

*Life Cycle Approach: a critical review in the
tourism sector*

Authors:

Gabriella Arcese

Roberto Merli

Maria Claudia Lucchetti

**DEPARTMENT OF BUSINESS STUDIES
ROMA TRE UNIVERSITY**

Introduction

**The concept of
"sustainability"**



Comes from the scientific literature that defines sustainable the management of a resource if it's not exceeded in its exploitation beyond a certain threshold defined critical natural capital.

(Arcese, 2013)

Introduction

Three main component of sustainability



- ✦ The ability to generate income and employment for the people's livelihood (economic sustainability)
- ✦ The ability to generate conditions of human well-being, understood as the territory security, an equal distribution of health and civil rights (social sustainability);
- ✦ The ability to maintain the same level of quality and reproducibility of natural resources (environmental sustainability)

Introduction

The Life Cycle Sustainability Assessment (LCSA)



It can be used for the sustainability evaluation of products/processes or services. The goal is to create a comprehensive tool to measure all dimensions of sustainability whose output can be presented and understandable to non-experts in the field and methodology.

(Finkbeiner et al., 2010)

G. Arcese; R. Merli; M.C. Lucchetti

Methods: Literature Review

The tools for sustainability assessment based on life cycle approach are argue with the aim to improve some current methodologies application for environmental analysis, socio and economic evaluation of the impact in the cycle of the tourism activities.

The sustainability Indicators

The sustainability indicators consider areas where economy-environment and society are weak.





The sustainability Indicators

A good sustainability indicator must meet the following requirements for effectiveness (Tenuta 2009):



1. Relevance: that show an aspect of the system that you need to know
2. Comprehensibility, even by non-experts
3. Verifiability, otherwise it cannot be credible
4. Representativeness: that is likely to prove difficult measures directly executable.

The sustainability Indicators

the sustainability indicators that have been developed can be grouped into three categories:



- ✦ 1. indicators of critical load and critical level;
- ✦ 2. socio-ecological indicators;
- ✦ 3. indicators for measuring sustainable development (SDR, Sustainable Development Records);

The sustainability Indicators

The definition of **LCSA** is defined as the approach to evaluation of all relevant environmental, economic and social impacts and benefits in decision making the improvement of the sustainability of a product through the entire lifecycle
(UNEP/SETAC, 2011).

$$LCSA = E-LCA + LCC + S-LCA$$

- **E-LCA** refers to the environmental life cycle assessment;
- **LCC** is the life cycle costing methodology;
- **S-LCA** is social life cycle assessment.

(Klöppfer 2008, Finkbeiner et al., 2010).

G. Arcese; R. Merli; M.C. Lucchetti

Life Cycle Approach and Tourism: our approach

The first applications of the methodology in the tourism sector dates back to the '90s, with **the implementation of LCA methodology to the Tour Operator by the UK CEED**, who conducted the analysis for British Airways Holidays (BAH). At a **first step** only the environmental impacts of major destinations were detected, and only in a **second phase** the impact of the management of tourist facilities was carried out.

(Sisman 1994; UK CEED 1998; Tontodonati 2002; Petti & Tontodonati 2002, De Camillis et al., 2010)

Life Cycle Approach and Tourism: our approach

The LCA conducted **hotel**, in which the phases of the life cycle have been defined basing on the life cycle of the building, and lead mainly to an environmental assessment of the performance characteristics of the building and related services (Floridia 2007), or to support an eco-design of processes with the aim of comparing the various construction projects (König et al. 2007).

Results

The objective of the study

Quantify the environmental impact of the activities carried out by the customer during the time of full use of its tourist services of a holiday in a specific structure, in this case, the accommodation taken into analysis.

The aim of the study

Identification of the critical points and design of appropriate strategies to reduce the impacts..

Functional Unit

The functional unit is a temporal unit.

The service is considered as a stay of 10 days, chosen on the basis of mean residence time in the structure during the high season. Analyzing the locally obtained data in fact, it was verified that the largest number of customers stay on average from 7 to 14 days. Customers of the structure, moreover, tend to be loyal to the site and to repeat the same holiday for several consecutive years. This helps to detect the profile.

System Boundaries

In the definition of system, boundaries have been outlined, taking into account the period of stay of tourists in the structure .For each phase, the processes usually considered are: arrival in the structure, permanence, the end of the stay and departure of the visitor. (Castellani e Sala, 2012)

Cuts off:

It is excluded the environmental impact of the construction of the building. They are not charged with the cost of production and maintenance of household appliances.

Quality of data: Source

- Primary data coming directly from the bills of water, electricity and gas use, waste through questionnaires and directed interviews to facility staff and customers;
- Secondary data analysis from interacting with local companies operating in connected services (transport, tourism, catering and laundry services) specific databases for LCA, including Ecoinvent, database software used for modelling inventory, and other external documents.

G. Arcese; R. Merli; M.C. Lucchetti

Discussion

There aren't more studies in this fields.

There aren't more applications and case studies.

Part of these are based on LCA framework,
in part represent a hybrid economic-environmentl input-
output LCA or simplified analysis.

More frequent in tourism LCA application are the adoption
of a hybrid model (Patterson and Mc Donald, 2004).

The CML indicator had a minimum amount in the reference
and are not to be considered in major part of calculation as
the ADP (Abiotic Depletion) according the CML2001.

Conclusions

Even for a functional unit so specific impact indicators most affected reflect the results found in other studies. Indicators of impact categories most affected are the GWP for all reservation services and, based on Eco Indicator, in specific for the transports Human Health and l'Ecopoint Quality for the endpoint indicator. In more of case studies of LCA applied in tourism activities, high value had presented in the Water Depletion and in the Acidification Potential, in particular for the rooms services and laundry services.

Thank you for the attention

Authors:

Gabriella Arcese

Roberto Merli

Maria Claudia Lucchetti

G. Arcese; R. Merli; M.C. Lucchetti