

Article

A Sustainable Tourism Paradigm: Opportunities and Limits for Forest Landscape Planning

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Abstract: The promotion of sustainable tourism models has been widely debated; many pages have been devoted to the attempt to provide the subject with a strong theoretical base and coherent structure. This said, it is still the case that, although such frameworks are crucial for the development of appropriate planning and policy instruments, their actual implementation continue to be fraught with difficulties. These problems are exacerbated when sustainable tourism entails development opportunities which require the support of the local community and the management of natural resources which are typically common goods. Under these circumstances, new management structures, which can both satisfy the needs of the local community and ensure the appropriate stewardship of the natural resources, must be created. Management solutions are not always easy to define and often need to be considered within a general framework, based on which individual cases are then formulated. This study analyses the connections between models of sustainable tourism and natural resource management considering the forest landscape case. This relationship is first examined from a theoretical perspective and then within a case study, in order to highlight the dual approach—both general and within a specific context.

Keywords: sustainable tourism; natural resource management; forest landscape; local communities

1. Introduction

The tourism sector is experiencing strong growth despite the recent economic and financial crises [1]. Developing countries perceive tourism as an economic opportunity and the sector is also performing very well in industrialized countries [2,3]. In recent decades a significant body of academic research has focused on the need for a sustainable paradigm of tourism activities. However, starting from the Brundtland report definition of sustainable development [4], now so well known, further definitions and tools, the use of which is not fully consistent, particularly in the tourism sector, have been proposed.

This lack of consistency can be attributed not only to the heterogeneity and pervasiveness of tourism activities, but also to the evolution of the concept of sustainability. “Our common future” definition highlights the need for development, in order to be sustainable, to satisfy human needs without compromising future generations’ possibility to satisfy those same needs [5]. Further definitions of sustainable development emphasize the role play by the environmental component such as that contained in the Rio Declaration in 1992 [6] and the transfer of this concept to tourism acknowledges, as that contained in the Lanzarote Charter, 18 principles which strongly underline the need for a sustainable approach to tourism [7]. Thus, the first definition of sustainable development has been expanded and modified over the years in an attempt to define the concept more concretely, thereby enabling its extension into a range of development areas. Moreover, the initial anthropocentric understanding of the term has been gradually shifting towards a more ecocentric approach which grants natural resources a value not just in relation to their utility to humans but also to their indispensable role in the production of ecosystem services vital for the whole terrestrial system. From an anthropocentric point of view, natural resources are inputs into the economy and their availability is a determining factor within the whole economic system. The nonrenewable and non-substitutability nature of these natural resources, however, clearly are constraints on their exploitation and necessitates that their use be scheduled as efficiently as possible [8]. Underlying this kind of planning is an acceptance of the concept of an intergenerational pact regarding the use of natural resources which is clearly based on human needs. From an ecocentric perspective, natural resources provide a vast range of ecological services which don’t just function as direct inputs into the economic system but are also involved in the regulation, support, and coordination of the Earth’s ecosystem [9].

Climate change, an awareness of the ecological limits dictated by finite natural resources, the ever increasing consumption of nonrenewable energy sources, and the exploitation of natural resources considerably in excess of their carrying capacity and ability to regenerate, are all powerful drivers for such a change.

Indeed, the strong connections between tourism and global dynamics, the sector’s wide ranging economic effects and the potential danger it poses to the environment, have all contributed to a push towards a sustainable paradigm in tourism development. However, both the intrinsic nature of the activities associated with tourism and the factors necessary for sustainability have made it very difficult to transfer the sustainable development paradigm to the tourist industry, and this process is by no means complete [10].

More recent versions of the concept of sustainable tourism development underline the extent to which, although it has been widely debated and, indeed, promoted in numerous studies, the concept is still far from having been fully articulated [11,12]. In practice, the application of the conceptual

framework of sustainable tourist development is not straightforward, particularly where natural resources, like forests, are concerned.

Within this context, the objectives of this study are: to explore a forest ecosystem and identify its potential flows of utility, addressing those which best satisfy tourism activities and recreational purposes; to identify the most appropriate tools to manage the flows of utility based on sustainable principles which integrate tourism activities. This analysis is carried out using a case study—Paveveggi forest—and is then related to a more general framework.

