

Chapter 3

Some Scenic Evaluation Techniques

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Mountains are the beginning and the end of all natural scenery.

John Ruskin, Modern Painters, vol.3, Pt iv, v 29.

Abstract The quest for an objective analysis of coastal scenery ranging from top class to very poor, which includes the physical environment and incites an aesthetic response from the viewer, has existed for many years and a variety of approaches have been employed. These range from utilizing photographs as surrogates for locations, to compiling lists of what are deemed to be the important physical and anthropogenic landscape parameters, either from field studies, Ordnance Survey map squares, or *via* questionnaires of public attitudes and perception, etc. The bulk of these studies have been aimed at producing numbers that can be attributed to relevant assessment parameters in an attempt to quantify landscapes. These include physical items, such as, relief and slope, which relate to mountains, hills, lowlands, as well as human induced elements, such as, towns, industrialized areas, and farmed landscapes. The spectrum covered by these techniques tends to be based on subjective assessments of landscape quality by individuals/groups, or by techniques using landscape physical attributes as surrogates for personal perception.

3.1 Introduction

Every day speaks a new scene; the last act crowns the play. Francis Quarles, Epigram
Respice Finem.

Arthur et al. (1977) argued that any scenic assessment must have:

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- Descriptive inventories that include ecological and formal aesthetic models, together with methods mostly applied by experts in an objective manner.
- Public preference models, such as, psychological and phenomenological, which are often undertaken using questionnaires are unavoidably linked to the problems of public consensus.
- Quantitative holistic techniques using a mixture of subjective and objective methods including psychophysical and surrogate component models.

All assessments should heed these words penned some 40 years ago. However, most scenic assessments have been carried out on a subjective basis; have no weightings attached to parameters (the latter invariably had the same value – wrong, as some parameters are more important than others); and none concerned itself with a technique that utilises fuzzy logic systems (Chap. 4), which look into the ‘grey areas’ rather than e.g. between black/white; true/false.

Landscape assessments procedures have usually been seen as a contrast between expert based opinions, usually based on ecology, which normally is the choice of management schemes and a perception based viewpoint, based on philosophical aesthetics. Non-expert judgements usually rely on methods based on landscape stimulus and the objective properties of landscape. Greenbie (1975) suggested that neural patterns of emotion have a characteristic shape within the brain which can be recognised in similar shapes in the landscape and produce similar emotional responses – see Chap. 2 and also Starr (2013). It is difficult to separate landscape experience from the viewpoint context and the emotional involvement, which makes for difficulty in developing techniques for methodological development other than unstructured phenomenological exploration. Human-landscape interaction suggests that aesthetic quality can occur in both the objective qualities of landscape and the subjective meaning of landscape, as observed many years ago by, for example, Lewis et al. (1973), Relph (1976) and Tuan (1977).

In the UK, the Countryside Act (1968, A2) stated: *‘The functions conferred by this Act on the said Commission in this Act (referred to as “the Commission”) are to be exercised for the conservation and enhancement of the natural beauty and amenity of the countryside, and encouraging the provision and improvement, for persons resorting to the countryside, of facilities for the enjoyment of the countryside and of open-air recreation in the countryside.’* This Act was a springboard to many other Acts, which resulted in the UK of a founding based on beauty, of e.g. Areas of Outstanding Natural Beauty (AONB) and Heritage Coasts (Fig. 3.1).

3.2 Background

Scenery is fine but human nature is finer. John Keats, letter to Benjamin Bailey, 13 March 1818

It is axiomatic that any landscape assessment invokes interaction between biophysical parameters and the perception that a viewer receives from looking at it. Both



Fig. 3.1 Cliffs at Glamorgan Heritage Coast, UK

involve the effects of spatial and temporal scales, which affect landscapes, especially the visual component. A psychophysical approach provides balance between the two viewpoints expressed, as advocated by the checklist given in Chap. 4, producing an equalising effect between the prime parameters needed for coastal landscape assessment, together with an objective account of a viewer's reaction. It is important to stress that there is nothing wrong in any person's subjective evaluation of any given landscape; however for management purposes the opinions of many people are required, as viewpoints from many individuals tend to conform to the required real and objective consideration.

Steers (1944, 6), after an 18 month journey around the coast of England and Wales emphasised that, '*any unspoiled part of the coast; cliffs, dunes, salt marsh, estuary, should be rated as good natural scenery. On the other hand certain parts of the coast can be regarded as of outstanding quality.*' He also added that, '*any assessment of coastal quality is likely to meet with criticism.*' This is certainly a truism, as Teale (1966, 72) also argued that, '*nature affects our minds as light affects a photographic emulsion on a film. Some films are more sensitive than others, some minds are more receptive.*' Davidson and Wibberley (1977, 87) followed up these comments suggesting that some landscapes appear intrinsically more valuable than others and this has been the basis of landscape conservation in many countries e.g. Britain. Therefore scenic beauty has become a very important factor relating to management decisions, in amongst others, National Parks (Fig. 3.2), Heritage Coasts, and has led to a proliferation of methodologies to predict landscape quality.

