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## **The economic sustainability of tourism growth through leakage calculation**

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## Abstract

The development and growth of tourism depends on its sustainability over time and on its benefits for destinations as a whole. However, calculating sustainability is not an easy task. The aim of this article is to focus on the economic sustainability of tourism growth and, after an exhaustive review of literature, to propose a quantitative mathematical model to measure it by analyzing and calculating leakage in the hotel sector. Leakage analyzes the amount of revenue generated by tourists which does not stay in the destination. Through a sample of 204 interviews with managers, this study validates the model created and calculates leakage in a mass tourism destination (Valencian Region, Spain). Our paper opens new areas of research in sustainability literature and, as it provides orientations to outcomes for policy, it is of great value to tourism planners and governments in their tasks to implement appropriate tourism development policies.

**Keywords:** Economic sustainability of tourism, leakage, economic multipliers.

Tourism is one of the most important industries in the world and is an essential mechanism for development in many emerging markets, where the hopes for economic improvement are firmly based on the amount of tourism revenue.

“The development of tourism has generally been considered a positive contribution to economic growth” (Dritsakis, 2012, p. 801). In this vein, as “visitors to a tourism destination spend money on buying goods and services, creating economic impacts” (Klijs *et al*, 2012, p. 1176), in many places “a growing tourism industry is seen as a potential solution to issues such as low employment rates or the need for foreign currencies and generating higher government revenues” (Rid *et al*, 2014, p. 102). In

addition, tourism can produce the development and high growth of subsidiary industries, infrastructures and even social facilities that have a considerable impact on the environment and the economy. However, “negative externalities accompanying rapid tourism growth have already drawn much attention in the literature” (Sheng and Tsui, 2009, p. 630). Hence, tourism theories have recognized the key importance of managing the positive and negative externalities of tourism to ensure the competitiveness of most types of tourist destinations (Inskeep, 1991; Mihalic, 2000), and facilitate the sustainability of tourism development.

Nevertheless, economic multiplier effects in other sectors are often not as relevant as they should be due to the effects of leakage, which impedes them from being widely filtered through the economy and other sectors (Garrigós *et al*, 2000). In this vein, “multipliers from tourism typically are greatly reduced by leakage” (Haddad *et al*, 2013, p. 175), with the average of import-related leakage estimated at 40-50% for small economies and 10-20% for advanced economies (UNEP, 2005; Budeanu, 2007). Moreover, “although the tourism industry has constantly grown, developing countries have benefited less than expected because of the “leakage” problem”, with the percentage of money spent in developing countries for tourism being very small in comparison (Carbone, 2005, p. 559-560).

However, leakage is difficult to observe and measure quantitatively. In this vein, few works have emphasized its measurement, due to its complexity, and the ones that have tried to do so have concentrated on qualitative mechanisms.

The aim of this article is to overcome this situation. Thus, after discussing the importance of economic sustainability and the carrying capacity of destinations, we have put forward a rigorous review of the literature on leakage and the measurement of economic impacts, and propose a model to measure leakage in the hotel sector.

Since almost all leakage measurements in literature are qualitative, our study also contributes by creating and postulating a mathematical model based on existing qualitative models to calculate leakage, and a measuring scale or questionnaire to develop it.

In addition, we applied this questionnaire in a tourist destination in order to validate the model and to calculate the variables and weights needed for the final leakage calculation formula. We used this model and calculated leakage in a mass tourism destination, more precisely in the region of Valencia (Spain). The sample comprised data from 204 interviews with different hotel managers.

### **The importance of economic sustainability.**

Nowadays, the tourism industry is facing enormous transformations which are essentially a result of the impact of new technologies in its concept, and also of the diverse impacts and pressures that the growth of tourism is causing in diverse environments.

By concentrating on this second aspect, the importance of sustainability has been addressed by all major tourism-related organizations such as the United Nations, the World Bank, the World Tourism Organization (UNWTO), the World Travel & Tourism Council (WTTC), and the World Wide Fund for Nature. According to Saarinen (2006), “the term and idea of sustainability was transferred to tourism from the ideology of sustainable development following the publication of the Brundtland Commission’s report ‘Our Common Future’ in 1987”, defining sustainable development as a process that meets the needs of present generations without endangering the ability of future ones to meet their own needs (WCED, 1987). In this vein, the principles of sustainability are designed to make optimal use of resources whilst simultaneously

protecting and enhancing them (Butler, 1999; Cawley and Gillmor, 2007; Saarinen, 2006).

