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# The SBE and VRM methods as landscape esthetic estimation methods on example of Elbląg Canal

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**Abstract:** *The SBE and VRM methods as landscape esthetic estimation methods on example of Elbląg Canal*. The present publication is a continuation of considerations on the topic of landscape valorization, and, in particular, the evaluation of its visual attractiveness. To estimate landscape we appeal to architectural or natural forms or to monumental values that are characteristic for that landscape. All that elements have influence on his esthetic aspect. The physionomic appearance of landscape beauty has the biggest impact on observers. During perception of landscape we register different kind of views. The sum of those views composes on observer's impression. Except for the opinion of natural, cultural and social factors that shapes the scenery the instruments and investigation methods on determination of visual landscape value allows to present basic local value for development of touristic movement were also checked in course research. Underneath we present these that in our opinion turned out useful to estimate investigated values. It will help us to point out such ways of areas development that won't reduce but will develop the existing potential of recreation.

Besides landscape estimation methods used in Poland we can find many foreign, often American one, which are commonly accepted in Western Europe. The valuation of the landscape, his esthetic value – visual quality ware made with analysis, which was executed in open landscape along the Elbląg Canal in the Ostróda – Elbląg section. To prepare analysis following methods were used: SBE (Scenic Beauty Estimation) and VRMP (Visual Resource Management Program). SBE method estimate beauty of landscape sceneries through to valuation of observer's impression. In that method wives were valuated by observers according to 10-point scale. VRMP method consists in making analyze of visual quality of landscape. That analysis leads in several stages in which the different features of landscape are estimated. For example: shape of land, flora, hydrological system also influence of adjacent areas and cultural transformation. The conducted analyses produced the possibility of selecting the fragments of the Elbląg Canal which are least aesthetically attractive, but which possess high and even unique values, both in the regional and local scale. This gives the possibility of further considerations on the topic of enriching and developing the least valuable areas and the possibility of managing these areas in the holistic approach. During the research, special emphasis was put on the usefulness of the used methods for landscape evaluation in linear configuration.

*Key words*: landscape perception, esthetic estimation, landscape units.

## INTRODUCTION

The current range of knowledge concerning the methods of landscape valorization is rather wide and describes this issue rather comprehensively. Such issues were examined in Poland by, among all, Wojciechowski (1986), who created a juxtaposition and description of the existing methods of landscape valorization based on perception research. Formal researches in this area have also been conducted by

Bogdanowski and Wejchert. The method of evaluation of units and architectonic and landscape interiors JARK-WAK by Bogdanowski (1999) is most often useful with physiognomic and cultural evaluation of a landscape with the aim of directing the protective activities spatially. Wejchert (1976) describes the mechanism of co-dependence among various urban forms, the observer and time. An illustration of this issue presents the "curve of impression" defining the level of impression in the moment of observation of a particular sight, analyzing its complexity.

Apart from the commonly used Polish methods of landscape evaluation, one may find many foreign methods, most often American ones. The SBA method (Scientific Beauty Estimation – the evaluation of the beauty of a scenery, 1976) is particularly useful in the case of landscape evaluation in the scale of the region. Similarly, in the case of landscape physiognomy based on a division of an area into units subject to varying evaluation of environmental boarders in the PUCE system (Pattern – Unit – Component – Evaluation). The VRM (Visual Resource Management Program, 1980) will be particularly useful in the evaluation of the level of contrast between the conducted investment and the existing landscape, and in the evaluation of its visual resources. In particular, the second form may be used for the research conducted.

## MATERIALS AND METHODS

In order to do the valorization of the Elbląg Canal landscape, it was necessary to previously recognize the area and performing photograph documentation. In this purpose the method of direct observation was used. It is based on identification of natural features and cultural elements of landscape by observer. This research has been conducted during a ship cruise on the Elbląg Canal on the route Ostróda–Elbląg in latest 2006–2007. The scenery was described in graphic form, that characterize: the sculpture of area, the area's covering with qualification of real vegetation, the aged structure of covering and the cultural elements as well as the dominants. During the cruises which took nearly 12 hours each, landscape interiors have been marked with the use of the unit method and the architectonic – landscape interiors of J. Bogdanowski (JARK-WAK). The results have been presented in graphic form on topographical map in the scale 1:25 000, that covers the entire route of the canal. These studies were necessary to realize further analyses and valorization of the Elbląg Canal landscape.

The aesthetic evaluation of the landscape has been performed on the basis of the SBE method (Science Beauty Estimation) and VRMP (Visual Resource Management Program). In the case of both methods, the research field covered 6 formerly appointed interiors along the Elbląg Canal. The representative interiors have been chosen in such a manner, that they present the diversity and the character of the Canal landscape in an objective way.

