

MULTISENSORY VALORIZATION OF A LANDSCAPE AS A METHOD FOR IDENTIFYING AREAS REQUIRING VALUE. A CASE STUDY

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Abstract

Multisensory landscape valorization as used in this study was intended to identify areas that required value. Our unique approach to the methodology allowed a comprehensive analysis of the research area, i.e. Lake Rusalka in Poznań, a major city in central western Poland. Analysis was based on recording multisensory experiences and assigning bonitation points to stimuli, enabling a comprehensive assessment of the analyzed area. The thusly designated zones indicated sites which required technical improvements and adequate planning in order to improve their perception.

MULTISENSORYCZNA WALORYZACJA KRAJOBRAZU JAKO METODA WYODRĘBNIANIA STREF WYMAGAJĄCYCH DOWARTOŚCIOWANIA. STUDIUM PRZYPADKU

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Abstrakt

Multisensoryczna waloryzacja krajobrazu ma na celu wyodrębnienie stref wymagających dowartościowania. Autorska modyfikacja podejść metodycznych pozwoliła na kompleksową analizę terenu badawczego. Stanowiło go jezioro Rusalka w Poznaniu w środkowozachodniej Polsce. Waloryzację oparto na odbiorze wrażeń wszystkimi zmysłami. Przeprowadzenie procesu w sposób multisensoryczny wraz z bonitacją punktową przypisaną odpowiednim bodźcom umożliwiło całościową i kompleksową ocenę analizowanego terenu. Wyznaczone w ten sposób strefy wskazały miejsca, które potrzebują zabiegów technicznych i planistycznych do poprawienia ich odbioru.

Introduction

Ambiguity is a most adequate term for describing a landscape. It is the common denominator of all definitions that have been constructed over the centuries (ZUBE et al. 1982, *Europejska...* 2000, MYGA-PIĄTEK 2001, *Ocena i wycena...* 2007, JANZ 2010, MAZURSKI 2012). But nowadays we may observe that the aesthetics of a landscape is becoming increasingly important in modern society (PORTEOUS 2004) and accordingly we have observed a growing number of projects aimed at revitalizing various areas through technical improvements and planning (ANIČIĆ et al. 2007, HUZUI et al. 2011, JASZCZAK and DREKSLER 2011, KAČIČ and LIDÉN 2011).

It is worth emphasizing that a perception of a landscape is multisensory (PORTEOUS 1985, PORTEOUS and MASTIN 1985, CARLES et al. 1999, *Landscapes...* 2003, PIETRZAK 2008). According to KOWALCZYK (1992), this concept means that the perception of surroundings involves vision, hearing, smell and feeling. Landscapes influence us in many aspects, creating positive or negative feelings which affect the individual assessment (valorization) of the landscape (WOJCIECHOWSKI 1986, 1994).

Valorization is a subjective term which can, similar to the notion of landscape itself, also be considered quite ambiguous (DAKIN 2003, KISTOWSKI 2006, SUROVA and PINTO-CORREIA 2008, STEPHENSON 2010, BATISTA et al. 2012). First of all it consists in defining problems and opportunities in the analyzed landscape. A thorough and careful approach makes it possible to eliminate the existing threats and to develop opportunities for the area that would ensure sustainable development and spatial order that is so much in demand in modern times (RASZEJA 2005, VIZZARI 2011, MIRSANJARI and MIRSANJARI 2012, HELDAK and RASZKA 2013).

In this study we perform valorization of the most neglected areas in the vicinity of Lake Rusalka in Poznań, which should enable the recovery of the area.

Materials and Methods

The research involved the immediate surroundings of Lake Rusałka, located in the center of Poznań, a major city (580,000 people) in the central western part of Poland (Figure 1). The lake is an artificial body of water, previously a clay excavation site used for the production of bricks. It was created by damming of the Bogdanka River in 1943 to an average depth of about 1.9 m (maximum depth of 9.0 m), covering an area of 36.7 hectares and 3330 m of shoreline.