However, sustainable tourism is a multifaceted concept encompassing social, economic, ecological, cultural, perceptual, psychological, ethical, physical and political aspects among others, “each having different implications” (Saarinen, 2006, p. 1125). In addition, sustainability is related to several factors such as the intensity of development, the speed of tourism growth, the environmental framework, and the measurement of economic development in the different regions (Garrigós *et al*, 2004).

Apart from the positive impact of tourism developments, the presence of tourists can have negative externalities, and hence, as Arrow *et al* (1995, p. 520) pointed out, “imprudent use of the environmental resource base may irreversibly reduce the capacity for generating material production in the future”. Nevertheless, literature must “go beyond the traditional notion of sustainable tourism, which concentrated mainly on the tourism-environment link” (Carbone, 2005, p. 564).

As Carbone (2005, p. 560) pointed out, “economic sustainability refers to the additional income provided to locals to compensate them for the burden that the presence of tourists may cause”. Moreover, we can define the economic sustainability of tourism growth as the net economic improvements for the local economy that tourism development can produce in the long term, taking into account all the diverse impacts that affect the different sectors and industries of the local economy.

Nevertheless, the sustainability of tourism development in general, and in particular the economic sustainability of tourism growth, must be measured in order to be useful (Garrigós *et al*, 2004), and although the question and challenge is whether this is possible (Buckley, 1999), – authors such as Garrigós *et al* (2004) faced many problems in this area –, the measurement of the different influential factors is essential to improving planning and managerial processes, and increasing the sustainability of an

area (Cooper *et al*, 1998). Measurement is particularly critical in the tourism industry, and especially when the growth and impacts of mass tourism are seen to be problematic for the environment and for the industry's future. This is particularly relevant in the mass tourism destinations on the Mediterranean coast (Saarinen, 2006), which is the case of this study.

This paper proposes a way to measure the sustainable economic development of a region by calculating its level of leakage. In fact, we consider that an economy whose level of leakage from tourism activities is high must concentrate on reducing this level before increasing growth in tourism, as this does not filter down to the rest of the economy. Kokkranikal *et al* (2003, p. 426–427) state that “a number of issues such as the fragile environment, limitations of resources and infrastructure, vulnerability of the indigenous societies, and lack of experience and expertise in tourism development, make it very difficult... to absorb and manage the inevitable impacts of tourism”, a situation that is exacerbated by “structural difficulties”, which perpetuate dependency, leading to higher levels of economic leakage. At this point, the level of leakage can show the relevance of positive versus negative impacts of tourism development, as this development can produce natural capital degradation which leads to a decline in visitation (Patterson *et al*, 2008), ultimately stagnating the local economy and producing a period of steady visitor decline in the sense of the tourism destination cycle of evolution set out by Butler (1980).

### **The importance of leakage in tourism**

Following Haddad *et al* (2013), “whether the benefits of tourism as an economic base are equivalent to those of other sectors depends on the degree of linkage within or leakage from the regional economy”. The main problem of economic sustainability or

economic growth is that, according to Budeanu (2007, p. 50), although the income generated by tourism is abundant it often leaks out from the region due to imports, or foreign ownership of tourist facilities. Hence, according to Sheng and Tsui (2009, p. 635), “the real tourism revenue is the amount of tourist spending that remains locally after profits and wages are paid outside the area and after imports are purchased. The amounts to be subtracted are called leakage”.

Leakage can be defined as the amount of revenues generated by tourists that do not stay in the region visited (imports, taxes... etc.) (Lejarraga and Walkenhorst, 2010). It can also be defined as “the failure of tourist spending to remain in the destination economy” (Sandbrook, 2010, p. 125), or “the loss of foreign exchange and other hidden costs deriving from tourism related activities” (Cernat and Gourdon, 2005, p. 6).

Although financial leakage occurs in many industries and sectors, its relevance is critical in the tourism sector (Mowforth and Munt, 2003) due to its importance and its multiplying effects. Specifically, the economic effects of the presence of visitors in tourist destinations stem from the fact that travelers and tourists spend their money on a wide variety of goods and services. This expenditure can be seen as an injection of financial resources into the host economy. In general, agriculture, construction, trade, hotels and restaurants, transport, water, electricity, social services and telecommunications (Mbaiwa, 2005) are those that benefit the most from the multiplying effect of tourism activities. Moreover, there is an extensive collection of studies in literature that emphasizes the importance of several tourism multiplier effects (Adams and Parmenter, 1995; Blake *et al*, 2008; Blake and Sinclair, 2003; Dwyer *et al*, 2000; Dwyer *et al*, 2006; Hughes, 1994; Pratt and Blake, 2009; Zhou *et al*, 1997).