In the SBE method, the beauty of the landscape scenery is evaluated by means of valuing the intensiveness of the observer's impression. The evaluation of the interiors with the use of slides has been conducted during the chamber

research. It is estimated in average, that for one selected area – units, from 10 to 25 photographs should be taken. The slides have been presented at the same time to all observers. The observers were people from varying environments (architects, landscape architects) and possessing varying levels of education (students, people with higher education). During the slide presentation, the observers evaluated the photographs in a 10 – point scale, in which 1 – the sight which they did not liked at all, and 10 – is a sight which they liked very much, entering the values to the evaluation sheets inside. Next, arithmetical average was drawn out of the results for every interior of all observers, plus an average for the entire landscape was also drawn. The result was standardized by means of a pattern for standard deviation.

The VRMP method allows for an evaluation of the visual quality of a landscape. The VRM system is an analytical process that identifies, sets, and meets objectives for maintaining scenic values and visual quality. The VRM system function in two ways: 1. For management purposes, the Bureau conducts an inventory that evaluates visual resources on all land under its jurisdiction (Inventory/Evaluation), 2. When development is proposed, by the Bureau itself (through its planning process) the degree of contrast between the proposed activity and the existing landscape is measured (Contrast rating). This method consists of several types of evaluation.

The first stage involves an evaluation of the scenic quality, that is of a holistic impression which is evoked by the landscape in the observer when they pass by, or pass through the given landscape. In the selected 6 landscapes, seven Key Factors have been evaluated: landform, vegetation, water, color, influence of adjacent scenery, scarcity and cultural modifications. The evaluation involved a 3-grade scale: high quality – 5 points, medium quality 3 points, low quality 1 or 0 points. Next, the points from all aspects in particular units have been summed up and the units have been qualified for one of the 3 classes of scenery quality: Class A – areas that combine the most outstanding characteristic of each rating factor (19–33 points), Class B – areas in which there are combination of some outstanding features and some that are fairly common to the physiographic region (18–12 points) and Class C – areas in which the feature are fairly common to the physiographic region (0–11points).

The second stage involved the evaluation of the sensitivity level, taking into consideration the frequency of travel through the evaluated area and the way of using the area. A 3 – grade scale has been used for the evaluation of the units: high level (H), medium (M), and low (L). In a situation, when there is an investment planned on the given area, the evaluation is supported by an environmental investigation, in which the occupants of given area are asked about the activities, which, in their opinion, should be undertaken in order to modify the landscape and its visual quality.

The next stage concerned the evaluation of the distance zones. The visual quality of a landscape and the impressions of the observers may differ due to the observation of the landscape from viewpoints and view routes. The landscape sceneries of each of the 6 units have been assigned to one of the three

groups, the so-called distance zones: 1) foreground/middleground (FG/MG), 2) background (BG), 3) seldom-seen (SS).

Classes of managements are defined on base of result of estimate from former stages. They take into consideration different modification of landscape and diversity of his basic elements. Attachment to one of 5 class is reads from model table made by authors of method.

- Class 1 – natural ecological changes and very limited management activity are allowed. An contrast created within the characteristic landscape must not attract attention. This classification is applied to wilderness areas, wild and scenic rivers, and other similar situations.
- Class 2 – changes in any of the basic elements (form, line, color, texture) caused by management activity should not be evident in the characteristic landscape. Contrasts are seen, but must not attract attention.
- Class 3 – contrasts to the basic elements caused by a management activity are evident, but should remain existing landscape.
- Class 4 – any contrast attracts attention and is a dominant feature of the landscape in terms of scale, but it should repeat the form, line, color, and texture of the characteristic landscape.
- Class 5 – the classification is applied to areas where natural character of the landscape has been disturbed to a point were rehabilitation is needed to bring it up to one of the four other classifications. The classification also applies to areas where there is potential to increase the landscape's visual quality. It would, for a example, be applied to areas were unacceptable.

The next stage involved the definition of the contrast rating. It is used for measuring the level of contrast between the proposed activity, for instance the planned investment, and the existing landscape. The result is compared with the accepted contrast levels for the proper Management Class. This comparison is performed for the purpose of stating, whether it is necessary to soften the visual influence of the planned investment on the landscape.

## RESULTS

As a result of the evaluation of landscape scenery beauty with the use of the SBE method, the Visual attractiveness for every interior has been performed by 37 different observers. The points from particular interiors have been summed up and, for each interior, an average has been drawn. The highest values have been achieved for interior no 5 – 7.91 points. The lowest result has been achieved for interior no 1 – 5.28 points in a 10 – grade scale.

