
Collaborative Landscape Assessment and GeoDesign

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1 Introduction

Collaborative Landscape Assessment aims to help integrate the public's views into landscape design and planning, particularly at large-scale, such as in collaborative GeoDesign. This paper presents an approach using the Web-GIS 'KuLaDig' to solicit landscape related information from people who represent different interest groups. Members of the public are invited to identify and assess landscapes that they are familiar with and that they like. The Web-GIS 'KuLaDig' offers a variety of features that support users in identifying an area and marking its location on a map and then performing landscape assessments. Personal commentaries may also be supplied to the area identified and assessed. Results from public assessments are compared, first with one another, by employing standard GIS analysis. The product is a map depicting a synopsis of all public assessments made. This map indicates where members of the public agree on areas and landscape elements that they like, and where they share common landscape values. In a next step this evaluation is compared with landscape assessments made by experts, such as in landscape character assessments and the inventorying of historic landscape elements. Again, a map is created that indicates where, in this case the public and some experts agree on important areas, and what particular values they attach to them.

The concept of collaborative landscape assessment is discussed where both experts and members of the public contribute to assessment and evaluation in a complementary way. The hypothesis is that differences exist, between public and expert assessments, and also within the groups that represent the public. It is important, with respect to principles of good governance and democratic decision making, to discuss how to best accommodate such differences in planning. Some proposals for solutions are made. A preliminary conclusion on the role of collaborative landscape assessment in the context of GeoDesign is also proposed.

The collaborative assessment concept is tested first with students of landscape architecture and planning. A second testing is conducted with members of the civil society representing NGOs, Churches, sport clubs, etc. This second testing is done in the real life environment of Cologne (Köln-Chorweiler), Germany. The City of Cologne and the LVR (Landschaftsverband-Rheinland) are local partners supporting this project by identifying key-persons to be included in the testing and by providing access to the Web-GIS-Platform KuLaDig.

This paper includes the preparations done to conduct the students and the public test applications of the proposed method. Preliminary survey results will be presented during the DLA 2012 conference.

2 The ‘KuLaDig’ System (KuLaDig – Kultur. Landschaft. Digital)

KuLaDig is a digital landscape information system originally designed for the inventorying of historic cultural landscape and landscape heritage elements. This system has been developed further, by the Rhineland Regional Council (LVR Landschaftsverband Rheinland) and the Hesse Department for Monument Preservation (Landesamt für Denkmalpflege Hessen), to allow wider applications. While KuLaDig still functions as a WebGIS based system for the documentation of historic cultural landscapes it now also offers the opportunity for everybody to participate in the further development of the database. A WebGIS interface is used for this purpose. In this way the new and innovative approach, presented here, is both participatory and expert based at the same time.

Thus, the idea is to use the KuLaDig system for the collecting of information pertaining not only to historic landscape elements but to all kinds of landscape phenomena. If the extended applications could also include information on what appears to be important to members of the public then this would be an important step towards doing landscape assessments in accordance with the European Landscape Convention (JONES 2011).

3 Landscape Perception

Current landscape concepts are based on multifunctional models (HABER 1971, MANDER, WIGGERING & HELMING 2007) while landscape planning and management are using ecosystem and landscape services concepts (DAILY 1997, TERMORSHUIZEN & OPDAM 2009). Important functions and ecosystem and landscape services are pertaining to the identification of people with a region and to their attachment to specific areas. These, as well as recreational aspects, are closely related to human health and wellbeing. Especially in densely populated areas these functions and services are considered of high importance to making human environments liveable. The assumption is that if a landscape affords a sufficient variety of identification objects – for example historic landscape elements (MOORE & WHELAN 2007, 2008 printing) – it is also able to fulfil central function such as local attachment and recreation.

Expert approaches to assessing landscape functions and services are based on the idea that landscape perceptions and preferences are more or less predictable. The assumption is that all people who live in a specific region collectively share what they feel is important in their environment. Expert assessments are thus interpretations of such collective preferences. In addition to cultural landscape analysis scenic landscape evaluations are done to provide evidence of which landscape objects are probably important for people’s identification with their environment. However, for very simple reasons, expert methods of landscape inventorying and assessment alone will never be able to explain the process of identification and feeling of attachment to an area that becomes home. When dealing with a common good like landscape no single person or a small elite groups can possibly know what everybody else thinks and feels. Planners are such a small elite group (KÜHNE 2011: 174) and, based on their education and knowledge, will make decisions on based on their special interest. They do not necessarily share the public’s emotions an aesthetic

preferences that cannot be explained by any modeling (DEMUTH 2000, 100; KÜHNE 2006, 150; TESSIN 2008, 8).

