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ECOSYSTEM SERVICES IN TOURISM RESEARCH; CASE STUDY OF AQUATIC RECREATION

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ŚWIADCZENIA EKOSYSTEMOWE W BADANIACH NAD TURYSTYKĄ. PRZYPADEK REKREACJI WODNEJ

STRESZCZENIE: W artykule omówiono możliwości zastosowania koncepcji świadczeń ekosystemowych w badaniach nad turystyką i rekreacją. Głównym warunkiem jej wykorzystania w tym zakresie wydaje się jest klasyfikacja świadczeń ekosystemowych, która byłaby przydatna w omawianej dziedzinie. Na przykładzie dwóch form rekreacji wodnej (żeglarstwo i wędkarstwo) wyróżniono trzy podstawowe grupy świadczeń: materialne, estetyczne i duchowe. Ze względu na fakt, że wartości niematerialne są w dużym stopniu uwarunkowane kulturowo, co utrudnia podział świadczeń na „ekosystemowe” i pozostałe, należałoby rozważyć upowszechnienie pojęcia świadczenia krajobrazowe.

SŁOWA KLUCZOWE: świadczenia ekosystemowe, świadczenia krajobrazowe, klasyfikacja, rekreacja wodna

Introduction

Tourism and recreation are an important form of human activity. Economically they grow constantly – in 2011 international tourism receipts surpass USD 1 trillion¹. Socially it is an indispensable part of life, especially in countries with a higher level of economic growth. Mutual interactions between tourism and recreation and environment are widely known, resulting in popularity of sustainable tourism, that respect environmental and social values. As mentioned above, tourism as a form of activity is of interest to a large part of society. The described phenomenon is highly interdisciplinary, remaining in the range of interest in the social sciences, economics and natural sciences. Undoubtedly, a tool which would allow to integrate various approaches and widely present research results is needed. It is believed, that the ecosystem services concept could be useful in this field. Some problems that concern the use of the concept within mentioned field are discussed in the presented article. These are:

- classification of ecosystem services for the purpose of tourism and recreation research;
- perspectives of integration social and ecological approaches within the concept of ecosystem services.

Two types of aquatic recreation: inshore sailing and angling have been selected as examples for discussed problems.

Tourism and recreation within the concept of ecosystem services

Recreational services are recognized by the most popular classifications^{2,3,4,5,6,7} (see Table 1). However divisions applied suggest their independency, it seems to

¹ *International tourism receipts surpass USD 1 trillion in 2011*, UNWTO press release, <http://media.unwto.org/en/press-release/2012-05-07/international-tourism-receipts-surpass-us-1-trillion-2011> [Date of entry: 30-09-2012].

² R. Constanza et al., *The value of the world's ecosystem services and natural capital*, "Nature" 1997, No. 387, p. 253-260.

³ *The Millenium Ecosystem Assessment, Ecosystems and Human Well – being: Synthesis*, Island Press, Washington D.C. 2005.

⁴ R.S. De Groot, M.A. Wilson, R.M.J., Boumans, *A typology for the classification, description and valuation of ecosystem functions, goods and services*, "Ecological Economics" 2002 No. 41, p. 393-408.

⁵ K.J. Wallace, *Classification of ecosystem services: Problems and solutions*, "Biological Conservation" 2007, 139, p. 235-245.

⁶ J. Boyd, S. Banzhaf, *What are ecosystem services? The need for standardized environmental accounting units*, "Ecological Economics" 2007, No. 63, p. 616-626.

⁷ R. Haines-Young, M.Potchin, *Common International Classification of Ecosystem Services (CICES): 2011 Update*, <http://unstats.un.org/unsd/envaccounting/seeaLES/egm/Issue8a.pdf> [Date of entry: 30-09-2012].

be impossible to separate recreational and tourism from another types of services. For example, in “The Millenium Ecosystem Aseessment” recreation is mentioned within “cultural services”⁸. This group is intentionally not directly related to the collection of material goods. Meanwhile, main threats to the environment from tourism correspond to direct, excessive use of resources. Environmental goods that support tourism can include both of benefits related to other cultural subgroups (especially aesthetical benefits) and to the group of provisioning services. For example, tourism is characterized by a large water holding capacity, both in terms of land use (eg. golf courses) and the individual behavior of tourists. The food supply is also important, with traditional farming as a basis of regional cuisine.