How is scenery evaluated, as it covers a spectrum of 'beauty/ugly', and how is this elusive concept called beauty defined – see Chap. 2; Fig. 3.3. It is far easier to agree on what constitutes ugliness, yet even scenes, such as, old coal tips, can on occasions, e.g. when covered by snow, take on an ethereal quality and even be con-



Fig. 3.2 Mwnt, Pembrokeshire National Park. Wales, UK



Fig. 3.3 Annaly Point, US Virgin Islands – a beautiful scene!

sidered *‘beautiful’*, remembering Margaret Hungerford’s (1889, 132) famous phrase, *‘beauty lies in the eye of the beholder.’*

However, coastal/beach managers/planners have to take cognisance of this point with respect to any management affecting the world’s coastlines. Decisions are taken with regard to coastal areas, but how much attention is paid to scenery; is it an important constituent for a pleasurable holiday – an emphatic *‘Yes’*; or if the deci-

sion is to zone an area as one of ‘Outstanding Natural Beauty’, ‘Heritage Coast’, ‘National Park’ etc., what criteria are utilised?

An early pioneer in this field was Hartshorne (1939) who looked at the separation between Natural and Human landscapes and Appleton (1975b, 2) was one of the later followers commenting that ‘*Landscape is a kind of backcloth of human activities*,’ and his classic book, posed the question, ‘*what do we like about landscapes and why do we like it?*’ Appleton (1975b, viiii). The history of landscape quality assessment/evaluation, ‘*has featured a contest between expert and perception based approaches, paralleling a long standing debate in the philosophy of aesthetics*’ (Daniel 2001, 267). A first rate review of landscape methodologies can be found at Macaulay (2014), whilst excellent up to date analysis of landscape character assessment can be found in Swanwick (2002), Olwig (2003), and Tudor (2014). ‘*Inspired by the open beauty of the open landscape*’ (Faulks 1999, 267), is a frequent literary comment, but how does one measure this?

Eckbo (1969, 19) mentions that ‘*...the tremendous volume of travel literature does demonstrate that the general quality of landscape can be measured and is measured, and that there is a fair unanimity as to their findings.*’ The need for evaluation only arises when: *it becomes necessary to make a choice between two or more articles... or courses of action*’ (Gillespie 1970, 25).

Evaluation is necessary, as it provides a means by which scenery/amenities can be compared against other resource considerations; it can improve resource inventories, carrying capacity decision-making and Environmental Impact Assessments (IEMA 2011). It is a process whereby landscape is weighed against set criteria, i.e. it is a statement of overall aesthetic quality of an object in comparison with other objects of the same class. It provides landscape preservation (identifying the value to society of particular views/areas); protection (identifying high quality landscapes/controlling developments); improvements (identification of components that can detract from views). Scenery is a section of any coastal landscape inventory available for managers or planners for coastal preservation, protection, development, etc. and can provide baseline information to managers so that a sound scientific basis may be established for any subsequently envisaged management plans. Landscape management and evaluation deals with heterogeneity in space, for example *via* type, shape, etc. of elements, together with time, e.g. the disturbance regime, which may be either natural or anthropogenic (Turner 1987).

A primary influence behind public concern for landscape quality and evaluation is an increasing rejection of older attitudes of man’s dominance over nature in favour of a more mutual respect. This had been mirrored in an increasing environmental awareness, which reached a watershed in the 1970s when extensive environmental lobbying had a significant effect on public policy (Sewell and Foster 1971). Landscape as a scenic resource expanded from, ‘*... concern with the uniquely beautiful to the uniquely ugly... and finally to the everyday, non-unique landscapes in which most (people) live, recreate, work and travel*’ (Zube et al. 1974, vii).

Landscape quality assessment presents a conundrum. Planners, geographers and others classify landscape on inherent physical qualities established with certain assumptions and criteria. Personal preferences do not occur, e.g. Linton (1968)



Fig. 3.4 Mountain scenery, Iceland

commented that mountains have high landscape quality (Fig. 3.4), resulting in landscapes being classified on a numerical, high, medium or low quality. The subjective basis of the selected criteria is ignored emphasising the role of scenery in attracting tourism. *‘Landscape is assumed to be a quality present in the scene, a quality which one visits to see, experience and enjoy* (Lothian 1999, 178). The perception approach uses objective psychological testing and looks to community preferences in order to obtain an impression of the landscape, *i.e.* it eliminates the subjectivity of the researcher.

Many scenic assessments have been made based upon subjective analyses, but few acknowledge the implications of subjectivity on the validity of the results (Kaye and Alder 1999). For example, in an attempt to boost tourism, a quantitative method was used on the Central Coast region of Western Australia by assessing the presence of infrastructure, levels of attraction and environmental degradation (Priskin 2001), but no attempt was made to reduce the subjectivity of the observer, which reduced results credibility. In the same vein Cocklin et al. (1990) assessed the potential of certain New Zealand areas for recreation possibilities, which graded sites on a High, Medium and Low scenic value basis. All were based on subjective observations of landform and cover plus presence of rare features.

After all:

What is the hardest thing of all?

