CARRYING CAPACITY IN EUROPEAN TOURISM DESTINATIONS

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Abstract

The paper discusses the application of Tourism Carrying Capacity in tourist destinations in EEA countries (member states of EU, Norway and Iceland). Empirical material was compiled for various EEA tourist destinations in respect to tourism carrying capacity issues, including islands, coastal areas, historical settlements, rural areas, protected areas and mountain resorts

Introduction

In general there is limited experience with the application of carrying capacity in the management of tourist destinations across European countries. This probably reflects the ambiguities involved with the concept and/or the difficulties in its operationalization. In addition there is little experience on the ground in managing tourist destinations, therefore there is little empirical evidence on tools and methods for that purpose.

However, the basic element of the concept: the need for a limit -a threshold -in the tourist activity is present in one way or another in various plans and policies. Tourism creates pressures on the natural and cultural environment, affecting natural resources, social structures, cultural patterns, economic activities and land uses in local communities. To the extent that such pressures are perceived as creating problems on tourism or alter “significantly” the functioning of nature and the local community, taking special measures to mitigate such impacts can be a viable option. These concerns increase and dominate public policy agendas as modern societies give increasing consideration to issues such as environmental conservation, quality of life and sustainable development. The issue of tourism development is increasingly sought within a local strategy for sustainable development in which case determining the capacity of local systems to sustain tourism becomes a central issue.

On the basis of the scientific literature on the subject, carrying capacity considerations revolve around three basic components or dimensions: physical-ecological, socio-demographic, political-economic. These dimensions reflect also the range of issues considered in practice (UNEP/MAP/PAP, 1997; Coccossis and Parpairis, 2000; Coccossis, 2001; Schreyer, R., 1984; Buckley, R. 1999)

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In considering carrying capacity the three components are assigned different weights (or importance) in different destinations. These differences stem from the type (characteristics/particularities) of the place, the type(s) of tourism present and the tourism/environment interface. The three are interrelated to some extent.

- **The characteristics of the locality** provide the basic structure for the development of tourism. These can be evidenced in terms of local resources, the vulnerability of local natural ecosystems, population size, economic structure, culture and local heritage, etc. To some extent the characteristics of a locality determine its resilience to pressures from tourism. The size, the structure and dynamism of the local society, culture and economy can be significant factors which influence the local ability to cope with pressures and impacts from tourism.

- **The type of tourism determines** the basic characteristics of tourist behaviour –to some extent- and condition the tourist/local community, tourism/local economy and tourist development/environmental quality relationships. The type of tourism can be expressed in terms of the motive(s) for visiting a place, the mode of mobility and transport, the frequency-length of stay- and activity range of tourists, etc. In this context it is important to consider differences among types of tourists in terms of expectations, attitudes and behaviour as these condition the pressures and impacts of tourism on a place.

- **The tourism/environment interface** is a composite of the previous two factors mainly in the form and type of tourist development (spatial patterns), the phase in a life-cycle context of the destination, the level of organizational and technological systems employed, the management regime, etc. The tourism/environment interface is expressed in terms of constraints evolving either from the impacts of tourism on the environment or from the degradation of the environment on tourism.

The above underline the need to consider a different emphasis-or significance- in carrying capacity considerations in each type of tourist destination (Coccossis, 2001; Borg, and Costa, 1995; Borg, Costa and Gotti, 1996)

- **Coastal areas:**
  Coastal areas are normally associated with mass tourism, large scale construction and infrastructure, intensive land development and extensive urbanization, a prevalent model in most Mediterranean destinations. Carrying capacity issues revolve around considerations about tourist density, the use of beaches and tourist infrastructure, congestion of facilities, sea pollution, etc.

- **Islands:**
  Island tourism, if not falling within the previous category, is more of the selective type with small and medium scale accommodation, often in (or around) existing
settlements, rural local societies, small communities, etc. Carrying capacity considerations focus on the relationship of tourism with the local society/culture, the effects on local production systems and the economy of the island, quality of life but also the demands and impacts on resources such as water and energy, the management of waste, etc.

-Protected Areas:
Tourism in protected areas is associated with appreciating and observing nature, scientific endeavour and education. This type of tourism is associated with minimal development of infrastructure and small scale interventions in areas of – normally-strong control and restrictive management. Carrying capacity issues concern the number of tourists, visitor flows and spatial patterns of concentration/dispersion vis-à-vis the protection of nature and the functioning of ecosystems but also the quality of experience of visitors.