Then, the results for all interiors have been averaged and an average for the entire canal was drawn, which ultimately equaled 6.73 points.

In the first stage of the VRM method, the quality of the scenic has been evaluated by means of valuing the seven basic elements of the landscape (Tab. 1). The results for particular elements of the sight have been summed up, which allowed for assigning each sight to one of the 3 classes of scenery quality. Class A contains these areas, which share the most outstanding features of the evaluated elements, these are units no 2 and 6. Class B contains these areas, which share outstanding

features, together with those typical of the physiognomy of the region, these are units with the numbers 3, 4 and 5, and class C are those areas, which possess elements typical for the physiognomy of the region. This class contains unit no 1.

The sensitivity level has been evaluated on the basis of analyses concerning the accessibility of representative units for tourists and the existing tourist infrastructure. For the purpose of the research, several source materials have been used, plus a reckoning during the local vision in the area. Due to the variety of landscape forms in the Elbląg Canal, the differences in the shape of the area, the differences in the arrangement of the area, the accessibility of these areas has been studied, the accessibility of these areas for tourists and the tourist basis have a different potential. In a 3 – grade scale for a group with the highest level of impression (H), the unit no 2 and 4 has been qualified, for the medium group (M), units no. 1 and 6 have been assigned, and for the lowest group (L), the units with the numbers 3 and 5 (Tab. 2).

The distance zones have been designed on the basis of analyses of particular sights from 6 representative units, drawing perceptible plans (Photo 1). Similarly, as in the case of defining the level of impression, the diversification of landscape forms of the Elbląg Canal had significant impact on the type of distance zone. In particular, this concerns the shape of the area and the plant cover. Undoubtedly, the weather conditions had also great influence on the perception of the landscape. As a result of the analyses, units no 1 and 5 have been qualified to the "distance zone", where the foreground and the middleground are visible (FG/ /MG), the units no. 4 and 6 have been assigned to the "distance zone", where the background is visible additionally (BG), and units no 2 and 3 have been assigned to the "proximity one", where the last ground is seldom-seen (SS) (Tab. 3).

Management Classes describe the different degrees of modification allowed to the basic elements of the landscape. Class designation are derived from an overlay technique that combines the results of

TABLE 1. The valorization of quality of the scenic for units 1–6

| Landscape unit no | Landform | Vegetation | Water | Color | Adjacent Scenery | Scarcity | Cultural Modyfications | SUME |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 3 | 0 | 3 | 0 | 1 | 0 | 8 |
| 2 | 3 | 5 | 3 | 5 | 5 | 6 | 2 | 29 |
| 3 | 1 | 5 | 5 | 3 | 3 | 1 | 0 | 18 |
| 4 | 1 | 5 | 3 | 3 | 3 | 2 | –4 | 16 |
| 5 | 5 | 3 | 3 | 1 | 0 | 1 | 0 | 13 |
| 6 | 3 | 5 | 3 | 3 | 3 | 2 | 2 | 21 |

TABLE 2. The evaluation of the sensitivity level for units 1–6

| Landscape unit no | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Sensitivity Levels | M | H | L | H | L | M |


PHOTO 1. Drawing perceptible plans for unit no 4

TABLE 3. Distance zones for units 1–6

| Landscape unit no | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Distance Zones | FG/MG | SS | SS | BG | FG/MG | BG |

TABLE 4. The membership of six units of management classes

| Sensitivity Levels | H | H | H | M | M | M | L |
|---|---|---|---|---|---|---|---|
| Scenic Quality Class A | 2 | 2 | **2 unit no 2** | 2 | **2 unit no 6** | 2 | 2 |
| Class B | 2 | **3 unit no 4** | 3 | 3 | 4 | 4 | **4 unit no 3, 5** |
| Class C | 2 | 4 | 4 | **4 unit no 1** | 4 | 4 | 4 |
| Scenic Quality | FG/MG | BG | SS | FG/MG | BG | SS | SS |

scenic quality, sensitivity levels and distance zones (Tab. 4). The overlays area used to indentify areas with similar combinations of factors. These areas are assigned to one of five Management Classes according to predetermined criteria.

The contrast rating was not defined because there is not planned in the area investigative new investment.

Suitability of a SBE method from a point of view of needs of the examined area.

