

# LANDSCAPE ASSESSMENT FOR LANDSCAPE PLANNING IN GERMANY<sup>1</sup>

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## 1 INTRODUCTION: ‚LANDSCHAFTSBILD‘ AND LANDSCAPE ASSESSMENT

German landscape planners have, despite Germany’s long and distinguished tradition of distinctive landscape thinking, developed no direct equivalent of the Landscape Character Assessment (LCA) approach. Instead there exist, on the one hand, a strong focus on natural environment and diversity and special areas, and on the other a number of approaches frequently labelled ‘Landschaftsbild’. The term and concept of *Landschaftsbild* refers to visual aspects of a *Landschaft*. Practical landscape assessments are produced that inform and guide planning, design and management. This chapter explores and analyses such ‘Landschaftsbild’ approaches. The one overarching rule that all, administrators and practitioners, have to follow in the contexts of statutory landscape planning is that of the Federal Nature Conservation Act.<sup>2</sup> According to this legislation three main aims and objectives must be referred to: ① diversity conservation, ② material and physical functioning and ③ the experience and perception of nature and landscape. For the latter the conservation act provides guidance by specifying

that beauty (*Schönheit*), diversity (*Vielfalt*) and the specific quality and character (*Eigenart*) of nature and landscape must be considered.

During the 1960s and 1970s landscape ecology became the foundation upon which modern landscape planning was built.<sup>3</sup> Complex analytical tools were put into place that seamlessly fit the rational planning model of the day. Since natural sciences had provided the algorithms that satisfied people’s desire for non-ideological approaches to landscape analysis, algorithms were soon developed to not only measure the “ecological” but also the visual landscape. A milestone is the so called “Diversity Index”.<sup>4</sup> With the “Diversity Index” at hand, the *Landschaftsbild* could now be measured and resulting numbers entered into landscape assessment matrices that resembled those of cost-benefit analysis. The *Landschaftsbild* had effectively been removed from people’s experience of their every-day surroundings; it had become the subject matter of bureaucrats and calculating experts. At the beginning in the early 1990s, not all but some experts started to include members of the public into landscape assessment and to develop argumentative (qualitative) methods.

## 2 CHALLENGE: A GREAT NUMBER OF ASSESSMENT APPROACHES AND METHODS TO CHOOSE FROM

According to a recent survey more than 200 different approaches and methods to visual landscape assessment are documented in Germany and many more exist.<sup>5</sup> Every one of the 16 *Länder* has issued specific legislation concerning landscape, and every city and county administration (a total of 295 municipalities) interprets this legislation in their specific way. In addition one needs to consider the many different opinions of practitioners. Landscape consultants may be grouped by the concepts of landscape they subscribe to. These groups may be arranged along a gradient where the object-focus is at the one and where the subject-focus is at the other end.<sup>6</sup> While the former is concerned with material objects of physical space, the latter is concerned with the image and picture that people (‘subjects’) perceive. While the object-focus relates to positivistic concepts, the subject-focus relates to constructivist concepts. The object-focus pertains to expert methods, including those that make use of landscape metrics, thus attempting to generate, through surveys of the physical

world, information that is processed as sensory experience. On the other hand, in order to better understand the interaction between people's experiences and their ideas of landscape, the subject-focus relies, at least partly, on public involvement into landscape assessment. While the object-focus approaches derive landscape values from the law and from expert judgement, the subject-focus approaches try to learn what people give value to in their surroundings (by applying methods of environmental psychology, sociology, etc.). Most practical applications include elements of both, the subject and the object focus.