-Rural areas:
Tourism in rural areas covers a wide range of purposes (motivations) and is usually associated with visiting areas of special beauty, being in nature, low intensity activities but widely dispersed around low density-often remote- rural communities. In some areas agro-tourism falls within this category. Carrying capacity issues involve questions about visitor flows, impacts on local society and culture, effects on rural economies, the spatial patterns of visitor flows, etc.

-Mountain resorts:
These are likely to resemble to the intensive development, mass tourism category, often centred around winter sports. Carrying capacity issues include environmental impacts from large scale infrastructure or access roads on natural ecosystems, microclimate change from artificial snow, vegetation cover losses and soil erosion, landscape deterioration, but also congestion of facilities and waste management.

-Historical settlements and towns:
Tourism is attracted to historic towns as a result of the built cultural heritage, urban amenities, lifestyle and cultural traditions, cultural events, etc. There can be several types of tourism in this category. The dominant mass tourism associated with large numbers of visitors centering around monuments, museums, etc. often of a short stay (even daily visits) in which case carrying capacity issues center around congestion of facilities, traffic, urban land-use change, waste management etc. At the other end of the spectrum in some other cases tourism in historic settlements could be more of the selective type associated with small groups of visitors, low pressures for development, etc. in which case carrying capacity considerations could be limited to urban fabric change, etc.

Whether real or perceived, limits (thresholds) can stimulate communities to take action at a destination level. Such action is easier to become incorporated within the existing
responsibilities, functions and activities of managing local affairs. It seems easier in two cases:

- Areas of special environmental interest, such as natural parks or protected areas, where management regimes exist already in the sense of administrative/organizational structures and –at best- management plans (goals, priorities and measures).

- Local authorities in the process of developing or reviewing local planning strategies, where future development issues become part of planning and management activities. Strategic planning can provide a supporting process to consider tourist carrying capacity.

**The Approach: TCC as part of a planning process**

The definition-assessment and implementation of TCC needs to be considered as a process within a planning process for tourism development. In this respect, the following should be noted:

1. The process of defining and implementing TCC and a broader process of planning for sustainable tourism, which are parallel and complementary processes, can provide a general framework which could guide the local community, planners and decision-makers. This framework consists of principles, goals, objectives and policy measures in regard to tourist development in an area on the basis of the area’s distinctive characteristics/features respecting local capacities to sustain tourism.

2. Setting capacity limits for sustaining tourism activity in a place involves a vision about local development and decisions about managing tourism. These should be carried in the context of democratic community strategic planning which requires participation of all major actors and the community at large. Consultation with relevant stakeholders is a key issue at all stages. The whole process is dynamic and cyclical.

3. Overall measuring Tourism Carrying Capacity does not have to lead to a single number (threshold), like the number of visitors. Even when this is achieved this limit does not necessarily obey to objectively, unchangeable, ever lasting criteria. An upper and a lower limit of TCC can be of more use than a fixed value. TCC assessment should provide not only the maximum but also the minimum level of development, that is the lowest level, necessary for sustaining local communities. In addition, TCC may contain various carrying capacity limits in respect to the three components (physical- ecological, social-demographic and political –economic). “Carrying capacity is not a scientific concept or formula of obtaining a number, beyond which development should cease. The eventual limits must be considered as a guidance. They should be carefully assessed and monitored, complemented with other standards, etc. Carrying capacity is not fixed. It develops with time and the growth of tourism and can be affected by management techniques and controls” (Saveriades, 2000).
4. The process of defining TCC can be considered as composed of two parts (Shelby and Heberlein, 1986).

**Descriptive:** Describes how the system (tourist destination) under study works, including physical, ecological, social, political and economic aspects of tourist development. Within this context of particular importance is the identification of:

- **Constraints:** limiting factors that cannot be easily managed. They are not flexible, in the sense that the application of organisational, planning, and management approaches, or the development of appropriate infrastructure does not alter the thresholds associated with such constraints.
- **Bottlenecks:** limiting factors of the system, which managers could manipulate (number of visitors at a particular place)
- **Impacts:** elements of the system affected by the intensity and type of use. The type of impact determines the type of capacity (ecological-physical, social, etc). Emphasis should be placed on significant impacts

**Evaluative:** Describes how an area should be managed and the level of acceptable impacts. This part of the process starts with the identification (if it does not exist already) of the desirable condition/preferable type of development. Within this context goals and management objectives need to be defined, alternative fields of actions evaluated and a strategy for tourist development formulated.

