THE IMPLEMENTATION OF THE LANDSCAPE ATLAS OF FLANDERS IN THE INTEGRATED SPATIAL PLANNING POLICY

Marc Antrop, Veerle Van Eetvelde
Geography Department, Ghent University, Belgium

Abstract
Since the federalisation of Belgium in 1993, the regions became responsible for spatial planning, environment and landscape protection. In Flanders region an inventory was made of the relics of the traditional landscapes from 1995 to 2001. The main objective was the assessment of the cultural and historical heritage values of the landscape, complementary to the already existing biological valuation map. The aim was to realise a GIS-based map at scale 1/50.000, linked to a database describing different types of relics of the traditional landscapes, i.e. the characteristics that refer to the landscapes that existed before the important changes of the 20th century. A global coverage of the Flemish region had to be made in a short period of five years using all existing datasets, without new fieldwork in the first phase. The historical map of de Ferraris, made during the Austrian period (1770), reflects the situation at the end of the Ancien Régime and was used as a base reference for the traditional landscape. The orthophotomap of 1990 was used as the reference to assess the actual condition. Relics of ancient landscape structures were identified and selected using a holistic method similar to the one used in aerial photo interpretation. A typology of relics was defined based on structural and spatial characteristics rather than using their nature or age. Four main types were recognized: relic zones, anchor places, linear and punctual elements. Relic zones are vast areas containing ancient landscape structures such as settlement and field patterns and land zonings. They were indicated on the map with fuzzy borders: 515 zones were selected covering 39% of the area of Flanders. Anchor places are complexes made by related elements of different nature sharing a common history; 381 were selected and cover 16.3% of the area. They are clearly delineated using material features on the terrain for an easy recognition. Linear elements consist of ancient roads, fortifications, water works etc. Punctual elements mainly consist of monuments of architectural important buildings. 544 linear elements with a total length of 4851 km and 4607 punctual elements were selected. The final atlas was widely distributed to regional and local authorities in electronic format. The importance of the atlas for a renewed policy in integrated landscape management was rapidly recognised, partly because the results fitted very well in current international actions such as the one initiated by the European Landscape Convention. In 2001, the Flemish government adopted the landscape atlas as an important policy instrument for the landscape management and protection policy. The decree on landscape protection was amended so funding for farmers and local authorities became possible for initiatives to conserve or restore the characteristic features in relic zones and anchor places. Although relics indicated in the atlas were now on a priority list for protection, this legislation was considered to slow and not appropriate anymore in a fast changing environment. According to the guidelines in the European Landscape Convention an integration of landscape management in the spatial and structural planning was proposed. Recently, in January 2004, a new amendment makes it possible to develop management plans for anchor places, which receive then a new status of heritage landscapes.

Keywords
Landscape inventory, landscape management, planning, Flanders, Belgium

INTRODUCTION
This article discusses the how cultural landscape values in the Flemish region of Belgium were revalorized and became a base for a new policy that aims a more integrated landscape management for the future. Landscape protection and management is a slow and difficult
process in the densely populated Flemish region of Belgium. In 2001, only 2.7% of the area of Flanders was protected as landscape of outstanding value. With the federalisation of Belgium in 1993, the regions became responsible for spatial planning, environment and landscape protection, resulting in a divergence of policies and priorities. Only the situation in the Flemish region will be discussed here. In Flanders, an inventory was made of the relics of the traditional landscapes between 1995 and 2001 resulting in a GIS-based landscape atlas. The context of its elaboration and the methods used will be described briefly. The results are compared to the district zoning plans and the biological evaluations map. Finally, the implementation so far of the atlas in policy and landscape management will be discussed.

1 - Landscape management and protection in Flanders

The legal context

In Belgium, the first law on the protection of monuments, sites and landscapes was issued in 1931. Since 1931 only 2.7% of the Flemish territory was legally protected in 2001 (Van Hoorick, 2000, De Borgher, 2002). Most important was also the legislation of spatial planning of 1962, which defined the district zoning plans for the future land use and also contained an indication of valuable landscapes, which were based upon a first National Survey of the landscapes (Delaunois, 1960). No strict rules were given and a clear description was lacking about what was valuable in these areas and which criteria were used to confine them. In 1993 the three regions Flanders, Brussels Capital region and Wallonia became responsible for these matters. Only the Flemish situation will be considered here. In Flanders successive laws were important for the policy in landscape management: the nature protection in 1973, adapted in 1997, the management of forests in 1990, the protection of the archaeological heritage in 1993. The structural planning was introduced in 1997 and the decree of 1999 regulated the gradual conversion of the zoning plans into structural plans, which a much broader vision upon landscape management. In the 1980’s the Flemish policy regarding nature conservation introduced the concept ‘landscape park’, which was replaced by ‘regional landscape’ in 1990. The law of 1931 was replaced in by decrees referring to the protection of monuments and city and town sites in 1976 and for landscape management and protection in 1996, containing the first legal definition of landscape. This decree was already amended in 2000, 2001 and 2004, partly to fit better in the international context, the European Landscape Convention in particular.