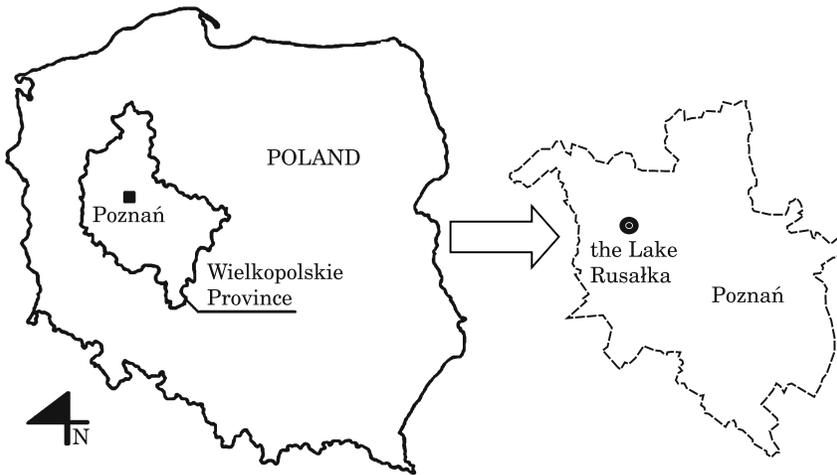


Fig. 1. Location of the study area

Lake Rusałka is a popular recreational site, often frequented by city residents, especially in the summer. Its popularity has increased since 2011, when bathing opportunities were limited at another lake in Poznań, i.e. Lake Strzeszyńskie (JONIAK et al. 2013). On the northern shore of Lake Rusałka is a patrolled swimming area which can accommodate 10,000 people (according to data from the Poznań City Hall). Such a large concentration of people in one place reduces the comfort of visitors, which is additionally exacerbated by the excessive wear or even a lack of adequate infrastructure around the lake.

In order to determine sites that require value, we performed field tests involving an inventory of the current state of development, and the designation of areas with different aesthetic values based on our unique modification of multisensory landscape assessment. This modification was based on the combination of two methodologies, i.e. by SKARŻYŃSKI (1992) and KOWALCZYK (1992).

The first method (SKARŻYŃSKI 1992) was based on the assessment of landscape aesthetics perceived only visually, taking into account the basic conditions of the assessment. Its author distinguished five sets of criteria for landscapes, with a maximum of 5 points and a minimum of -2 points, which can be assigned to the criteria. In this paper, Skarżyński's method (1992) was modified by introducing a more varied scoring. It was assumed that the assessment of aesthetics and order is definitely most important and affects the sense of sight more strongly than other factors. The score ranges were increased, to (-10, +10) in group III for the assessment of natural sites and man-made objects, and to (-5, +10) in group IV for the sense of harmony. A slight modification was introduced in the number of landscape elements in the 2nd group of criteria.

The approach of KOWALCZYK (1992) focused on using a variety of methods to examine selected landscape elements, including the analysis of scientific literature to identify types of multisensory landscapes and surveys. One of the most important parts of this landscape evaluation was selecting the appropriate type of multisensory landscape. The next step was to determine the suitability of the landscape for recreation. KOWALCZYK (1992) conducted this assessment using a method proposed by *Ocena krajobrazu...* 1991, based on the assessment of 12 features of a landscape and assigning them scores ranging from -2 to +3 points. In this paper a modified WYRZYKOWSKI method was used to evaluate the suitability of Lake Rusalka for recreation.

This modification was based on a more accurate determination of the individual features of the landscape by assigning respective scores that corresponded to their intensity. In addition, some features covered by WYRZYKOWSKI (*Ocena krajobrazu...* 1991) were omitted as they overlapped criteria specified by SKARŻYŃSKI (1992). The first two properties, solar exposure and light, were combined into a joint category of sunlight with different degrees of intensity (Table 1). They were divided into two subgroups, i.e. open areas and closed areas. Another criterion was the number of perceived natural colors in the landscape. The next category were odors, perceived as positive or negative, with 3 degrees of intensity. Other categories included aeration, perceived humidity and noise.