As it can clearly be seen, it would be very difficult to place all the phenomena related to tourism and recreation within one branch of the MEA (2005) classification; the same problem is observed with the other classifications mentioned above.

The attempt to simplify theoretical framework of ecosystem services concept was made by J. Boyd and S. Banzhaf⁹, who propose to achieve the goal by omitting regulatory and supporting services. The same idea has been presented by K. Wallace¹⁰. However simplification of the concept could be useful for marketing or educational purposes, it does not represent the complexity of natural phenomena. According to R. Constanza¹¹ to oversimplify the concept of ecosystem services means to deprive it of much of the scientific potential. Alternatively he suggests to use various classifications of ecosystem services depending on research scope. Different divisions are needed for different subjects, but they are also scale dependent, with level of detail increasing proportionally to scale of research.

Probably the simplest way of classifying ecosystem services for tourism and recreation is to assign them to various types of activities. This allows to identify areas of potential conflicts. The number of services taken into consideration depends on the scope of research. J. Boyd and S. Banzhaf¹² underline, that final benefit which man obtains depends not only on the of the ecosystem, but also on infrastructure, equipment and personal skills. However, each of mentioned means depends, more or less, on environment. Thus, ecosystem services are needed to support the existence of means mentioned above. They could be called secondary services, in contrast to primary ones, that result in providing direct benefits. Primary services are always connected with the area, where activity is realized. This not apply to secondary services, because materials used for the equipment can be derived from far away. That makes problematic detailed identification of secondary services.

⁸ *The Millenium Ecosystem Assessment*, op. cit, p. 44.

⁹ J. Boyd, S. Banzhaf, op. cit., p. 621.

¹⁰ K.J. Wallace, op. cit., p. 235.

¹¹ R. Constanza, *Ecosystem services: Multiple classification systems are needed*, “Biological Conservation” 2008 No. 141, p. 350.

¹² J. Boyd, S. Banzhaf, op. cit., p. 621.

Table 1.
Tourism and Recreation within different classifications of ecosystem services

Classification	Position of tourism and recreation	Recognizing of material aspects	Recognizing of nonmaterial aspects	Notes
Constanza et al. ^{a)}	One of 17 main categories	yes	no	Focus on eco-tourism and outdoor recreation.
De Groot, Wilson, Boumans ^{b)}	One of 23 ecosystem function (recognized as information function)	yes	yes	Function + process = services and goods. Classification of functions, but only examples of services provided.
Millenium Ecosystem Assessment ^{c)}	One of 4 subgroups of cultural ecosystem services	no	yes	
Wallace ^{d)}	One of 6 subgroups of category socio-cultural fulfillment	no	yes	
Boyd and Banzhaf ^{e)}	One of 6 benefits	yes	no	Recreation as a benefit not as a service
CICES ^{f)}	One of 23 service groups (within intellectual and experiential service class)	yes	no	Focus on use of resources (direct or indirect)

^{a)} R. Constanza et al., op. cit., p. 254.

^{b)} R.S. De Groot, M.A. Wilson, R.M.J. Boumans, op. cit., p. 396.

^{c)} *The Millenium Ecosystem Assessment*, op. cit., p. 120.

^{d)} K.J. Wallace, op. cit., p. 241.

^{e)} J. Boyd., S. Banzhaf, op. cit., p. 623.

^{f)} R. Haines-Young, M. Potchin, op. cit., p. 6.

The important feature of the ecosystem services' concept is that it joins two subjects – environment and its users. There is no service without demand. Diverse demand features could be the basis of ecosystem services' classification for tourism. However, description of demand is not easy, because tourism and recreation are very diversified. Detailed social research is necessary to describe which services and to which extent are needed. Concerning balance between material and nonmaterial features that are commonly described as important to tourism¹³ three types of ecosystem services can be distinguished:

- Material services – support goods and means necessary for specified type of activity
- Aesthetical services – support contact with beautiful surrounding
- Spiritual services – support spiritual experience.

