

Tourism monitoring system based on the concept of carrying capacity – The case of the regional natural park Pfyn-Finges (Switzerland)

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Abstract: The creation of regional natural parks offers the possibility of improving the economic situation of peripheral regions. However, the use of ecologically sensitive zones for tourism purposes also presents economic, environmental and social problems. The concept of carrying capacity is often presented as a useful approach for determining the intensity of tourism development that can be supported by a region. Our objective thus consisted in the operationalisation of this concept by defining a certain number of indicators to measure the different types of carrying capacity. However, the confrontation with the practical realities of the regional natural park Pfyn-Finges in Switzerland made us realise that what we intended to do was more a stylistic exercise than a setup of a management tool adapted to the needs of the park managers. We thus conclude that even though the concept of carrying capacity may have a high heuristic value, its practical value is rather limited.

Introduction

Unlike other European countries such as France or Italy, Switzerland has not encouraged the creation of regional natural parks in order to develop tourism activities in partly underdeveloped rural or mountain regions. The number of projects aiming at using such territories for tourism purposes by creating regional natural parks has only started to increase in the mid 90s. As Margot and Wespi (2001, p. 24) point out, “tourism is the economic sector which best allows to enhance the value of the rich heritage of decentralised regions. [...] The improvement of relaxation possibilities in a preserved landscape constitutes a concrete contribution of the parks to the increasing demand of the urban agglomeration population.” The study by Siegrist et al. (2002) on the potential of nature tourism shows indeed that Swiss tourists who stay in their country demand protected areas in their holiday region. The intention to enhance the value of regions with high quality natural or cultural heritage for tourism is also due to the fact that on an international level, ecotourism is a constantly growing market (Eagles 1999, UNEP 2001, Arnberger et al. 2002, Revermann & Petermann 2002).

The initiatives to create regional natural parks offer the possibility of improving the economic situation of peripheral regions (WCPA 1998, Küpfer

& Elsasser 2001). However, the use of ecologically sensitive zones, which have not been subjects to intensive tourism until now, for tourism purposes, presents economic, environmental and social problems (Epler Wood 2002). In this context, the concept of carrying capacity is often presented as a particularly useful approach for determining the intensity of tourism development that can be supported by a region, considering its economic, ecological and social characteristics. Until now, only few attempts have been made to operationalise this concept and to transform it into a management tool for the persons in charge of parks and protected areas. This article presents the results of a study¹ aiming at operationalising this concept by defining indicators to measure the different types of carrying capacity.² The ulterior objective will be the construction of a monitoring system based on these indicators to promote a sustainable management of tourism activities in Swiss regional natural parks. The research was carried out in the Pfyn-Finges Park in Valais (Switzerland). The central question of this article is to find out whether the concept of carrying capacity can be useful for the setup of a tourism monitoring system in regional natural parks.

Regional natural parks in Switzerland

The creation of regional natural parks in Switzerland – difficult beginnings

Switzerland was one of the first European countries to have a national park (the Swiss National Park was founded in 1914). However, not one single park has been created since. Following the emergence of several park projects at the end of the 90s and several procedural forms of requests for action, the Swiss Government has assigned the Swiss Agency for the Environment, Forests and Landscape (SAEFL) to prepare a revision of the Federal nature and landscape protection law to enable the creation of different types of parks (national park, regional natural park, periurban natural park) and to define the recognition criteria for these parks. According to the results of the consultation procedure, which was held between September 2002 and January 2003, the purposes of the new system for Swiss parks are as follows: “Enhance the biological diversity, realise the current objectives of the Federal nature and landscape protection law in a particularly intense way, promote sustainable development in a balanced way [...] and implement it in an exemplary way, achieve the objectives regarding the regional development and planning policy. The ecological dimension of sustainable development requires that the objective of the protection defined in the current Federal nature and landscape protection law be entirely achieved, even if social and economic development aspects are taken into account.” (DETEC/OFEFP 2003, p. 4)

The consultation of the cantons and the stakeholders has, on the whole, been favourable to the revision of the Federal nature and landscape protection law. In his meeting of 25 February 2004, the Federal Council nevertheless decided to remove this revision from the programme of the legislative period 2004–2007, because of the precarious situation of public finances. Several procedural forms of requests for action, a petition signed by the municipal presidents and the lobbying of different non-governmental organisations will hopefully prevent this question from being definitely ignored during the current legislative period.

