism; expenditures that prevent degradation could also be taken into consideration as a further adjustment”¹⁷.

The IRTS2008 clarifies that “the core of this macro-approach consists in establishing a more complex type of input/output matrix in which not only the ‘usual’ inputs are considered, but also environment inputs established in quantity, and output also includes waste, greenhouse gas emissions and other environmentally significant by-products”. Furthermore, “as the core of Tourism Satellite Account is a representation of tourism industries and tourism consumption within a supply and use framework, it could be adapted into this type of analysis, provided both Tourism Satellite Account and Environmental Accounts are compiled at a sufficient level of detail to allow some type of mutual integration”¹⁸.

This approach is fully consistent with the satellite accounting perspective, according to which, while the core system of national accounts and their derived indicators (such as GDP) are supposed to play the important albeit partial role of describing the functioning of society from a strictly economic point of view, there is a need to complement the information thus provided by means of satellite systems providing more comprehensive and holistic as well as *ad hoc*

¹³ World Tourism Organization [2008], *International Recommendations for Tourism Statistics 2008*, Madrid, New York; from now on IRTS2008.

¹⁴ Cfr. IRTS2008, par. 8.39.

¹⁵ Following an ad hoc revision process, The System of Environmental-Economic Accounting (SEEA) – Central Framework was adopted as an international standard by the UNSC at its forty-third session in 2012. In the same year a white cover publication was then issued jointly by the European Commission, the Food and Agriculture Organization, the International Monetary Fund, the Organisation for Economic Co-operation and Development, the United Nations and World Bank. From now on the white cover publication is referred to as SEEA.

¹⁶ These types of accounts are also known as NAMEA-type accounts, where NAMEA stands for National Accounts Matrix including Environmental Accounts. Extensive information on the various types of environmental accounts and related handbooks can be accessed on the website of the United Nations as well as of Eurostat.

¹⁷ IRTS2008, par. 8.40.

¹⁸ IRTS2008, par. 8.41.

statistical information¹⁹. A relevant aspect concerns the data availability and comparability and, in this context, the linkage between satellite accounts and national accounts statistics: the latter are readily available, comparable over time, compiled to common international standards, and place the satellite accounts measures in the context of the national economy and its major components, such as the relationship with economic growth and public finance.

Furthermore, among the two options recalled above, the second one corresponds to a more empirical approach and it hardly would lead to statistically robust results. Mainly for this reason and for the reasons mentioned above the first option has been chosen.

In the subsequent sections of the present document, an approach proposed for measuring along the lines of the first bullet quoted above the links between tourism and the natural environment is discussed. Further specifying what in a sense appears to be implicit in the IRTS2008 guidelines, proposals are made for integrating elements of the TSA and of environmental flow accounts in a single accounting framework^{20 21}.

In order to present the hybrid account for tourism, it is preliminarily essential to introduce some elements concerning satellite accounting. Regarding this, we will define the principal characteristics of the environmental accounting and tourism satellite account in order to analyze how these two kind of account can be integrated in a single common framework.

5. Satellite accounts

When we speak about national accounts, we refer to European System of Accounts (hereinafter referred to as 'the ESA 2010' or 'the ESA'), the system of national accounts and regional accounts used by members of the European Union, fully consistent with the United Nations System of National Accounts in definitions, accounting rules and classifications. The European System of Accounts is an internationally compatible accounting framework for a systematic and detailed description of a total economy, its components and its relations with other total economies.

As we know, the central framework of European of National Accounts consists of the following:

- a) integrated economic accounts (institutional sector accounts) providing an overview of all economic flows and stocks;
- b) an input-output framework providing an overview of the supply and use of goods and services in current prices and in volume terms;
- c) tables linking the industry information in the input-output framework with the institutional sector accounts;
- d) tables on expenditure by function of government, households and corporations;
- e) tables on population and employment.

¹⁹ Cfr. Costantino C., Anzalone M., Tudini A., *Hybrid environmental flow accounts for tourism*, material used for section on Tourism of SEEA 2012 Extensions and applications, Draft version prepared for the London Group meeting on Environmental Accounting London, UK, 12-14 November, 2013.

²⁰ A first way to integrate the two types of satellite accounts was defined in 2003 at Istat and was put forward in the paper *How to develop an accounting framework for ecologically sustainable tourism* by Costantino C. and Tudini A. The paper, presented in 2003 at the international conference on "Tourism and Sustainable Economic Development – Macro and Micro Economic Issues" organised in Italy by Fondazione Eni Enrico Mattei and CRENoS with the support of the World Bank, is published in Lanza A., Markandya, Pigliaru F. (editors) [2005], *The Economics of Tourism and Sustainable Development*, Edward Elgar, UK, USA. At that time, the methodological guidelines concerning the TSA were provided in Commission of the European Communities - Eurostat, Organisation for Economic Cooperation and Development, World Tourism Organization, United Nations statistics Division [2001], *Tourism Satellite Account: Recommended Methodological Framework*, Luxembourg, Madrid, New York, Paris; this document has been referred to as TSARMF until its updated version, the TSARMF2008, was delivered.

²¹ The first empirical research concerning this approach has been carried out in Italy by Anzalone M - PhD research - *La valutazione della sostenibilità del turismo: proposta di realizzazione di una contabilità integrata di tipo ibrido turismo-ambiente*, Studiorum Universitas Messinae, 2012. In this study, based on the updated conceptual framework given by the TSARMF2008, it has been carried out an experimental implementation of elements included in the paper *How to develop an accounting framework for ecologically sustainable tourism* by Costantino C. and Tudini A. (2003) - which is focused only on theoretical and general aspects. The Anzalone's PhD dissertation has been used as a conceptual framework for the creation for the creation of the Tourism section of SEEA on Applications and Extensions, "Presentation of environmental-economic accounts data for tourism", Draft version prepared for the London Group meeting on Environmental Accounting, London, UK, 12-14 November, 2013.

The central framework of European of National Accounts doesn't supply specific information about non- monetary flows or information such as instructions, tourism, environment. At the same time, this information do not cover all information we need to evaluate the different aspects of sustainability.

Satellite accounts, instead, can meet specific data needs by providing more detail, by rearranging concepts from the central framework or by providing supplementary information, such as non-monetary flows and stocks. Satellite accounts elaborate or modify the tables and accounts in the central framework of national accounts to serve specific data needs. Changing those concepts can improve the link with economic theory concepts such as welfare or transactions costs, administrative concepts such as taxable income or profits in the business accounts, and policy concepts such as strategic industries, the knowledge economy and business investments used in national or European economic policy²².

Fig.nr. 2 - Overview of satellite accounts and their major characteristics

Eight characteristics of satellite accounts								
	Functional accounts	Links to industries or products	Links to institutional sectors	Inclusion of non-monetary data	Extra detail	Supplementary concepts	Different basic concepts	Experimental results and more use of modelling
<i>1. Satellite accounts described in this Chapter</i>								
Agricultural		X			X	X		X
Environmental	X	X		X	X	X	X	X
Health	X	X		X	X		X	X
Household production			X	X	X		X	
Labour and SAM		X	X	X	X			
Productivity and growth		X		X	X	X	X	X
R&D	X	X		X	X		X	
Social protection	X			X	X			X
Tourism	X	X		X	X	X		
<i>2. Satellite accounts described in other chapters</i>								
Balance of payments			X		X			X
Government finance			X		X	X		X
Monetary and financial statistics, and flow of funds			X		X	X		X
Supplementary pension table			X		X	X	X	X
<i>3. Examples of other satellite accounts with international guidelines, or in the EU data transmission programme</i>								
Corporate activity			X		X			
Informal sector					X		X	
Non-profit institutions			X		X		X	
Public sector			X		X			
Tax revenue tables			X		X			X

Source. European System of Accounts – ESA 2010

The Satellite accounts (fig. nr. 2) allow to: (a) links to functions, as in functional satellite accounts; (b) links to industries or products, which is one type of special sector accounts; (c) links to institutional sectors, a second type of special sector accounts; (d) extension with physical or other non-monetary data; (e) extra detail; (f) use of supplementary concepts; (g) modification of some basic concepts; (h) use of modelling or inclusion of experimental results²³.

