A Basic Study for Landscape Ecological Design and Planning by Public Participation in the Sheffield Green Belt

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주민참여를 통한 쉐필드 그린벨트의 경관생태학적 설계 및 계획을 위한 기초 연구

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ABSTRACT : 경관특성평가(Landscape character assessment)는 지속가능한 경관생태학적 설계 및 계획을 찾는데 있어 점점 중요한 역할을 담당하고 있다. 이 연구는 농촌경관(Rural landscape)평가방법의 잠재성에 초점을 두고 전문가에 의한 쉐필드 그린벨트의 경관가치 평가가 그린벨트 안이나 주변에 사는 거주자들의 의견을 반영했는지를 연구하였다. 쉐필드 그린벨트지역을 대상으로 경관특성평가를 하였고 설문지 조사 결과는 경관에 전문지식을 갖고 있는 전문가에 의한 평가와 일반인에 의한 평가결과를 서로 비교하는데 이용하였다. 결과를 통해 두 그룹사이의 유사점들과 차이점들을 판단할 수 있었고 경관생태학적 설계 및 계획을 위한 경관특성평가 과정에서 일반인의 참여의 가능성을 제시할 수 있었다. 앞으로 지속가능한 경관생태학적 설계 및 계획의 중요한 수단으로서 진보된 경관특성평가의 접근방법이 개발되어져야 할 것으로 사료된다.

Key words : Landscape character assessment; Landscape ecological design and planning, Public participation, Rural landscape

I. INTRODUCTION

In the UK, there is a growing emphasis on public participation in the process of landscape character assessment for landscape ecological design and planning. Landscape designers and planners have recognised the benefits of including and incorporating the views of the public into the decision-making process. Recent legislation, plans and researches have all strongly highlighted the importance of public participation and it has taken a central role in landscape ecological design and planning. Local Agenda 21 has had the most significant effect in contributing to thinking on ways of developing and implementing co-operative participation. Agenda 21, the main document to come from the Earth Summit in Rio de Janeiro in June 1992, recognised the important source of environmental information which could be derived from public involvement in the decision-making process(Janse and Konijnendijk, 2007). As a response to the Rio Summit, Local Agenda 21 requires all local authorities to implement and monitor programmes which aim at ensuring that all citizens are represented in decision-making, landscape ecological planning and implementation processes.

There has been considerable debate between professionals about the benefits of public participation. Many professionals have more confidence in the opinions of experts than the uninformed public(Joyce, 2003; smith and Kelly, 2003). Landscape planners and designers often consider public participation as interference in the process and believe that groups of citizens do not represent the interests of the community as a whole. The former Countryside Agency and Scottish Natural Heritage (2002) strongly encourages the involvement of stakeholders in

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landscape character assessment. It also suggests the need for involvement at both communities of interest(government departments and agencies, local authorities, and NGOs) and communities of place (residents, visitors and local groups). The latter is especially important at the local level and in forming judgements about landscape character. White(2000) also stressed the need for broad participation in planning. Public participation can therefore be seen to be forming an increasingly integral part of the landscape ecological planning and design process(Tippett, 2005). The landscape profession must be ready to take greater consideration of the preferences and views of the public. Therefore, this research aims to identify the potential of landscape character assessment methods and investigates whether a professional assessment of the landscape importance/value of part of the Sheffield Green Belt reflects the attitude of residents living in or near the Green Belt and of those responsible for its landscape ecological design and planning.