The Swiss conception of a regional natural park

The revision of the Federal nature and landscape protection law is largely inspired by French experiences. A regional natural park is considered “an instrument of regional policies used for revitalising certain territories or for assisting them in their adaptation to economic and technological mutations, without losing their specific characters, which are an evidence of their know-how, their cultures and their diverse cultural landscapes” (Margot & Wespi 2001, p. 5). The following definition of regional natural parks has been retained:

“A regional natural park is a territory of high natural, cultural and landscape value, whose culture, nature, social structure and local economy are part of a sustainable development project, in harmony with the aspirations of the population. (...)”

- It will be a territory of high natural, cultural and landscape value, which importance is demonstrated by regional, cantonal, federal and international inventories;
- A regional natural park project stems from a regional initiative;
- The regional natural park is a development tool for regions, and especially for rural areas;
- The “Swiss Landscape Concept” (1997) and the “Sustainable Development Strategy 2002” of the Federal Council establish the framework of regional natural parks” (Oppizzi 2003, p. 5)

In its project, the SAEFL underlines that “only natural and landscape parks stemming from regional initiatives and supported by the local population and the Canton” (Oppizzi 2003, p. 4) can be recognized by the Confederation. The minimum size for the construction of a regional natural park is 100 km². The Confederation plans to subsidize the creation and the management of such parks up to 60%.

The designation “Regional Natural Park” gives the park managers the right to award “a label with the park emblem to the producers, firms, societies or associations that are active within the park and offer products and services that are typical of the park” (Oppizzi 2003, p. 22). This regional quality label must be renewed every three years and is only awarded to products, services or social and associative activities that correspond to the protection requirements for natural, landscape and cultural heritage and to the requirements of sustainable development.

To ensure that the Federal requirements are respected and to decide on the renewal of the convention, an evaluation system is planned. However, “this evaluation must not be conducted at the end of the procedure, but be prepared while setting up the park project. A progressive and continual approach is needed, which can be summarized in three big stages:

1. Setup of the monitoring devices
2. Management of the park project
3. Assessment of the concept and impact analysis.” (Oppizzi 2003, p. 24)

Our attempt to develop a monitoring system of tourism activities can be situated on the level of this evaluation procedure, and particularly within the first stage described above.

The concept of carrying capacity

Definition

We will refrain from giving an overview of the many different definitions of the concept of carrying capacity that can be found in literature. Yet, it is necessary to clarify our comprehension of this concept.

The World Tourism Organisation (WTO) defines the concept of carrying capacity as follows: “The maximum number of people that may visit a tourist destination at the same time, without causing destruction of the physical, economic and socio-cultural environment and an unacceptable decrease in the quality of the visitors’ satisfaction” (cited in PAP/RAC 1997, p. 5).

Hunter (1995, p. 67) gives a more precise definition by distinguishing four different types of carrying capacity:

“*Physical carrying capacity* – the limit of a site beyond which wear and tear will start taking place or environmental problems will arise.

“*Psychological (or perceptual) carrying capacity* – the lowest degree of enjoyment tourists are prepared to accept before they start seeking alternative destinations.

“*Social carrying capacity* – the level of tolerance of the host population for the presence and behaviour of tourists in the destination area, and/or the degree of crowding users (tourists) are prepared to accept by others (other tourists).

“*Economic carrying capacity* – the ability to absorb tourism activities without displacing or disrupting desirable local activities.”

Papageorgiou and Brotherton (1999, p. 272) underline what they think the central point of the concept of carrying capacity is: “In a recreational context, central to all definitions of carrying capacity is the idea of maintenance of the integrity of the resource-base and the provision of a high-quality recreation experience to users.”