That which seems the easiest:

For your eyes to see, That which lies before your eyes. Goethe, quoted in Luijk (2012, 12)

Assessment of landscape scenery has evolved considerably during the past 30 years even though Appleton’s (1975a) dictum still prevails, *i.e.* it exists in a theoretical vacuum. Zube et al. (1982, 25) went further arguing that research without a

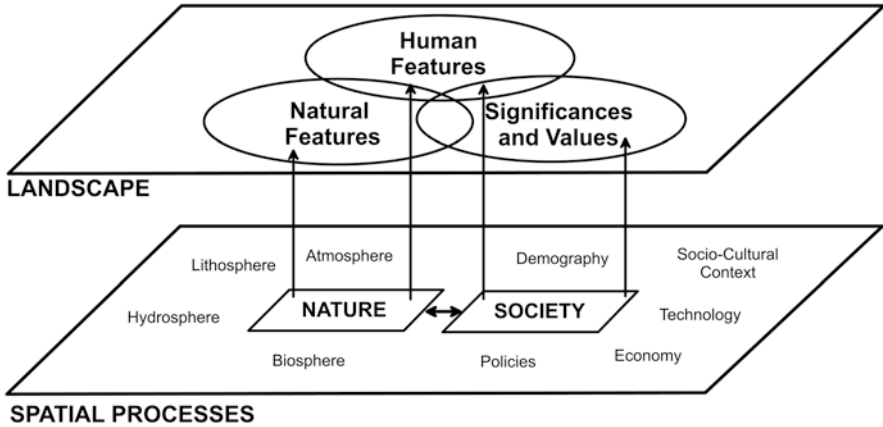


Fig. 3.5 A conceptual model for landscapes (after Castiglioni 1973, cited in Luijk 2012)

general theory is fragmentary and has a hit-or-miss quality to it, and it was hard to understand how various research efforts fit together. Ideas that permeate the field have followed the pattern shown by Smith et al. (2002) for geomorphological research in landscape development in that they conform to the model for scientific change proposed by Kuhn (1962). Major quantum shifts characterise conceptual thinking, rather than a gradual diffusion of ideas and ‘falsificationism’ as advocated by Popper (2005). Brady (2003) has given an excellent assessment of these ideas. Many checklists and photographic inventories have been utilised, and important concepts expressed, for example by, amongst many others, Fines (1968), Leopold (1969), Shuttleworth (1980a, b), Penning–Rowse (1989), Penning–Rowse and Lowenthal (1986), CCW (1996, 2001), TLE (2013).

This twofold landscape approach entails a basal fundament onto which is superimposed the visual landscape, consisting of a three-pronged overlapping Fenneman (1919) system diagram. In essence, these are the natural, anthropogenic and significance/values, (Fig. 3.5) that are assigned to the observed features, the latter is of importance only to society, determining how people view landscapes and has three components:

- The aesthetic sphere.
- The effective sphere *i.e.* landscape is part of one’s own identity.
- The symbolic sphere *i.e.* elements within the landscape are of particular significance to people who perceive them.

Landscape evaluation is strongly rooted in the man–environment tradition and ‘scenery has become a resource’ (Linton 1968, 219) and it is an ‘economic resource and not a dispensable luxury’ (Clark et al. 1984, 34), ‘because it is an accepted component of resource assessment programmes’ (Kaye and Alder 1999, 302–304). Therefore managers need to attempt an evaluation of scenic resources in an objective and quantitative manner (Priskin 2001). Developing a methodology to fit with the constraints of quantification entails measuring the contributions of specific land-

scape elements to overall preference (Buhyoff and Riesenmann 1979) remembering that scenery is a vital component for coastal tourism and drives the economy of many coastal countries.

A sub-section of coastal tourism is beaches and these are worth billions of tourist dollars (Clark 1977) and considered a major player in the tourism market (Houston 2013) and many tourism oriented countries, e.g. around the Mediterranean rim, have developed proactive growth policies along the coastal area (Benoit and Comeau 2005). For example, in Spain, France, Italy and Greece tourism receipts account for some 5% of the gross domestic product (UNWTO 2008), these countries accounting for *'the most significant flow of tourists. A sun, sea and sand (3S) market'* (Dodds and Kelman 2008, 58). California beach visits exceed 567 million/year compared to 286 million to all National Parks USA (Dodds and Kelman 2008). After questioning >200 beach users at Gower, UK, Morgan and Williams (1995) found that scenery was the first choice of prioritised beach aspects; Unal and Williams (1999), questioned 120 beach users at Cesme Peninsula, Turkey, and concluded that scenery ranked second after clean bathing water. Many designated areas, such as National Parks etc., all reflect the scenic component in advertising the beauty of the area.

National and cultural differences in landscape appreciation and preference within the literature are sparse, especially with regard to coastal landscapes. Eletheriadis et al. (1990) found agreement between European nationality groups with regard to the most/least preferred landscapes – but also many significant differences, which were attributed to cultural differences and home environment familiarity. Lyons (1983) found that preferences changed throughout the life cycle: 6–12 year olds were more enthusiastic and less consistent than others were; 12–20 year olds gave a dip in preference levels generally, which rose slightly after the age of 20. From 36 years of age onwards, there was a, slow, downward trend in preference levels. Preferences also changed with respect to gender, sex and residence.