Adopting Kühne's constructivist landscape concept a new approach to integrating landscape perception into planning must be taken. Very few aspects of landscape may be evaluated on the basis of 'objective' criteria applied to the 'physical landscape' alone. Examples are soil properties and their ecosystem functions. Even some landscape properties might be analyzed 'objectively', for example in order to measure landscapes for their diversity. However, to penetrate the realm of people's landscape perception, one has to depart from the physical landscape and start to understand its social dimensions. According to Kühne's concept these include three dimensions of the 'adopted physical landscape', the 'social landscape', and the 'individually adopted social landscape'. First, the 'adopted physical landscape' includes all of the material objects and elements that people perceive in their surroundings. The 'social landscape' is the product of the evaluation of the 'adopted physical landscape' by the public, while the 'individually adopted social landscape' is a single person's perceived landscape that is generated from the social landscape as well as from the individual's landscape experiences. Most landscape evaluations are not made with reference to the 'physical landscape' but to the 'social' and to the 'individually adopted social landscape'. Consequently, decisions on landscape issues should be made during a participatory process that help to find out which values people see in the landscape.

4 Online Participatory Visual Landscape Assessment

It is common practise to conduct visual landscape assessments based on expert lead methods. Participatory approaches are rarely applied. Research on participatory landscape assessments are more advanced than their practical application. A variety of options exist. One of the most common method is based on the assessment of landscape photographs. Such methods have been established in research as early as the 1970s (KAPLAN 1975, 93; DANIEL & BOSTER 1976). Recent research using photographs was conducted by ROTH (2005) and STEINIZ (20 Nov. 2009). While methods employing photographs are easy to use one of their disadvantages is that the images are chosen by experts before the actual assessment occurs. Through this preselecting of landscapes, perspectives and of images, perceptions and assessments are limited to what researchers provide. Results do not provide a complete spectrum of the potential variety of the public's landscape conception. Another participatory and collaborative approach to landscape assessment in planning is to use GIS (webGIS, PPGIS). A well know German example of online participation in planning is the so called 'Interactive Landscape Plan' for the municipality of Königslutter (Interaktiver Landschaftsplan Königslutter) (VON HAAREN et al. 2005). Visual assessment is one aspect among several topics related to landscape planning. At the time when the policy making process in Königslutter started the accessibility of the Internet was not as advance as it is today. Only a small portion of all of the relevant participatory activities were done via the Internet. But for those statements received via new IT media it can be stated that these were more precise than most others, and they also had a concrete spatial reference (VON HAAREN et al. 2005, 229). More recently, KAHILA & KYTTÄ (2009) have introduced what they call a 'softGIS Approach'. It has a special focus on urban planning and employs a webGIS

method to collect 'soft' data. The term 'soft' is used in contrast to the 'hard' physical data that experts use traditionally. Similarly to them, also NORDIN & BERGLUND (2010) and BERGLUND & NORDIN (2007) have reported on experiences using GIS for generating and processing 'soft' data, in their case in the context of children's participation in planning. It seems that, even for young children starting with the age of 10, they have no trouble to locate sites of their everyday landscape experiences on maps and aerial photographs. Brown and Weber (in preparation) did a survey on national park experiences, also using a webGIS. As it turned out in this case, the PPGIS (public participatory GIS) method could successfully be used to measure visitors' experience and evaluation of different spots within the Greater Alpine region of Victoria, Australia.

These examples suggest that most people – including young children - are able to work with GIS and that they are also able to express their landscape experiences using maps and aerial photographs. Therefore it seems quite reasonable to use a WebGIS (in this case KuLaDig) to generally include people into the assessment of landscapes. These methods and technique are related to traditional mental map approaches (GOULD & WHITE 1974, LYNCH 1960). The aim of combining WebGIS and mental mapping is for planners to get to know the landscapes that are in people's minds, and to make them visible on maps.

5 Study Area: 'Cologne Chorweiler'

For the purposes of this study an area within the District No. 6 of the German city of Cologne was chosen. This district is called 'Chorweiler' and it is part of the greater Cologne agglomeration. It is located at its western edge. This edge situation includes all of the many different spatial phenomena that are known to be typical for similar agglomerations in Germany, and many other countries. It might be described as a transition area, a sort of interface between rural and urban zones. The term 'Zwischenstadt' has been coined for such 'in-between' situations (SIEVERTS 2001). In this particular case the dynamics of turning open space into urban development are very high.

While the Cologne agglomeration edges appear to typically represent the 'Zwischenstadt' phenomena, at the same time, and in many ways, there is also a number of special issues to be considered. The City of Cologne is located on the north-south transportation axis that follows the Rhine River. All modes of transportation, such as motorways and train lines, have extremely high traffic volumes. The development of new, and the improvement of existing, transportation infrastructure is thus a mayor political issue. Currently, Cologne already has two major 'Autobahn' rings, and a third ring road system is now in the planning stages. The changed traffic flow will dramatically affect the agglomeration's edge at Chorweiler. The third ring will be build by using existing roads and streets. The Trans-European traffic will be channelled towards the new highway ring and it will, at the same time have substantial influence on all other forms of transportation infrastructure. Regional and local traffic that has been using the roads of the third ring so far will now try and find alternative routes. This diffusion of huge amounts of vehicular traffic into the finer networks of local streets will cause a landscapes change of hitherto unknown proportions, and its effects will be felt all over the agglomeration's edge.