At this stage, we will retain the two following main elements from these definitions:

- The notion of a quantitative frequentation limit related to a given surface area and to a degree of satisfaction.
- The notion of maintaining the natural resources on which the tourism activity is founded.

A concept difficult to operationalise

The concept of carrying capacity has been the object of numerous publications and discussions in the last 30 years. Many studies were focused on the quantitative operationalisation of the concept, thereby neglecting the qualitative aspects. In addition, even though the concept has sometimes been related to the concept of sustainable development (Coccosis & Parpairis 1992, Hunter 1995), only few attempts have been made to operationalise the concept by taking into account the economic, ecological and social aspects. Too often, the carrying capacity is determined by only one of these three dimensions (Williams 1994), generally the ecological aspect. Furthermore, as every territory has its own specific characteristics, these must be taken into account when operationalising the concept of carrying capacity. For this reason, different methods will be used to

determine the carrying capacity of a winter holiday resort, a seaside resort or a regional natural park.

The concept of carrying capacity has been used for parks and protected zones for several decades, but only recently attempts have been made to operationalise this concept by using indicators and quality standards (Manning 2002, Martin et al. 2002). These experiences mainly concern national parks, and thus cannot be transposed to other types of parks as such, especially not to regional natural parks, which are characterised by the many socio-economic activities on their territory. In this context, our initial approach was to start from Hunter’s definition (1995, p. 67) to establish indicators enabling the measurement of the four types of carrying capacity identified by this author. Our approach has greatly evolved, though, as we felt it necessary to rely more on the concrete entities of regional natural parks in Switzerland than on the theoretical concept of carrying capacity.

The monitoring of tourism in regional natural parks

The common aspect of the whole literature on monitoring the sustainability of tourism development is the absence of a satisfactory method, which is accepted by everybody: “Monitoring of tourism in the context of sustainable development is necessary if we are to understand and plan for tourism more effectively. But the problem is what and how to monitor in an efficient and effective way with only general concepts and criteria such as economic health, diversity, productivity, maintenance of essential processes and equity in mind?” (Nelson 1999, p. 339).

One of the solutions is to start from the objectives defined for regional natural parks, and then to define the indicators linked to these objectives. According to the Swiss concept, a regional natural park pursues several objectives in the following areas:

- socio-cultural vitality;
- economic vitality;
- nature & landscape;
- information & education;
- administration & policy.

The management of the territory of a regional natural park is a dynamic process. All five areas must more or less simultaneously be taken into account by defining specific objectives for every area. On the basis of the revision of the Federal nature and landscape protection law, we were able to extract five to six objectives for each of the areas mentioned above (Clivaz et al. 2004). For instance, the objectives for the area “socio-cultural vitality” are:

- Maintain and develop attractive living spaces;
- Enhance the value of heritage and of traditions;
- Promote the quality of life;
- Maintain a sane and stable demography;
- Allow the local population to appropriate the regional natural park project;
- Create value added and innovating jobs.

In practice, these broadly defined national objectives must be specified according to the characteristics of each park, and a certain number of indicators have to be chosen for every objective. Afterwards, a diagnostic of the current situation in relation to the five areas (T1) can be established with the help of the indicators, and the state to be achieved can be defined (T2). This state must ideally result from a consensus based on the common vision of the actors concerned by the regional natural park project. The middle- and long-term objective of a park is the progression on every axis (area) to achieve the “ideal” pentagon (cf. Figure 1). This ideal pentagon represents a sustainable development situation, which combines the objectives of development and of resources conservation.

The project of the regional natural park of Pfyng-Finges

Pfyng-Finges is crossed by the wild Rhone River and comprises pine groves, ponds, hills and an alluvial zone. Its entry into different inventories of national importance and its protection by the Canton limit the possibilities of economic use of this site and impose severe conditions on the different projects in relation to the area. The combination of natural and cultural values and the Mediterranean climatic conditions of the Pfyng-Finges region constitute the ideal basis for the development of green tourism, which aims at conserving the landscapes and the richness of fauna and flora.