Modern approaches have focussed on development of more detailed specific approaches. For instance: Yamashita (2002) explored the scenic perception between adults and children. His conclusion was that it was the immediate surroundings that children focus upon, whereas adults were more aware of distal aspects, as well as the immediate surroundings; so do scenic evaluations adequately represent children's perceptions?

Fines (1968) and Kaplan and Kaplan (1989a, b) found natural landscapes to be perceived as more distinguished, spectacular and more scenic amongst culturally homogenous participants, suggesting that landscape preferences relate to landscape stimulation, as well as a need to make sense of it. Zube and Pitt (1981) and Zube and Sell (1986) showed that not all cultures shared the same perception of anthropogenic landscapes, suggesting that man might be taught, or implicitly led to believe, that scenic beauty is an attribute of unmodified landscapes (Fig. 3.6). They suggested that environmental experience and landscape familiarity were very important factors in shaping perceptions, the opposite to that found in studies by, for example, Wellman and Buhyoff (1980), Buhyoff and Arndt (1981).



Fig. 3.6 Norwick is a tiny settlement in the [Scottish](#) archipelago of [Shetland](#), located on the island of [Unst](#). During [World War II](#), the [Royal Air Force](#) built a [Chain Home radar](#) station at Norwick. (Photo by Arthur Maxwell)

Zube et al. (1982, 25) pointed out that ‘the first phase of landscape quality research was conducted in a more or less benevolent atmosphere (in both the U.S.A. and Britain) where scenic quality was assumed to be important by national leaders. That phase is ended. To continue in the same theoretical way in present research is to risk loss of consideration of scenic values in future landscape policy decisions.’ Have modern policy decisions followed Zube et al. (1982) warnings, as in order for scenery to take a prime position in political decision making, it must involve making a significant contribution to improving economic/social factors.

Areas of high ecological value usually coincide with areas considered to have significant natural beauty and Lee et al. (1999) proposed that it was possible to assess landscape quality based on vegetation cover evaluation alone. Canters (2002) and Gulinck et al. (2001) documented similar techniques predicting measurable land cover indicators that corresponded with areas of high scenic value. GIS imagery has been to the forefront of modern approaches and in New Zealand, Henderson and de Lambert (1992) suggested that utilisation of GIS overlays on land types be used in conjunction with other assessment techniques. New Zealand scenic evaluation utilises assessment criteria (cultural, historical, etc.) as surveys to identify coastal areas of significant natural character, which makes them less useful for determining strategies for the protection of scenery alone (Houlahan and Findlay 2004).

These examples – and see later ones – highlight the increasingly technical nature of scenic evaluation but fail to address simple issues, such as, variations in people's perception, or the basic inaccuracies in analysing landscapes based on images. Land cover mapping can give a general impression of a site but ground based fieldwork should be incorporated.

Yeomans (1986) suggested that when individual experts are the primary determinants of scenic evaluation the reliability issue could be ameliorated by repeating assessments made by others and cross checking results, as the aesthetic experience of individuals range considerably. Smith and Theberge (1987) highlighted the need to re-evaluate any technique based on assumptions, as perceptions vary over space through time. The Landscape Institute (2011) argued that expert scenic assessment incorporates a balance of qualitative/quantitative judgment to increase credibility. Palmer and Hoffman (2001) researched the implications of a US Supreme Court decision requiring experts to provide reliable and valid assessments when providing evidence. They found that few reports contained such assessments and some that did had alarming results. Dakin (2003) commented that one should go beyond the use of experts and participation by the wider public and feedback of their perceptions helps to produce better environmental outcomes. In the USA, scenic assessment implementation has caused some concern and a shift has occurred from 'visual resource management' determined by expert based assessment to a more community focused and public participatory approach.

Many national bodies have incorporated scenic assessment studies as part of wider resource management strategies. The Australian strategy for locations with outstanding scenic quality was based on physical parameters and as a result, a number of coastal reserves have been established. This has been a difficult process due to the intersection of public and private land for management and planning (Harvey and Caton 2010).

In essence, scenic assessment has had a long and chequered history in that landscape descriptions appeared in many a Victorian explorer's notebook, as well as military manuals. A voluminous literature exists on this general topic, which rapidly shrinks when the coastal scene is involved, as formally coasts were primarily seen as having only ecological value (Sheail 1984). During World War II, a UK coastal scenery inventory and scientific interest assessment led in 1973/4 to the founding of the England and Wales Heritage Coast movement (Steers 1944). This originally had 27 designated areas but now has 45 and the organisation manages some 34% of the coastline of England and Wales, UK. with an emphasis on scenic beauty.

It was in the 1960–80s that a flurry of papers occupied themselves with the question of 'how does one assess scenery?' Many authors/authorities have written about the problems using a myriad of techniques, such as, Shafer et al. (1969), Fines (1968), Linton (1968, 1982), Leopold (1969), Shafer and Meitz (1970), Coventry-Solihull Warwickshire (1971), Robinson et al. (1976), Carlson (1977), Briggs and France (1980), Buyoff and Arndt (1981), Zube et al. (1982), Penning Rowsell (1982, 1989), Williams (1986), Countryside Commission (1987, 1993), CCW, (1996, 2001), CoE (2000), Ergin et al. (2002, 2006), TLE (2013). A summary for some of the above is given below.