²² Cfr. SEC2010, par. 22.04.

²³ Cfr. SEC2010, par. 22.06.

Major advantages of satellite accounts concerning the use of a set of clear definitions and the application of a systematic accounting approach, characterized by consistency and coherence.

5.1 Environmental accounting

The integrated set of accounts for economic and environmental information permits an analysis of the contribution of the environment to the economy and the impact of the economy on the environment. It meets the needs of policymakers by providing indicators and descriptive statistics to monitor the interaction between the environment and the economy. It can also serve as a tool for strategic planning and policy analysis to identify more sustainable development paths. For example, policymakers determining the development of industries making extensive use of environmental resources either as inputs or sinks need to be aware of the long-term environmental effects. This is the case, e.g., of the tourism activities. Policymakers setting environmental standards also need to be aware of the likely consequences for the economy, e.g. which industries are likely to suffer and what the consequences for employment and purchasing power are. Alternative environmental strategies can be compared by taking into account the economic consequences²⁴.

From a methodological point of view, environmental accounting is placed against the background of information production and the actual information use, although the data produced with such instrument can also be used, with appropriate elaboration, to the purpose of public communication, such as in the case of business environmental accounting.

Environmental accounting approaches a certain type of information on the environment, and is particularly focused on the statistic information on the environment which is distinguished from the first – environmental information, in general – as it represents the result of methods and techniques rendering it a representation of a certain reality.

The accounting reference framework is that typical for national accounts. The environmental accounting discipline in fact develops methodologies and accounts perfectly in line with national accounting, in order to favour the simultaneous and joint analysis of economic and environmental phenomena. It develops a specific theme – namely that related to the interaction phenomena between the environmental and the economic systems – which wouldn't be otherwise apparent by reading the data produced within the national accounting core. The idea is to expand, rather than correct in the environmental sense, the economic accounting discipline, in view of reading a wider set of phenomena with the already acquired economic-accounting approach mindset. Thus, the environmental accounting discipline allows an integration of the environmental component into the economic decision, rather than making it the object of separate decisions²⁵.

5.2 Tourism satellite account

The setting up of a Tourism Satellite Account implies a detailed analysis of “all the aspects of demand for goods and services which might be associated with tourism”, the identification of “the actual interface with the supply of such goods and services within the economy of reference or outside” and the description of “how this supply (from domestic or imported origin) interacts with other economic activities, using the Supply and Use Tables (SUT) of national accounts as reference”²⁶.

The information contained in TSAs allows to evaluate²⁷:

²⁴ Cfr. SEC2010, par. 22.61.

²⁵ Freely translated from AA.VV, *Contabilità ambientale*, cit., p. 11.

²⁶ Cfr. TSARMF2008, par. 1.12.

²⁷ Cfr. TSARMF2008, par. 1.15.

- the share of tourism sector on the overall economy, in terms of national accounts main aggregates, namely value added and GDP, which are key indicators for analysis and comparison. The consistency between macroeconomic aggregates referred to tourism sector and those for the total economy allows to make a comparison between them;
- Detailed data on tourism consumption, a more extended concept associated with the activity of visitors as consumers, and a description on how this demand is met by domestic supply and imports, integrated within tables derived from SUT;
- Detailed production accounts of the tourism industries, including data on employment.

From a methodological point of view, compiling TSAs requires, first of all, a new outlining of the boundary of tourism's sector. Such a delimitation is a peculiar one, in as much as it does not correspond to the conventional approach followed for the core system of national accounts, which is based on an analysis by institutional sector or branch of economic activities, according to the rules internationally established.

Once designed the new universe, in terms of tourism products and activities, through the selection of what is relevant from the national accounts, the implementation of TSA requires two different evaluations:

- The demand perspective;
- The supply perspective.

The structure of the tourism industry strictly depends on the qualitative and quantitative elements observed on the demand side, thus differing from other economic sectors. Tourism, within satellite accounting, as a demand side phenomenon refers to the activities of visitors²⁸, and their role in the acquisition of goods and services. In this sense, tourism consumption is a key concept for a correct identification of tourism-related both activities and consumption products. From the supply perspective, the aim is to describe the productive activities that provide the goods and services that visitors acquire.

The following tourism products are distinguished:

- *tourism characteristic consumption products*²⁹: "those that satisfy one or both of the following criteria:
 - tourism expenditure on the product should represent a significant share of total tourism expenditure (share-of-expenditure/demand condition);
 - tourism expenditure on the product should represent a significant share of the supply of the product in the economy (share-of-supply condition). This criterion implies that the supply of a tourism characteristic product would cease to exist in meaningful quantity in the absence of visitors."
- *tourism connected products*³⁰.

From the supply side, the production is outlined by taking into account the demand side, i.e. by making reference to the above products.

The classification of TSAs products and activities is derived from the relevant international classifications used in the compilation of national accounts, CPC and ISIC respectively. Full compatibility of the ISIC and CPC codes (see Table 1) enables the use of SUT accounting schemes.

²⁸ "A visitor is a traveler taking a trip to a main destination outside his/her usual environment for less than a year and for any main purpose (business, leisure or other personal purpose) other than to be employed by a resident entity in the country or place visited." (TSARMF2008, par 1.1).

²⁹ IRTS2008, par. 5.10.

³⁰ IRTS2008, par. 5.12. "Their significance within tourism analysis for the economy of reference is recognized, although their link to tourism is limited worldwide. Consequently, lists of such products will be country-specific."

Table 1 - Products and activities: correspondence between international classifications

CPC- Central Product Classification - Ver. 2		Italian Product classification - CPA		ISIC- International Standard Classification of all Economic Activities - Rev. 4		Italian Classification of all Economic Activities - Ateco ³¹	
Section	1digit	Section	1digit	Section	Letter	Section	Letter
Division	2 digits	Division	2 digits	Division	2 digits	Division	2 digits
Group	3 digits	Group	3 digits	Group	3 digits	Group	3 digits
Class	4 digits	Class	4 digits	Class	4 digits	Class	4 digits
Sub-class	5 digits	Category	5 digits			Sub-class	5 digits
		Sub_category	6 digits			Sub-category	6 digits

In line with the International Recommendations for Tourism Statistics, the TSARMF2008³² provides a list of tourism characteristic consumption products and corresponding activities. Categories 1 to 10 comprise the core for international comparison (see Table 2), for both products and activities. The two other categories are *country-specific* with category 11 covering tourism characteristic goods and the corresponding retail trade activities and category 12 referring to tourism characteristic services and activities.