### 3 ASSESSMENT PRACTICE: LANDSCAPE ASSESSMENT FOR STATUTORY LANDSCAPE PLANNING

To start with an example: Eleven municipalities are organised, for purposes of municipal planning, in the so called 'Nachbarschafts-Verband (NV) Karlsruhe'. Karlsruhe is a city in Baden-Württemberg, a state (*Land*) in the south-west of Germany. Statutory landscape planning is part of the NV Karlsruhe's planning tasks. The landscape plan eventually becomes part of the strategic municipal

land-use plan. Both are official planning documents that provided guidance for future municipal development, including landscape management and the assessment of and compensation for landscape impacts. The method for visual landscape assessment includes the following steps:

- A. Definition and delineation of landscape 'units' according to physical properties:
  - Topography and land form;
  - Land use and land use pattern, visual (structural) landscape features (elements);
  - Natural and cultural elements/features that define and lend identity to a landscape;
  - Overall visual appearance of a landscape.
- B. Landscape survey and inventory of information pertaining to:
  - Diversity;
  - "Eigenart" (landscape quality, character);
  - Beauty;
  - Exposure to impact (visual, noise, etc.)
- C. Landscape assessment, performing rankings separately for
  - Diversity;
  - "Eigenart" (quality, character);
  - Beauty;
  - And by considering exposures to impact.

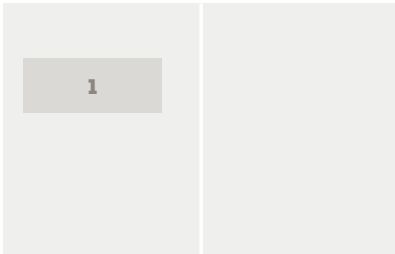
**1** This paper is an abridged version of a chapter in the book on 'landscape character and assessment', to be published 2016 in the Routledge 'Handbook' series (<http://www.routledge.com/books/handbooks/>).

**2** Act on Nature Conservation and Landscape Management (Federal Nature Conservation Act BNatSchG), most recent and amended version entered into force 01.03.2010.

**3** Naveh, Z., Liebermann, A.S. (1984) *Landscape Ecology: Theory and Application*. Springer, New York.

**4** Kiemstedt, H. (1967) *Zur Bewertung natürlicher Landschaftselemente für die Planung von Erholungsgebieten*. Jänecke, Hannover (In German).

**5** Roth, M. (2012) *Landschaftsbildbewertung in der Landschaftsplanung. Entwicklung und Anwendung einer Methode zur Validierung von Verfahren zur Bewertung des Landschaftsbildes durch internetgestützte Nutzerbefragungen*. Berlin: Rhombos-Verlag p.84



**Fig. 1:** Ranking of "Vielfalt" and "Eigenart" for assessing individual landscape units

Rank	„Vielfalt“ (diversity)	“Eigenart“ („character“)
Very high	<ul style="list-style-type: none"> <li>Highly diverse mosaic of land use and landscape structure.</li> <li>Vista points with far reaching views.</li> </ul>	<ul style="list-style-type: none"> <li>Typical topography in place (unchanged);</li> <li>Typical land use context and cultural history easily visible and understandable;</li> </ul>
High	<ul style="list-style-type: none"> <li>Diverse mosaic of land use and land use intensity.</li> <li>Diverse landscape structure.</li> <li>Vista points with several views into the distance.</li> </ul>	<ul style="list-style-type: none"> <li>Typical topography largely unchanged);</li> <li>Location and regionally specific land use and land use systems mainly unchanged;</li> <li>Large number of semi-natural landscape features/elements;</li> <li>Large number of features/elements of special natural/cultural interest</li> </ul>
Medium	<ul style="list-style-type: none"> <li>Large tracts of homogeneous land use; few structurally diverse landscape elements, medium diversity.</li> <li>Vista points with far reaching views, some exposed to recent impact.</li> </ul>	<ul style="list-style-type: none"> <li>Typical topography recognisable;</li> <li>Location and regionally specific land use and land use systems recognisable;</li> <li>Some semi-natural landscape features/elements in place;</li> <li>Some features/elements of special natural/cultural interest in place.</li> </ul>
Low	<ul style="list-style-type: none"> <li>Large tracts of homogeneous land use; no structural elements.</li> <li>Few vista points and views.</li> </ul>	<ul style="list-style-type: none"> <li>Mainly anthropogenic land forms;</li> <li>Few semi-natural landscape features/elements in place;</li> <li>Few features/elements of special natural/cultural interest in place;</li> </ul>
Very low	<ul style="list-style-type: none"> <li>Large tracts of urban development, including industrial areas and infrastructure.</li> <li>No vista points and views.</li> </ul>	<ul style="list-style-type: none"> <li>Anthropogenic land forms dominate;</li> <li>No semi-natural landscape features/elements in place;</li> <li>No features/elements of special natural/cultural interest in place.</li> </ul>