II. METHODS

1. The study area

The North-West Sheffield Green Belt in the Sheffield Unitary Development Plan adopted in March 1998, which was the statutory development plan for Sheffield, was selected for this research (Figure 1). Lying on the edge of the Pennines, the land basically rises from east to west. Handsworth and Tinsley Park for instance lie at less than 100m (330 ft.) above sea level whereas Ringinglow and Bolsterstone are about 300m (980 ft.) above sea level. By far the largest land use in the Greenbelt is agriculture and the landscape is particularly susceptible to permanent change as a result of changes in farming operations. Fortunately, the Sheffield countryside has escaped much of the dramatic changes which have taken place in other parts of the country. As s result, the patchwork of fields bordered by stone walls in the west and by hedges to the east, which are so important to the visual quality of the landscape has largely remained intact. Other important features of the rural landscape are industrial plants generally associated with the early expansion of manufacturing in Sheffield. As such they are in almost all

cases situated close to running water in valley bottoms. Due to their location, they often conflict with footpath access for informal recreation, natural history habitats, and the general visual amenity of the area. Whist new industrial development of this sort would not be acceptable now, there is little that can be done about existing plants. Finally, development on the fringe of the urban areas has in some cases had a significant visual impact on the countryside. This generally depends on the type of land use involved, the prominence of the site and the amount and size of tree and shrub screening incorporated within and on the edge of the development.
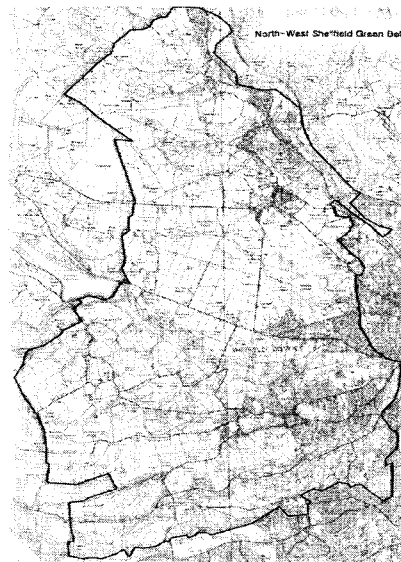

Figure 1. The location of study area

2. Landscape character assessment of the Sheffield Green Belt

Landscape character assessment is now a widely applied technique used throughout the UK and elsewhere, such as Ireland and Hong Kong (Scottish Natural Heritage and Fife Council, 1999; City of Hong Kong; 2001, Environment and Heritage Service, 2001; Countryside Agency and Scottish Natural Heritage, 2002; Bishop and Phillips, 2004; Martin, 2004; McCormack and O'Leary, 2004; Starrett, 2004; Swanick, 2004). Landscape character is defined as a distinct and recognisable pattern of elements that occur consistently in a particular type of landscape (Swanwick, 2004). Landscape character assessment is to identify

landscape character types through the systematic analysis of these natural and social landscape attributes. Landscape character assessment aims to support the development of goals for spatial landscape ecological design and planning that are specific to the special needs of the character types. Moreover, it is considered as a tool which contributes to environmental protection and prudent resource use to fulfil the objectives of sustainable development.

The methodology of landscape character assessment used for this research consisted of three steps (Figure 2). In the first step, the main source of information used for the landscape character assessment was land cover data, obtained through the visual interpretation of black and white aerial photographs, topographic maps (1: 25,000) and related information. Each of the natural (landform, landcover) and human features (pattern and types of fields and settlement patterns) was mapped and saved as a separate layer in an initial Geographical Information System (GIS). The single feature maps were overlaid in a GIS and the study area was delineated into areas of distinct character. Areas of similar character were grouped together in landscape character types. Land use, landcover and topography were used as the main criteria for delineating the landscape character types. In the second step, a field survey followed to verify the draft character map and to further describe the character types. A structured field survey form was prepared to record observations on

landscape type, characteristic landforms, predominant land cover, landscape elements and aesthetic factors. In the third step, the findings from the desk study and field surveys were drawn together to prepare a final map of landscape character types. Their key characteristics, features and distributions were described for each of the landscape character types. Several landscape character types produced by landscape character assessment were used for people's preference to help to identify possible similarities and differences between the public and professionals.