3. The implementation of TCC can be assisted, guided and monitored, with a coherent set of indicators. During the process of defining TCC an initial set of indicators may be developed, finalised following the final decision on TCC of the total system. The whole process is dynamic and, as already noted, since TCC is not a fixed concept; it should be regarded as a tool for guiding policy formulation and implementation towards sustainable tourism
Application of Tourism Carrying Capacity

Issues to be considered
Carrying capacity is a powerful concept for policy making although from a scientific perspective it has met with considerable controversy due to the analytical difficulties in arriving at a “calculated” capacity (threshold or limit). This difficulty stems from the multiple dimensions of the concept and the inherent constraints in estimating limits in natural and human ecosystems. Getz (1987) identified six different approaches of interpretations or methods of determining carrying capacity: Tangible Resource Limits, Tolerance by the Host Population, Satisfaction of Visitors, Excessive Rate of Growth of Change, Capacity based on the evaluation of costs and benefits, The role of Capacity in a Systems Approach. In recent literature the interest on carrying capacity has shifted from an “objectively” assessed threshold to –policy useful- desired conditions providing more advantages to planning and decision making. Alternative concepts have been also suggested in the spirit of management-by-objectives approaches such as Visitor Impact Management, Limits of Acceptable Change, Visitor Experience Resource Protection frameworks, instead of TCC.

There is a growing concern for developing and utilising tools that could facilitate planners and decision- makers in their efforts to control tourism development. However, there is limited, almost non-existent, experience not only in implementing tourism carrying capacity but also in measuring it. The review of theory and practice in EEA tourist destinations indicated that the following issues should be taken into account:

Spatial considerations
Carrying capacity is easier to be defined in limited well-defined areas. In addition TCC could vary among the different parts of an area (ex. centre of the town vs. surrounding areas, or in various sub-areas within ecologically sensitive areas, etc). In some cases it could be that entire regions can be considered as for example in the case of islands or river valleys, etc. Through planning tools, such as zoning, and management techniques, such as visitor flow management, the impacts of tourism (therefore the capacity of an area to sustain tourism: TCC) can be mitigated.

The role of Actors
- Effective implementation depends on the political will to impose rules on the way tourism develops, as for example, to control access to a destination in order to protect it. Within this context the development of appropriate institutional measures/mechanisms is absolutely essential. An effective legal framework could help to reduce/mitigate the negative impacts from tourism.
- Consensus of key stakeholders over the definition of TCC is critical. An agreement on the goals of tourism development will be necessary. The results of the TCC study should be communicated to stakeholders, local people and users who will have to support the implementation of envisaged measures. The participation of tour Operators is essential too in those cares where they may have a prominent role (i.e. mass tourism destinations, as coastal zones)
The implementation of carrying capacity needs to take into consideration cultural elements.

Integrating TCC in planning process and institutional context

- Carrying capacity studies have to be incorporated in a plan for sustainable development although this is not a prerequisite in order to employ TCC. Consensus among the various stakeholders over a strategic vision of the area could be helpful.
- TCC should be incorporated in the institutional framework.

Evaluation-Monitoring

- Carrying capacity needs to be flexible and reflect the particularities of the area under study. Systems are dynamic, therefore are subjected to continuous changes. Visitors and local communities, for example, tend to alter their behaviour over time and often adapt to worsening or different conditions, resulting to a different social response.
- There is a need for monitoring but also for credible data and information in order to assess and implement carrying capacity. In that sense significant resources will be required in the initial stage but also during implementation. Demand needs to be monitored as well.

Constraints and common pitfalls in implementing TCC

- The changing role of the state. In a market economy, the private sector is expected to undertake increasingly the responsibility or initiative of nature/environmental protection or local identity enhancement. In some countries for example forests are privatized. This may probably lead to an increase in pressure, since recreational activities may grow and expand in order to increase profits.
- Action is generally encouraged at local and national level, while several environmental problems are transnational. Managing pressures at local level often requires policies at a higher level.
- Synergies are often overlooked as a result of fragmentation of responsibilities. An integrated approach in planning and management could provide a good basis.
- Several rather sophisticated systems have been developed in order to measure Carrying capacity. However the final number provided doesn’t prove to be always useful and the confusion over alternative measures might discourage managers and policy makers. Furthermore limited effort and resources have been given for the implementation of TCC assessments. The promotion of more pilot projects at European level is necessary including the dissemination of experiences over the use of TCC or its components in managing tourism.