Table 2 - List of categories of tourism characteristic consumption products and tourism characteristic activities

Products		Activities	
1.	Accommodation services for visitors	1.	Accommodation for visitors
2.	Food and beverage serving services	2.	Food and beverage serving activities
3.	Railway passenger transport services	3.	Railway passenger transport
4.	Road passenger transport services	4.	Road passenger transport
5.	Water passenger transport services	5.	Water passenger transport
6.	Air passenger transport services	6.	Air passenger transport
7.	Transport equipment rental services	7.	Transport equipment rental
8.	Travel agencies and other reservation services	8.	Travel agencies and other reservation services activities
9.	Cultural services	9.	Cultural activities
10.	Sports and recreational services	10.	Sports and recreational activities
11.	Country-specific tourism characteristic goods	11.	Retail trade of country-specific tourism characteristic goods
12.	Country-specific tourism characteristic services	12.	Country-specific tourism characteristic activities

Within the research work carried out in Italy for integrating elements of the TSA and of environmental accounts, the estimates made for implementing on a pilot basis the proposed accounting framework concern the first 10 categories of table nr. 2.

5.3 TSA and environmental accounting inside the DPSIR model

The main themes developed by environmental accounting are related to analysing the amount and state of the natural patrimony (amount of the various natural resources and qualitative state of the various natural resources and environmental media), use, degradation and depletion of natural patrimony (intake of natural resources, emissions of pollutants and environmental damage phenomena) and defensive expenditure (prevention and reduction of quantitative use of natural resources and of pollution and restoration of environmental damage). Making further reference to the DPSIR model, the first case refers to *state* information, the second to the *pressures* and the third case – defensive expenditures – to the *responses* adopted by the anthropic system.

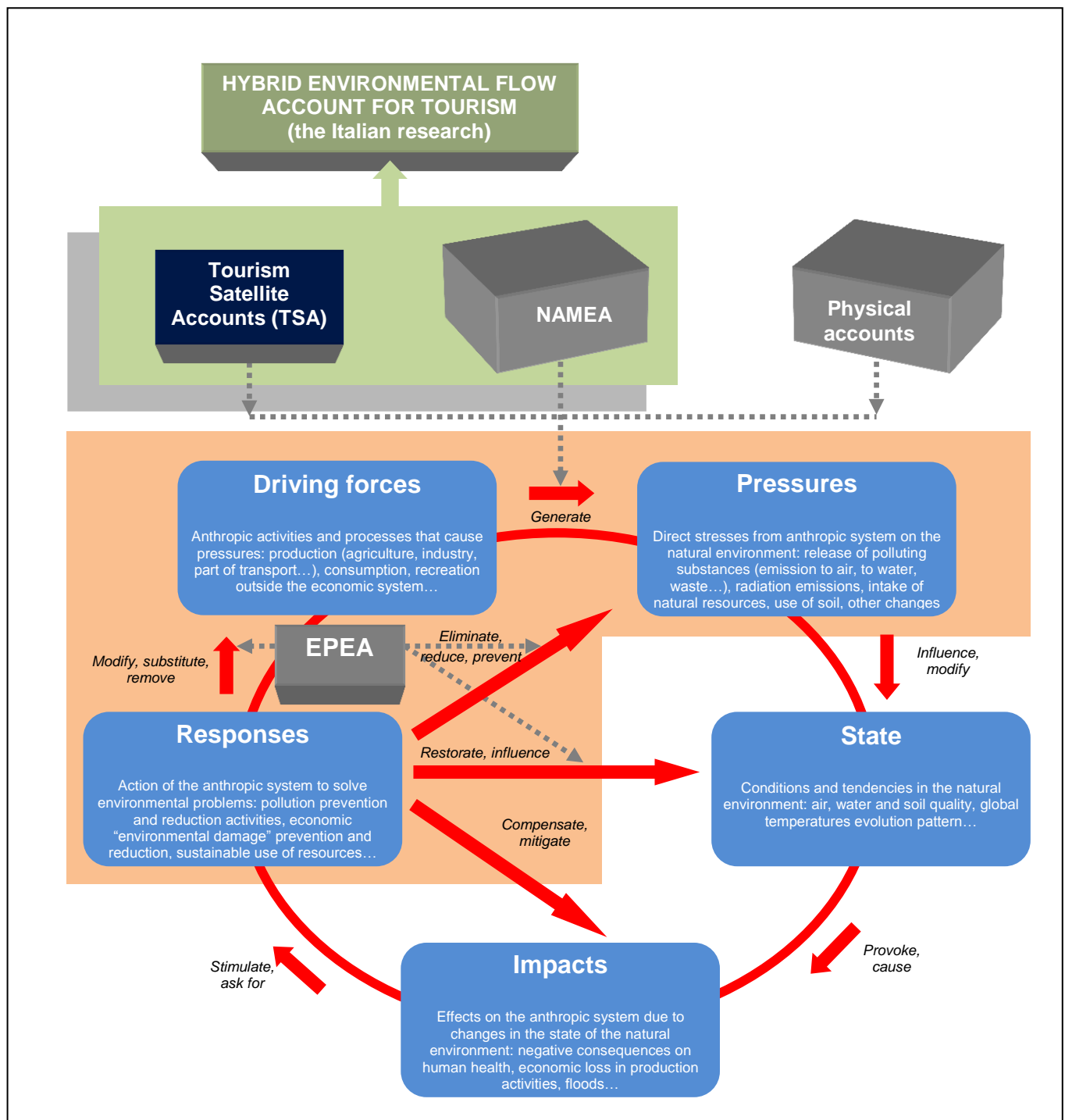
The Tourism Satellite Account (TSA) must be collocated within the human's activities that imply direct pressures on the natural environment (driving forces) through the release of polluting substances, for instance (emissions to air, waste generation) or the irrational use of natural resources in the production process (intake of natural resources, use of soil).

³¹ Referring to the revised Ateco2007.

³² Cfr. TSARMF2008, par. 3.10.

Therefore, referring to the DPSIR model, we can collocate the tourism satellite account and the environmental accounting as follow.

Fig.nr. 3. - TSA and environmental accounting inside DPSIR model



6. Hybrid environmental flow accounts for tourism: the accounting framework developed in Italy

The IRTS2008 suggests two main options to estimate the links between tourism and environment at the level of the national economy within a macro-accounting approach:

- incorporating tourism as a specific set of industries and of consumers within the hybrid flow accounts of the Environmental Accounts;

- “greening” the tourism GDP that is derived from the Tourism Satellite Account taking into consideration the cost of the degradation of the environment and the use of the natural capital by tourism; as a possible further adjustment, expenditures that prevent degradation could also be taken into consideration.

As already mentioned, the first option has been chosen. The setting up of this kind of account was not so easy. We have analysed the limitations characterizing the TSA and the Environmental Accounts. They don't supply information about the tourism sustainability. The TSA shows the contribution of the tourism sector to the economy, but the environmental consequences of tourism activities are not taken into account in the accounting system. On the other side, the Environmental Accounts describe the interaction between the economy and the environment by making reference, among other things, to international statistical classifications of economic activities (ISIC and NACE); in doing that, however, the latter accounts do not single out the tourism sector, whose productive activities are part of those covered under several items of the mentioned classifications of economic activities.

Starting from this limitations, it has been set up an hybrid environmental flow account specific for the tourism sector that combines the two satellite accounts in a different and consistent structure.