Depending on activity, but also on individual user's features, significance of every group changes. Every group distinguished above is different when the

¹³ M. Kowalczyk, S. Kulczyk, *Krajobraz jako obiekt badań geografii turystyki*, "Problemy Ekologii Krajobrazu" 2010 Vol. 27, p. 197-201.

problem of economic valuation is considered. Probably the easiest to sum up are material services. Various methods of tourist values economic assessment has been described by C. Tisdell¹⁴. However, significant lack of quantitative data on aesthetical and especially spiritual services is observed¹⁵.

Case study – aquatic recreation at Great Masurian Lakes

The Great Masurian Lakes (Wielkie Jeziora Mazurskie) is a subregion within Masurian Lakeland (Pojezierze Mazurskie) in northeastern Poland. Water bodies make 7% of Masurian Lakeland area and 20% of Great Masurian Lakes¹⁶. Vast forest areas, extensive agriculture and relatively well preserved nature determine touristic and recreational values of the region, which is one of the favorites holidays destinations in Poland. Various forms of recreation and tourism are realized within the area – from typical leisure stays through different forms of active tourism. Popularity of aquatic tourism is logical consequence of area's natural characteristics. However aquatic recreation is widely recognized as regional brand¹⁷, there are no data available on the number of people practicing it's different forms¹⁸.

For further analysis sailing and angling have been selected. Sailing strongly influences the image of The Great Masuria Lakes. It has been remarked as a tourist product recommended for further development¹⁹. Whereas inshore sailing is the strong regional feature (thanks to relatively big lakes that are connected each to others), angling is popular all over the country, being one of the most common aquatic activities in Poland.

As far as preferences of tourist visiting area of Great Masurian Lakes are concerned, there are no data that focus on active recreation. P. Duczmał²⁰ in her research on preferences of leisure tourists within the area identified 3 main features important for tourist, that could be treated as ecosystem services. These

¹⁴ C. Tisdell, *Valuation of Tourism's Natural Resources*, "Working Papers on Economics, Ecology and the Environment" 2003, No 81, <http://ageconsearch.umn.edu/bitstream/48962/2/WP81.pdf> [Date of entry: 30-09-2012].

¹⁵ *The Millennium Ecosystem Assessment*, op. cit., p. 120.

¹⁶ J. Kondracki, *Geografia fizyczna Polski*, PWN, Warszawa 1988, p. 332.

¹⁷ PART SA, Raport otwarcia marki Warmia i Mazury, http://mazury.travel/media/art/159/file/Raport_Otwarcia_Marki_Warmii_i_Mazur.pdf p.47 [Date of entry: 30-09-2012]

¹⁸ M. Kozak, *Turystyka jako czynnik rozwoju regionów Polski Wschodniej*, http://www.mrr.gov.pl/rozwoj_regionalny/Polityka_regionalna/Strategia_rozwoju_polski_wschodniej_do_2020/Dokumenty/Documents/TURYSTYKA_PL_WSCH_18_10_2011.pdf, p. 56 [Date of entry: 27-09-2012].

¹⁹ W. Banasik, M. Bucholz, *Strategia rozwoju turystyki województwa warmińsko-mazurskiego*, <http://wrota.warmia.mazury.pl/images/stories/file/Turystyka/strategia%20rozwoju%20turystyki.pdf> p. 54 [Date of entry: 30-09-2012].

²⁰ P. Duczmał, *Ogólnodostępna baza noclegowa w Mazurskim Parku Krajobrazowym*, master thesis realized in the Department of Tourism Geography and Recreation, WGiSR UW, 2009, p. 106

are silence and peace, beautiful views and waterways availability. According to the classification proposed above, silence and peace respond to spiritual services, beautiful views represent aesthetical services and waterways availability is of material character. It is assumed, that same needs characterize most of activities realized within the area. However, details differ depending on activity. The attempt has been made to describe different groups of ecosystem services and their mutual relations. The presented analysis is of preliminary character. It focuses on methodology, that could be applied in future research.

Material Services

As mentioned above material services depend as well on quality of environment as on goods and means that are necessary for specified type of activity (e.g. equipment, dress etc.). For both activities taken into consideration availability of open water areas and properties of shoreline are recognized as primal services. It is possible to economically evaluate at least some of them. Basing on interviews with experts and taking into account own experience crucial conditions for both forms of recreation were specified (see Table 2).