3.3 Some Existing Scenic Methodologies: A Review

Though this be madness, yet there is method in't. W. Shakespeare, Hamlet, II, ii, 237

Evaluation techniques cover a spectrum from those based upon subjective landscape assessments by individuals/groups e.g. Shafer et al. (1969) or via a landscape's physical attributes e.g. Leopold (1969). Arthur et al. (1977) classified them into descriptive and public preference inventories, with quantitative and non-quantitative sub-sections for both models. The former has the largest category of techniques (quantitative and qualitative) for landscape assessment and these are usually applied by experts in an objective manner, e.g. Leopold (1969). A critique has been that landscape components are arbitrarily identified by experts, which is not the case in the checklist technique given in this book (Chaps. 4 and 5), as the 26 parameters identified were obtained as a result of many public questionnaire surveys. These surveys relate to Public Preference Models including psychological and phenomenological, e.g. Kaplan and Kaplan (1989a, b), Shuttleworth (1980a). Subjective assessment by many individual users can cover the range of perceptions involved for the total landscape and quality/beauty is discerned through judgement of these preferences (Jacques 1980). Other researchers have used different techniques to sub-divide assessments, e.g. direct and indirect (Briggs and France 1980), preference and surrogate components (Croft 1975), but it all revolves around experts vs. subjective public viewpoints, and coastal management must surely have an objective methodology in order to make meaningful decisions regarding any phenomena, and not only for scenery.

Fines (1968) linked photographs to landscape features in map grid squares and identified landscape units. The method involved evaluation of 20 'still' black and white photographs by a group of 45 representative people (what are these?) split into sub-groups according to sex, training and experience in a design discipline of each person. The mean value for each view was calculated for each sub-group and the highest mean value divided by the lowest gave a six category range of values, from unsightly (0–1) to spectacular (16–32). In the UK 18 was the highest obtainable value found in Highland areas; 12 in Lowland ones, with townscapes being ranked lower than natural landscapes.

Several disadvantages resulted from this study, mainly from lack of definitions and an assumption that all participant viewpoints were the same and more importantly it was assumed that photos are surrogates of scenery, a point not proved in the study. On this point it is interesting to note the following comment: *'An article with a definite tendency is for the most part read only by people who can already be reckoned to this tendency. At most a leaflet or a poster can, by its brevity, count on getting a moment's attention from someone who thinks differently. The picture in all its forms up to the film has greater possibilities. Here a man needs to use his brains even less; it suffices to look, or at most to read extremely brief texts, and thus many will more readily accept a pictorial presentation than read an article of any length. The picture brings them in a much briefer time, I might say at one stroke, the enlight-*

enment which they obtain from written matter only after arduous reading' (Hitler 1974, 427). It appears that Hitler was a fan of pictorial representation.

Shafer et al. (1969) and Shafer and Meintz (1970) used personal interviews and photographs (100, 8" by 10", black and white) in the USA to design an equation of landscape evaluation. Preferences scores were obtained *via* adding the resulting 50 rank values for each photo and the total for each photo was designated the preference score Y. From these they found that 10 significant terms explained 66% of the variation in landscape reference scores. They postulated six different landscape types based on: perimeters of immediate vegetation (individual leaves, not such fine detail, unable to distinguish vegetation shapes); and area (intermediate vegetation, water, distance of non-vegetation sector). The authors urged caution for resource planners using the technique.

Linton (1968) produced a composite assessment of scenery in Scotland and argued that appraisal was founded on scenic elements that influence one's reactions to it. He recognised two types.

Landform landscapes based upon relative relief, slope, abruptness, frequency, dissecting valley depth. He argued that processing landscape landforms was a tedious process, so substituted a subjective relief appraisal of features on 10" to the mile OS maps, producing; mountains (8), bold hills (6), hills (5), plateaux (3), low uplands (2), lowlands (0).

Land usage – urban/industrialised (–5), continuous forest (–2), treeless farmland (1), moorland (3), varied forest/moors (4), richly varied farmed landscapes (5), wild (6).

Summation of the above bracketed numbers enabled a scenic resource map to be drawn. Relief was the dominant factor and the distance over which the view extended was not defined as was the differing quality of urban landscapes. This was very subjective and water was ignored.