3. People's preference for different landscape types in the Sheffield Green Belt

The 41 resident preferences for different types of the Green Belt landscape were tested by the questionnaire survey, which comprised of a series of one to one interviews which took place in Worrall, Oughtibridge, Stannington, Walkley, Wisewood, and Fulwood. Residents were selected irrespective of age and gender to acquire as wide a selection of view points as possible. Colour photographs chosen as being representative of the range of landscape types were selected in the study region. The nine landscape character types were distinguished by landscape character assessment of the study area. Each A4 sheet included photographs which were representative of one of the identified type of landscape of Green Belt.
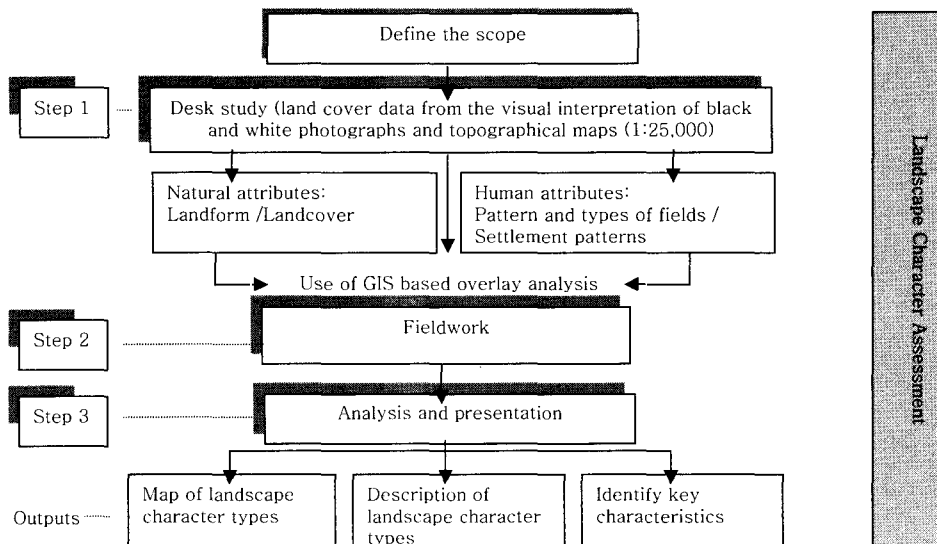

Figure 2. Key steps of landscape character assessment

Residents were asked:

(1) To choose which two of the photograph sheets represent landscapes you prefer or you think most important for their landscape value.

(2) To judge strictly on your own preference and not on what you think others would prefer or what you should prefer.

(3) To judge the total landscape as a whole and not its specific parts.

The residents were then asked:

(4) To explain the reason why they chose the two sheets either by an unprompted answer or by reference to an adjective checklist and

(5) To name the landscape elements which most influenced their choice.

17 landscape architect graduates and students in the University of Sheffield who have some special knowledge of landscape and landscape character assessment were asked to take part in the survey to determine the professional preferences for different types of landscape. The same method used in the resident preference survey was used in this stage to help to identify possible similarities and differences between the public and professionals.

III. RESULTS

1. Landscape character assessment of the Sheffield Green Belt

Landscape character assessment provided sufficient information on which to base as landscape classification of the Green Belt landscape, dividing it into nine landscape character types (Table 1). Each landscape character type had broadly similar patterns of geology, landform, landcover, settlement and field pattern. Table 1 showed the key characteristics and features for each of the landscape character types.