In March 2000, the “Pfyng-Finges Association” was founded. Its members are the administrative bodies concerned (municipalities, socio-economic regions, canton), tourist offices, environmental associations, various private persons and public institutions. The first objective of this association is to lodge an application addressed to the Canton to create a “natural park” according to the 21st article of the Cantonal nature, landscape and site protection law. Their second objective is to obtain the Federal recognition of Pfyng-Finges as a regional natural park.

The tourism concept 2010

In order to define the spatial planning of the Finges site, a tourism concept was established under the aegis of the Pfyng-Finges Association (Verein Lebens- und Erlebnisraum Pfyng-Finges 2003), which will be realised by 2010. This planning tool enables the development of a soft tourism according to the principles of sustainable development defined in the Federal Constitution. It consists of 11 action sheets, which specify the suggested measures, such as the creation of a nature and landscape centre, the construction of recreational facilities at the park entrances, direct sales of regional products or an access concept for motor vehicles, bicycles, hikers and riders.³ At the present time, it is not planned to evaluate the success of these actions by using indicators. Such an evaluation could be made within a larger monitoring system of tourism activities.

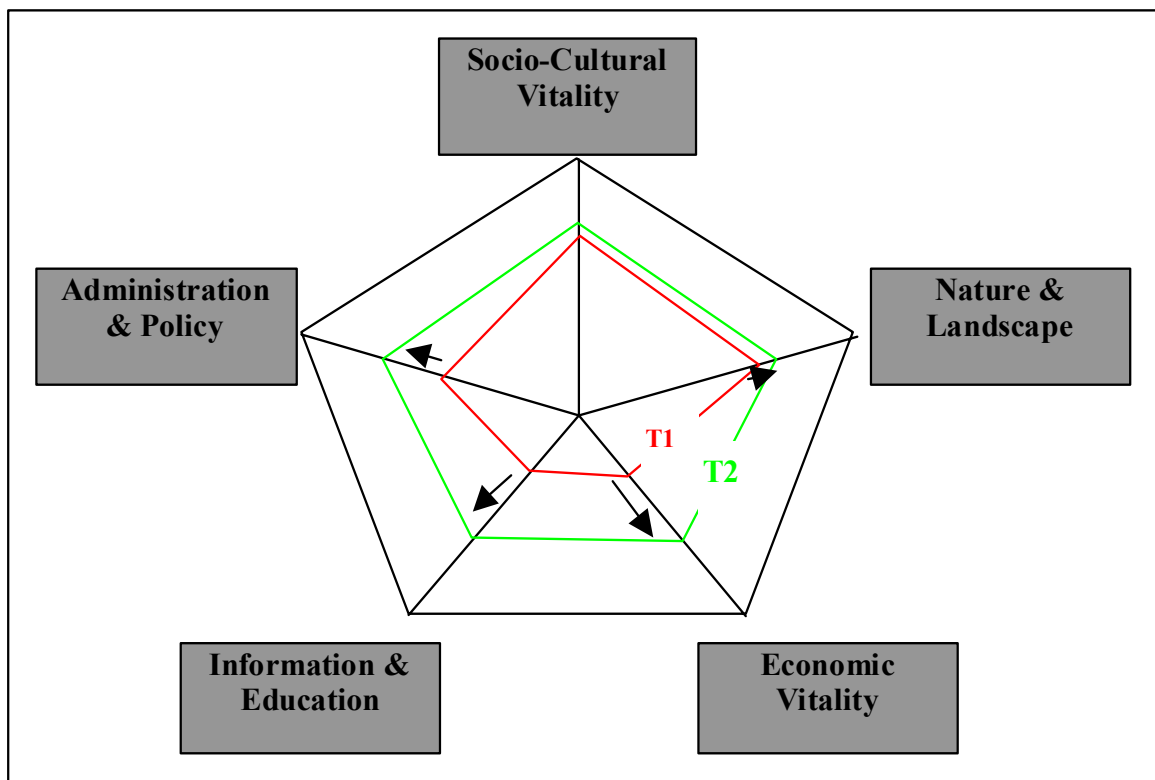


Figure 1. The five key areas of a regional natural park in Switzerland (T1 = diagnostic of the current situation; T2 = state to be achieved in the future).