In order to introduce this approach, we can refer to one of accounts of the environmental accounting: NAMEA account (*National Accounts Matrix including Environmental Accounts*). Therein, the physical data on the environmental pressures is presented in connection to the economic or consumption activities having generated them and is analysed together with the economic data. Thus, NAMEA allows to both highlight the economic sectors most invasive in terms of environmental pressure, and show such sectors' related contribution to income generation, defined according to the national accounting-specific accounting means³³.

Table nr. 3³⁴, therefore, presents the accounting matrix of the Italian NAMEA. Consumption activities are grouped in macro-categories (e.g. transport and communications) and only some of the most relevant environmental pressures are mentioned.

It shows a framework that typically inspires the development of hybrid environmental flow accounts for the total economy. It is characterized by systematic, straightforward and direct links established between socio-economic data on production and consumption activities and physical data on the environmental pressures generated by the same production and consumption activities.

The whole conceptual matrix provided by NAMEA shouldn't be considered when analysing tourism industry activities, but only with reference to some of its parts. The socio-economic and environmental aggregates marked with an 'x' in table nr. 3 indicate that the corresponding production or consumption headings do contain activities or consumption products that may be at least partially tourism-related. The activity or product categories within which it is suggested to identify the different tourism industries or tourism characteristic consumption products are singled out in the table.

The table nr. 3 matrix, in this sense, indicates some of the production or consumption activities also relevant for the tourism sector. For instance, for the hotels and restaurants activities, the following are pointed out:

- “in the economic aggregates module: a) the economic activity sectors most relevant for the tourism industry and their contribution to income and job generation; b) households consumptions, and therein, particularly those directly or indirectly related to tourism activities, such as, for example, expenses born by households for transfers by own means;
- the environmental module emphasises the direct or indirect pressures of the production and consumption activities and therefore the contribution/responsibility of each of them to environmental changes”³⁵.

³³ Cfr. Tudini A., *La NAMEA*, in AA.VV., *Contabilità ambientale*, cit.

³⁴ The table is taken from Anzalone M., forthcoming, *Environmental accounting as a planning support tool - potential applications in the sustainable tourism field*, paper distributed at The 2009 International Conference on Tourism and Workshop on Sustainable Tourism within High Risk Areas of Environmental Crisis” held at the Studiorum Universitas Messinae.

³⁵ Anzalone M. [2009], *Environmental accounting as a planning support tool - potential applications in the sustainable tourism field*, paper distributed at The International Conference on Tourism and Workshop on Sustainable Tourism within High Risk Areas of Environmental Crisis” held at the Studiorum Universitas Messinae

Table 3 - Hybrid environmental flow accounts – identification of tourism characteristic activities and characteristic consumption products

Economic activities and household consumption	Socio-economic aggregates				Environmental pressures: pollution			Environmental pressures: intake of natural resources		
	Production	Value added	Employment	Final consumption	Air emissions	Water emissions	waste	Fossil Fuels	Minerals	Biomasses
AGRICULTURE, FORESTRY AND FISHING										
MINING AND QUARRYING										
MANUFACTURING										
ELECTRICITY, GAS AND WATER SUPPLY										
CONSTRUCTION										
WHOLESALE AND RETAIL TRADE	x	x	x		x	x	x	x		
TRANSPORT										
- Land transport; transport via pipelines	x	x	x		x	x	x	x	x	x
- Air transport										
- Water transport										
HOTELS AND RESTAURANTS										
- Hotels and similar accommodation	x	x	x		x		x			
- Holiday and other collective accommodation										
- Recreational vehicle parks, trailer parks and camping grounds										
- Other accommodation										
REAL ESTATE, RENTING AND BUSINESS ACTIVITIES	x	x	x		x		x			
PUBLIC ADMINISTRATION AND DEFENCE; COMPULSORY SOCIAL SECURITY										
- Regulation of the activities of providing health care, education, cultural services and other social services, excluding social security	x	x	x		x		x			
OTHER ACTIVITIES	...	...	...		...	...	...	...	...	...
HOUSEHOLD CONSUMPTION:										
- Transport				x	x	x	x	x	x	x
- Heating										
- Other										

Not applicable

Source: Anzalone M. [2009]

It should be noted that comprehensive hybrid environmental flow accounts, i.e. accounts covering the entire range of economic sectors broken down according to statistical classifications of economic activities (ISIC or NACE), do not allow to immediately assess all tourism industries, since the existing classifications are arranged in a way that it may not be possible, without further investigation, to immediately define the boundaries of sectors that are characterised, like tourism, by being cross-cutting sectors.

The branch of national accounts, even if inclusive of tourism activities, can't be entirely overlapped to the corresponding tourism industry, as the scope of a TSA is different and consists in grouping economic activities in a tourism logic. As already mentioned, compiling TSAs requires, first of all, a new outline of the boundary of tourism sector, as showed in the T5 of TSA (table nr. 4).

Table 4 - Production accounts of tourism industries and other industries (T5 of TSA)

	TOURISM INDUSTRIES												TOTAL (5.13)	Other industries (5.14)	Output of domestic producers (at asic prices) (5.15)=(5.13)+(5.14)
	Accommodation for visitors (5.1)	Food and beverage serving industry (5.2)	Railway passenger transport. (5.3)	Road passenger transport (5.4)	Water passenger transport (5.5)	Air passenger transport (5.6)	Transport equipment rental (5.7)	Travel agencies and other reservation services industry (5.8)	Cultural industry (5.9)	Sports and recreational industry (5.10)	Retail trade of countryspecific tourism characteristic goods (5.11)	Country specific tourism industries (5.12)			
A. Consumption products															
A.1 Tourism characteristic products															
1- Accommodation services for visitors															
1.a- Accommodation services for visitors other than 1.b															
1.b- Accommodation services associated with all types of vacation home ownership															
2 - Food and beverage serving services															
3 - Railway passenger transport services															
4 - Road passenger transport services															
5 - Water passenger transport services															
6 - Air passenger transport services															
7 - Transport equipment rental services															
8 - Travel agencies and other reservation services															
9 - Cultural services															
10 - Sports and recreational services															
11 - Country-specific tourism characteristic goods															
12 - Country-specific tourism characteristic services															
A.2 Other consumption products															
B. Non consumption products															
B.1 Valuables															
B.2 Other non consumption products															
Total Output (at basic prices)															
TOTAL INTERMEDIATE CONSUMPTION (at purchasers price)															
TOTAL GROSS VALUE ADDED (at basic prices)															

Therefore, we need to integrate the economic information supplied by the TSA within the conceptual matrix provided by NAMEA. In order to do it, we need to structure the economic module of the hybrid environmental flow accounts following the scheme of the T5 of TSA.

The final accounting framework for hybrid environmental flow accounts specific for tourism is basically like the one shown in Table 5, which represents an aggregated version of it. It results from combining in a single accounting framework an economic module derived from the TSA and an environmental one consisting of NAMEA-type environmental flow accounts.

In Table 5 also an additional column is shown which includes environmental efficiency indicators broken down by economic activity, as an example of possible analysis that the proposed accounting framework helps to develop thanks to the possibility of matching economic and environmental data.

Table 5 - Hybrid environmental flow accounts specific for tourism – combining the TSA and Environmental accounts

	Economic Module			Environmental Module		Environmental efficiency indicators
	Tourism Satellite Account (TSA)			SEEA, NAMEA-type accounts		
	Economic aggregates	Employment	Other variables	Pollution	Intake of natural resources	
Supply (TSA)						
Use (TSA)						

Once tourism industries and tourism characteristic consumption products– on the supply side and the use side respectively – are specified, the aggregated version of the proposed accounting framework as reported in table nr. 5 develops into the one shown in table nr. 6.