The interference of different legislations in the context of an integrated landscape management is obvious. The procedures for landscape protection and management are consequently slow and cumbersome. Until the 1990’s, most of the areas to be protected as landscape were selected for their natural qualities. One of the reasons is that during the 1970’s and 1980’s the public opinion became aware about the ecological deterioration of the environment. As the lobby of the nature conservation was becoming more powerful, natural landscape values were easily accepted and helped the protection of such sites. In many cases, the cultural, historical and aesthetic qualities were added as non-vital complementary ones. Also, the descriptions and motivations of the cultural, historical and aesthetic qualities were rather vague, lacked consistency and theoretical background. Meanwhile, devastating changes happened at an accelerating speed, in particular since the 1960s. Very often autonomous changes occurred faster than could be enforced by the law.

Only since 1995 an important change in policy occurred and placed the integrated landscape management as an objective. Simultaneously, the cultural, historical and aesthetic qualities of the traditional cultural landscapes were revalorized and used in a new integrated inventory of the landscape resulting in the landscape atlas of Flanders. This stimulated the implementation
of a new legislation that aims an integrated management of all landscapes according to the suggestions of the European Landscape Convention (Council of Europe, 2000).

**Defining landscape**

The Flemish decree of 1996 defines landscape as ‘a confined area of with low density of buildings and possessing an internal coherence which has an appearance and coherence that is the result of natural processes and social developments’ (literal translation). Although the basic elements found in the definition given in the European Landscape Convention can be recognized, two typical aspect of the Flemish situation appear: the extremely high degree of urbanization of the countryside and the necessity to delineate area where the specific regulations will be applied. The latter refers more to land management than real landscape management.

Landscape and land are no synonyms. Land refers to soil, ground (Zonneveld, 1995), thus to property and territory. Landscape on the contrary is considered as a common heritage and a collective identity and this concept was added to the Flemish decree on the landscape management in 2004. Landscape covers many properties, which makes that no one really owns it, but also makes it confusing regarding who should take care of the landscape (Antrop 2000a). A landscape is bound by views and not by administrative borders, unless it received a special status such as a legal protection. Nevertheless, the etymology of landscape does not only refer the scenery of the countryside, but also to a homeland and a collectively organized territory, which is given symbolic, cognitive and aesthetical values (Claval, 2004, Olwig, 2004, Groth and Bressi, 1997, Cosgrove, 1993). Thus landscape is an important source of information of forgotten knowledge (Austad, 2000). Understanding these relics is essential for their preservation and integration in future landscape design (Fry and Sarlov-Herlin, 1995). The growing integration between research in landscape ecology, spatial analysis and archaeology illustrates this also (Fry et al., 2001). Landscape research and planning becomes increasingly transdisciplinary (Fry, 2001, Tress et al., 2003).

**Criteria for landscape evaluation**

In general three main groups of qualities are generally used for evaluating landscapes: natural, cultural and aesthetical ones. The natural ones often refer to natural sciences, where biology and ecology are dominant aspects. The cultural group includes history, social and economical values as well as religious, symbolic and linguistic aspects. The aesthetical qualities are often restricted to visual or scenic qualities and sensorial ones such as tranquility. According to the actual Flemish law (decree on the landscape management and protection), four groups of values can be used for selecting landscapes to become protected: the natural-scientific value, historical value, socio-cultural value and aesthetical value. Very different criteria are used to evaluate each of them (Antrop, 2003).