In step (A) landscape units are defined on the basis of GIS-analysis and verified and further detailed by field reconnaissance. Surveys and inventories are carried out by employing standardised survey sheets, also first starting with a desk study which is followed by field surveys. Collected data are documented using GIS procedures. Instead of using algorithms and landscape metrics (that practitioners rely on in many other cases), ranking scales are proposed and decided on, and each landscape unit is individually assessed based on expert judgement. The following general ranking scale serves to exemplify the assessment of "Vielfalt" (diversity) and "Eigenart" ("character"):

The Karlsruhe landscape assessment identified a total of 72 discrete landscape units. These were presented in the form of maps (figure 2) and documented in detail (data base, GIS). Both the process of assessment and the documentation of landscape information are publicly accessible and the format of presentation and documentation is transparent.

The landscape assessment for the NV Karlsruhe landscape plan is mainly expert led and subscribes to the object-focussed method. The planning experts did, however, link landscape assessment to a participatory process. Parallel to working on preparing landscape planning documents the planners organised a series of so called 'Landscape Conferences'. The purpose of these participatory meetings is to invite members of the public and to discuss methods, rankings and results, first of the landscape analysis and assessment, second of the landscape quality objectives, and then of the vision statement and the conceptual landscape plan and action plan.<sup>7</sup>

#### 4 LANDSCAPE ASSESSMENT USING WEBGIS TECHNOLOGIES

The landscape planning for the 'Ostwuerttemberg' region is presented as an example where members of the public are invited to take part in landscape

assessment procedures. The region is located in the eastern part of the state (*Land*) of Baden-Wuerttemberg. Landscape planning documents are prepared for purposes of regional planning. An approach is employed, in addition to expert led visual landscape assessment, that helps understand what non-experts perceive and what people experience and give value to in their region. The aim, in this particular case, is to perform a kind of co-operative landscape assessment. An online platform was created called "mitmachen-ostwuerttemberg.de". Web-GIS technologies are employed to reach out to as many people as possible. Members of the public are invited to identify and mark their most favourite places and areas on an interactive map; it is possible to choose one or more locations and to describe them in a narrative way, for example by writing short comments. One way of making public assessment results compatible with statutory planning is to use pre-defined categories such as landscape types and

catalogues of landscape features and elements that match those contained in official planning documents. All information that members of the public are unable to fit into existing categories and catalogues, may be submitted as written text, using the commentary function of the interactive map. These explanations are subjected to systematic content analysis using qualitative methods. All recorded messages are thus processed and entered into the overall landscape assessment which now includes information on people's emotional attachment to certain places and areas, on people's aesthetic appreciation of landscapes, and on which areas are perceived and noticed as valuable while others are not. All of the landscape assessment information, both expert led and those generated by public involvement, is kept separate and made available in individual maps and written documents.