The main value added of the framework proposed for hybrid environmental flow accounts specific for tourism derives, in general terms, from the fact that it organises statistical information on economic and environmental aspects in a way that best enables an accurate assessment of the environmental implications of the economic development of tourism. By making it possible to identify trade-offs between economic development and environmental pressures as far as tourism is concerned, the statistical information organised according to the framework is best suited for providing a valuable support to decision-making for sustainable tourism. Once time series are made available, these hybrid environmental accounts allow to check e.g. whether or not *decoupling* is occurring and, in this perspective, they can be used as a key tool for assessing the sustainability of actions taken or policies proposed for adoption in the tourism sector³⁶.

³⁶ Cfr. Costantino C., Anzalone M., Tudini A., *Hybrid environmental flow accounts for tourism*, material used for section on Tourism of SEEA 2012 Extensions and applications, Draft version prepared for the London Group meeting on Environmental Accounting London, UK, 12-14 November, 2013.

Table 6 - Hybrid environmental flow accounts specific for tourism – specifying tourism industries and tourism characteristic consumption products

		Tourism Satellite Account (TSA)					Environmental accounts (SEEA, NAMEA-type accounts)							
		Economic aggregates				Other	Environmental pressures							
		Production	Intermediate Consumption	Valued Added	Tourism consumption	Employment	Pollution			Intake of natural resources				
							Air emission	Water pollution	Waste	Fossil Fuels	Minerals	Biomasses	Water	
Supply (tourism industries)	Accommodation for visitors													
	Food and beverage serving activities													
	Railway passenger transport													
	Road passenger transport													
	Water passenger transport													
	Air passenger transport													
	Transport equipment rental													
	Travel agencies and other reservation services activities													
	Cultural activities													
	Sports and recreational activities													
	Retail trade of country-specific tourism characteristic goods													
	Country-specific tourism characteristic activities													
Use (tourism characteristic consumption products)	Accommodation services for visitors													
	Food and beverage serving services													
	Railway passenger transport services													
	Road passenger transport services													
	Water passenger transport services													
	Air passenger transport services													
	Transport equipment rental services													
	Travel agencies and other reservation services													
	Cultural services													
	Sports and recreational services													
	Country-specific tourism characteristic goods													
	Country-specific tourism characteristic services													



Accounts proved to be feasible according to the research work developed in Italy



Accounts apparently not feasible for the time being, due to insufficient break-down of available basic data (at least in Italy)



Accounts apparently not feasible for the time being, due to lack of basic data (at least in Italy)



Not applicable

Source: Anzalone M. [2012]

7. Pilot implementation in Italy of hybrid environmental flow accounts specific for tourism

In general terms, as underlines in chap. 22 of the European System of Accounts, designing and compiling a satellite account consists of four steps (fig. nr. 4):

- (a) defining the purposes, uses and requirements;
- (b) selecting what is relevant from the national accounts;
- (c) selecting relevant supplementary information, e.g. from various specific statistics or administrative data sources;
- (d) combining both sets of concepts and figures into one set of tables and accounts.

In this research, turning to methodological aspects, the pilot implementation of the accounting framework put forward in the previous paragraphs has been structured according to the following main steps:

- learning from the international guidelines provided by IRTS2008, TSARMF2008 and SEEA;
- analysis of available sources (Supply and Use tables; basic statistics deriving from SBS, administrative sources, Air emission accounts);
- compilation of the economic module following the guidelines provided by IRTS2008 and TSARMF2008: actually estimates have been made for production, intermediate consumption, gross value added and employment of tourism industries³⁷;
- compilation of the environmental module: actually estimates have been made for the air emission flows generated by the various tourism characteristic activities;
- compilation of the hybrid environmental flow accounts through the integration of the economic and the environmental modules within a single accounting scheme.

The first step concerned the identification of a new outline of the boundary of tourism sector. In this sense, we identified the tourism industries and tourism products according to the rules defined in the IRTS2008:

- “tourism industry is composed of all establishments whose main activity is a particular tourism-characteristic activity and which serves visitors directly”³⁸ where “the output of tourism industries might not consist exclusively of tourism-characteristic products, and the output of other non-tourism industries may include some tourism-characteristic products”³⁹
- tourism products are “those goods and services directly acquired by visitors that are part of individual consumption expenditure incurred by households”⁴⁰;

For the identification of the relevant products and activities listed in tables nr. 7-8, a *bottom-up* approach has been followed⁴¹. Both products and activities have been traced starting from the highest possible level of detail provided by the SUT structure, in which both principal and secondary activities were distinguished. Tourism industries have been identified within the Italian national accounts production matrix, after excluding from the scope of analysis those

³⁷ A separate assessment has been made for package tours: the services typically provided by travel agencies, tour operators, and other providers of reservation services have been treated, according to the TSARMF2008, separately from the rest of tourism consumption services that are purchased through their intermediation. This accounting treatment “derives from the consideration that it is legitimate to consider reservation service providers as tourism characteristic activities, so that, in the TSA, they should be represented as providing a service directly to visitors. Additionally, it is necessary to measure all reservation services in the same way, irrespective of the procedure through which those services are actually remunerated (mark-ups, fees or commissions). In this context, «their output, that is measured using the gross margin they generate, is to be considered as purchased separately by the users of the reservation services, and the value of the rest of tourism consumption services purchased through them should be established “net” of this gross margin” (see TSARMF2008, Annex 3, page 83).

³⁸ IRTS2008, par. 6.16.

³⁹ IRTS2008, par.6.20.

⁴⁰ IRTS2008, par.5.2.

⁴¹ Maresca, Anzalone, Piscitelli [2012] *Versus the first italian tourism satellite account: the production approach*, Paper presented at the 20th IIOA conference, Bratislava.

activity groupings which clearly did not include any tourism industry at all. It has to be stressed that some special issues required flexibility in applying international correspondence between economic activities and products, leading to include in the tourism industries kind of productions, or part of them, not directly considered tourist in.

In the process of singling out the activities relevant according to the TSA, one specific issue was the lack of perfect overlapping between the industries shown in *Table5* of the TSA and the corresponding activity groupings in the core system of national accounts. This appears clearly from table nr. 7 below, where a bridge between the industry classification adopted in the TSA and the one adopted in the core system of national accounts is provided in terms of ISIC Rev. 4 classes⁴².