References to natural values are mainly supported by list of rare or endangered species and habitats. Direct indications to archaeological findings are rare as well. Nevertheless, the way the values are described using internal cross-references and repetitive style, illustrates the holistic approach to the landscape as well. Although different values are described according to the legal system, it is their combination that makes the exceptional quality for their protection. Each of these values is described and assessed using a set of criteria, which are referred to by similar, names but receive different meaning according to the context. A content analysis of the terms used in these dossiers to evaluate cultural, historical and aesthetical qualities, revealed a set of concise criteria (Antrop and Van Damme, 1995).
Traditional and modern landscapes

The actual concern about the degradation of our cultural landscapes refers mainly to the ‘past’ rural landscapes and not to the new emerging modern cultural landscapes. The concept of traditional (cultural) landscapes was introduced in Flanders in 1985 and became gradually accepted as a framework in the new regional planning and landscape assessment (Antrop 1997). Traditional landscapes refer to the rural landscapes that existed before the important and rapid transformations during the Revolutions Ages caused by political, social and technological changes that started since the end of the 18th century and which are characterized by changing patterns in mobility, urbanization and globalization (Antrop 2000b, 2004a). The traditional rural character of the countryside is one of slow transition and great stability and an inherent sustainability. Grandparents and grandchildren lived in the same environment and knew and spoke about the same landscape, which was a stable reference in their lives (Antrop, 2003). The modern landscapes are still continuously changing at an increasing pace and are characterized by a polarization between more intensively and more extensively used land (Vos and Klijn, 2000).

The map of the traditional landscapes of Flanders shows 77 landscape units consistently grouped according to natural regions and history. The great diversity in the rather small area of Flanders was obvious and the classification was found to be a helpful framework for the new spatial planning policy (Antrop, 1997). However, the need was felt to have a finer delineation and more detailed descriptions of the ideal characteristics and condition of these pre-industrial landscapes. A more extended adaptation including criteria and case studies for mapping landscape types and relics was reported in 1995 (Antrop and Van Damme, 1995). This formed the basis for the landscape atlas of Flanders, which allowed also refining the classification and delineation on a map at a working scale of 1/50000.

2 - The landscape atlas of Flanders

The background

The inventory of the relics of the traditional landscapes in Flanders region started in 1995 on a provincial basis. Although that time no GIS facilities were implemented in the Flemish administration and digital data were very limited and not standardized, the concept of the atlas was conceived entirely as an open GIS-database. The initial plan was to realize the inventory for the entire Flemish region in an extremely short period of four years. There were several very practical reasons for this. First, the new spatial planning policy in Flanders developed in parallel and was asking urgently for basic information about landscapes to be included in the overall more integrated planning scheme. In particular the discrepancy between the available information about nature and ecology and the cultural and historical assessment became unacceptable. Second, the increasingly faster changes in the landscape and environment demanded a rapid response. Third the short term of the project was politically attractive and feasible to achieve during the time of one legislation. However, the scientific and methodological consequences of these constraints were important (Antrop, 2003). Only existing knowledge could be used and datasets were of very different nature and quality. In order to fill in the many gaps in knowledge that were expected, the whole system had to be open and flexible for further extension. Fortunately, Belgium possesses since the end of the 18th century a rich collection of detailed topographical maps of high quality. Also, several sets of aerial photographs were extremely important. At the start of the project in 1995 most of these data were still analogue maps. During the realization of the atlas, all data were gradually digitalized and integrated into a GIS.
**The method**

The historical map of count de Ferraris shows the Austrian possessions in the Low Countries in a detailed scale of 1/11,200 and dates from about 1770. This map was used as the reference for the traditional rural landscapes. The classification and description of the traditional landscapes served as a descriptive reference base of the ideal landscape types and character. The analogue orthophoto maps of 1990 were used as the reference to assess the actual landscape. Several editions of the topographical maps in between allowed assessing the transformation of the landscape. The selection of the relics was based on a visual interpretation of patterns on these documents to detect ancient structures that were still recognizable and coherent in the orthophoto maps of 1990.

All relics had to fit into a classification scheme that could be implemented into an open GIS-database. New information was very likely to emerge and had to be integrated easily into the system. Also, many cultural layers and time periods were combined in most of the relics. In order to create a ‘neutral’ classification, which would be useful in a multidisciplinary way, the main categories were based upon the spatial dimension of the relics selected (Table 1). Relic zones (R) referred to larger areas and were represented by polygons with fuzzy borders. Particular unique complexes were classified as ensembles called anchor places (A) and delineated as polygons. Linear elements such as road segments, canals, rivers, ditches and military defense works were classified as line relics (L). Discrete objects such as buildings, solitary trees and landmarks were classified as point objects, coded as P when a description or name was available, otherwise coded as X. Finally, a preliminary attempt to map also particular viewpoints and sights was made (Z). Each of the relics received a unique identification code starting with the letter referring to its type, followed by the statistical code of the province it is situated in and a serial number. This allowed to store the descriptions of each relic in a database and to link them to the map.