Institutional framework to implement TCC

At European level there are several instruments that may encourage and facilitate the application of tourism carrying capacity. There are opportunities to include TCC (as guidelines) in existing interventions and tools which are well accepted:
Natura 2000, the Habitat Directive and the Red Lists are valuable instruments for nature protection and for defining CC levels for ecological sensitive sites so as to limit tourist development. Of significant value can be corresponding institutional approaches like Emerald Network, UNESCO World Heritage and Biosphere Reserve, Ramsar Convention, which set as a priority the protection of these areas.

Rely on the Compensation Principle. It is one of the ways to put priorities on capacity considerations, as for example in the case of TGV construction in France, by assigning nature a price in order to protect it.

Tourism carrying capacity as a required concern in Environmental Impact Assessment. It should be applied to proposed development projects and programmes in order to evaluate the potential impacts in light of forecasted tourism growth and peak demand. Alternative sites for development should be considered, taking into account local constraints and carrying capacity limits.

TCC could be a central concern required in SEA (Strategic Environmental Assessment) since this reflects anticipating development on the basis of the capacity of local systems to support it.

Management tools for implementing TCC

Regulatory

- **Zoning** is a rather useful tool, easy to be applied. It is applied mainly in protected areas, since their special status allows the definition and delimitation of zones where protection, conservation and limitations in the various uses are imposed.

- **Limits to free access.** It could help significant environmental protection. However, many European laws protect free access. It is not possible to discriminate people on the basis of various factors (ex. cartavenezia). Imposing limits to accessibility is allowed only in certain cases like the application of International Conventions.

- **Limits to specific activities.** All kinds of tourist activities have to be evaluated in order to prevent impacts on the environment or conflicts among different users. Special permits or the application of EIA are not foreseen in the case of new forms of activities as in the case of infrastructure development. Some activities may be forbidden given particular conditions, while others may be just limited to certain periods of the year or to a limited number of users. For example paragliding is forbidden in some French National Parks because it disturbs fowls.

- **Eco-labels.** The use of eco-labels in tourist hotels and other public establishments had a little overall effect on resource consumption and waste production.

- **Concentration or dispersion of development pressures and tourist flows.** From an environmental point of view concentration is not always the best approach to manage tourist flows. Dispersal is preferable, because externalities appear only when the system reaches certain levels of thresholds. However it is also a matter of choices: is it better to concentrate tourists or to disperse them? Alternatively, could it be better to promote the creation of several poles of tourist development? The concept of carrying capacity can be applied in all three cases. However even in cases where a plan for tourism dispersion exists, it would be difficult to manage and guide tourist’s flows.
Land use/spatial planning is a process par excellence to implement carrying capacity assessment in the case of islands and coastal areas, while for the areas with ecological value institutional mechanisms seem to be a more appropriate way in order to ensure protection. As far as historical centres, where the pressure is not from land development, the management of flows could prove to be a more suitable way to go. However, attention needs to be placed on the changes of the functions/uses within the cities.

Economic

- **Pricing** It is not always the most appropriate tool to use in order to limit/control tourism development/growth. In the case of Venice such a policy is expected to penalise tourists and not excursionists, who do not consist a preferable target group. Imposing such a policy selectively to certain groups (i.e. lower prices for residence) is against European laws, since it implies discrimination. However, there are occasions when pricing for parking and entry to major attractions should be imposed in order to discourage visitors. Although pricing is considered, as the least desirable solution, it remains the most effective at least in the short-term.
- **Taxes** may be used as a way to incorporate in prices various externalities like environmental destruction. Increased prices can discourage tourists and entrepreneurs as well.
- **Cost-benefits analysis** should be conducted in the different phases of the life-cycle of a tourist destination. Costs are always higher in the earlier phases of tourist development.
- **Incentive schemes** should be applied in both public and private sectors in order to spread tourism demand over time and space and optimises the use of accommodation.