However, the higher the leakage of a region, the lower the economic impact of tourism is, with many of these benefits not remaining in the local economy. For instance, in some regions, local residents do not obtain enough benefits from tourism



development when hotel managers prefer to hire foreign workers instead of local ones (Hohl and Tisdell, 1995). In addition, sometimes only a small portion of the productive value of the tourism sector remains active in the local region, and much tourist spending returns to the region of origin (e.g. when a tourist buys imported products, or there are few taxes) or never leaves the country of origin (this is the case of fees for travel agents, tour operators and airlines) (Lejarraga and Walkenhorst, 2010).

In short, there are many factors that cause an increase in the leakage of a region. These factors correspond to several situations such as holiday planning, transportation and accommodation (Supradist, 2004). One of these situations is when foreign companies try to sell tourists all inclusive packages in order to maximize their profits. In addition, there are other factors that influence leakage such as labor, infrastructure, technology and imported goods and services (Thomas *et al*, 2005).

This phenomenon is more relevant in countries with developing economies (Mbaiwa, 2005). Oppermann and Chon (1997, p. 114) observe that “high leakages are the primary reason for the disenchanting performance of tourism in developing countries”. Leakage levels are related to the supply capacity countries have (Mbaiwa, 2005; Simpson and Wall, 1999). Thus, developing countries and rural areas are the most affected regions (Torres, 2003). Similarly, Supradist (2004) argues that developing countries and islands are those most exposed to high levels of leakage. Specifically, these countries find difficulties in procuring local suppliers which means they have to import large quantities of products and thus significantly increase leakage. In the words of Kokkranikal *et al* (2003, p. 444) “high levels of economic leakage undermine the aim of localization of economic benefits and meaningful participation of the local community in tourism”.

To sum up, when leakage is important, the economic sustainability of a region is affected by this loss of benefits, and only a small portion of the productive value of the

tourism sector remains in the region. Hence, when expressed as a ratio of the amount of benefits received by the local economy compared to the amount that is lost, sustainability is said to result from a positive economic balance (Mowforth and Munt, 2003), which we consider to be correctly measured with the concept of leakage.

## **Review of the studies and variables of leakage calculation**

Nevertheless, and despite its importance, economic leakage is not often considered and many regions have overlooked it (Supradist, 2004). Some authors have discussed the economic impact of leakage in the tourism industry. However, despite the importance of this factor, few studies have been carried out so far and they have not been particularly exhaustive (Kokkranikal *et al*, 2003). Moreover, almost all the literature studies have centered on qualitative methods whilst quantitative methods are practically non-existent. To try to improve this, our article provides an empirical approach to the calculation of leakage from a quantitative viewpoint.

Although there are few quantitative studies on leakage, some authors have described important variables in qualitative models (Akama, 2000; Asiedu, 2008; Sandbrook, 2010; Shaalan, 2005). Thus, before choosing the variables to be used in our model, we carried out an exhaustive study of the existing literature.

In spite of the fact that there are no mathematical models in literature that directly calculate leakage, there are models that calculate multiplier factors in local tourism. These studies are very interesting because they describe the most important variables that cause the greatest tourist impact on local economies (see Table 1).

This literature shows that different methodological evaluations and statistical tools have been used by authors, with input/output analysis being predominant in these multiplier effect calculation methods (Archer, 1995; Frechtling and Horvath, 1999,

Kweka *et al*, 2003; Zhou *et al*, 1997). Other methodologies used in literature are computable general equilibrium (CGE) models (Pratt, 2011), case study methods (Lacher and Nepal, 2010), applications of Keynesian-type multipliers (Archer, 1977), cost-benefit analysis (CBA) (Abelson, 2011), and the social accounting matrix (SAM) method (e.g., Wagner, 1997)...etc.

These previous studies have been conducted in various regions in different continents such as the Seychelles (Archer and Fletcher, 1996), Hawaii (Zhou *et al*, 1997), Kenya (Akama, 2000), Egypt (Shaalán, 2005), Denmark (Zhang *et al*, 2007), Brazil (Blake *et al*, 2008), and Uganda (Sandbrook, 2010). This fact is interesting as it reveals the variables that are common to all regions, thus enabling us to generalize a model.

Table 1 provides an approach to the main variables described by many authors.