2. People's preference for different landscape types in the Sheffield Green Belt

The results of the survey were given in the Figure 3 which showed the number of times a particular landscape character type was chosen as a percentage of the total number of choices of landscape character types made by the residents and the profession. Figure 3 indicated that between the two groups the distribution of preferences for different landscape types were very similar. The residents and professional landscape architects generally preferred landscape character type No. 1. Professional respondents also tended to choose the landscape character type No. 5 and the landscape character type No. 8, whilst the residents tended to choose landscape character type No. 8 and landscape character type No. 9. These results would indicate that there were considerable similarities between professional and residents' views in terms of their preferences for particular types of landscape.
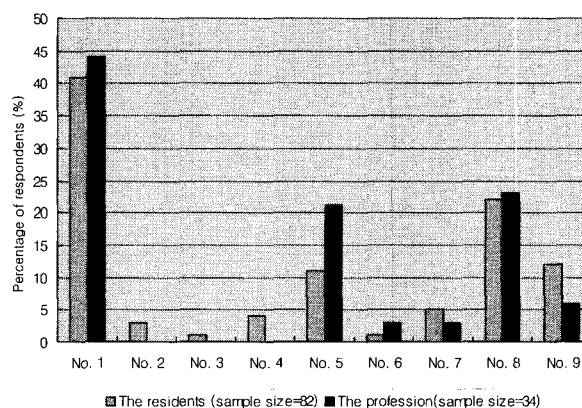
x^2(chi-square test) = 6.175, p = 0.628, N = 116

Figure 3. The percentage of residents and professional respondents who expressed a preference for each of the photographic sheets shown to them, numbered one to nine

Table 1. Nine landscape character types of the Sheffield Green Belt

Landscape character types		Key characteristics and features
1 : Wooded Valley Lowlands		• A well-defined irregular pattern of small to medium sized fields bordered by stone walls • Permanent pasture, rough grazing and woodland • Woodlands, reservoirs, field patterns, landform, valley and natural vegetation are the landscape elements which dominate this landscape character type • Well- wooded river corridor
2 : Urban Fringe Amenity Parklands		• Belts of mature ornamental trees associated with parks • The majority of the area is managed as a golf course, but there is also a small recreation area adjacent to urban edges • Wide open areas of amenity grassland • The edges of this landscape are generally well wooded
3 : Urban Fringe Hill Artificial Woodlands		• A well wooded landscape with small copses and pasture • Commercial timber plantations are the dominant land use • Woodlands prominent on hills
4 : Urban Fringe Farmlands		• A gently rolling landscape with a regular, small-scale field located at the edge of urban area • The farmlands used for horse grazing and the pastures invaded by scrubby vegetation • The farmlands located at the edge of the urban settlements
5 : Urban Fringe Semi-Natural Woodlands		• A gently sloping landscape with semi-natural vegetation • Natural vegetation (Bracken/Heath) on hill tops • An undulating landscape with a gentle slop
6 : Regular Open Farmlands		• Open landscapes with a regular, large-scale field pattern defined by stone walls • Gentle slope • Neat, regular fields • Open mixed arable and pastoral farming associated with modern settlement
7 : Hill Slop Farmlands		• A gently sloping landscape with an irregular, small-scale field pattern bordered by stone walls • Sparsely wooded, tree cover being mainly in the form of isolated copses and trees • Irregular field patterns
8 : Ancient Irregular Small Slop Farmlands		• An ancient landscape with an intimate pattern of small and irregular fields bordered by stone walls, narrow lanes and traditional hamlets • A varied undulating landscape with steep slopes and narrow lanes • A well-defined irregular pattern of small to medium sized fields bordered by stone walls • Permanent pasture • Many ancient hills, giving a strong historical character.
9 : Hill Open Farmlands		• Open, gently rolling landscapes with large fields incorporating a mixture of arable land and pasture • Large scale gently rolling landscape • Permanent pasture associated with traditional villages • Group of trees, giving a strong historical character • Long distance views

3. The landscape elements influenced their choice

Having asked respondents to give reasons why they chose each of the two sheets, respondents were also asked, in each case, to identify the landscape elements which most influenced their choice from a list of 27 landscape elements. In addition, respondents were allowed to name any other landscape elements which they believed to influence their decision. The results of this part of the survey were given in the Table 2 which showed the number of times a particular landscape element was chosen as a percentage of the total number of choices of landscape elements made by the residents and the profession.