The paper is organized as follows: Section 2 contains a review of the goods and services provided by Alpine forests and focuses on the tourist/recreational use of these resources. Section 3 contains an analysis of the sustainable management of a forest landscape. Section 4 analyses a case study of forest management. Section 5 is the conclusion.

2. The Goods and Services of Alpine Forests

A forest is an extremely complex ecosystem with a multiplicity of functions and uses, and of stakeholders and consumers—both actual and potential [13]. Using the widely accepted definition that the services provided by ecosystems can be defined as “the benefits which people obtain from ecosystems” [14] allows us to understand not only how a forest ecosystem contains all kinds of services but also how the utility flows it generates have both local and global effects. Similar results are obtained starting from an alternative definition that distinguishes between environmental services and goods: the former being the availability of services provided by a natural resource, and the latter the flow or stock of capital that it represents [15]. In the particular case of forests, both the environmental services they provide and their products are numerous and can be classified as timber based, non-timber based, or intangible [16]. Although timber has traditionally been considered the main good provided by forests, it is by no means the only forest product, and sometimes not even the most important benefit generated by a forest ecosystem [13].

The general classifications of ecosystems can also be applied to forests, distinguishing four different categories: carbon sequestration, the conservation of biodiversity, the protection of aquifers, and hydrogeological functions, the beauty of the natural landscape, enjoyed through forms of contingent use like tourism and ecotourism or the contemplation and awareness of spiritual values [17]. This last function entails a strong relationship between at least three elements: nature, culture, and local community. This triad highlights the role played by local culture and communities in natural resource management and use [18]. In a forest management context, this concept emphasizes even more the multifunctional dimension of forests.

A growing awareness of the multifunctionality of forests has led to their widespread management from this perspective: recognizing both the above-mentioned functions and the numerous other services and goods provided by the forest, this approach emphasizes the need to plan forest management in two stages. The first is the identification of the significant functions performed by the forest for the ecosystem; the second is the identification of the type of forest management best suited to both performing these functions and obtaining these products and services. A forest system is no longer seen only as a provider of timber products, but also of diverse goods and services, satisfying many different social needs and providing new opportunities for use [19].

The demand for more varied forest goods and services which are capable to satisfy such multiple needs is, thus, both changing and increasing. This transformation arises compatibility and coexistence issues for both forest management per se and in respect to the satisfaction of local communities' claims. The fulfillment of forest functions can be understood at two levels: the global and the local. The former refers to the general functions obtained by particular forest management patterns; the latter entails other functions related to goods and service production which can both satisfy the needs of local communities and generate additional sources of income for them. Forest management which can achieve both these ends is necessary for long term sustainability and operating and management methods which simultaneously guarantee long term sustainability and allow products and services to be translated into sources of income for local populations are therefore necessary [20].

This production represents potential utility streams able to satisfy a variety of consumer demands, although their appropriation and management are not always conflict-free. From this perspective, the landscape is one of the most controversial utility streams involved in forest management. The most critical issues concern not only the definition of landscape and the establishing of its value, but also determining access to, and the conservation and management of, the resources that can be understood as the several flows of utility generated by this ecosystem.

Forest Landscapes from the Perspective of Tourist Use

The important role of landscape is widely recognized and includes various meanings and definitions [21]. The definition of landscape as the result of continuous changes caused by the interaction between human activities and the environment implies two considerations. The first regards the analysis of the factors which determine such transformations and the other regards the valuation of the landscape which, given the constant changes to which it is subject, must be dynamic and appropriate to the particular historical context of the area [22]. From the point of view of tourism, landscape (including that of forests) is considered to be a crucial input for recreational activities [23]. In this context, landscape stands for all elements, both natural and built, thus including socio-cultural features and dynamics [24]. Considering the value of landscapes from the demand perspective, we can distinguish three elements: scenic value, recreational value and evocative value [25].

Briassoulis [23], in his analysis of the relationship between common natural resources and sustainable tourism development, devotes considerable space to landscape, and also refers to Jafari's definition of landscape as providing "background tourism elements" [24,26].