The leakage phenomenon has gained importance in recent years, but leakage calculation models have been poorly researched. From the theoretical framework described above, we aim to make a proposal for calculating leakage based on a number of variables that quantitatively measure leakage.

## **Methodology**

Several models and empirical studies have investigated and analyzed the economic impacts of tourism and the relationship between tourism development and economic growth (Dritsakis, 2012, Klijs *et al*, 2012). They have been “often estimated using input-output models” (Haddad *et al*, 2013, p. 174). However, according to Haddad *et al* (2013, p. 174) “there is a great deal of variation about the magnitude of their impact”, according to the diverse methodologies used. Our proposal is to calculate leakage, and calculate it in a quantitative way. As mentioned above, this is an innovation and a

contribution to literature since almost all leakage measurements in previous literature have measured this construct qualitatively (Table 1 shows a brief representation of the literature on leakage that measures it qualitatively, as well as the most important works using quantitative measures). Specifically, our study has created scales of measurement and postulated a mathematical model to calculate leakage taking into consideration existing qualitative models.

In order to validate our model we also conducted an empirical study. First of all, we developed a questionnaire with the help of experts from the hospitality field (including academic and professional experts) in order to add or avoid a series of items and improve it. We used objective measurements and questions with percentages, and for almost all items, responses were measured on a 1-5 Likert scale ranging from 1=Totally Disagree to 5=Totally Agree. This questionnaire was then answered by a population of top hotel managers, excluding hostels, guesthouses, halls, and bed and breakfasts.

Our study was carried out in the Valencian Region. We obtained 204 completed questionnaires from top managers, out of a total population of 726 hotels, (this sample represents 28% of the population). In order to corroborate the goodness-of-fit of our sample, and to ensure that it was representative of the population, we used data from the Valencian Tourism Agency (2012). According to official data, a geographical breakdown of the population by major areas revealed that there were 205 hotels in Alicante (28%), 137 hotels in Benidorm, (19%), 228 hotels in Valencia (32%) and 156 hotels in Castellon (21%). Our sample also reflected these percentages, as we obtained 57 questionnaires from Alicante (28%), 41 from Benidorm (20%), 66 from Valencia (32%) and 40 from Castellon (20%).

### *Description of variables used in the model*

Our work ignores other types of leakage within the tourism sector and instead focuses on the calculation of leakage in the hotel sector, due its relative importance in the tourism chain. To do so, we also considered studying the leakage factor from two leakage subgroups: leakage produced by hotel suppliers and leakage caused by hotel customers.

Leakage produced by suppliers is caused because companies from other countries provide goods and services which have been outsourced by the hotel. This is the case of maintenance, cleaning, and electricity companies, for example. If the majority of these companies are foreign, leakage is greater. We calculated leakage by observing the weight of each hotel's expenditure items (the amount a hotel spends on consumables is not the same as the amount it spends on electricity) and multiplied them by the weight of foreign suppliers in each case.

After a comprehensive study of the literature, we specifically considered the following variables when calculating supplier leakage: light, water and gas (Archer and Fletcher, 1996; Cernat, and Gourdon, 2012; Gooroochurn and Sinclair, 2005), food (Archer, 1995; Pratt, 2011; Zhou *et al*, 1997), beverages (Archer and Fletcher, 1996; Frechtling and Horvath, 1999; Hjerpe, Yeon-Su Kim, 2007), telecommunications (Archer and Fletcher, 1996; Gooroochurn and Sinclair, 2005; Zhou *et al*, 1997), salaries (Lacher and Nepal, 2010; Sandbrook, 2010; Wagner, 1997), maintenance (Frechtling and Horvath, 1999; Gooroochurn and Sinclair, 2005), consumable products (Walpole and Goodwin, 2000; Zhang *et al*, 2007), decoration (Lacher and Nepal, 2010; Pratt, 2011), cleaning (Archer and Fletcher, 1996), restaurants (Blake *et al*, 2008; Lejarraga and Walkenhorst, 2010; Madsen and Jensen-Butler, 2007; Supradist, 2004; Zhou *et al*,

1997), tours (Akama, 2000; Frechtling and Horvath, 1999; Pratt, 2011; Supradist, 2004) and others.

We observed that authors used other variables in the literature such as transport (Archer, 1995; Blake, 2008; Supradist, 2004), accommodation (Akama, 2000; Blake, 2008; Lacher and Nepal, 2010), retailing (Archer, 1995, Zhang *et al*, 2007) and others. However, we concentrated on the 12 variables mentioned above because they were the most relevant according to the weight of total hotel expenditure. Thus, we conducted a pilot test involving 25 personal interviews with hotel managers. This step enabled us to find out the weight of each of the variables used in the model.

