ECOSYSTEM SERVICES IN TOURISM AND RECREATION. REVISITING THE CLASSIFICATION PROBLEM

ŚWIADCZENIA EKOSYSTEMOWE NA POTRZEBY TURYSTYKI I REKREACJI. JESZCZE RAZ O PROBLEMIE KLASYFIKACJI


SŁOWA KLUCZOWE: turystyka i rekreacja, świadczenia ekosystemowe, klasyfikacja
Introduction

Tourism and recreation are the important element of human well-being. Natural values are concerned to be crucial for the most of leisure activities. Their identification and assessment can be conducted using ecosystem services concept which has gained its global popularity in the last 15 years. This paper does not aim at its characteristics, however three principal advantages of using ecosystem services concept should be mentioned. First, it allows to recognize relations between economic and ecological aspects of use of natural resources. Second, it makes possible to identify consequences of different scenarios of spatial development. Third, it has high potential as and information and educational tool.

Tourism and recreation find its place within the discussed concept and are typically listed as one of the cultural ecosystem services. However, their position remain unclear, as they are positioned at different levels and in various relations to other services (see table 1). One of the ambiguities is if recreational ecosystem services are of material of nonmaterial character. The popular Millenium Ecosystem Assessment (MEA)\(^1\) classification recognizes tourism and recreation as one of the cultural services, thus promotes their nonmaterial character. In Common International Classification of Ecosystem Services (CICES 4.3)\(^2\) classification recreation is also considered as a cultural service, and it is described even in a more narrow way, as physical and intellectual interaction with the environment. As tourism and recreation are a very diversified phenomenon, the existing classifications are supposed to be too limited. The one way to resolve this problem is to create new, more suitable typologies\(^3\). However, the use of common and well established frameworks would allow to easily combine research on tourism and recreation with those concerning other types of human activities. The implementation of common classification of ecosystem services is thus significant from scientific as well as from practical point of view. In our opinion ecosystem services for tourism and recreation cannot be limited to just one category. This paper attempts to identify the weight of different ecosystem services to tourism and recreation phenomenon.

CICES classification has been explored in order to describe the importance of different ecosystem services to tourism and recreation. The classification which was developed on the basis of environmental accounting undertaken by the European Environment Agency (EEA) is based on the requirement that any new

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\(^2\) Common International Classification of the Ecosystem Services v. 4.3, www.cices.eu [27-09-2014].

\(^3\) R. Costanza, Ecosystem services: multiple classification systems are needed, “Biological Conservation” 2008 no. 2(141), p. 350-352.
classification has to be consistent with previously accepted typologies. Widely used in Europe and in other countries, it has three hierarchical levels and can be modified depending on scale and approach of undertaken research. CICES has gone through a number of evolutionary stages since it was first proposed in 2009. The most recent version (4.3) has been used as the basis of this work.

**Method**

The Analytic Hierarchy Process (AHP) has been implemented to identify which of CICES categories are supposed to be the most important for tourism and recreation. Developed by Saaty in the 1970s, this multiple choice method is widely used both for management and scientific purposes. It has been also imple-
mented in tourism research. The method allows to incorporate both qualitative and quantitative elements of a problem within a single study and to arrange them in a hierarchical form. The AHP approach involves three basic steps: (1) decomposition – creation of the hierarchy (2) pairwise comparison of elements of the hierarchical structure; (3) synthesis of priorities. The values of the pairwise comparisons are determined according to the nine point scale, where 1 means that two activities contribute equally to objective and 9 that the importance of one over another is affirmed on the highest possible order. After the pairwise comparison a matrix is constructed, a vector of priorities is calculated and is then normalized to sum to 1.0. Finally, the reliability of the experts’ judgments is checked using the consistency ratio (CR) metric. Inconsistency unveils exaggerated or careless judgments. Originally, T.L. Saaty considered CR = 0.1 as the acceptable upper limit, but depending on a character of an analysis and on a number of compared elements values up to 0.3 could also be accepted.

Due to limited human capacity for proceeding information the number of elements taken into account in AHP analysis should not exceed 9. Accordingly, the second level of CICES classification has been assessed. These are 8 elements: nutrition; materials; energy; mediation of wastes, toxics and other nuisances; mediation of flows; maintenance of physical, chemical and biological conditions; physical and intellectual interactions with ecosystems and land-/seascape, spiritual, symbolic and other interaction with ecosystems and land-/seascape. The table shows the position of analyzed elements within CICES classification. As it has been mentioned above, tourism and recreation activities themselves taken into account by CICES as a sublevel of “physical and intellectual interactions (...)”.

Ten experts were asked to make comparisons of the elements presented above. Five of them were landscape ecologists and five were tourism geographers. For every set of judgments the individual AHP matrix were constructed. Results were finally synthesized to one final AHP matrix. The analysis was conducted with the use of free AHP Excel template elaborated by K. Goepel.