In the case of landscape character type No. 1, both the residents and the profession identified field patterns, natural vegetation, woodland, reservoirs, landform and valley as particularly influencing their choice of this particular sheet. These were the landscape elements which dominate the landscape illustrated by landscape type No.1 and were therefore those which we should be most careful to preserve in future landscape ecological planning and management of the Green Belt. In the case of landscape character type No. 5, both the residents and the profession identified natural vegetation and woodland as the landscape elements which influenced their choice of this particular landscape type. The residents also tended to identify hills and individual trees as important, whilst the profession also stressed landform, rough grass and clumps/groups of trees as most affecting their choice. In the case of landscape type No. 8, both the residents and the profession emphasised field patterns and farmland as landscape

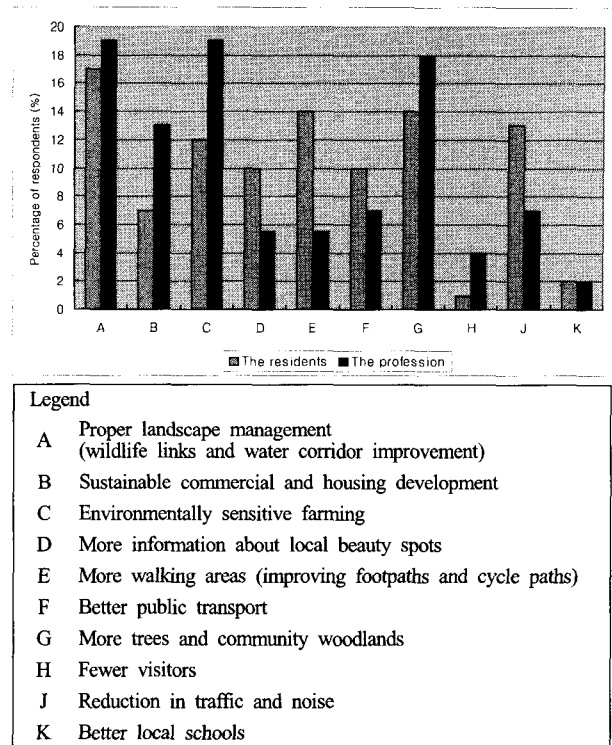Table 2. The landscape elements influenced their choice

Landscape elements	Landscape character No.1		Landscape character No.5		Landscape character No.8	
	The public (%)	The profession (%)	The public (%)	The profession (%)	The public (%)	The profession (%)
Farm buildings	1.88	1.24	0.00	0.00	7.08	10.00
Field patterns	7.25	9.88	2.56	0.00	12.12	14.00
Industry	0.00	0.00	0.00	0.00	0.00	0.00
Farmland	3.38	4.94	0.00	0.00	9.09	10.00
Modern settlement	0.00	2.47	0.00	0.00	1.01	0.00
Natural vegetation (Bracken/Heath)	7.88	8.64	23.10	17.23	3.03	8.00
Brooks/stream	0.73	1.23	0.00	0.00	1.01	0.00
Individual trees	2.72	0.00	10.28	3.45	4.04	4.00
Track	0.72	0.00	2.56	3.45	1.01	0.00
Bridleway	0.72	0.00	2.56	0.00	0.00	0.00
Woodland	12.50	11.11	17.96	17.23	7.07	4.00
Stone house	0.00	0.00	0.00	0.00	10.10	6.00
Field ponds	0.72	0.00	2.54	0.00	0.00	0.00
Reservoirs	13.93	9.88	2.54	0.00	0.00	0.00
Stone walls	4.05	7.41	0.00	3.45	6.06	6.00
Hills	9.88	4.94	10.26	6.90	9.09	6.00
Landform	7.22	14.81	7.70	17.24	8.08	12.00
Linear	0.00	0.00	0.00	0.00	0.00	0.00
Traditional hamlets/villages	2.05	0.00	0.00	0.00	4.04	4.00
Rough grass	1.88	4.94	5.14	13.80	0.00	4.00
Clumps/Group of trees	4.72	8.64	2.54	13.80	3.03	10.00
Roads/lanes	0.73	0.00	0.00	0.00	1.01	0.00
Footpaths	3.22	1.23	5.13	0.00	2.02	0.00
Power lines	0.00	0.00	0.00	0.00	0.00	0.00
Valley	9.93	8.64	5.13	3.45	9.09	2.00
Farm animals	3.89	0.00	0.00	0.00	2.02	0.00
Golf course	0.00	0.00	0.00	0.00	0.00	0.00
Total	100	100	100	100	100	100