In order to calculate leakage from hotel clients, we used the three hotel distribution channels. In this sense, we considered the percentage of rooms booked directly by the hotel, by tour operators, and by other travel agencies respectively (Buhalis, 2003; Buhalis and Law, 2008). We calculated the weight of these three channels on hotel sales and also weighted the data according to the percentage of money the hotel receives when obtaining clients from each one. Finally, we also calculated the percentage of foreign distributors in these three channels.

Table 2 shows the main variables used in our calculations and their weight in the final calculation of each kind of leakage. We weighted these variables in order to calculate leakage from suppliers and leakage from customers.

### ***Proposal to calculate leakage in hotels***

Having described the variables used in the model, we put forward the following mathematical model in order to calculate the total leakage in the hotel sector of a region.

In order to calculate supplier leakage we proposed the following formula:

$$L_s = 1 - \sum_{i=1}^{12} e_i * p_i$$

In this formula:

$L_s$  is the leakage produced by suppliers for each hotel.

$e_i$  is the percentage of domestic companies for each of the 12 types of suppliers.

$p_i$  is the weight of each type of supplier as a percentage of total hotel expenditure.

In terms of customer leakage, we observed the different ways in which clients hired their rooms. To do so, we used the three types of distributors that sell hotel rooms directly to customers. These three distribution channels include sales through the hotel itself, sales through specialized websites (e.g. Booking) and sales through tour operators. This led us to corroborate the significant growth of e-commerce and its influence on hotel distribution (Buhalis, 2003; Buhalis and Law, 2008).

We considered that it was necessary to observe the percentage of sales of each of these three hotel distribution channels for this type of leakage, and ponder it again by the percentage of foreign companies. In this case, we found that the greatest leakage was associated with purchases made through agencies and foreign tour operators. We also observed the hotel's profit percentage after a sale through intermediaries (tour operators and websites). In this sense, and as in the case of supplier leakage, we were able to present a formula to calculate customer leakage.

The following formulas considered the three possible distribution channels: 1 was distribution by the hotel itself, 2 was distribution by specialist websites and 3 was distribution by the different tour operators.

$$X_{jt} = (a_{jt} * b_{jt} * c_{jt})$$

$$Z_{jt} = X_{jt} + ((1 - X_{jt}) * Y_{jt})$$

$$Lc = 1 - \sum_{i=1}^3 Z_i$$

In this formula:

$X_i$  is the percentage that remains in the hotel out of the total income in each of the three channels.

$Y_i$  is the percentage of domestic companies in each of the three channels.

$Z_i$  is the percentage that remains in the country in each of the three channels.

$a_i$  is the percentage of hotel rooms sold in each of the three channels.

$b_i$  is the percentage of hotel income after a sale in each of the three channels.

$c_i$  is the percentage of the average room price paid in each of the three channels.

Therefore, the overall leakage associated with the hotel industry is the sum of supplier leakage and customer leakage (Supradist, 2004):

$$Leakage = Ls + Lc$$

Taking into account these formulas, we calculated the leakage of each hotel individually. In addition, we considered hotel size in order to calculate the total leakage of a region. Specifically, we added the leakages from each hotel, taking into account their weight (depending on size). To measure the size of a hotel, authors such as Gartner (1999), and Morrison and Thomas (1999) propose quantitative criteria such as number of rooms, number of employees and number of beds. In our case, we concentrated on number of rooms. We thus obtained the following results for the Valencian Region (see



table 3) from the different tourist areas. As a result, we can observe that the area with the highest concentration of foreign tourists (Benidorm) has the highest rate of leakage.

## **Conclusions and future work**

The tourism industry has grown considerably in the last few decades and has become one of the main sources of income in many countries. However, its sustainability is not always observed in tourism development policies. This paper has concentrated on the concept of economic carrying capacity and more specifically on the measurement of leakage in order to determine the economic sustainability of tourism growth.

“Tourism activities are considered a source of economic growth throughout the world” (Dritsakis, 2012, p. 801). In this vein “the role of tourism to the economic growth and to the progress of modern societies has become a common awareness in political authorities worldwide” (Dritsakis 2004, p. 307). However, and although “tourism is an alluring source of income to struggling countries (and regions)”, as a result of leakages, “the multiplier effects generated for the local regional economy by tourism tend to be restricted” (Haddad *et al*, 2013, p. 175).