Two examples of landscape planning for states (*Länder*), one for ,Baden-Wuerttemberg'<sup>6</sup> and the other for 'Saxony',<sup>9</sup> use approaches where expert led and participatory methods are combined. Results are included into regional and state landscape plans that provide guidance to comprehensive and strategic spatial planning. The aim is to produce landscape assessments (maps and descriptions) that cover all of the state territory. Since it is difficult to activate a large number of people to get involved in state wide planning processes, a method was selected where people's judgments are considered in an indirect way. Criteria and indices for landscape preference are established and then linked to land-use and land-form data. The empirical basis for landscape assessment was obtained by asking people to take

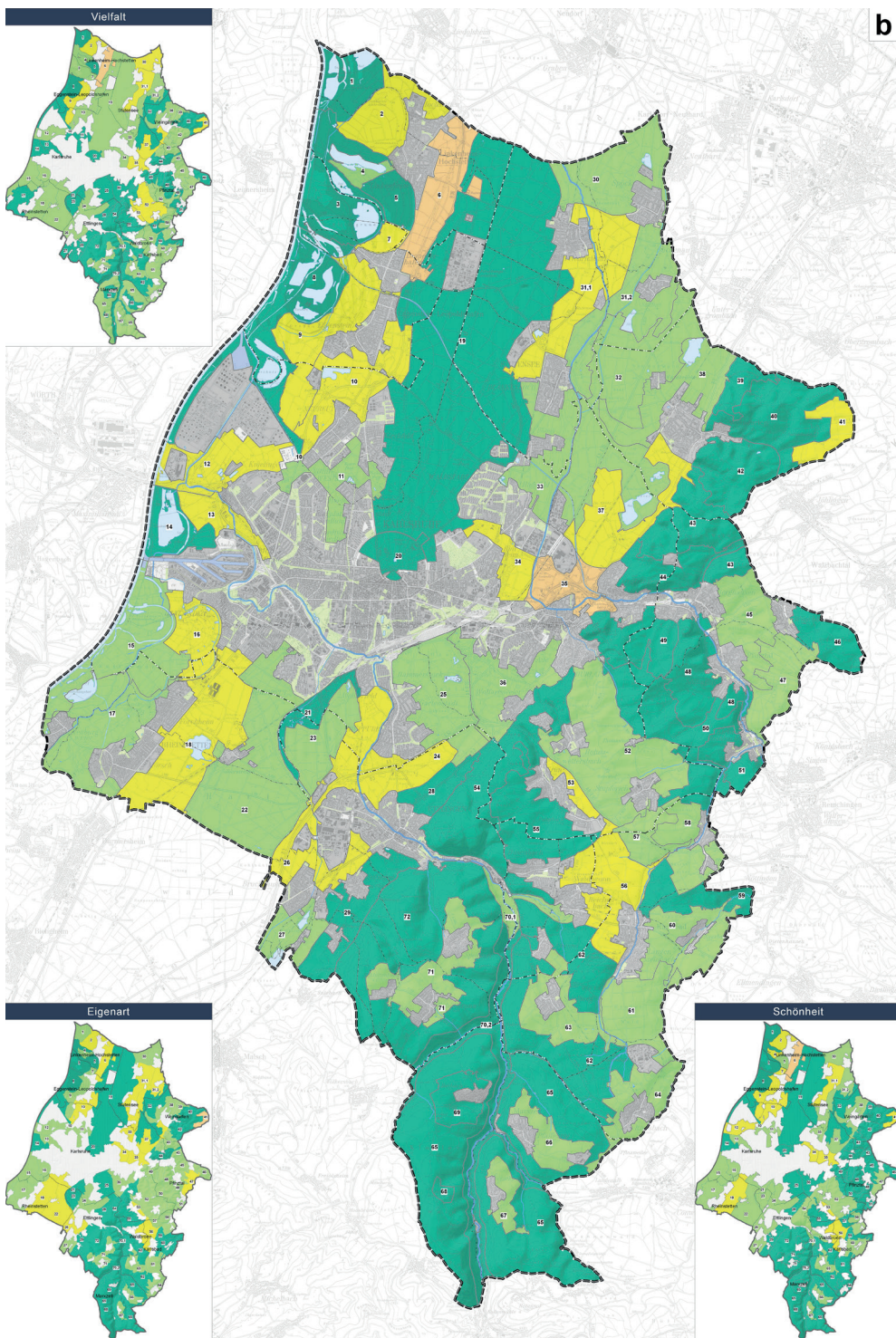
part in preference rating exercises where several photographs are ranked according to different criteria (Roth 2010). Landscape metrics are used to link public landscape preference ratings obtained from photograph rankings with measurable landscape features using GIS. Preference rating scales are applied to these landscape features and landscape assessment maps are generated.