Indeed, the forest landscape can serve a variety of functions within the ambit of tourism. It can be instrumental to tourism activities, whether as a "resource container" or simply as a background. In the first case, the forest landscape is seen as a clearly defined resource whose use by the consumer is either partial or full. Adventure parks, and acrobatic parks in general, are examples of this type of function. Only a limited area of forest is used but the access to it is regulated in order to guarantee exclusive and specific use of the resource. In the second case, the forest landscape constitutes a general resource, with no single specified recreational use. The area involved is very large but clearly defined. It is not, however, possible to ensure exclusive use. In the third case, the forest is not seen as crucial to the carrying out of the particular activity. The area involved is very large, indeed from the perspective of the user the boundaries will not be very clear, and it is not possible to guarantee exclusive use [22].

This initial description of the value and function of forest landscapes as tourism activity inputs has revealed two important characteristics which determine consumers' opportunities to access and use forest landscapes: excludability and rivalry. The economic utility of all, including forest, landscapes can be usefully framed by means of these two characteristics.

Different levels of excludability and rivalry define public goods, private goods, and common goods (or club goods). The operating and management models are different for each of these categories, thus entailing different pathways to sustainability. However, ensuring the appropriate and sustainable management of a single forest function or good, e.g., timber, does not necessarily mean that the remaining functions will be sustainably managed. Moreover, since new forest functions may be recognized at any time, with a subsequent alteration of the relative importance of the utility flows guaranteed by forests, it is necessary to update operating and management methods constantly in order to ensure efficiency and sustainability. Given the need to plan management frameworks over the long term, it is very difficult in practice to select the most appropriate tools or mechanisms. And so it is not by chance that since the late 1980s the need to move away from old models of economic development and uses of environmental goods and services has become increasingly clear. World population growth, while feeding a growing demand for these goods, also risks compromising their production due to the inability of the current economic system to work within a framework of long term sustainability.

Environmental resources in general and forest resources in particular are becoming increasingly sought after and subject to competing claims for their use. Consequently, it is necessary to devise new models to manage and assign economic value to these resources in order to create effective tools for their appropriate maintenance and use.

A wide range of intervention tools and mechanisms for the management of natural resources exists [27]. Payment systems for environmental services (PESs) have recently been introduced: financial mechanisms to commercialize natural goods and services through the introduction of incentives which encourage local actors to produce the relevant goods and services.

Other mechanisms include integrated conservation and development projects and sustainable forest management practices aimed not only at encouraging management strategies which ensure the availability and quality of these goods over time, but also sensitize local populations to the presence of these environmental services and guarantee them a supplementary source of income.

3. Sustainable Forest Landscape Management

Based on current evidence, for forest management to be sustainable in the long term it must both be appropriate and deliver a sufficient income for the local population. Appropriate forest management requires that the production of those goods and services that form the flows of utility for an ecosystem and its local population be guaranteed. Such management must be able to provide a supplementary income to local populations; it cannot only represent the costs inevitably incurred for the conservation and production of the goods and services provided by the forest. In the specific case of forest landscapes the link between local populations and the forest involves a process of continual transformation. This process is a result not only of physical interventions, but also of the socio-cultural background of the local populations, who, through their interpretation and appropriation of the traditions and customs handed down from generation to generation, have shaped the forest landscape.

This connection between local populations and the forest landscape and environment is very important to Alpine communities.

The conservation and management of the forest landscape in a given community is often an expression of the connection between that community and its surroundings. Traditionally, the Alpine environment was seen as hostile to human settlement; in order to survive and carve out a life in the mountains, it was always felt, people were forced to adapt and make numerous compromises. Multifunctional forest management takes into account the multiple potential products and related sources of income.

In fact, as has already been mentioned, one of the most important functions of appropriate forest management in the Alpine region, alongside the obtaining of raw materials, is the conservation of the landscape and natural resources as a background for recreational activities and the preservation of the local social network [28].

Forest management in the Alps has to be multifunctional, has to take the forest's status as a public good into consideration and has to be able to provide local populations with sufficient products and services for them to feel that the forest represents a source of income. Given these objectives, the appropriate tools to promote such management involve a mix of self-government of public goods and the introduction of payment mechanisms.

4. Case Study: The Forest of Paneveggio

The forest of Paneveggio is situated in the autonomous Province of Trento, in the north eastern Italian Alps. Covering over 4300 hectares, it is the largest state owned forest in the area and extends within the administration of four different municipalities; the area includes a mix of meadow, forest and unproductive zones (see Table 1).