During the process, the GIS facilities increased in such a way that most thematic datasets became available in digital form and also the capacity of using electronic information in the administration increased substantially. The final realization of the atlas was achieved entirely in the GIS environment coordinated by GIS-Flanders (GIS Vlaanderen, 2001). Technically, the atlas is based on the Arcview GIS 3.x shape format linked to a Microsoft Access database. However, the files can be consulted using Arc Explorer or a stand-alone viewer in Windows 2000. The atlas was widely distributed on CD-ROM accompanied by a book (Hofkens and Roossens, 2001). Internet versions are planned in the near future.

**Criteria and selection rules**

The criteria used for the selection of relics and their evaluation was based upon a preliminary study of the criteria used in previous landscape protection cases (Antrop and Van Damme, 1995). The most important ones were coherence, legibility and preservation condition (soundness) of landscape structures such as settlement patterns and types, field systems, road networks, landscape type and land use. Additional criteria for the evaluation were scenic quality and information potential. For each of the types of relic a procedure and rules for the selection were described (Antrop, 2001, 2003).

The rules for the selection of an area as relic zone were one of more of following properties:

- The existence of recognizable structures and objects dating from the end of the 18th century up to the Second World War
- The occurrence of geomorphologic features that structure the landscape or have a physical or natural monumental value
- The occurrence of concentrations of typical objects or linear elements
• The occurrence of known or expected concentrations of important archaeological sites
• The occurrence of particular viewpoints and sights offering a good scenic view over the relic zone
• Landscape with high scenic value and not disturbed visually by modern constructions or infrastructures.

Relic zones are mapped at a scale of 1/50 000 using fuzzy borders to indicate that a more detailed delineation should be done on a larger appropriate scale and after field surveying.

The rules for the selection of an ensemble as anchor place are one of following:

(1) The ensemble is situated outside a relic zone:
• A complex of clustered heritage elements
• Elements having a distinct genetic, morphological or functional coherence
• Elements that are representative for a particular period, style or type
• A sufficient preservation condition so the ensemble can be used as an ideal example.

(2) The ensemble is situated within a relic zone:
• A complex of clustered punctual or linear elements
• Elements having a distinct genetic, morphological or functional coherence
• Elements that are representative for a particular period, style or type
• Possesses typical characteristics that are related to the relic zone
• Is part of a larger geographical structure
• Forms an aesthetical and not disturbed whole.

Selected anchor places were checked on the field in 2000 and were delineated sharply on the map using material landscape features that can be recognized easily in the field.

The rules for the selection of linear features as a relic are one of the following:
• Or the element possesses a cultural of historical meaning as a connection or border that still can be recognized in the landscape
• Or the element is an ecological valuable corridor
• Or the element is a natural ecotone or forms a visual gradient or transition between different landscapes
• And the element can be clearly recognized in the landscape an forms a visual and structural element.

The whole element is selected and disturbed segments are marked.

The rules for the selection of point relics are one of the following:
• Objects that have an intrinsic natural, scientific, cultural, historical or aesthetical value
• And have a good condition of preservation
• And are situated in a undisturbed spatial context.
If they have a legal protection status, this is indicated.

Results and discussion

The results of the inventory were surprising to many (table 1). Indeed, in the highly urbanized and severely fragmented landscape of Flanders one easily gets the impression that no valuable heritage and nice cultural landscapes are left. The landscape atlas revealed on the contrary that still many areas exist where the character of the traditional landscape is preserved. Clearly the selected relics refer mainly to the rural countryside and are complementary to the already existing biological and ecological assessment (tables 2 and 3). Many relics of the cultural landscape are located in zones of low biological value. The comparison with the actual land use also indicates that not only extraordinary and special landscape types have been selected, but also ordinary landscapes are covered. However, the number of relics, their average size and length as well as the maps shows that they form many fragmented and disconnected patches. Most of the relic zones are situated at the periphery of the former municipal territories, which indicates they represent more the landscapes formed during the late 18th century on the former outfields (Van Eetvelde and Antrop, 2003). Clearly, most disturbances and degradation of the traditional landscapes are caused by urban sprawl around even smaller centers and following the dense road network.

Table 1. Results from the landscape atlas of Flanders

<table>
<thead>
<tr>
<th>Relic type</th>
<th>Code</th>
<th>Number</th>
<th>Area or length</th>
<th>% of Flanders area</th>
<th>Average size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relic zones</td>
<td>R</td>
<td>515</td>
<td>530000 ha</td>
<td>39.0</td>
<td>1029 ha</td>
</tr>
<tr>
<td>Anchor places</td>
<td>A</td>
<td>381</td>
<td>221051 ha</td>
<td>16.3</td>
<td>580 ha</td>
</tr>
<tr>
<td>Linear relics</td>
<td>L</td>
<td>544</td>
<td>4851 km</td>
<td></td>
<td>Min: 5 m</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Average: 5.3 km</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Max: 77 km</td>
</tr>
<tr>
<td>Point relics</td>
<td>P, X</td>
<td>4607</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Relations between landscape relic zones and other classifications in Flanders (after Tack and Van den Brempt, 2001).