Table 1 shows the separate categories and sub-categories, and scores from -10 to +10. The increased scale of points in the modification of the method by SKARŻYŃSKI (1992), involved categories that were assumed to have the greatest impact on the senses, i.e. smell and noise, the strongest factors of comfort for a visitor at a particular place. In order to obtain the most comprehensive assessment of the analyzed area which would combine the visual aspect with other senses, we combined both aforementioned methods. Assigning point scales to individual categories was used to reduce the subjectivity of the valorization, which was difficult to eliminate completely.

Table 1

Criteria of multisensory landscape characterization and point bonitation

Group	Criteria and their distribution	Point bonitation
1	2	3
I	Number of planes in the landscape: – three planes (and more) – two distinct planes with sporadic clearances of the third plane – two planes – one plane	5 4 3 1
II	Number of elements constituting the landscape and the possibility of their identification – varied landscape (> 5 elements) – moderately varied landscape (3-5 elements) – poor landscape (< 3 elements)	5 3 1
III	Variety of elements constituting a landscape and the possibility of their identification – water facilities dominant in the landscape noticeable (presence without domination) no water facilities – woody vegetation presence of dense woods and single trees or tree clusters presence of only a dense forest, individual trees or clusters shrubby vegetation no vegetation Individual anthropogenic objects or natural objects or their sets affecting the aesthetic value of the landscape – positive – neutral – negative – extremely negative	3 2 1 3 2 1 0 10 5 0 –5
IV	Co-occurrence of landscape elements (harmony) – harmonious landscape – landscape with partially disturbed harmony – landscape with strongly disturbed harmony – landscape with a completely disturbed harmony	10 5 –5 –10
V	The vertical structure of the landscape – well-developed – moderately developed – poorly developed	3 2 1
VI	Solar exposure of: – open areas high moderate low – areas enclosed by natural elements of the landscape high moderate low	5 3 1 1 3 5
	Dominant natural colors in the landscape > 2 natural colors	3

cont. Table 1

1	2	3
VII	2 natural colors 1 natural color 0 natural colors	2 1 0
VIII	Odors – a high intensity of positive smells – high intensity of negative odors – moderate intensity of positive smells – moderate intensity of negative odors – low intensity of positive smells – low intensity of negative odors	10 –10 5 –5 1 –1
IX	Aeration – high – moderate – low	3 2 1
X	Perceived humidity – high – moderate – low	3 2 1
XI	Perceived noise – severe – moderate – low	0 5 10

This combined method created a substantial basis for the implementation of this field research. The study area was determined by applying 50 x 50 m squares (black line, Figure 2) onto the map of the area analyzed at a scale of 1:5 000. Then we distinguished squares with a 100 m side (yellow line, Figure 2), which reflected the route frequently traveled by visitors. The applied two-step breakdown enabled the best possible and most accurate selection of representative areas. The analyzed area included thirty-seven 100 x 100 m squares.

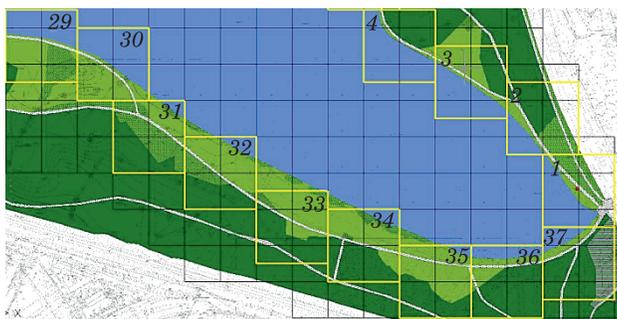


Fig. 2. A two-stage division of land into a grid of squares with their numbers

The study commenced in square number 1 (Figure 2) and continued in a north-western direction around the lake. The research was carried out between June and September 2012. The multisensory valorization of the landscape took place in the center of the designated 100 00 m squares and included a 180° field of view. It should be noted that the assumed barrier introduced a limit for the senses other than sight. Odors, light, noise, aeration and humidity were assessed at the central point of the determined area.