A second important issue is pertaining to the development of renewable energy. Recent governmental decisions include energy production through agricultural uses; this decision

will have an even more dramatic change on landscape as has ever been known to date. In fact, these changes are equal to introducing a fundamentally new phase in the era of industrialization of agriculture. The changing of energy production systems is accompanied by changes in the energy supply infrastructure. Not all of the energy production occurs near to where the major consumers are located. For Germany, for example, energy that is produced in the north might be needed by consumers who live and work further south.¹ In the particular case of Cologne it again is the western agglomeration edge that is affected the most: it has been designated to, somehow, accommodate a number of new high voltage power lines.

Resulting from these and other developments, planning in this area does not have a local dimension any longer. The driving forces for development have assumed a regional, national and, in the case of trans-border transportation, an European dimension. Municipalities have no choice but to collaborate and create regional concepts. Therefore, the new challenge is that public participation also has to be done across municipal borders.

Köln-Chorweiler has been identified as the study area. It is considered to typically represent the agglomeration edge, and it is affected by a multitude of different developments. The spectrum of spatial and land use types is large and includes high density residential and commercial areas, such as those near the former village Chorweiler, mosaic of rural areas such as those of the 'Worringer Bruch', and also the highly industrialised complexes of the globally active Bayer corporation at Dormagen. At the same time there is a long history of human settlement and traditional agriculture. A large variety of relicts have been documented, witnesses of former land use, including old country estates, chapels, shrines and crucifixes, but also historic vista-lines and archaeological monuments, the most important of them being the Battle of Worringen (MOLITOR & UTZERATH 2009). All of the historic landscape elements and monuments are endangered to succumb to the enormous pressure exercised by the development described above. In fact; there is a high risk for many places of altogether losing their identity. When a place is turned into a faceless settlement or infrastructure the landscape does no longer tell the story of its multi-faceted genesis.

6 Aim of the Project

The aim of this project is to try and learn to understand if and how it might be possible to undertake public landscape assessment using a WebGIS. In doing so one specific question is how and to what extent public landscape assessment results differ from results gained from expert landscape assessments. Detailed investigations are made to analyse the matching and mismatching of the different forms of assessment. Finally, the ways of integrating (informally done) public landscape assessment results into (formal) planning and also into (statutory) landscape policy.

¹ For detailed information please refer to the Energy concept of the Federal Republic Government Bundesministerium für Wirtschaft und Technologie and Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (October 2011).

7 Methods

The survey will be conducted using a web interface (www.landschaftsbild.org) that introduces to the project and is offering a lot of information on how to work with the KuLaDig System. Besides this it was designed not to be too complicated and is lacking all that is not really necessary to participate in the project.

For purposes of conducting public landscape assessments individual people are invited to use the tools provided by the information system KuLaDiG. In particular, individuals are asked, for every single landscape or landscape element they wish to introduce into the system, to draw a polygon on a map and to provide a written description. The narrative should include an explanation of what it is that they like about this special place.

The output of this survey includes a number of polygons and texts. To analyse these outputs, a 'content analysis' will be done for the texts, using CAQDAS (SILVERMAN 2010, 251). Attributes and qualities of these places will thus be identified, while the polygons will be used for a geographical overlay analysis. If place qualities and attributes are attached to the polygons an evaluation map can easily be produced using GIS-Software. Recurring words and items will be used to create thematic maps. At this point, mainly for technical reasons, it is not possible to integrate empirical tools provided by social sciences. For example, it would be good to make use of a Semantic Differential, a tool which would make it much easier to gain data that are immediately comparable with one other.

After a map containing results from the public landscape assessment has been made available, and after this map has been checked and verified, it is ready to be compared with results generated by other landscape assessment procedures. In this particular case all results from assessments will be included into the comparative analysis that can be found in plans and policies of Cologne planning administrations. These included statutory policy documents and plans such as the official landscape plans and the zoning plans, including environmental reports. In addition, informal documents and plans will be included, such as the 'Interkommunale Integrierte Raum-Analyse' (IIRA).

8 Conclusions and Outlook

The outcome of the survey was not available when this paper was written, but it will be presented on the DLA2012 conference. Meanwhile only preliminary conclusions can be made. Public participation via the internet seems to have a great perspective. Most people use this media and as shown before are able to use WebGIS to express their landscape experiences. It still is questionable if a survey will produce outcomes that are usable for a landscape assessment. Still not solved is the problem of combining experts and public evaluation, especially if both are contrary. Who then is right? Which decision making mechanism will be used in this case?

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