Table 2
Conditions for sailing and angling

	Lake (open water)	Shoreline
Sailing	<ul style="list-style-type: none"> • Area • Shoreline • Connections with other lakes 	<ul style="list-style-type: none"> • Lack of reeds • Yachtports • Type of land use
Angling ¹	<ul style="list-style-type: none"> • Fish population • Shoreline • Volume of lake • No. of stocking species 	<ul style="list-style-type: none"> • Low shore • Lack of reeds – accessibility of water • No. of recreational platforms and its area

Source: A. Skrzypczak, A. Mamcarz, *Zastosowanie wskaźników przydatności rekreacyjnej jezior w ocenie ich stanu ekologicznego*, www.icoz.uni.lodz.pl/prezentacje/sesja/sesja_V_A.Skrzypczak.pdf [Date of entry: 12.06.2012].

The conditions mentioned above can be divided in natural and anthropogenic (cultural). The second ones are important for angling in particular, because fish population is related to number of stocking species. Stocking has a very strong impact on fish population. However, it is very difficult to estimate fish population living/occurring in the lake²¹. Despite mentioned difficulties, majority of listed conditions could be easily presented in strict metrics and indexes, which are listed below (Table 3 and 4).

²¹ J.C. Schneider, C. James, 1998, *Lake fish population estimates by mark-and-recapture methods*. Chapter 8 in: J.C. Schneider, C. James (ed.) 2000. *Manual of fisheries survey methods II: with periodic updates*. Michigan Department of Natural Resources, Fisheries Special Report 25, Ann Arbor, www.michigandnr.com/publications/pdfs/IFR/manual/SMII%20Chapter08.pdf [Date of entry: 04.10.2012].

Table 3
Evaluation of lakes suitability for angling

Natural conditions	Infrastructure and human activity
Shape of shoreline [shoreline development ratio]	Number of recreational platforms
Reeds occurrence [width of reeds' belt along the shore in meters]	Area of recreational platforms
Area of forests and wetlands in direct catchment [till 100 m from shoreline]	Number of stocking species
Accessibility of water surface [linear, in meters]	Quantity of annual stocking

Source: A. Skrzypczak, A. Mamcarz, *Zastosowanie wskaźników przydatności rekreacyjnej jezior w ocenie ich stanu ekologicznego*, www.icoz.uni.lodz.pl/prezentacje/sesja/sesja_V_A.Skrzypczak.pdf [Date of entry: 12.06.2012].

Table 4
Evaluation of lakes suitability for sailing

Natural conditions	Infrastructure and human activity
Total length of shoreline	Number of marinas
Length of shoreline of different land use: favorable (forested), accessible (unbuilt, reed free)	Number of yachts
Lake's area (open water without reed and other obstacles)	
Connectivity to others lakes: free or with obstacles	
Weather conditions: length of summer period	

The metrics and indexes presented above can be divided in two groups: that of natural conditions and that of infrastructures development, which can be understood as cultural conditions. The same division can be applied in evaluation of lakes suitability for sailing. As it is stated above, there are some differences in needs of anglers and sailors. Metrics and indexes presented in Table 4. are proposed to evaluate lakes suitability for sailing.

The evaluation conducted for sailing²² shows significant differences between lakes as well as the large gap between the valuation of the basin as a whole and its coastline. As far as pricing conditions for sailing depend on lakes's surface, the valuation assumptions highlight the diversity of the shorelines characteristics. Conducted economic evaluation of Great Masurian Lakes for sailing has revealed, that many simplifications and assumptions are needed to be made in order to present environment in economic values. The obtained results are of informative value. Therefore, the problem of complex economic evaluation of ecosystem services is still actual and need to be developed.

²² M. Kowalczyk, S. Kulczyk, *Wycena potencjału rekreacyjnego w krajobrazie pojeziernym na przykładzie żeglarstwa*, "Problemy Ekologii Krajobrazu" 2012 Vol. 27, in print.

Aesthetical and spiritual services

Aesthetic preferences are very individual ones. However, some common patterns exist and their identification is scope of environmental psychologist and other research disciplines²³.