Organisational

- **Reservation and booking systems.** They facilitate management of both tourists and excursionists flows. In Venice, for example, the promotion of the Venice card, which corresponds to a package of services facilitates management of tourists flows. In this case it is also possible to introduce taxes in a more equitable way tourists, because the Venice card is available to everyone. People also use this card can benefit from discounts on local transportation, and entry fees to museums and other facilities. The only condition is advance booking. However the use of such system may encourage social inequalities since the cost for visiting such places would be affordable only to specific groups. One should also be aware of the possibility of the creation of a “black market”. The possibility of introducing a corresponding package for excursionists should also be explored.
- **Information management** In Venice information in respect to congestion, peaks, traffic, etc is constantly provided through the web site. This is a way to discourage tourists from visiting Venice and avoid as a result overcrowding.
- **Education** of local community in order to gain their support for implementing TCC is essential.
- **Training** of local planners-managers in the use of various techniques, etc.
• Market control. At present there is little co-ordination between management, planning and tourism marketing. Sophisticated marketing and communication allows marketers to pursue particular market segments and to undertake promotions for periods in which there is available carrying capacity. Tour operators could play an important role in managing environmental impacts and maintaining the sustainability of tourism through promoting activities and other actions. (See tour operators project of UNEP)

Conclusions

Tourism is incontestably a key economic activity for most of the EEA countries. Its significance for local and regional development is expected to grow further, along with the pressures exerted particularly to local environmental and cultural resources, although its contribution to global phenomenon such as climate change need not to be overlooked.

Planning and management for tourism growth is becoming essential in the context of sustainable development. As recreation is gaining a central place in modern lives, along with the demand for environmental quality, the development of tourism in accordance with sustainability principles becomes a real challenge for both planners and managers. The emergence of new tourist destinations will only increase the pressure on existing tourist destinations to keep their position in a rather competitive market. Mature destinations, either coastal or mountain resorts are already focusing in the diversification of their tourist product in an effort to expand their clientele. Peaks, either in the winter, summer or in national holidays are not avoided, on the contrary opportunities for further development are sought since tourism remains a vital factor for local employment and income.

Although prospects for growth are promising, there is still high uncertainty in respect to the way that tourism will evolve in the future. Its management is becoming a rather complex task as tourism by itself is transformed into a complex and diversified activity. European entrepreneurs are realising that tourism development implies important costs in respect to infrastructure development, environmental protection and enhancement of cultural heritage, while they also recognise the strong dependence of tourism on environmental quality. Along with these there is a need to tackle other issues such as equal distribution of economic benefits, participation of local communities in planning and management of tourism growth, even safeguarding the potential for development for future generations. A strategy for tourism needs to be elaborated as part of a broader strategy for local or regional development, taking into account uncertainty arising from broader changes along with local particularities and priorities.

Evidence from practice indicates that in most cases the response has been reactive and remedial: planing and management often follows tourism growth, the appearance of impacts, the provocation of conflicts among users. In very few cases mainly in the case of areas with high ecological significance, policy for tourism has been proactive. The regime that characterises these areas plays a decisive role in their protection since it provides the opportunity for the early adoption of guidelines and limits for any kind of
development including tourism. In this respect tourism needs to be developed in accordance with certain rules and implementation of measures should be strict and the monitoring effective. The use of various tools such as TCC assessment, with the aim to impose limits (for entering or exercising various activities), is appropriate since they conform to the prevailing concerns for conservation of natural and cultural heritage. However TCC needs to be regarded as a management tool and not as a rigid technique, which could lead to the definition of a unique numeric value.

Particular emphasis should be placed on implementing TCC. The implementation can be seen as part of a continuous (on-going) planning and management process for sustainable tourism development. Capacity limits are not only perceived in ecological terms but also in physical, economic and cultural. CC limits are changeable and quite often negotiable, in the sense that several of the existing constraints can be altered. Carrying capacity limits could change as the organisational and technical capacity of the destination improves.

Legislation remains also a significant tool for the implementation of TCC. Regulatory tools can be useful particularly in the cases of tourism development in areas with high ecological value.

Last but not least monitoring is essential for implementing and even re-defining TCC. Monitoring can be based on a set of selected indicators. Particular attention is required for the selection since the demand and respectively the cost for data and information is not always affordable. Preferably indicators could focus on key factors.

Furthermore stakeholders participation is essential at all stages since TCC incorporates and reflects aspirations and goals of local community.

In addition to all these it is necessary to promote pilot studies to test methodologies for defining and implementing TTC in the various European destinations. Implementing these studies is essential since evidence from practice is limited. Dissemination of the experience gained is critical and it could be accomplished through proper networking. The forthcoming Environmental Action Program promotes such initiatives.

In conclusion it should be stressed that assessment of TCC does not provide necessarily limits for development but opportunities for re-orientating tourism development. TCC need not to be regarded as a mean to cease development, instead as an opportunity to safeguard development, even secure further growth through the adoption of appropriate measures. TCC can also serve as a tool for education and awareness. Managers and decision- makers could understand and appreciate, through the utilisation of TCC, the critical relationship between tourism development and environmental quality.
References

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