Table 1. Subdivision of the forest by land use.

Land Use	Area in hectares	As a percentage of the total area
Wood	2787.14	64.16%
Meadow	1263.52	29.08%
Unproductive	293.63	6.76%
Total	4344.29	100%

Source: own elaboration from [29].

The forest as it is now constituted dates back to at least the 19th century; it was included in economic plans drawn up towards the end of that century. It is home to a rich and varied fauna and is famous for the production of so called “resonant wood”, obtained from the red spruce, which is much prized by luthiers for the high quality of the sound produced by string instruments whose bellies are made from it. Alongside the recognized value of the resonant wood, this fame generates considerable visitor flows and income for the whole zone [30]. In fact, there are several flows of utility that this forest generates both at a global and local level.

Indeed, as well as its importance in carbon sequestration, biodiversity conservation, the protection of aquifers and its hydrogeological functions, this forest area is an extremely precious landscape

resource, imbued with, and modified by, the constant presence of local communities which have, through their labors, defined its shapes and uses (see Table 2).

Table 2. Flows of utility generated by Paneveggio forest.

Goods	Non-rival	Congestible	Rival
Non-excludable	Entirely public goods: absorption of carbon dioxide; non-use values of landscape	Open access resources: landscape as resource-based input for recreation; cultural and spiritual values	
Excludable to non-community members	Local public good: biodiversity; protection of aquifers; hydrogeological function. Landscape as scenic component	Common property resources: hunting, fishing, gathering	
Excludable	Toll goods: landscape as an option value	Club goods: trails	Private goods: timber, landscape as resource user-oriented for recreation; handicraft

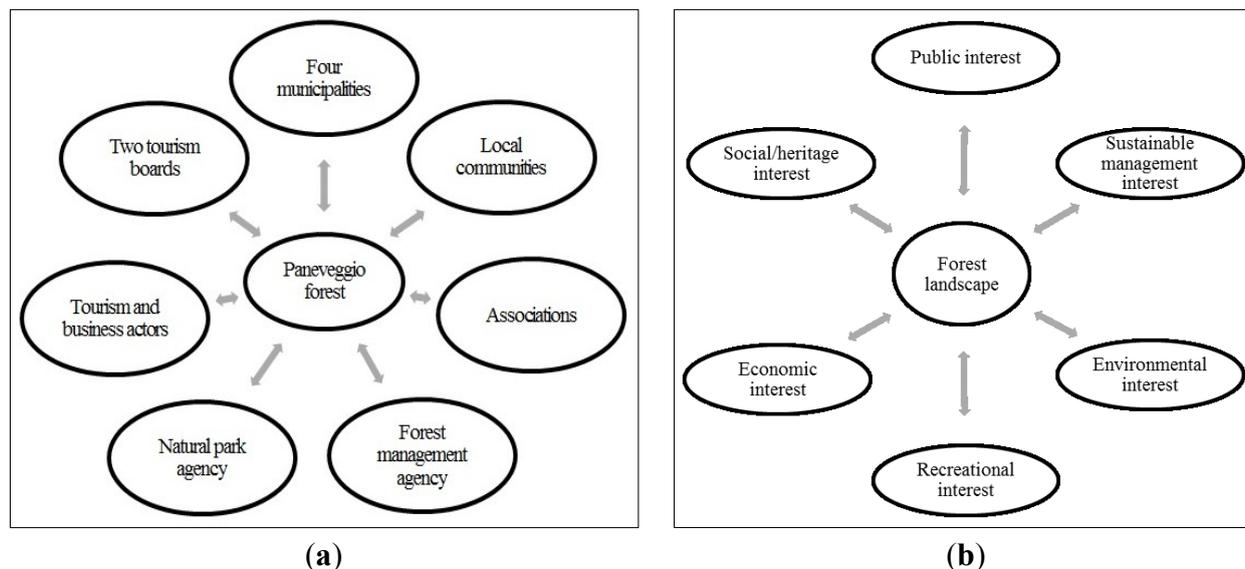
Source: own elaboration from [22].