Leopold's (1969, 4) main aim was to reduce subjectivity so that results, '*could be used in many planning and decision making context,*' carried out by ranking parameters (on a 1 to 5 scale *i.e.* bad to good) producing calculations/graphs, which rated chosen sites according to their aesthetics. This seminal paper by Leopold (1969) stressed the value of uniqueness of scenery and developed an index of river and landscape character based on physical, biological and human parameters using some western USA rivers, e.g. the Snake, as an example of the technique. The essence of his philosophy was that any landscape that was unique in either a positive/negative manner is of more significance than one that is common. He was well aware of the techniques shortcomings, e.g. a uniqueness score does not necessarily indicate attractiveness or unattractiveness, it does not differentiate between the significance of different factors, but was only one characteristic of the environment (what about intensity, novelty, etc.?). Some of Leopold's (1969) factors were directly measurable, others estimated and each observation was assigned to one of five attributes – see Chaps. 4 and 5. No weightings were given and each site parameter was assigned a uniqueness ratio. The validity of the scoring system cannot be proven but its use by previous observers has shown it to be consistent and operation-

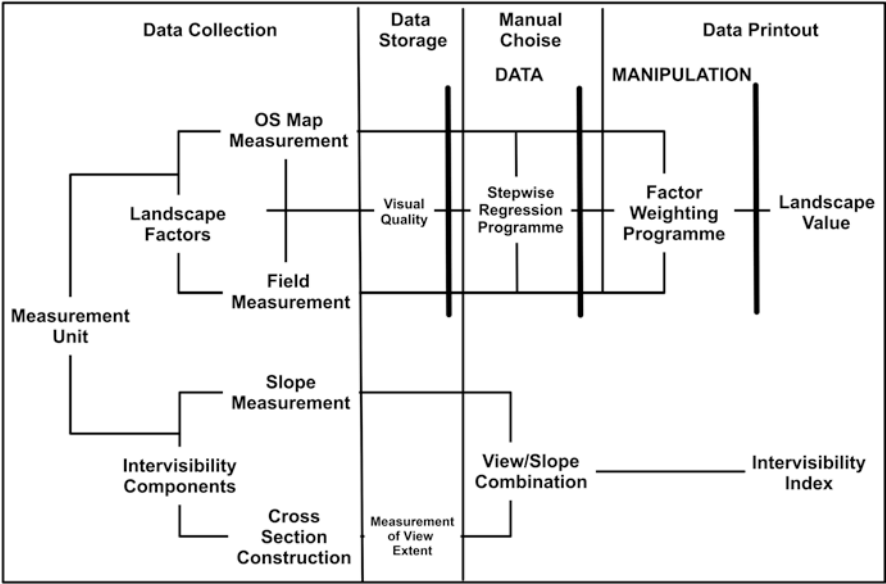


Fig. 3.7 Landscape evaluation technique. (Based on the Coventry Solihull Warwickshire Study, 1971–75, 123)

ally reliable. This was the seminal paper that resulted in the scenic assessment technique given in this book (Chap. 4). Although continued knowledge acquisition is necessary, there is an increasing need for innovative manipulation so his original checklist was amended.

The Coventry-Solihull-Warwickshire, UK (1971) study derived an aesthetic directory from assessment of landform, usage and land feature measurements culminating in an index of landscape value (Fig. 3.7). The base unit was the square kilometre and they delineated 24 factors, e.g. mining, water, railways, hedgerows, listed buildings, density, roads, farmland, residential, woodland. Specific examples being *landscapes worthy of conservation* (+60 to +80), e.g. parks (Arbury, Umberslade); *minimum acceptable residential areas* (–40), e.g. Shirley, Cranmore Industrial estates; *average urban areas* (–10), e.g. Otton, Tile Hill; *Landscapes comparable to Areas of Outstanding Natural Beauty* (+90 to +120), e.g. Weston Park.

Multiple regression analysis was performed to discover how far the variation between measured factors of 1 km² and those of another accounted for variation between visual quality scores subjectively given to those squares. This was one of the few techniques when weightings (derived from subjective surveys by the planners) were applied to each factor and these were multiplied by the incidence of the measured factors to give a landscape value, which ranged from –120 to +120 and represented the inherent quality of each square kilometre. Databases were set up in a GIS format and analysed via techniques, such as, TWINSpan. Most sub-regions

fell in the farmland category but results closely corresponded with subjective surveys, not surprising given the high multiple correlation coefficients found. Home interviews were also undertaken classified by Gross Rateable Value bands (£30 and under, £31–56, £57–100 and £101 and over) and 117 responses were recorded with 12 refusals; houses empty/not located etc. amounted to 31.

Zube et al. (1974) working in the Connecticut River Valley, USA used 56 landscape settings of the area, which were deemed to give a representative coverage of types, and identified 23 landscape dimensions as being significant determinants of landscape quality. Each of these 56 settings was measured, using photos and topographic maps for: landform, area, land use area, edge and contrast, water and view, and 307 people took part in the study. One hundred and twenty four correspondents evaluated eight of the 56 sites and described them from a 51 item checklist together with an 18, seven point (1–7), bi-polar semantic differential scale (varied), mountainous, common, unusual, tidy, closed, open, etc. Panoramic photographs of these sites were then assessed as to scenic quality. Colour photos of all 56 sites were also evaluated by a Q-sort procedure by the remaining 183. A strong correlation was found between on-site analysis and photographs. There was an unexplained variance between physical elements and perceptual responses. A series of papers by Buhyoff and Riesenmann (1979), Buhyoff and Wellman (1980) and Buhyoff and Arndt (1981) later investigated the problems associated with dimensionality as significant determinants, culminating in Kroh and Gimblett (1992) who found little relationship between live scenery viewing and pictures, arguing that multi-sensory experiences were very important.