Table 7 - Composition in terms of ISIC Rev. 4 classes of tourism industries and of their corresponding items within the activity groupings of the Italian national accounts

Activity groupings selected from the Italian national accounts for TSA purposes (TSA <i>Table5</i>)	ISIC. Rev. 4 classes included in the activity groupings selected from the Italian national accounts	ISIC. Rev. 4 classes included in the tourism industries	Tourism industries (TSA <i>Table5</i>)
1- Accommodation	5510-5520-5530-5590	5510-5520-5530-5590	1- Accommodation for visitors
2- Buying and selling of real estate and real estate activities for third parties	6810-6830	6810-6830	
3- Rental and management of properties owned or leased	6820	6820	
4- Food and beverage serving activities	5610-5621-5629-5630	5610-5629-5630	2- Food and beverage serving activities
5- Railway transport	4910-4920	4910	3- Railway passenger transport
6- Other land passenger transport	4931-4932-4939	4932-4939	4- Road passenger transport
7- Maritime and inland water transport	5010-5020-5030-5040	5010-5030	5- Water passenger transport
8- Air transport	5110-5121-5122	5110	6- Air passenger transport
9- Renting and operating leasing activities	7711-7712-7721-7722-7729-7731-7732-7733-7734-7735-7739-7740	7711	7- Transport equipment rental
10- Services activities of TA, TO and related reservation services and activities	7911-7912-7990	7911-7912-7990	8- Travel agencies and other reservation services industry
11- Creative, arts and entertainment activities	9001-9002-9003-9004	9001-9002-9003-9004	9- Cultural industry
12- Libraries, archives, museums and other cultural activities	9101-9102-9103-9104	9102-9103-9104	
9- Renting and operating leasing activities	7711-7712-7721-7722-7729-7731-7732-7733-7734-7735-7739-7740	7721	10- Sports and recreational industry
13- Lotteries, betting and casinos related activities	9200	9200	
14 – Sports, amusement and recreation activities	9311-9312-9313-9319-9321-9329	9311-9319-9321-9329	

Source: Maresca S., Anzalone M., Piscitelli I. [2012]

For any tourism industry the whole production was quantified: both main and secondary.

⁴² Ivi.

Table 8. Composition of tourist products from Italian NA's structure.

NA selected products	T5 products
1- Hotel services and similar	1- Accommodation services for visitors
2- Other accommodation services	
3- Sale of real estate services with own property made services	
4- Real estate services for third parties	
5- Administration services and property management for third parties	
6- Real residential housing services	
7- Imputed residential housing services	
8- Food and beverage sales services	2- Food and beverage serving services
9- Interurban railway passengers transport services	3- Railway passenger transport services
10- Other land passenger transport services	4- Road passenger transport services
11- Shipping, cabotage and inland water passengers transport services	5- Water passenger transport services
12 - Air transport services of passengers	6- Air passenger transport services
13- Services of renting and leasing of consumer goods for recreation and leisure	7- Transport equipment rental services
14- TA services	8- Travel agencies and other reservation services
15- TO services	
16- Other reservation service and related services	
17- Library, archives, museums and other cultural services	9- Cultural services
18- Creative, art and entertainment services	10- Sports and recreational services
19 - Services relating to gambling	
20- Management services of sports arenas and sports facilities	
21- Sports entertainment and recreation services	

Source. Maresca S., Anzalone M., Piscitelli I. [2012]

As a matter of fact, calculating the economic aggregates to compile *Table5* of the TSA has turned out to be fairly feasible due to the fact that the information obtained starting from the Italian national accounting production matrix was broken down by 106 branches of economic activity and by 266 product items (table nr. 8).

Table 9 - Break-down of products and branches of economic activity in the Italian national accounting production matrix

Products	Branches of economic activity						Total
	1	2	...	i	...	106	
1	$p_{1.1}$	$p_{1.2}$	...	$p_{1.i}$	...	$p_{1.106}$	P_1
2	$p_{2.1}$	$p_{2.2}$	...	$p_{2.i}$	...	$p_{2.106}$	P_2
...
j	$p_{j.1}$	$p_{j.2}$	...	$p_{j.i}$	...	$p_{j.106}$	P_j
...
266	$p_{266.1}$	$p_{266.2}$	...	$p_{266.i}$	...	$p_{266.106}$	P_{266}
Total	$P_{.1}$	$P_{.2}$	...	$P_{.i}$	...	$P_{.106}$	$P_{..}$

With reference to the previous table nr. 9, for each tourist industry, grouped as shown in Table 4, the tourist part of production was estimated, through a cross-analysis branch/product made using NA's matrix, as envisaged in the below table nr. 10. Therein, the examples of breakdown of the accounting branch refer branches entirely tourist (e.g. branches 2 and i) or partially tourist (e.g. branches j and n).

Table 10 - Break-down of products and branches of economic activity in the Italian national accounting production matrix. Tourist branches and products

Matrix: Tourist branches and products									
Products	Tourist products (t: products entirely or partially tourist)	Branches of economic activity							Total
		(t: Branches entirely or partially tourist)							
			t		t	t		t	
		1	2	...	i	j	...	n	
1		p ₁₁	p ₁₂	...	p _{1i}	p _{1j}	...	p _{1n}	p _{1.}
2	t	p ₂₁	p ₂₂	...	p _{2i}	p _{2j}	...	p _{2n}	p _{2.}
...	
I	t	p _{i1}	p _{i2}	...	p _{ii}	p _{ij}	...	p _{in}	p _{i.}
J		p _{j1}	p _{j2}	...	p _{ji}	p _{jj}	...	p _{jn}	p _{j.}
...	
m	t	p _{m1}	p _{m2}	...	p _{mi}	p _{mj}	...	p _{mn}	p _{n.}
Totale		p _{.1}	p _{.2}	...	p _{.i}	p _{.j}	...	p _{.n}	p _{..}

Source. Anzalone M. [2012]

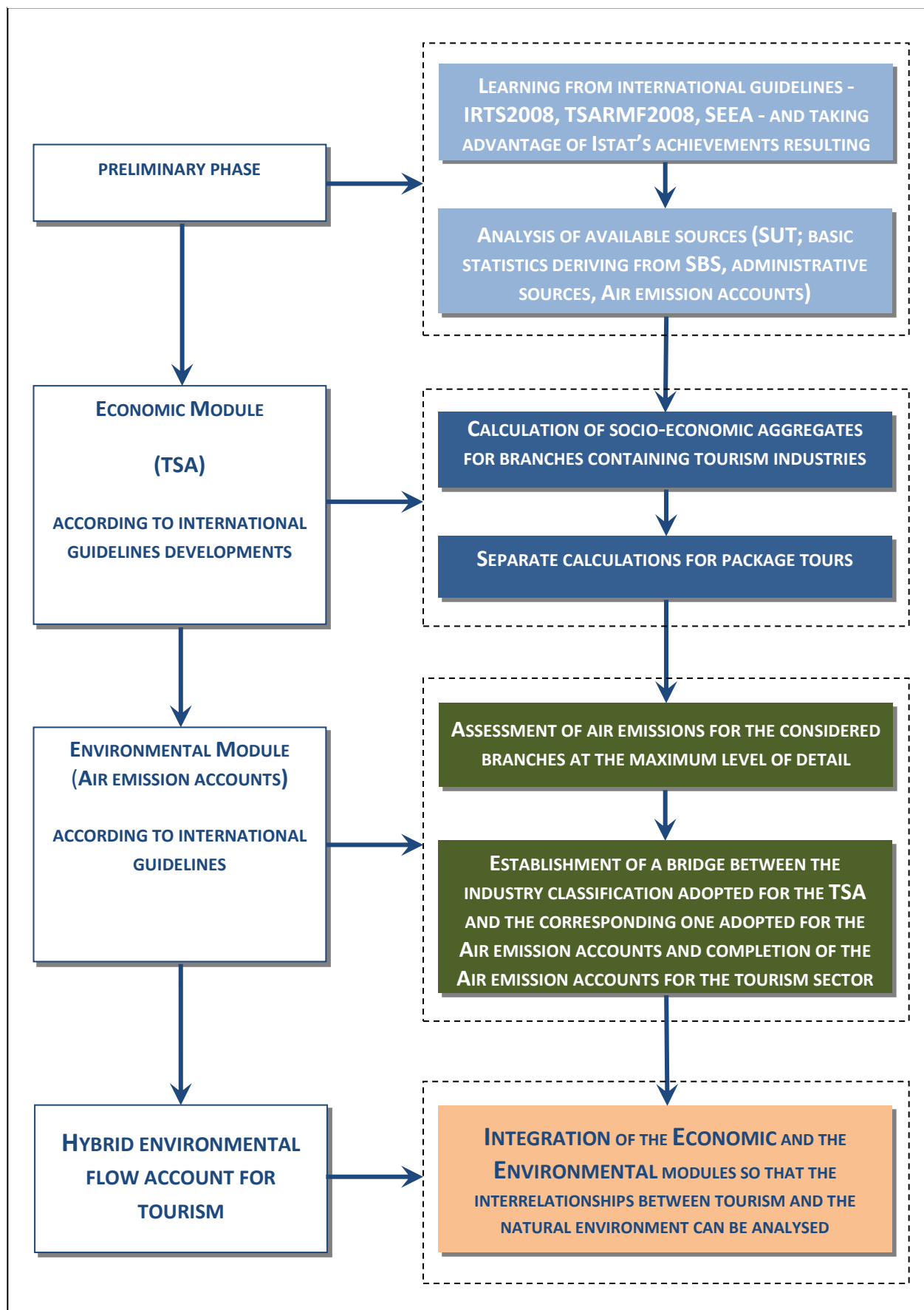
After the completion of the preliminary phase – analysis of the international guidelines provided by IRTS2008, TSARMF2008 and SEEA and analysis of available sources – production, intermediate consumption, value added and employment of tourism industries has been estimated according to *Table5* of the TSA⁴³. It has been hence set up the environmental module of the hybrid environmental flow accounts.