From an administrative point of view, Paneveggio is owned by the Autonomous Province of Trento, its public ownership is, in fact, inalienable; the Autonomous Province of Trento is responsible for its management and has appointed an agency, APROFOD, to carry out this task. As has been mentioned, the forest falls under the jurisdiction of four different municipal administrations, and also of the National Park of Paneveggio and Pale di San Martino. Moreover, precisely because it is a public good, the forest also has a large number of stakeholders, both local and not: associations, environmental groups, tourists, public bodies, and local communities... (See part a, Figure 1).

The large number of organizations and stakeholders involved in the management of the Paneveggio forest reflects the multiple interests that the opportunities and potential uses of the resource represent (see part b, Figure 1).

Tourism development plays a primary role, both in the use of the resource and in according it appropriate value; it represents a pull factor and connotes the territory as suitable for recreation, thereby offering economic opportunities through the creation of valid alternative methods by which to generate supplementary incomes. Tourism development is only one of the potential uses of this resource and the economic advantages for local populations are, in turn, only one of the needs which the resource is called upon to satisfy. The other utility flows, provided by the forest landscape, and the forest as a whole, cannot be ignored, nor can the need to conserve and protect the natural environment. Nevertheless, in order to ensure the long term sustainable management of the forest, all these interests and functions must be considered together. The critical issues for such management arise, on the one hand, from the need to coordinate all the local stakeholders and organizations, and, on the other, from the evaluation of all the diverse interests and functions involved, and the contribution which each of these elements brings to the overall, long-term management of the forest system, understood as the interaction between natural resources and the local community, at both the local and the global level.

Figure 1. Organizations and local stakeholders involved in the management of the forest of Paneveggio; Connection between stakeholder and interests.



Source: own elaboration.

Given the high complexity of organizations and interests, to ensure a sustainable management of Paneveggio forest is not straightforward. In particular, tourism development faces certain limits related to the large number of both stakeholders and flows of utility (see Figure 1) which are not integrated by adequate compensation mechanisms and tools. To identify both the amount of these flows of utility (based on a mix of different methodologies) and the typology of these mechanisms are the main requirements for a successful implementation and management of this forest area. Some details of these mechanisms are provided in Table 3.

Table 3. Tools and mechanisms to manage the flows of utility generated by Paneveggio forest.

Goods	Non-rival	Congestible	Rival
Non-excludable	Public and compensation mechanisms	Public and compensation mechanisms; common property regimes	
Excludable to non-community members	Public and compensation mechanisms	Public and common property regimes	
Excludable	Payment mechanisms (such as PES)	Compensation mechanisms and payment mechanisms (such as PES)	Payment mechanisms (such as PES)

Source own elaboration from [20,22].

5. Landscape Management for Sustainable Tourist Use: Conclusions

Forest landscape management is extremely complex, involving a wide range of factors. Moreover, the management of public goods is never straightforward, and is full of pitfalls—as has been frequently observed [23,31,32]. The management of public goods involving local communities arises the question of ownership of natural resource planning which entails a shared understanding on issues and methods to address such a question [33].

This complexity is increased when a resource has both a wide range of uses—which sometimes generate conflicting claims and requirements—and involves a large number of institutions, management bodies and stakeholders. The forest of Paneveggio is a very good example of such a situation. This multiplicity of uses is due to both the extraordinary importance of the landscape in terms of wildlife and the ecosystem generally and to the numerous opportunities it offers for tourism. The forest landscape of Paneveggio serves at least two functions within the local tourism offer: it is both a good in its own right and a background for the pursuit of recreational activities. Although these uses are undoubtedly potential income sources for the local population, their conservation and maintenance also involve positive externalities and high costs.

This management is not made any easier by the many stakeholders and other governing bodies. A possible solution to the problem could be the planning of bodies and institutions of self-government for these resources. However, the success of such management assets will depend on a range of factors: the clear demarcation of the forest's limits, a satisfactory cost—benefit analysis, local regulations, the consensus of the local population, mechanisms of control, sanction and conflict resolution, and the recognition of the right to self-organize and to impose sanctions [34].