Although previous literature has shown the difficulties of measuring sustainability (according to Dritsakis, (2012, p. 802), the differences in empirical studies have revealed that many produce different results for different countries, different time periods within the same country and different methodologies in different regions, and there are special difficulties in calculating the leakage of a particular destination, we have revised the literature extensively in order to quantitatively measure the leakage of a tourism destination. In addition, we have proposed a mathematical model and we have calculated the leakage of hotels in a mass tourism destination. This fact is important, “limited understanding of the dynamics between different determinants of tourist sustainable behavior is a challenge that hinders sustainable progress” (Budeanu, 2007,

p. 505), and the understanding of the sources of leakages helps us to identify these behaviors in the economic sustainability of tourism growth.

Our work opens new areas of research as most previous studies only use a qualitative approach to measure this aspect. Future papers could try to improve our measurements or focus on the calculation of leakage in other subsectors of the tourism industry, in this or other destinations. In addition, further works should try to carry out in-depth research into the determinants of diverse leakages, and the influence of leakage on other variables of the economy, or on its influence on employment and the growth of this and other sectors.

In addition, our results are very important from a practical point of view as they can be used by planners and practitioners in order to develop their policies and to mitigate the leakage from tourism destinations and promote policies for economic sustainability. Our work has stressed the different leakages existing in the diverse areas studied, which can help government and firms to identify the advantages of the diverse tourism developments. In addition, we have shown the weight of the variables when calculating leakages, which can help government to concentrate on the most important areas to reduce leakage and improve the economic sustainability of tourism growth.

We have stressed that tourism in general, and tourist purchases in particular are a major source of income for destination communities (Budeanu, 2007). However, the effect of tourism “will depend mostly on the composition of the expenditures, both the direct purchases by tourists in the destination regions and the associated multiplier effects” (Haddad *et al*, 2013, p. 175). Whether the economic sustainability of tourism developments centers on compensating locals for the burden that the presence of tourists may cause, the importance of the multiplier effects, and of the amount of money that remains in the destinations are critical. In addition, “while tourism may provide financial benefits and economic growth for some, it may result in unequal distribution

of resources” (Carbone, 2005, p. 563), a factor that we consider essential as it can destroy the bases of the economic sustainability of tourism growth

In order to improve the benefits of tourism growth, we agree that “channeling injections of income from abroad to specific regions of a country may still be seen as a process of high probability of activating the multiplier effect in those areas” (Haddad *et al*, 2013, p. 175), despite uncertainties about its magnitude and potential leakage and crowding-out effects. However, as Dritsakis (2012, p. 801) pointed out, what is needed is “a balanced and harmonious growth of the tourist economy in relation to other sectors of economic activity, especially sectors such as agriculture and industry”. According to Carbone (2005, p. 562), “tourism is not inherently positive or negative... but everything depends on how it is planned and managed”.

Mshenga and Richardson (2013, p. 667) pointed out that “stimulating local entrepreneurs to participate in tourism is an important factor in maximizing the potential for the sector to contribute to regional economic development”. In addition, we agree with Mshenga and Richardson (2013, p. 680) in that greater participation in hotel procurement of products from micro and small enterprises and other local businesses may contribute more to local and regional economic development, minimizing foreign exchange leakages that are associated with the supply of imported products.

In addition, Mshenga and Richardson (2013, p. 679), who identify factors which influence micro and small enterprise participation in tourism and the linkages between them and hotels, and the Agenda 21 for tourism (UNEP, 2003), call for greater community involvement in tourism policy development and initiatives to increase participation of micro and small enterprises and the impact of tourism on the local economy. The participation of locals is also stressed by Rid *et al* (2014, p. 103), “it has been argued that one form of reducing leakages is through locals becoming more directly involved in terms of ownership and levels of control of tourism business”. In

this vein, these authors emphasize the importance of promoting community-based tourism enterprises or pro-poor tourism initiatives. Carbone (2005, p. 560) also underlines that “the idea of pro-poor tourism – tourism that generates net benefits for the poor – has been advanced as a solution to the leakage problem. This author also emphasizes that “creating a long-term vision, which includes not only tourism development but also the general development of the community, is key to the success of any tourism strategy” (Carbone, 2005, p 562). Hence, tourism planning should entrust more decision making power in local communities.