One specific issue in the overall process was to obtain a detailed enough industry break-down for both the economic module and the environmental one. Also, having exactly the same industry break-down in both modules was a pre-condition for linking the two modules within the proposed single accounting framework. Given the TSA, therefore, an ad hoc step has been made starting from the Air emission accounts currently produced by Istat: all emissions have been broken down by NACE Rev. 2 class and all classes resulting to be out of tourism industries have been excluded from the hybrid environmental flow accounts specific for tourism, so that a one to one correspondence has been established between industries according to the TSA *Table5* and flows of air emissions registered in the accounts.

The following pages report in self-explaining figures a selection of data and diagrams elaborated within the pilot implementation of the accounting framework proposed for hybrid environmental flow accounts specific for tourism (see fig. nr. 5 to fig. nr. 10).

⁴³ TSARMF2008, page 69.

Fig.nr. 4 - Developing hybrid environmental flow accounts specific for tourism – main steps of the research work carried out in Italy



Source: elaboration from Anzalone M. [2012]

Fig.nr. 5. Italian Hybrid environmental flow account for tourism 2008 – TSA Table 5⁴⁴ aggregates plus emission flows

[illegible]

⁴⁴ In addition to monetary aggregates according to the TSA *Table5*, also figures concerning employment are included.

Fig.nr. 6- Italian hybrid environmental flow accounts for tourism 2008. Main monetary and physical variables

		Data			%	
		Tourism industries	Other industries	Total Economy	Tourism industries/ Total Economy	Other industries/ Total Economy
Economic Module	Production (*)	183.043	3.023.569	3.206.612	5,7%	94,3%
	Intermediate Consumption(*)	92.735	1.696.377	1.789.112	5,2%	94,8%
	Value Added	90.308	1.327.192	1.417.500	6,4%	93,6%
	Employment	2.232.534	24.045.986	26.278.520	8,5%	91,5%
Environmental Module	As	151	41.775	41.926	0,4%	99,6%
	Cd	44	7.635	7.679	0,6%	99,4%
	CH4	1.141	1.773.471	1.774.612	0,1%	99,9%
	CO	28.361	1.021.923	1.050.284	2,7%	97,3%
	CO2	18.852.813	356.900.843	375.753.657	5,0%	95,0%
	Cr	310	55.568	55.878	0,6%	99,4%
	Cu	5.830	106.216	112.046	5,2%	94,8%
	Hg	6	9.603	9.609	0,1%	99,9%
	N2O	658	90.933	91.592	0,7%	99,3%
	NH3	53	397.505	397.558	0,0%	100,0%
	Ni	4.969	100.557	105.526	4,7%	95,3%
	NMVOC	7.661	548.584	556.245	1,4%	98,6%
	Nox	156.406	840.147	996.553	15,7%	84,3%
	Pb	4.796	269.270	274.065	1,7%	98,3%
	PM10	9.392	113.364	122.756	7,7%	92,3%
	PM2_5	9.238	86.504	95.742	9,6%	90,4%
	Se	402	11.821	12.222	3,3%	96,7%
	Sox	46.690	280.640	327.330	14,3%	85,7%
	Zn	3.805	934.978	938.783	0,4%	99,6%

Fig.nr. 7 - Italian hybrid environmental flow accounts specific for tourism 2008. The tourism sector in comparison to the total economy

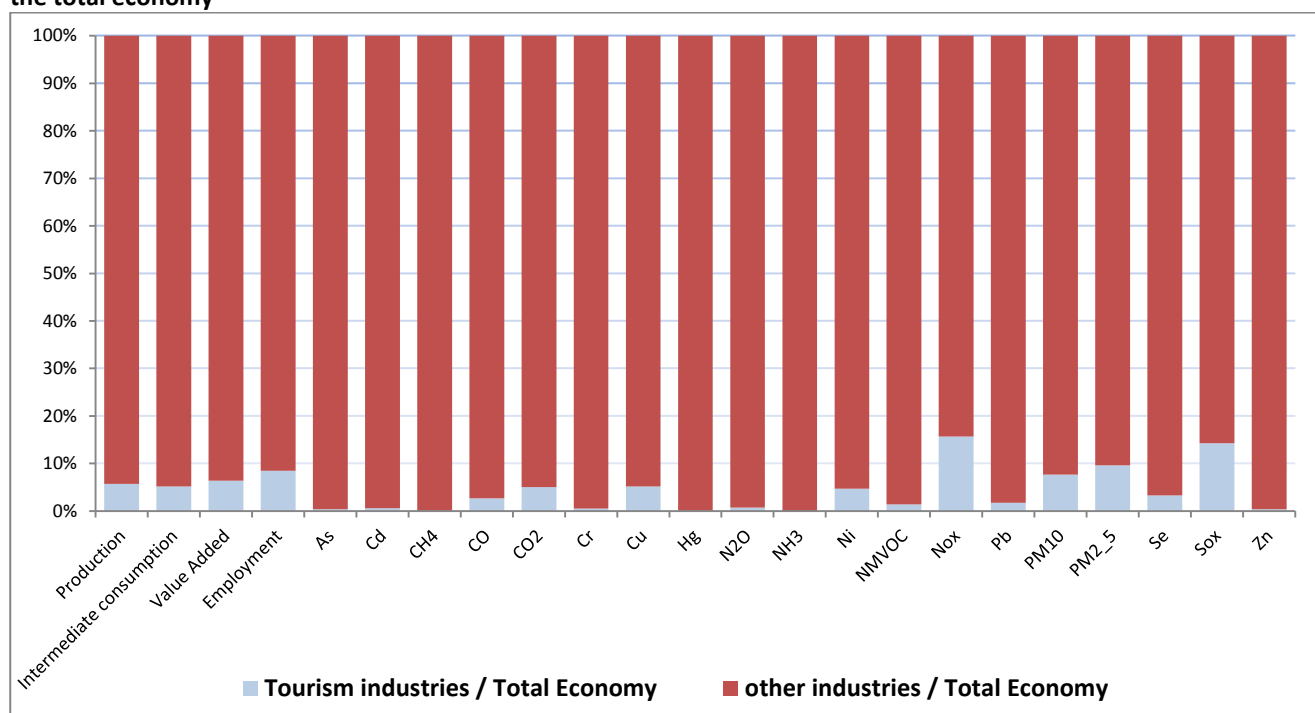


Fig.nr. 8 - Italian hybrid environmental flow accounts specific for tourism 2008. Production of the tourism sector