Maps that result from involving members of the public while establishing an expert led assessment system are of a hybrid nature. These maps are expressions of what may generally be considered attractive and valuable landscapes of the state (*Land*). This information is politically highly relevant and, in fact, one that has never before been available in the same quality. The judgments made are, however, not transparently exposed because the information that official maps contain cannot be traced back to individual judgments made during picture rating exercises. However, the output gained by applying this approach is considered valid and reliable.<sup>10</sup> Evidence is being obtained that helps identify landscapes that are highly valued by the public, however the degree to which these may be representative cannot be ascertained. The methods applied allows for indirect public participation in landscape assessment at regional and state levels. It is here where it is most difficult to engage people and to include individuals in assessment activities.

## 5 DISCUSSION

It must be cause for concern that many visual landscape assessment methods

- 6** Roth, M. (2012) *Landschaftsbildbewertung in der Landschaftsplanung. Entwicklung und Anwendung einer Methode zur Validierung von Verfahren zur Bewertung des Landschaftsbildes durch internetgestützte Nutzerbefragungen*. Berlin: Rhombos-Verlag, pp. 73-86.
- 7** Buchholz 2014: [http://www.lubw.baden-wuerttemberg.de/servet/is/240091/naturschutz\\_info\\_2014\\_1.pdf?command=downloadContent&file\\_name=naturschutz\\_info\\_2014\\_1.pdf](http://www.lubw.baden-wuerttemberg.de/servet/is/240091/naturschutz_info_2014_1.pdf?command=downloadContent&file_name=naturschutz_info_2014_1.pdf) - 16.12.2014 p. 57.
- 8** Roser, F. (2013) *Ist die Schönheit der Landschaft berechenbar? Naturschutz und Landschaftsplanung* 45(9/2013): 265-270.
- 9** Roth, M., Gruehn, D. (2010) *Modellierung von Vielfalt, Eigenart und Schönheit von Natur und Landschaft; Naturschutz und Landschaftsplanung* 42(4/2010): 115-120.
- 10** Roth, M. (2012) *Landschaftsbildbewertung in der Landschaftsplanung. Entwicklung und Anwendung einer Methode zur Validierung von Verfahren zur Bewertung des Landschaftsbildes durch internetgestützte Nutzerbefragungen*. Berlin: Rhombos-Verlag



**Fig. 2:** Visual landscape assessment for the territory of the NV Karlsruhe

exist and different results may be obtained if two different methods are applied to assess the same area. To make landscape assessment more reliable, landscape experts are pursuing different paths. One path is to generate even more quantifiable data; another one is to involve members of the public and to not only rely on judgments made by one or two experts.

GIS-technologies have led to a renaissance of landscape metrics. Landscape metrics hold the promise of consistently producing quantifiable data. The most

recent advances in landscape metrics pertain to landscape structure and visual landscape assessment as shown in example three.<sup>11,12</sup> Many of these new methods trace back to the diversity index mentioned in the introduction (Kiemstedt 1967). In some cases, researchers and practitioners are seeking to establish links between ecological and visual parameters.<sup>13</sup> In many instances, criteria are employed that are provided not by cultural history but by physical geography and landscape ecology in order to define landscape units and to

assess the *Landschaftsbild*. Such criteria were first introduced for the definition of “*Natur-Räume*” (physiographic regions) that geographers started to map during the late 1930s; they are still in use today. Increasingly ‘naturalness’ is included into landscape assessment; in such cases a *Landschaftsbild* where the results of natural processes prevail over anthropogenic ones is ranked highest. Such mixing of landscape and biological conservation does little to develop landscape assessment as an activity that stands alone.