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8 T.L. Saaty, M.S. Ozdenic, Why the magic number seven plus or minus two, “Mathematical and Computer Modelling” 2003 no. 3 (38), p. 233-244.
Table 2  
CICES classification – 1st and 2nd level

<table>
<thead>
<tr>
<th>Section</th>
<th>Division</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provisioning</td>
<td>Nutrition</td>
</tr>
<tr>
<td></td>
<td>Materials</td>
</tr>
<tr>
<td></td>
<td>Energy</td>
</tr>
<tr>
<td>Regulation &amp; Maintenance</td>
<td>Mediation of waste, toxics and other nuisances</td>
</tr>
<tr>
<td></td>
<td>Mediation of flows</td>
</tr>
<tr>
<td></td>
<td>Maintenance of physical, chemical, biological conditions</td>
</tr>
<tr>
<td>Cultural</td>
<td>Physical and intellectual interactions with biota, ecosystems, and land-/seascapes</td>
</tr>
<tr>
<td></td>
<td>Spiritual, symbolic and other interactions with biota, ecosystems, and land-/seascapes</td>
</tr>
</tbody>
</table>

Source: Common international classification . . . , op. cit.

Results

Figure 1 presents the results of the conducted analysis. Both included types of cultural services have occurred to be the most important for tourism and recreation, with physical and intellectual interactions with ecosystems and land-/seascapes at the first position. Provisioning services, especially nutrition, are also significant. The importance of regulation and maintenance remains unclear. The elements of this group have been weighted as less significant.

However the final matrix has high level of consistency (CR = 0.018), the judgments of the individual experts are less consistent. Only four experts reached the level of consistency suggested by T.L. Saaty (CR <= 0.1). CR for another six sets of judgments varied between 0.1 and 0.3.

The experts’ academic background seems to have no influence on their judgments. As well those of physical geographers and specialists in tourism remain highly diversified (see Figure 2). In posterior personal communication experts admitted that the task appeared difficult for them. The main problems which they perceived were:

- broad and unclear categories, although some examples were given to make them clearer;
- a lack of knowledge of the assessed phenomena; especially regulating and maintenance categories were seen as problematic;
- the need to treat tourism and recreation in general; in reality it remains very diversified.
Figure 1
The results of AHP analysis

e1...e5 – landscape ecologists, t1...t5 – tourism geographers.

Source: own elaboration.
Discussion

The division into provisioning, regulating & supporting and cultural services originates from the MEA and is implemented also in CICES classification. This division is one the most used. Understandably, it could not fit all purposes. It has been criticized in context of environmental accounting9 and poverty alleviation10. However considering ecosystem services complexity an idea of a single classification system should be approached with caution11 common classifications such as MEA or CICES, allows for easy communication and comparisons within different contexts.

The CICES classification defines tourism and recreation as one of cultural services. The discussed phenomenon is included into the category of physical and intellectual interactions with ecosystems/landscapes. The conducted analysis shows clearly that tourism and recreation is too broad and complicated phenomenon to be treated as a single ecosystem service itself. However, cultural ecosystem services are definitely the most important for tourism and recreation (0,32). Physical and intellectual interactions with ecosystems of land/seascapes are followed closely by spiritual and symbolic interactions (0,28). Nutrition should be also considered as an important service (0,11). Its significance seems to respond to the growing popularity of regional food, that is in many cases an important driver of tourism activity.

The regulating and maintenance services occurred to be the most problematic ones. On the one hand, the expert were conscious that tourism and recreation influenced ecological functions, but they seemed not to have the detailed knowledge of the problem. In fact, the relations between different leisure activities and various types of ecosystems still remain unknown. Additionally, the enormous diversity of relations that should be included makes their evaluation very difficult if possible at all.

It has to be noticed, that the notion of tourism and/or recreation is very broad and its limit remain unclear. Therefore, it is difficult to identify any ecosystem – human relations as connected or separate to tourism. It is not just the case of regulating and maintenance services mentioned above, but also of the ecosystem services, that are easier to be identified and to quantified. For example nutrition service supports tourist interests as well as everyday human needs. Delivery of regional products is just a small fraction of the phenomenon and does not nec-

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The diversity of the ecosystem services concept and its implications for their assessment and management.

Essarily concern only tourists. The mentioned products can be also consumed by locals. Also, if sold far from the place of their origin, they would lose their importance to tourism.

Originally, the concept of ecosystem services has been used as a tool for nature management and biodiversity conservation. Growing interest in the nature-human relations resulted in transformation of the original concept into the planning tool, where nature’s services are used in a holistic approach centered around human well-being concept. The followers of the second approach often

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refer not to ecosystem but rather to landscape services, as landscape is more complex term that include human activity\textsuperscript{13}.

The approach results in different position of tourism and recreation (Figure 3 and 4). If the research is socially focused, limiting tourism and recreation to one synthetic category could result in omitting some elements that are important to human-nature relation. However, the adopted level of detail should reflect spatial, social and time scale of the research.

Conclusions

The ecosystem services concept has been widely discussed in the scientific literature for the past 15 years. It can be very useful also in tourism studies, as an enormous part of tourism and recreation activities are undertaken in nature. In the existing classifications of ecosystem services, however, tourism and recreation are considered just as a single service. This paper proved that such an approach is too limited and it does not take into account the complexity of the studied phenomenon.

Natural ecosystems have an important value as a place where people can come for rest, relaxation, refreshment and recreation\textsuperscript{14}. However, in order to use them as places for tourism and leisure, other ecosystem functions should also be considered. This paper aimed at discussing the position of tourism and recreation in classifications of ecosystem services. It showed, that they should be treated as a complex phenomenon and not just as a separate service. This approach should be continued and expanded.

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