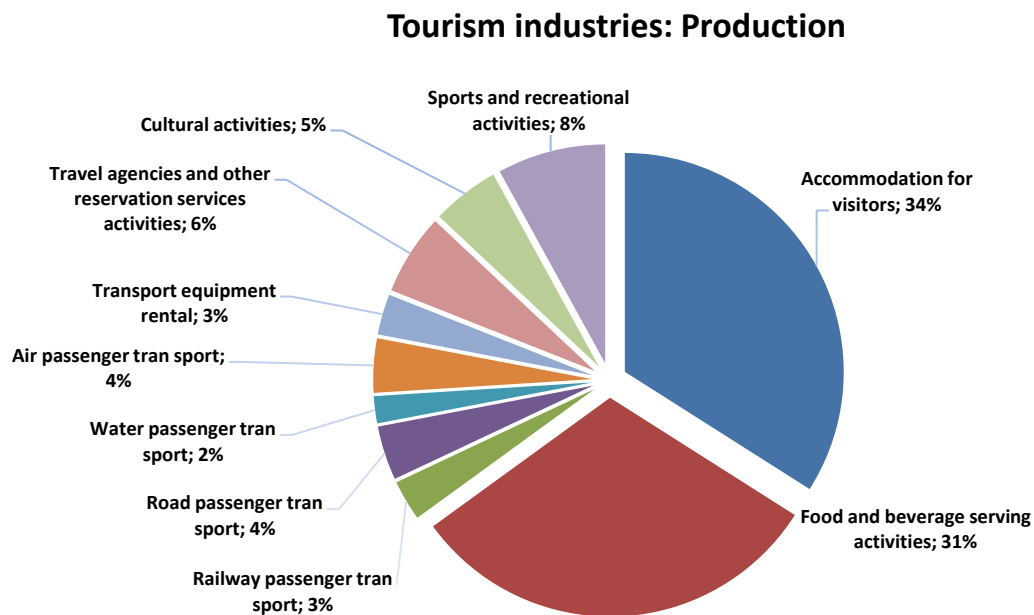


Fig.nr. 9 - Italian hybrid environmental flow accounts specific for tourism 2008. Intermediate consumption of the tourism sector

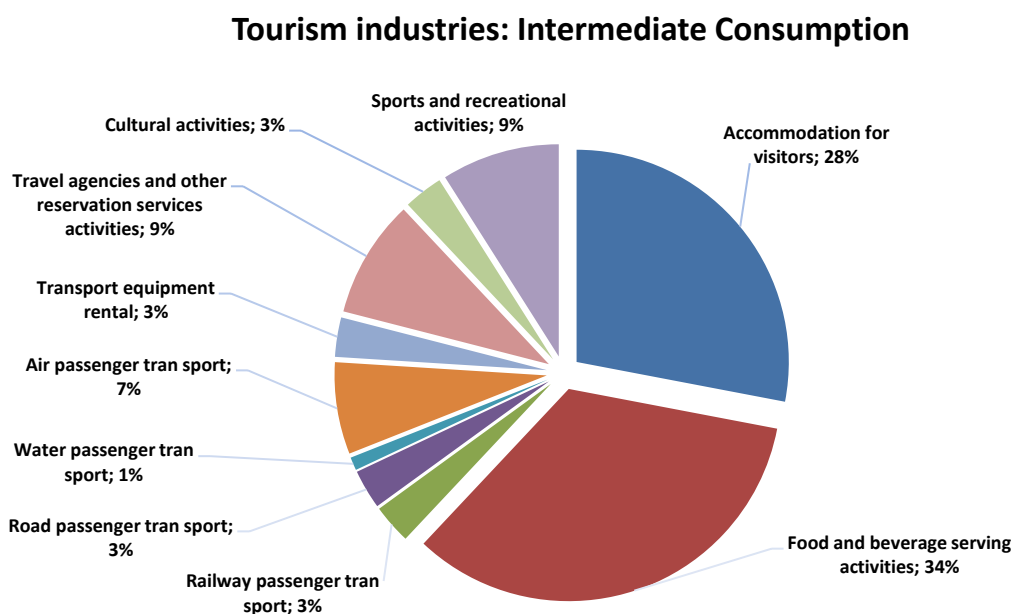
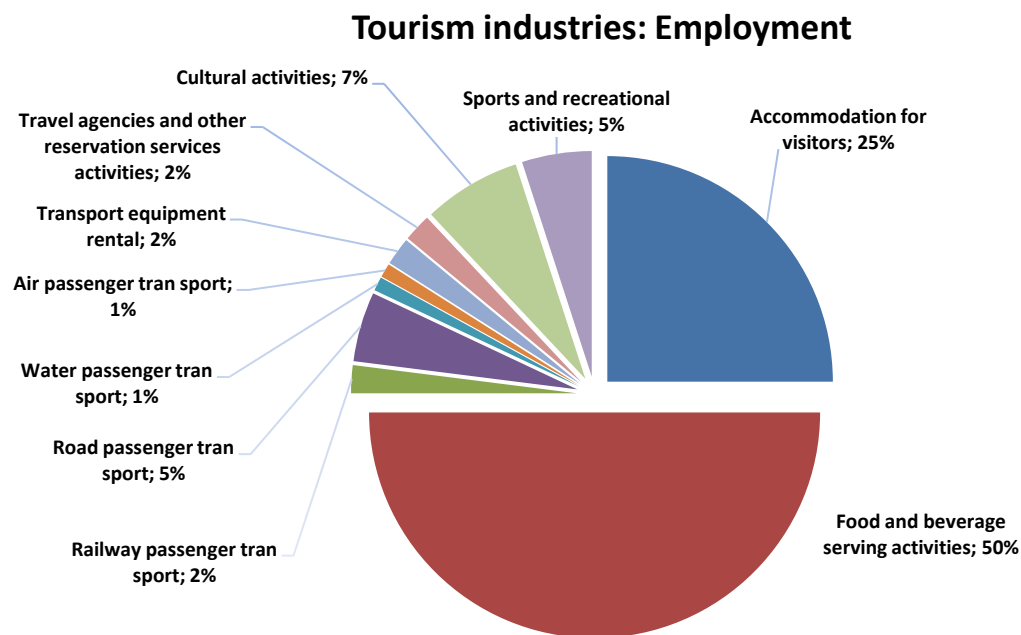


Fig.nr. 10 - Italian hybrid environmental flow account for tourism 2008. Employment of the tourism sector



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