elements which influenced their choice of this particular type of landscape. The residents also tended to identify the stone houses, hills and valley as important in influencing their choice, whilst the profession pointed to landform, farm buildings and clumps/groups of trees as most affecting their choice. Information on key landscape elements in a landscape identified by the residents and the profession can be used to provide a basis for the preparation of landscape ecological planning and design strategies, such as conservation and maintenance of existing key characteristics, enhancement of existing character through the introduction of new elements and features or different management of existing ones and restoration of character, where this is appropriate to current land use activities. It is also used to help to guide land use change in positive and sustainable ways, for example programmes of woodland expansion for an ecological network, and new uses for disturbed and degraded land.

4. Future changes in the Green Belt

Figure 4 indicated that the percentage of resident respondents and professional respondents for the views of future positive changes in Sheffield Green Belt. The Figure 4 suggested that professional landscape architects tended to stress the need for environmentally sensitive farming (C), compared to the public, who prefer more walking areas (E) and a reduction in traffic levels and noise (J). Both residents and professional respondents stressed the need for proper landscape management (A) and more trees and community woodlands (G). In short, both groups had slightly different views about future changes which might have a positive effect on the Sheffield Green Belt. This result suggested that the profession would not reflect current needs of local residents in future landscape ecological planning and management. This also suggested that there should be the resident involvement in landscape character assessment in order to obtain a consensus on future landscape ecological design and planning.

Figure 5 indicated that the percentage of resident respondents and professional respondents for the views of future negative changes in Sheffield Green Belt. The figure suggested that professional landscape architects tended to stress the damaging effect of unsuitable landscape management (A), the destruction of walls (D) and more
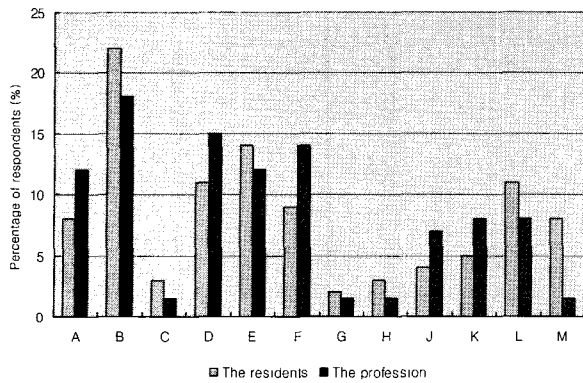

Legend	
A	Proper landscape management (wildlife links and water corridor improvement)
B	Sustainable commercial and housing development
C	Environmentally sensitive farming
D	More information about local beauty spots
E	More walking areas (improving footpaths and cycle paths)
F	Better public transport
G	More trees and community woodlands
H	Fewer visitors
J	Reduction in traffic and noise
K	Better local schools

x^2(chi-square test) = 9.089, p = 0.524, N = 116

Figure 4. The views of future changes which might have a positive effect on the Sheffield Green Belt

traffic and roads (F), compared to the public, whohighlight the negative effect of chopping trees down (E) and more noise and pollution (L). Both public and professional respondents stressed the damaging effect of more commercial and housing development (B).