Thus it could be expected, that need of different material services would be connected with specific aesthetical preferences. Technical aspects of observation also seemed to be important; anglers usually stay close to the shore and their small boats are close to the water level, whereas sailors prefer open spaces and yachts decks are situated higher above water. Another parameter, that should be taken into consideration, is spatial and temporal dynamic of observation. Anglers stay longer in one point, whereas sailing means frequent change of viewpoints. Finally, there is a significant difference in a philosophy of both discussed activities. Angling is considered to be contemplative, and sailing active and dynamic.

As far as spiritual services are concerned, similar differences could be observed. Participant observation and conducted interviews with experts lead to statement, that inshore sailing is closer to cognitive tourism then to recreation; a yacht is often used as a mean of travel, whereas main goal of holidays is to visit tourist attractions ashore. Not only material aspects of visited places, but also legends, beliefs, history and other interesting "stories" draw attention of visitors²⁴. In comparison to sailors, anglers are much more focused on material benefits – fishes.

Sailing is social activity, with lively culture and many links to global (or at least European) history and tradition. Meeting peoples, singing and playing musical instruments, organizing races and parties – all these events form a cultural image of discussed activity. In case of anglers remaining a part of social group is also important (otherwise it would be impossible to talk about fishing successes) but the social aspect of the activity is of less importance.

One could ask, if spiritual services, that are so strongly human oriented should be included in ecosystem ones? The answer should be positive. The basis of sailing culture phenomenon on Masuria is the presence of aquatic ecosystems; as generally human activity is based on environmental conditions.

Material, aesthetical and spiritual services are strongly connected. The last two groups are especially difficult to evaluate. Presented remarks are only general and require refinement. Implementing of social sciences methodology and tools would be very useful.

²³ P.A. Bell, T.C. Greene, J.D. Fisher, A. Baum, *Environmental Psychology*, 5th Edition, Harcourt College Publishers, Fort Worth 2001.

²⁴ S. Kulczyk, *Znaczenie czynników kulturowych dla rozwoju ekoturystyki na przykładzie Wielkich Jezior Mazurskich*, in: *Turystyka kulturowa. Spojrzenie geograficzne*, ed. A. Kowalczyk, Uniwersytet Warszawski, Warszawa 2008.

Conclusions

The concept of ecosystem services could be very useful for tourism and recreations research. The crucial problems of its apply are the scale of conducted studies and the scope of the research. Tourism and recreation are types of human activity which take a place in landscape (that is understood as spatially related set of ecosystems) scale. Landscape's value is the main factor determining selection of area for active recreation. Therefore, in case of tourism and recreation use of term "landscape services' would be more adequate than "ecosystem services". It should be underlined, that however still rarely used, the integrative value of such an approach has been previously recognized. Termorshuizen and Opdam²⁵ have found "landscape services" concept suitable for interdisciplinary research and applicable in spatial planning practice. The importance of landscape approach has been mentioned also by A. Mizgajski²⁶.

The main problem that concerns the classification of ecosystem services for tourism and recreation is character of benefits obtained from environment. As well material, as nonmaterial benefits should be taken into account. Whereas material benefits mostly depend on environmental features, nonmaterial benefits are deeply connected to receiver's (human) characteristics, as cultural background and a system of values.

The strongest point of ecosystem services concept is that it is a way to evaluate and to present a value of environment. However, economical evaluation of environment is difficult process and its methods still need to be developed. This particularly concerned the evaluation of nonmaterial benefits.

Tourism and recreation are strongly human related, that makes difficult their placement within the concept of ecosystem services. Depending on classification they are treated as benefit, function or ecosystem service (see Table 1). Their complexity, that results in importance of as well material, and nonmaterial features is rarely recognized.

Due to diversity of tourism and recreation, the investigation on ecosystem services should always concern its specified form. As it is presented above, even relatively close types of activity, as sailing and angling, differ significantly. As far as nonmaterial aspects need to be taken into account, closer cooperation with social sciences would bring new solutions.

²⁵ J.W. Termorshuizen, P. Opdam, *Landscape Services as a bridge between landscape ecology and sustainable development*, "Landscape Ecology" 2009 Vol. 24, p. 1037-1052.

²⁶ A. Mizgajski, *Zarządzanie krajobrazem jako aspekt zarządzania środowiskiem*, „Problemy Ekologii Krajobrazu” 2008 Vol. 20, p. 147-152.