Positive aspects:

- Clear estimation criteria
- Not much complicated and easy to apply

Negative aspects:

- Weather conditions and season can affect the estimation of the same units of landscape seen on the photo

- Applied method for estimation of terrain with linear arrangement, like for example, the Elbląg Canal where the observation is made only from the canal's axis, limits the possibility of observation of the landscape and preparation of the extensive photographic documentation
- A group of people is necessary for estimation

Suitability of a VRM method from a point of view of needs of the examined area

Positive aspects:

- Clear estimation criteria
- It can be applied directly in the field and in study works (with use of photographic documentation and plans)
- Suits for estimation of superficial and linear terrains
- Only one person is necessary for the estimation

Negative aspects:

- Multistage and more complicated
- Use of different scales at different stages of the method
- Weather conditions and season can affect the estimation of the same piece of landscape seen on the photos

## CONCLUSION AND DISCUSION

Based on researches made at use of SBE and VRM methods we can affirm, which fragments of Elbląg Canal landscape are not enough esthetic and which are unique in local and region scale. Described Elbląg Canal landscape, then, when he was shaped was used for agricultural and transport needs. The esthetic values were minor features. The touristic sector is today important source of the occupants of given area and the beauty of landscape is for that industry the most important value. Results of such researches can became a base of further works in direction of enrichment and development of the least valuable areas. The effectiveness of both methods of valorization of Elbląg Canal landscape confirms possibility of using these methods on different areas about the linear structure for example: of river valleys, railway routs, car and bicycle routs. It is important to lead the individual stages of valorization happened in the same weather conditions. It in course of researches was checked the investigative methods permitting on the qualification the visual landscape values, which for development of touristic movement are the basic value. These researches show such directions of development of studied area which will not reduce but will develop the existing recreation potential.

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**Streszczenie:** *Metody SBE i VRM, jako metody oceny estetycznej krajobrazu na przykładzie Kanału Elbląskiego*. Niniejsza publikacja jest kontynuacją rozważań na temat waloryzacji krajobrazu, a w szczególności oceny jego atrakcyjności wizualnej. Krajobraz oceniamy, odwołując się

do urody jego form architektonicznych lub przyrodniczych lub do cechujących ten krajobraz wartości zabytkowych. Wszystkie te wartości będą decydowały o jego estetyce. Jednak to, co najsilniej na nas oddziaływuje, to ogólny wyraz fizjonomiczny krajobrazu, piękno zawarte w pejzażu. Oprócz oceny kształtujących krajobraz czynników przyrodniczych i kulturowych, w toku badań były sprawdzane metody badawcze pozwalające na określenie wizualnych wartości krajobrazowych, które dla rozwoju ruchu turystycznego stanowią podstawową wartość terenową. Poniżej zaprezentowano te, które okazały się przydatne do oceny badanych wartości i pozwolą nam wskazać takie kierunki rozwoju badanych terenów, które nie uszczuplą, ale rozwiną istniejący w nich potencjał rekreacyjny. Obok stosowanych w Polsce metod oceny krajobrazu, znaleźć można wiele metod zagranicznych, często amerykańskich, powszechnie przyjętych w krajach Europy Zachodniej. Oceny krajobrazu, jego walorów estetycznych, dokonano w wyniku analiz, które wykonano w krajobrazie otwartym wzdłuż Kanału Elbląskiego na odcinku Ostróda–Elbląg. Do sporządzenia analiz posłużono się metodą SBE (Scenic Beauty Estimation, 1976) i VRMP (Visual Resource Management Program, 1980). W metodzie SBE oceniane jest piękno scenerii krajobrazu poprzez wartościowanie intensywności wrażeń obserwatora. Ocenie podlega zestaw widoków oceniany przez obserwatorów, którzy stosują 10-punktową skalę ocen. Metoda VRMP daje możliwość wykonania analizy, jakości wizualnej krajobrazu. Analiza ta prowadzona jest w kilku etapach, w których ocenie poddawene są różne cechy krajobrazu. Między innymi do oceny brana jest rzeźba terenu, roślinność, wody, a także wpływ krajobrazu przyległego i kulturowych przekształceń. Przeprowadzone analizy dały możliwość wyłonienia fragmentów krajobrazu Kanału Elbląskiego mało atrakcyjnych estetycznie oraz o dużych, a nawet unikatowych, walorach w skali regionu i w skali lokalnej. Daje to podstawy to dalszych rozważań na temat wzbogacania i rozwoju terenów najmniej wartościowych i możliwości zarządzania tymi terenami w ujęciu całościowym. W badaniach szczególną uwagę zwrócono również na przydatność zastosowanych metod do oceny krajobrazów o układzie liniowym.

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