However, as regards photos being scenery surrogates, Williams and Lavalley (1990) showed conclusively that this was perfectly acceptable if they viewed the same scene taken with a 50 mm camera lens (NB the human eye field of vision is 145°). To date this has not been done. They took three groups of people (skilled, semi-skilled and laymen; $n = 45$) to 28 coastal sites. Two pictures were shown: one of 'heaven' (positive score + 100; serene, lovely coastal view) and one of 'hell' (negative, score – 100; industrial coastal cement factory). A box was then fitted to the observer's head so that the view was restricted to that of a 50 mm camera lens. Observers were then asked to look at a scene, evaluate it and give a value with respect to the two control pictures. Scores were then standardised and a colour photo taken with a 50 mm lens of the exact scene. Two weeks later the same observers were shown photographs taken on the field trip and asked to repeat the scoring. Statistical testing showed no differences between groups. Dupont et al., (2015) have done an excellent review on this topic.

Penning-Rowsell (1989) assessed public attitudes and perception in the UK as did Pendleton et al. (2001) in the USA. Penning-Rowsell (1989) investigated the evaluation techniques of various UK County authorities, which involved five questions sent to 165 authorities of which 93 authorities had not used any assessment in the past 5 years. Sixty-seven percent replied and 22% of these used some type of systematic evaluation procedure, while 13% indicated reservations of the techniques used.

With the rise of GIS, Bishop and Hulse (1994) using a raster data base of a 6 km square in Oregon, and Brabyn (1996), demonstrated the potential of GIS for analysis of scenic beauty. IEMA (2011) showed that the iterative design approach to Environmental Impact Assessment (EIA) was commonly recognised and its value widely accepted by practitioners.

In essence, scenic evaluation emerged mainly in the late twentieth century, as a tool to separate the classification and description of landscapes. It was the process of identifying the importance of a particular landscape, landscape type or landscape feature, by reference to specified value criteria, i.e. it is one form of landscape appraisal to identify value criteria against which value can be determined.

In the twenty-first century this morphed into Landscape Character Assessment (Fig. 3.8), defined as, ‘*a distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse*’ (LI. 2016) of which scenery plays but a part. It identifies/explains the unique combination of elements and features (characteristics) that make landscapes distinctive – and this is still evolving (Daniel 2001; Swanwick 2002; Tudor 2014).

Earlier UK Countryside Commission (CC) reports (1987, 1993) confirmed that landscape character assessment factors were natural (e.g. geology, soils), cultural (e.g. land use, settlements), aesthetic (visual, sounds) and associations (e.g. history). In Wales, UK these have all been incorporated into the LANDMAP (Landscape Assessment And Decision Making Process) system, via, a partnership programme between the Countryside Council for Wales (now Natural Resources Wales) and all the Unitary and National Park Authorities of Wales (CCW 2001). It was a benchmark publication and a tool for assessing landscape resources to aid decision-making and natural resource planning at a range of levels (local to national) where landscape characteristics, qualities and influences on the landscape are recorded. The scales utilised are commonly:

- National and Regional, typically at 1:250,000 (broad patterns in landscape character variation).
- Local Authority, usually at county, unitary authority or district level, 1:50,000 or 1:25,000 (identifying landscape types and/or areas.)
- Local or Site Level, normally at 1:10,000 or larger scales.

The core of LANDMAP comprised five spatially related datasets recording information about the characteristics, qualities that influence the geology, habitats, visual and sensory, historical and cultural on the landscape, which is managed through a complete Geographical Information System. The areas are represented as single polygons (or polyline) in a single map layer. Therefore, LANDMAP is represented by five map layers in a GIS format. Also utilised were aerial photographs, preferably orthographically corrected, and available as continuous digital coverage for a study area (not as individual tiles) and local/unitary development plans/documents, e.g. landscape assessments. A hierarchical classification system was utilised aiming to classify landscape into areas of distinct Visual & Sensory character at four separate levels (Table 3.1). The landscape qualities/characteristics of discrete areas are first mapped and survey records and management recommen-