However, economic sustainable growth needs a balance of interest and motivators as well as suitable policies from the diverse stakeholders (tour operators, local governments, local communities, local firms...). In this vein, Carbone (2005, p. 563) postulates a “frank dialogue”: “discussions are often lengthy, but the eventual compromise is the only solution to ensure the productivity and longevity of this sector”. According to Budeanu (2007, p 505), authorities “need to create the institutional context in which sustainable tourism products can be developed by the industry”, yet the participation of the industry, which has to invest in innovative sustainable products, and create incentives for sustainable tourist behavior is also essential, “behind these challenges, there are also great opportunities for tourism to reinvent its markets and practices”. The participation of the industry is crucial because although “there are no uniform solutions to problems, and some may not be solved easily”, “considerable inventiveness on the part of the tourism industry is required if these problems are to be remedied” (Carbone, 2005, p 562).

In addition, we have to take into account that leakage is not always negative, because its composition is also important. In this vein, as Dritsakis (2004, p 309) pointed out, although “tourist growth provides a remarkable part of the necessary financing for the country to import more products than to export ones”, “if those

imports are capital goods or basic inputs for producing goods in any area of the economy, then it can be said that earnings from tourism are playing a fundamental role in economic development". In this sense, our study is important, because research into the composition of leakages is essential to identify the bases of the economic sustainability of tourism.

Nevertheless, we are aware that our research is limited as it has only considered the hotel sector and has only been applied in a particular tourist destination.

However, it is also postulated as a working basis for further studies. In this vein, possible future work may consider the application of our formulas and scales in other regions of the world, in order to make tourism more sustainable, or may complement our research by investigating the importance of leakage in other sectors of the tourism chain, such as restaurants, leisure attractions and transportation.

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**Table 1. Important variables used in the calculation of leakage and economic multipliers of tourism.**

Author/s (Year)	Title of the paper	Region	Methodology for the measurement of the variables	Variables	Evaluation
Archer (1995)	Importance of tourism for the economy of Bermuda	Bermuda	Quantitative	Food and beverages, hotels, restaurants, tourist attractions, retail, transport, utilities, others.	Input/Output Analysis
Archer and Fletcher (1996)	The economic impact of tourism in Seychelles	Seychelles	Quantitative	Food and beverages, electricity and water, restaurants, communications, hotels, trade, shopping, air transport, construction, manufacturing, others.	Evaluation of tourism multipliers
Slee <i>et al</i> (1997)	The economic impact of alternative types of rural tourism.	Scotland	Quantitative	Attractions, restaurants, shops, hotel suppliers, hotel buildings, others.	Case Study. IO Analysis
Zhou <i>et al</i> (1997)	Estimating economic impacts of tourism	Hawaii	Quantitative	Food, manufacturing, construction, communications, energy, restaurants, hotels, trades, others.	Input/Output Analysis
Wagner (1997)	Estimating impacts of tourism	Brazil	Quantitative	Employment, transportation, construction, salaries, food, energy, others.	Social Accounting Matrix
Huse <i>et al</i> (1998)	Tourism impact comparisons among Norwegian towns	Norway	Quantitative	Hotels, restaurants, shops, gas stations, tourist attractions, others.	Multiplier calculation
Frechtling and Horvath (1999)	Estimating the Multiplier Effects of Tourism Expenditures on a Local Economy through a Regional Input-Output Model	USA	Quantitative	Eating and drinking, hotels, entertainment, shopping, salaries, maintenance, others.	Input/Output Analysis
Akama (2000)	The Efficacy of Tourism as a Tool For Economic Development in Kenya	Kenya	Qualitative	Air tickets, food, accommodation and recreational activities	Qualitative description

Eagles <i>et al</i> (2000)	Estimating the Tourism Volume and Value in Protected Areas in Canada and the USA	Canada	Qualitative	Food and drink, electrical equipment, textiles and infrastructure services, others.	Qualitative description
Tohamy and Swinscoe (2000)	The Economic Impact of Tourism in Egypt	Egypt	Quantitative	Accommodation, transport, attractions, food and beverages, travel agencies, others.	Input/Output Analysis
Walpole and Goodwin (2000)	Local economic impacts of Dragon Tourism in Indonesia	Indonesia	Quantitative	Employment, hotels, shops, restaurants, meals and drinks, consumables, others.	Small-scale survey
Kim <i>et al</i> (2002)	Convention Industry in South Korea: an economic impact analysis	South Korea	Quantitative	Hotels, transportation, communications, restaurants, entertainment, others.	Input/Output Analysis
Chhabra <i>et al</i> (2003)	The Significance of Festivals to Rural Economies: Estimating the Economic Impacts of Scottish Highland Games in North Carolina	USA	Quantitative	Food and beverages, lodging, gasoline, vehicles, others.	Input/Output Analysis
Kweka <i>et al</i> (2003)	The economic potential of tourism in Tanzania	Tanzania	Quantitative	Food, hotels, tours, crafts, others.	Input/Output Analysis
Supradist (2004)	Economic leakage in tourism sector	Sweden	Quantitative	Holiday planning, restaurants, transportation, accommodation, food and entertainment, shopping and visiting experience.	Tourism Value Chain
Shaalaa (2005)	Sustainable tourism development in the Red Sea of Egypt threats and opportunities	Egypt	Qualitative	Shopping, transport, accommodation and others.	Qualitative description
Gooroochurn and Sinclair (2005)	Economics of Tourism Taxation	Mauritius	Quantitative	Restaurants, hotels, transport, communications, tourism attractions, electricity, gas and	CGE model