The obstacles to the setup of a tourism monitoring system

The development of tourism activities is a priority for the Pfyng-Finges Association. This is why it is crucial to prevent the degradation of the site by a massive and uncontrolled influx of visitors. This risk of over-frequentation must not be underestimated, as Pfyng-Finges is close to big tourist resorts (Crans-Montana, Loèche-les-Bains, Val d'Anniviers). The "traditional" clientele of these resorts could be very interested in the additional offer of this regional natural park. It is thus particularly important for the park managers to have an operational monitoring system for the tourism activities in order to be able to take the necessary measures in due time. Nonetheless, the development of such a system will take time, mainly for the following three reasons:

- The persons in charge of Pfyng-Finges recognise the importance of such instruments for the observation of the economic, ecological and social consequences of the tourism for the park. However, in the present situation, where the survival of the park is still not ensured, they have other priorities.
- The global objectives for regional natural parks are clear. However, they must be refined according to the economic, ecological, social and institutional particularities of Pfyng-Finges before an indicator set can be elaborated. From a sustainable development perspective, this requires the participation of all concerned actors, which implies a relatively long and complex process.
- If the evolution of the different areas and objectives mentioned above are to be monitored, a huge amount of data is needed. A rapid overview of the data currently existing in Switzerland shows that the situation is not very favourable, either because this data has simply not been collected or because it exists on another level (national, cantonal) and is therefore not always applicable to a regional natural park.

Conclusion: Heuristic and practical value of the concept of carrying capacity

Whichever definition is chosen, the concept of carrying capacity is far from being unanimously approved by researchers and is still widely discussed. According to Sun and Walsh (1998, p. 326), "although the carrying capacity concept has been generally accepted in outdoor recreation management (...) some scientists consider it a useful theoretical concept, but limited in practical application". For Hughes (2002, p. 465–466), citing Butler (1993), "there are no satisfactory indicators of carrying capacity or the ability of the environment to sustain tourism". Even the authors who do use the concept recognize its limitations. According to Papageorgiou

and Brotherton (1999, p. 271), "carrying capacity remains a highly elusive concept, and its implementation is linked with the practical problems involved in measuring it". On the same page, these authors also point out Manning et al.'s (1996) acknowledgement, that "efforts to determine and apply the concept of perceptual carrying capacity to areas such as the National Parks have remained problematic".

In this article, we have presented an attempt to operationalise the concept of tourism carrying capacity for a regional natural park by defining a certain number of indicators to measure the four types of capacity defined by Hunter (1995, p. 67). As we have already pointed out before, a more thorough analysis of the literature and of existing experiences and the confrontation with the practical realities of the park convinced us to adopt a different approach. In accordance with the authors cited above (Hughes 2002, Papageorgiou & Brotherton 1999, Sun & Walsh 1998), we consider that the concept of carrying capacity has a certain heuristic value in its ability to account theoretically for the relations between human activities and their impact on the territory, especially regarding the environmental factor. However, we are more doubtful regarding the practical value of this concept, as we had to adopt a different approach to be able to propose a tourism monitoring system for regional natural parks. The definition of the indicators to measure the different types of carrying capacity was thus more a stylistic exercise than a setup of a management tool adapted to the needs of the park managers. This is why our study was oriented towards the development of an approach that allows each park to define its objectives and indicators according to its own characteristics and needs (Clivaz et al. 2004). This modification of the direction of our study corresponds to a more general tendency, which has been observed in other projects concerning the development of sustainable development indicators (Clivaz & Babey 2003, Pastille Consortium 2002). This tendency consists in switching from top-down approaches, where indicators are defined by experts, to bottom-up approaches, where indicators are defined by means of participative processes including local actors.

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¹ The final report of this study (in French) can be downloaded from the following website: <http://iet.hevs.ch>

² See below for the presentation of the different types of carrying capacity.

³ The tourism concept Pfyn-Finges 2010 (in German and in French) can be downloaded from the website <http://www.pfyn-finges.ch>