IV. CONCLUSION

The results of a questionnaire survey suggest several reasons for supporting the use of public involvement in the process of landscape character assessment for landscape ecological design and planning. Between the two groups the distribution of preferences for different landscape types is very similar. This would indicate that there are considerable similarities between professional and residents' views in terms of their preferences for particular types of landscape even though their own personal preferences may be different. However, both groups have slightly different views about the landscape elements which most influenced

Legend

A	Unsuitable landscape management/ abandonment of land
B	More commercial and housing development
C	Conversion of farm buildings to dwellings
D	Destruction of walls
E	Chopping trees down
F	More traffic / improved roads / new roads
G	Changes in farming practices (e.g. livestock or crop types)
H	New reservoirs or changes to existing reservoirs
J	Mining and quarrying
K	Lack of integrated local planning (e.g. public transport issue)
L	More noise and pollution
M	Derelict buildings in rural areas

x^2(chi-square test) = 6.160, p = 0.862, N = 116

Figure 5. The views of future changes which might have a negative effect on the Sheffield Green Belt

landscapecharacter from a list of 27 landscape elements. This result suggests that the profession would not have knowledge of local information about wildlife, local history and recent landscape changes without local residents' involvement in the process of landscape character assessment.

The two groups also have different attitudes to future changes which might affect the Sheffield Green Belt. For instance, although professional respondents tend to stress the need for environmentally sensitive farming, the members of the public prefer more walking areas and a reduction in traffic levels and noise. In short, a professional assessment of the landscape importance or value of part of the Sheffield Green Belt may not completely reflect the attitudes of residents living in or near the Green Belt. This result suggests that there should be the public involvement in landscape character assessment in order to obtain a consensus on future

landscape ecological design and planning. Therefore, this research suggested that the public can be involved at different steps of landscape character assessment. The public can be involved at the step 1, 2 and 3 of landscape character assessment in order to provide information of wildlife, ecology, local history and events, to help to identify distinctive character areas, to determine their key characteristics and to give views about what constitutes a key features in the locality(Figure 6). The landscape character approach is complemented by landscape ecological analysis to provide quantitative information for landscape ecological design and planning in the second stage. The public can be also involved at the step 5 in order to provide views on landscape ecological change and its effects and to work to achieve a consensus on the future needs of the landscape ecological planning and design. This study should be regarded as merely one step forward. There is still a lack of knowledge about how to combine the landscape architect's skills with the values of the residents. The landscape profession has an important part to play in developing a suitable approach to landscape character assessment as an essential tool for landscape ecological planning and design but in order to do so must seek to develop new ideas about public involvement. The small study area and restricted sample size to compare between two groups have limited the conclusions of this research. A large sample would have been desirable to increase precision and statistical accuracy. However, the results suggest that there is considerable potential for broader research, with the need to compare the results obtained from this study with other Green Belt areas of different character. The same method could be used in other Green Belt areas around Sheffield and elsewhere. While the current research has highlighted the role of resident preferences to inform the wider view of the landscape, there is also potential to undertake a more specific evaluation of landscape quality, value and management needs based on public judgements.
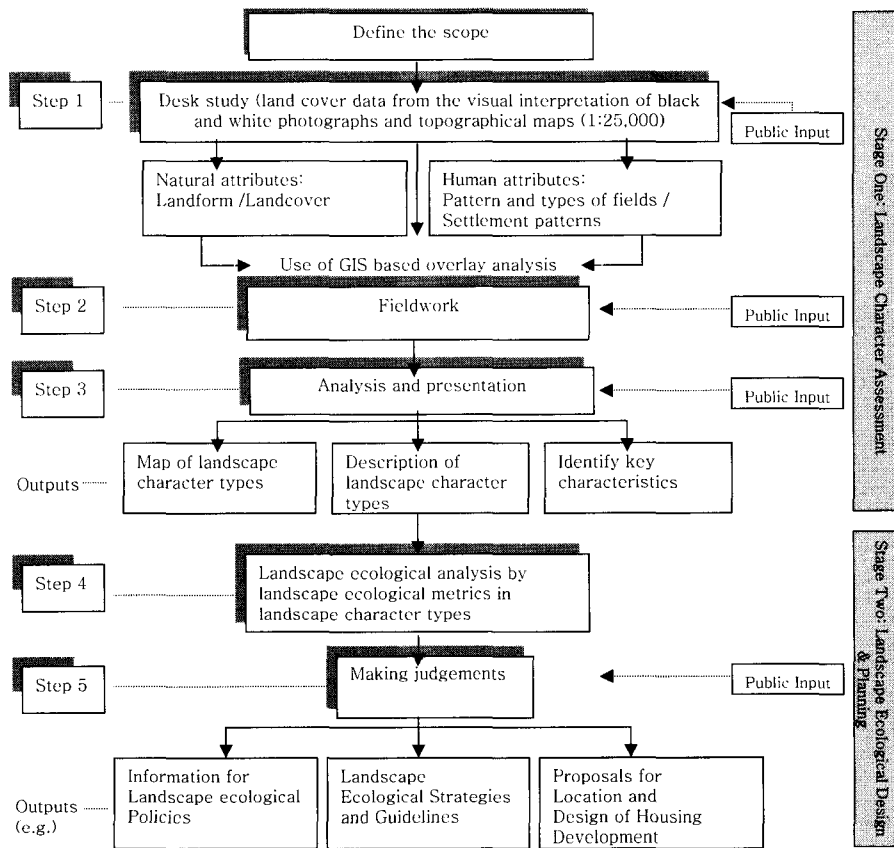
Figure 6. The public involvement in landscape character assessment suggested by authors