The introduction of payment mechanisms is another solution; these constitute a direct source of income for local populations, while simultaneously covering, at least in part, the costs incurred in the conservation and management of the resource. In the case study analyzed a number of management tools based on the utility flows generated by Paneveggio forest have been proposed (see Table 3). For most non-rival goods, the introduction of compensation mechanisms is one of the best options; goods which are both non-rival and excludable, however, can probably be better managed through payment mechanisms. In the case of rival goods, the introduction of these mechanisms is to a certain extent limited by their level of excludability.

The management tools for congestible goods also depend on the level of excludability. On the one hand, appropriate management tools for congestible and non-excludable goods can range from public compensation mechanisms to common property regimes; on the other hand, congestible goods—that are excludable to non-community members—can be managed by either public or common property regimes. Finally, compensation and payment mechanisms can be implemented for goods which are both congestible and excludable.

The implementation of management tools for Paneveggio forest, which, due to the specific characteristics of its utility flows, must necessarily be complex, also faces further challenges because of the large number of stakeholders involved in the governance system. It is therefore imperative that the implementation of these management tools takes the particular features of the local system into account.

A combination of management tools based on stakeholder involvement is potentially beneficial and, in certain cases, mandatory, in order not only to protect but also to maximize the utility flows generated by these natural resources.

Consequently, the utility flows generated by Paneveggio forest require a mix of management tools. The forest management should take a multifunctional approach in order to maximize utility flows. This approach must acknowledge those goods which require a public management regime—such as the conservation of biodiversity, the protection of aquifers, and the improvement of hydrogeological functions—and combine this regime with appropriate payment mechanisms for tourism activities. These tourism activities can be based on forest direct use (use value), e.g., adventure parks, and/or

indirect or background use (scenic or option value) e.g., theme trails. Activities such as hunting, fishing or the gathering of soft fruit, truffles and mushrooms should follow common property management regimes for community members and payment mechanisms for non-community members. The limiting of permit availability allows forest management systems which husband and increase these resources to be rewarded and fully regulates their consumption, thus preventing overexploitation.

For utility flows with more clearly definable market values (such as timber), payment mechanisms are the most appropriate management tool.

Recognizing the difficulties involved in the coordination of such a complex system, denoted by multiple interests, stakeholders, and utility flows—the whole set of management tools and mechanisms needs an integrated and collaborative management approach in order to achieve long term sustainability. Nevertheless, the development of tourism activities based on the goods and services generated by forests certainly offers an economic opportunity for local communities, since such activities can create additional sources of income, and supplement these traditionally provided by forests. However, these opportunities are considerably limited by the need to control the exploitation of the resources used in tourism activities in order to provide a real opportunity to ensure the long term sustainability of these activities.

When the management of forest landscapes involves the development of tourism activities not only the two elements noted above (level and time frame of exploitation of resources) but also the other flows of utility which are provided by forest, need to be taken into account. The recognition and assessment of all flows of utilities is crucial, as are the definitions of interests and needs specified by stakeholders; this first step both defines priorities and identifies the most likely conflicts of interest. These interests need to be balanced and integrated to obtain a sustainable management plan. The choice of these management tools requires a concerted approach in both the selection and the implementation phase.

The limits of certain tools are well known and generally relate to poor managerial design; tools must be sufficiently solid and appropriate, and incentives, to comply with them, must be strong enough to be effective. Other limits are connected to the potential conflicting in using certain flows of utility.

Following a sustainable tourism paradigm, appropriate forest management which includes recreational needs can both offer a number of opportunities and provide a more long term perspective.

Adopting a sustainable approach both to tourism and to forest planning, further integration of the management of both is necessary to address the above mentioned limits.

Generally, the management of a forest landscape which is appreciated as an enjoyable setting for tourism activities demands a public management component which can be integrated with both compensation mechanisms to those stakeholders who contribute to the maintenance of the forest landscape and, when viable, with mechanisms requiring payment from those tourist operators who gain indirect advantages from the resource. When direct use of this good is made, in situations involving excludability and rivalry, it is possible to introduce payment mechanisms.

To manage other forest flows of utility which have different degrees of excludability and rivalry, the tools discussed and their implementation—both singly and in combination—need to be case appropriate. The reference framework can certainly be global, but individual solutions will necessarily be strongly colored by their local context.

Author Contributions

The authors equally contributed to this work.

Conflicts of Interest

The authors declare no conflict of interest.

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