The examples above serve to illustrate how members of the public may successfully become part of landscape assessment. Participatory elements are included into expert led methods for assessing large territories. At state and regional scale this method is so far the only one that allows for integrating expert and public landscape judgments, and also for identifying landscapes of regional and state importance. Where photographs are included, into landscape assessment, these limit any public involvement to the *Landschaftsbild* that experts select. Public landscape assessments are made for those pictures, and not for the entirety of all lands. In addition, landscape images are usually presented and preference rated according to socially defined ideal landscape ideas. In many cases these are far removed from people's every-day surroundings. There is a certain danger of reproducing stereotype value judgments and neglecting the individuality of landscape and of personal and (locally) shared landscape experience and preference. Approaches such as presented as 'hybrid' might best be suited at regional and especially at state level, where the evaluation of landscape according to a commonly shared landscape idea (ideal landscapes) is a reasonable way to address landscape, including empirically established landscape preferences.

Non-expert knowledge has played a role in all of the examples above, but the form and degree of public involvement differed. Only in example two, local knowledge is directly integrated into landscape assessment via public participation. In the case of the project „mitmachen.ostwürttemberg.de“ it was possible to include many members of

the public and their voice may be taken as giving expression to the „landscape as perceived by people“ (ELC) that now find their way into official landscape planning documents. This approach is thus highly compliant with the message of the European Landscape Convention.

Local landscape values may be seen as synonymous with intangible landscape aspects.<sup>14</sup> In his study of public involvement using GIS, Stemmer<sup>15</sup> (2014) used complementary and interdisciplinary methods to address the relationship between (local) people's and official's (expert) perspectives on landscape values; tangible and intangible aspects are thus included. Results from interviews where people are asked to describe places they value in the area in which they live have been compared with results obtained from a study prepared by official planners. This comparison shows that a gap exists between tangible and intangible understandings of landscape. To overcome this gap approaches shown in examples one and two may be combined for landscape assessment done at local and (sub-) regional scales.

When implementing the European Landscape Convention, official landscape activities can no longer be allowed to remain an exclusive field of study or action monopolized by specialist, scientific and technical. A *Landschaft* is, after all, “not so much the objective scenic spatial framework of a location, but a place constituted through the tangible and intangible social and cultural practices that shape the land”.<sup>16</sup>

**11** Peters, J.; Torkler, F.; Hempp, S.; Hauswirth, M. (2009) Ist das Landschaftsbild "berechenbar"? Entwicklung einer GIS-gestützten Landschaftsbildanalyse für die Region Uckermark-Barnim als Grundlage für die Ausweisung von Windeignungsgebieten. In: *Naturschutz und Landschaftsplanung* 41 (1), S. 15-20.

**12** Roser, F. (2013) Ist die Schönheit der Landschaft berechenbar? *Naturschutz und Landschaftsplanung* 45(9/2013): 265-270.

**13** Fry, G., Tveit, M.S., Ode, A., Velarde, M.D. (2009) *The ecology of visual landscapes: Exploring the conceptual common ground of visual and ecological landscape indicators*, *Ecological Indicators*, 9(9): 933-947.

**14** Swensen, G., Jerpåsen, G. B., Sæter, O., Tveit, M. S. (2013) *Capturing the Intangible and Tangible Aspects of Heritage: Personal versus Official Perspectives in Cultural Heritage Management*. *Landscape Research*, 38(2), 203-221

**15** Stemmer, B. (2014) *Kooperative Landschaftsbewertung in der räumlichen Planung; sozialkonstruktivistische Theorie als Grundlage einer Herangehensweise zur Mitwirkung der Öffentlichkeit bei der Bewertung von Landschaften*. Doctoral Thesis, Kassel University.

**16** Olwig, K. R. (2007) *The practice of landscape 'conventions' and the just landscape: The case of the European Landscape Convention*, *Landscape Research*, 32(2), 579-594.