It was noted that sensations associated with sight could not be strictly divided into predetermined distances. It can be argued that the assumed distances in the applied division of space are misleading as the evaluation of a landscape usually involves the entire view up to the horizon perceived as a whole. Determination of artificial barriers limits the scope of assessment and ignores this overall view.

Results and Discussion

Lake Rusałka is a popular recreation site not only in summer but also in spring and autumn. The forest area adjacent to the lake has a popular bike trail. Designated walking paths, partly paved with rubble and asphalt, are used by cyclists, walkers and horse riders. The area is also attractive to anglers, although night angling and spinning are prohibited. In the middle of the northern shore are the facilities of the local center of sport and recreation (POSiR), which takes care of a patrolled swimming area equipped with a pier, slide into the water, changing rooms and dining facilities.

Our inventory shows that both the buildings and general infrastructure are in poor condition. There is also a high number non-official shortcuts across green areas, which indicates an improper arrangement of paths for pedestrians and cyclists. The number of bins is sufficient, although their size, color and distribution should be changed. All these defects lower the value of the area, and the current status results in a growing discontent among visitors.

The picturesque landscape of Lake Rusałka can be truly appreciated and not affected by negative sensations after leaving the area belonging to POSiR. The landscape includes a smooth transition of lawns going down to the water. A large number of trees that surround the area provide a chance to rest in the shade during periods of intense sunlight. In autumn the scenery of the lake becomes even more attractive. The nearby forests are dominated by deciduous species, distinguished by leaves assuming various colors in autumn with various shades of yellow, red and brown. Around the lake one can see a large number of visitors who choose this side of the lake not occupied by buildings and is not significantly transformed by man.

Perhaps contact with nature and the real chance to relax in a smaller group of fellow visitors is the most important aspect of the area for people (MOON et al. 2006). The area is a good place for active recreation and family walks, and enables close contact with nature which is especially valuable for residents of large cities.

At the initial stage of the evaluation, the type of landscape was defined as a surface water landscape with a deep horizon, partly or completely covered. It can be characterized as a picturesque landscape, where on a clear day the sunlight glistens on the water.

The surrounding vegetation provides shelter from excessive sunlight. In this area, the predominant colors are blue and green, which can be invigorating and calming for city dwellers. During a sunny day, the temperature conditions are favorable, while at night and in the morning the area has a lower temperature and considerable humidity. These are conditions conducive to noise propagation, which may become irritating after a longer visit.

After analyzing all the elements included in the aforementioned multisensory method of landscape valorization for each study area, the obtained point results were divided into 3 intervals with distinct differences in scores. This indicates a considerable variety in the study areas and also a wide range of bonitation points adopted in the method.

Designation of individual zones around the lake was performed only after a comprehensive valorization of the entire area. Those plots which obtained the lowest scores (16–30) are marked with a red line (Figure 3). Low scores