<table>
<thead>
<tr>
<th>Land use</th>
<th>%</th>
<th>District zoning plans</th>
<th>%</th>
<th>Biological Valuation map</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetlands &amp; water</td>
<td>1.7</td>
<td>Agrarian</td>
<td>60.1</td>
<td>Less valuable</td>
<td>65.9</td>
</tr>
<tr>
<td>Arable</td>
<td>34.4</td>
<td></td>
<td></td>
<td>Valuable</td>
<td>20.5</td>
</tr>
<tr>
<td>Grassland</td>
<td>27.0</td>
<td></td>
<td></td>
<td>Very valuable</td>
<td>8.2</td>
</tr>
<tr>
<td>Heath land, dunes</td>
<td>2.5</td>
<td>Nature, forest</td>
<td>26.5</td>
<td>No value</td>
<td>0.1</td>
</tr>
<tr>
<td>Woodland</td>
<td>19.2</td>
<td>Other</td>
<td>12.8</td>
<td>Not mapped</td>
<td>4.5</td>
</tr>
<tr>
<td>Built land</td>
<td>1.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>5.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Relations between landscape anchor places and other classifications in Flanders (after Tack and Van den Brempt, 2001).

<table>
<thead>
<tr>
<th>&gt; 10% of land use</th>
<th>%</th>
<th>District zoning plans</th>
<th>%</th>
<th>Biological Valuation map</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetlands &amp; water</td>
<td>17.7</td>
<td>Agrarian</td>
<td>53.2</td>
<td>Less valuable</td>
<td>34.4</td>
</tr>
<tr>
<td>Arable</td>
<td>65.7</td>
<td>Nature, forest</td>
<td>39.4</td>
<td>Valuable</td>
<td>14.5</td>
</tr>
<tr>
<td>Grassland</td>
<td>86.8</td>
<td>Other</td>
<td>7.4</td>
<td>Very valuable</td>
<td>11.1</td>
</tr>
<tr>
<td>Heath land, dunes</td>
<td>8.1</td>
<td></td>
<td></td>
<td>Not mapped</td>
<td>4.6</td>
</tr>
<tr>
<td>Woodland</td>
<td>73.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3 - Implementation in the planning practice

The minister responsible for landscape protection launched the landscape atlas in 2001 during a meeting where also a renewed, broader and more integrated policy regarding the landscape was announced. As this fitted well in the initiatives proposed in the European Landscape Convention, important means for distributing the atlas were provided. The atlas was available on CD Rom almost for free for the administrations at the different institutional levels. The Support Centre for GIS-Flanders offered the technical support. The landscape atlas was accompanied by a book describing the new policy goals, the method used for making the atlas, the results and examples of its application in planning, environmental impact assessment and landscape protection. This proved to be a successful strategy as a wide use of the landscape atlas was imminent. New amendments to the Flemish landscape decree of 1996 in 2001, 2002 and 2004 anchored the landscape atlas in the legislation. It became a legal reference document not only to be used for landscape protection, but also in a general context conform to the suggestions of the European Landscape Convention. In particular, the integration with the spatial structure planning was enforced, in particular for the ongoing development of structure plans at the local level. Also, the anchor places of the landscape atlas are subject to become heritage landscapes when appropriate a long-term vision and management plan are formulated.

CONCLUSION

The devastating transformations of the landscapes since the 1960’s resulted finally in a growing awareness of natural and cultural values of the landscape and lead to a gradual change of the policy in the 1990’s. Flanders region follows more or less the general trend in Europe in this matter. Nature protection in Flanders was better developed than the protection of cultural and aesthetical landscape values and a renewed interest in these was initiated almost simultaneously with the growing international interest for the cultural landscape. The landscape atlas of Flanders became rapidly and successfully integrated in the new planning process because of is fast and broad distribution and the growing need to meet the international trend. It is now generally used in landscape protection and management policies, in environmental impact assessment and structural countryside planning.
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L’ATLAS DE PAYSAGES DANS UNE POLITIQUE D’AMENAGEMENT INTEGREE DE L’ESPACE EN FLANDRES

Marc Antrop, Veerle Van Eetvelde
Geography Department, Ghent University, Belgium

Résumé

Mots-clés
Inventaire paysager, gestion du paysage, aménagement, Flandre, Belgique