REFERENCES

1. Bishop, K. and A. Phillips, 2004, Countryside Planning - New Approaches to Management and Conservation, Earthscan, London

2. City of Hong Kong, 2001, Landscape Value Mapping of Hong Kong: Inception Report, Government Information Services, Hong Kong

3. Countryside Agency and Scottish Natural Heritage, 2002, Landscape Character Assessment : Guidance for England and Scotland, Countryside Agency and Scottish Natural Heritage, Wetherby

4. Environment and Heritage Service, 2001, Northern Ireland Landscape Character Assessment 2000, Corporate Document Services, Leeds

5. Janse, G. and C. Konijnendijk, 2007, Communication between science, policy and citizens in public participation in urban forestry-Experience from the Neighbourwoods project, Uban Forestry & Urban Greening 6 : 23-40

6. Joyce, L, 2003, Improving the flow of scientific information across the interface of forest science and

policy, Policy and Economics 5: 339-347

7. Martin, J, 2004, Applications of Landscape Character Assessment, In. Bishop, K. and A. Phillips, (Eds.) Countryside Planning, Earthscan, London, pp. 203-221

8. McCormack, A. and T. O'Leary, 2004, Development and Application of Landscape Assessment Guidelines in Ireland: Case Studies using Forestry and Wind Farm Developments, In. Bishop, K. and A. Phillips, (Eds.) Countryside Planning, Earthscan, London, pp. 141-154

9. Scottish Natural Heritage and Fife Council, 1999, Fife Landscape Character Assessment, Scottish Natural Heritage Publications Section, Perth

10. Smith, W. and S. Kelly, 2003, Science, technical expertise and the human environment, Process in Planning 60 : 321-394

11. Starrett, M, 2004, Policies and Priorities for Ireland's

Landscapes, In: Bishop, K. and A. Phillips, (Eds.) Countryside Planning, Earthscan, London, pp. 125-140

12. Swanwick, C, 2004, The Assessment of Countryside and Landscape Character in England : An Overview, In: Bishop, K. and A. Phillips, (Eds.) Countryside Planning, Earthscan, London, pp. 102-124

13. Tippett, J, 2005, The value of combining a systems view of sustainability with a participatory protocol for ecologically informed design in river basins, Environmental Modelling & Software 20 : 119-139

14. White, G.F, 2000, Water science and technology: some lessons from the 20th century, Environment 42 : 30-39