				water, maintenance, others.	
Hjerpe and Kim (2007)	Regional economic impacts of Grand Canyon river runners	USA	Quantitative	Recreational activities, food and drink, transportation, lodging, others.	Economic impact analysis
Lee and Chang (2008)	Tourism development and economic growth: A closer look at panels	55 countries	Quantitative	Local goods, employment, transportation, roads and airports, others.	Statistical panels
Zhang <i>et al</i> (2007)	Regional Economic Impacts of Tourism: The Case of Denmark	Denmark	Quantitative	Restaurants, transports, retailing, hotels, activities, others.	Social Accounting Matrix
Asiedu (2008)	Participants' Characteristics and Economic Benefits of Visiting Friends and Relatives (VFR) Tourism - an International Survey of the Literature with Implications for Ghana	Ghana	Qualitative	Local restaurants, events and attractions, accommodation and others.	Qualitative description
Blake <i>et al</i> (2008)	Tourism and poverty relief	Brazil	Quantitative	Remunerations, transport, travel agencies, restaurants, accommodation, recreation, others.	Computable general equilibrium (CGE Model)
Sandbrook (2010)	Putting leakage in its place: the significance of retained tourism revenue in the local context in rural Uganda	Uganda	Qualitative	Shopping, tour guides, food and drinks, salaries, others.	Qualitative description
Lejarraga and Walkenhorst (2010)	On linkages and leakages: measuring the secondary effects of tourism	150 Countries	Quantitative	Hotels, restaurants, travel agencies, transport, entertainment, others	Keynesian multipliers
Lacher and Nepal (2010)	From Leakages to Linkages: Local-Level Strategies for	Thailand	Quantitative	Accommodation, retail, salaries, restaurants, employment, local	Case-study method

	Capturing Tourism Revenue in Northern Thailand			businesses, seasonal workers, prices and others.	
Pratt (2011)	Economic linkages and impacts across the TALC	Hawaii	Quantitative	Construction, food processing, transportation, arts, eating and drinking, entertainment, others.	Case Study. IO Analysis
Cernat and Gourdon (2012)	Paths to success: benchmarking cross-country sustainable tourism	Asian countries	Quantitative	Internet, electricity, water, restaurants, lodging, entertainment, hotel prices, others.	Sustainable tourism benchmarking tool
Haddad <i>et al</i> (2013)	Domestic tourism and regional inequality in Brazil	Brazil	Qualitative	Accommodation, restaurants, transportation and entertainment	IO Model



**Table 2: Summary description of the variables used to calculate leakage and its corresponding weights in the case of the Valencian Region.**

<b>Name of variable</b>	<b>Weight of the variable in “Supplier Leakage”</b>
Light, water and gas	30.12%
Food	19.82%
Beverages	13.55%
Telecommunications	3.82%
Salaries	30.29%
Maintenance	0.41%
Consumable products	0.42%
Decoration	0.31%
Cleaning	0.27%
Restaurants	0.38%
Tours	0.33%
Others	0.29%
<b>Name of variable</b>	<b>Weight of the variable in “Customer Leakage”</b>
% rooms sold by hotel	29.91%
% rooms sold by web	31.26%
% rooms sold by tour operators	38.83%

**Table 3: Leakage in the hotel sector (Region of Valencia).**

<b>AREAS</b>	<b>Nº total rooms in our sample</b>	<b>Leakage of the diverse touristic areas</b>
Benidorm	9634	38.78 %
Valencia	5735	11.90 %
Alicante	4228	21.49 %
Castellon	6170	21.46 %