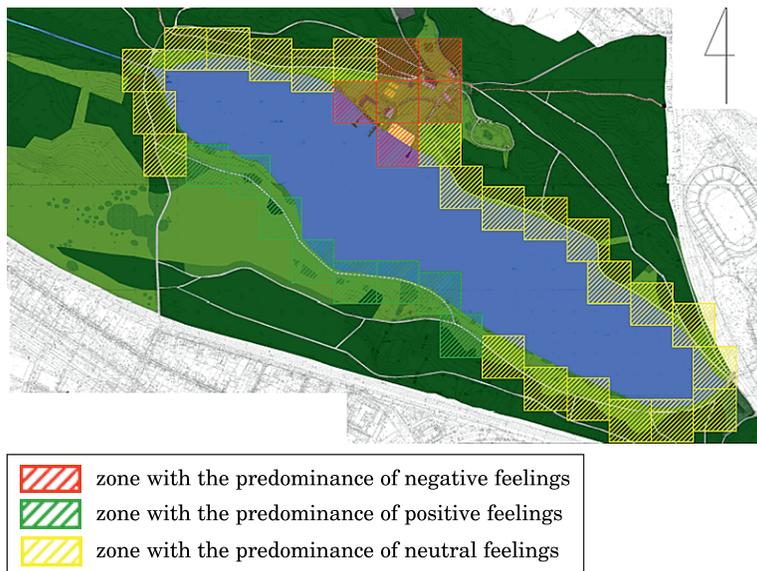


Fig. 3. Multisensory landscape valorization – zoning

indicate a need for immediate revitalization, and were due mainly to negative feelings resulting from the low aesthetic value and the sense of disharmony (Figure 4a). Another significant element was the high intensity of unpleasant odors from the nearby fish restaurants. A yellow line corresponds to areas which received moderate scores (ranging from 37 to 52). These areas were marked by a lack of significant negative or positive elements affecting the landscape (Figure 4b). Landscape in these areas can be considered neutral for observers. The areas with the highest point scores (ranging from 57 to 59) are indicated by the green line. The high score was related to sites that induced positive feelings. Aesthetics and harmony in these areas were not perceived as distorted and had a positive impact on the recipient (Figure 4c).

a**b****c**

Fig. 4. Landscape of Lake Rusalka: *a* – the worst zone, *b* – medium zone and *c* – the best zone
Phot. K. Tomasz

The use of this simple technique was meant to establish individual zones that require revitalization. Table 2 shows the total results for each of the squares.

Table 2
The aggregate value of multisensory landscape valorization together with the designation of zones

Numbers of the squares	Number of points	Zone	Numbers of the squares	Number of points	Zone	Numbers of the squares	Number of points	Zone
1	42	neutral feelings	16	41	neutral feelings	32	48	neutral feelings
2	47		17	42		33	46	
3	52		18	40		34	47	
4	52		19	37		35	46	
5	52		20	43		36	46	
6	52		21	49		37	40	
7	50		22	49		32	48	
8	47		23	46				
9	44							
10	18	negative feelings	24	57	positive feelings			
11	16		25	58				
12	30		26	59				
13	26		27	59				
14	26		28	57				
15	26		29	57				
			30	58				
			31	58				

After selecting the zones (Figure 3) it turned out that the land belonging to POSiR was the area in the greatest need of revitalization. The best zone was located at the opposite bank of the lake. Its green meadows have a great potential, while rather unpleasantly looking infrastructure on the northern shore created, paradoxically, a pleasant panorama when seen from a distance, and had a positive impact on aesthetic feelings. The sense of harmony in the area was not perceived as disrupted.

The best and the worst zones were buffered by an intermediate zone, an area in need of only low-scale remedial treatment.

The land belonging to POSiR can be perceived as the most neglected and accordingly received a low score. On the other hand, after corrective management it can become the best area combining human activity and natural beauty. It can create an ideal place for recreation for the whole family. Lake Rusalka is a universal site where one can spend free time at any time of the year. This feature should be emphasized by proper management.

Adequate planning and technical development should enable correct development of the zone, attract tourists and allow extension of the duration of the season and increase the tourism potential of the Lake (KURLETO 2013,

REMENYIK et al. 2013, RODRIGUES et al. 2013). Appropriate solutions should highlight the potential of the area and could become its great assets, as evidenced by examples of successful landscape revitalization projects all over the world (BRUTTOMESSO 2001, MAJDECKA-STRZEŻEK 2009).

The method of evaluation in this study is an attempt at the most accurate determination of factors that influence the perception of a landscape by observers. It defines and identifies the most important stimuli that affect perception of the surrounding landscape, making it possible to reconcile different concepts of landscape perception (KOWALCZYK 1992, KAPLAN et al. 2006, BERNAT 2012). Adding other senses to visual perception makes the method more comprehensive than traditional methods, and enables the processing of the observer's feelings into a clear scale of points (PORTEOUS 1985, PORTEOUS and MASTIN 1985, SCHAFER 1994).

Conclusions

The developed method of multisensory landscape valorization enables the conversion of the observer's feelings into a clear point scale. Because sensory (and elusive) impressions are presented with the use of numbers, the results inform about the needs of designated areas in a clear and understandable manner. This allows a maximally objective distinction of zones and identification of their needs in terms of revitalization. The used multisensory method of landscape valorization has successfully designated the locations most urgently requiring value.

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