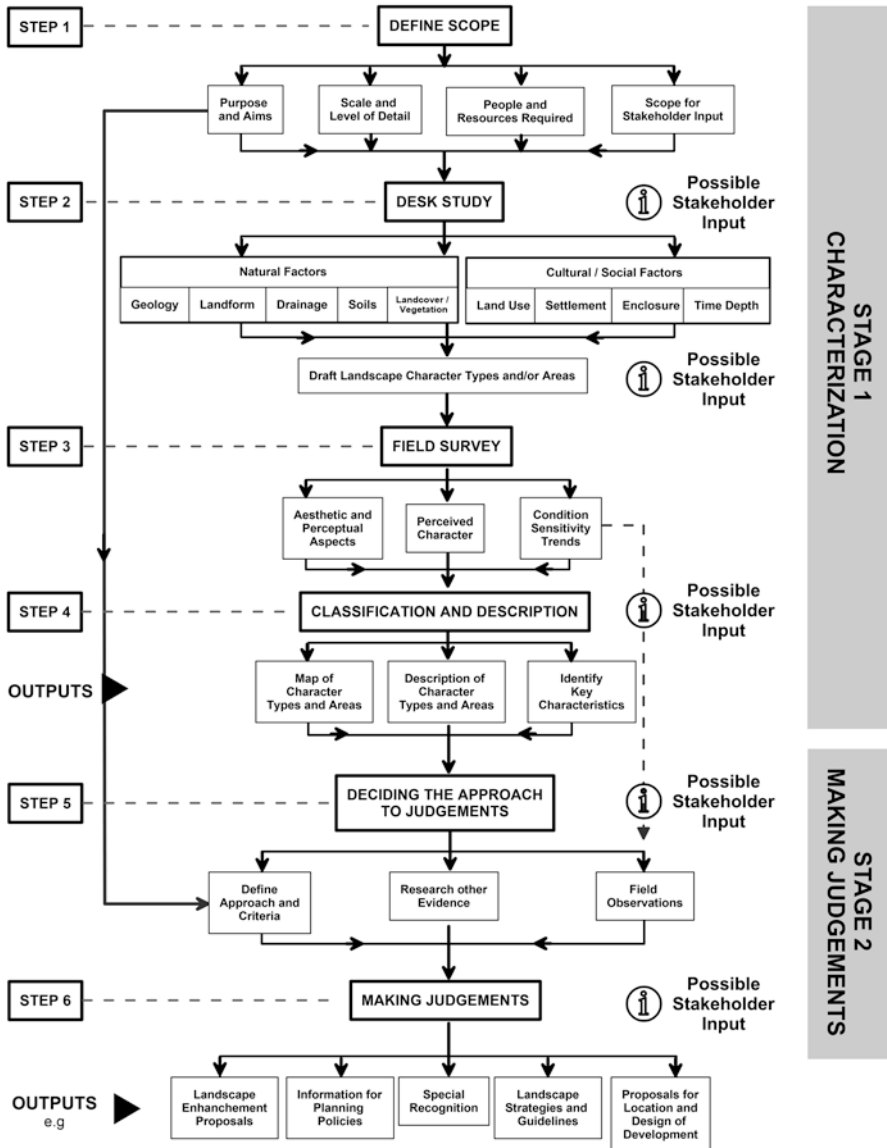


Fig. 3.8 Landscape character assessment. (After Swanwick 2002, 13)

datations and criteria based evaluations added. The terminology differs slightly from that of Landform Character Assessment (LCA) and Fig. 3.9 indicates the relationship.

Overlays can now be produced utilising remote-sensed satellite data, showing each variable on an ordinal scale, which can be combined to identify various feature sets (physical characteristics and land cover – Fig. 3.10).

Table 3.1 Hierarchy levels for landmap

Level 1	Level 2	Level 3	Level 4
Broad landform and land cover	Landform	Land cover	Detail – Location/scale/exposure/settlement

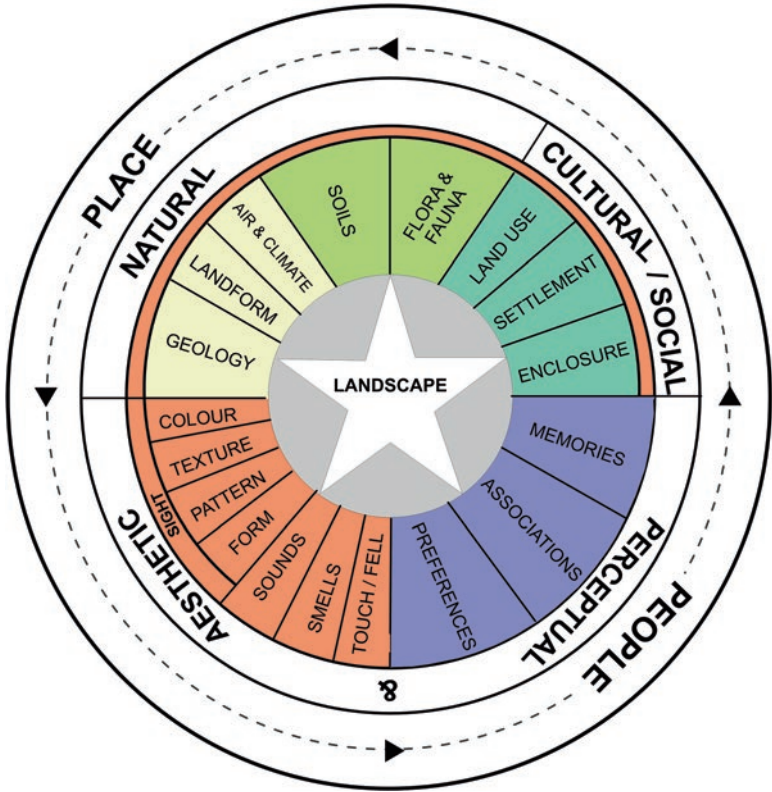


Fig. 3.9 The relationship between Landform and LCA. (After Tudor 2014)

Landscape Character Assessment is now being increasingly used to inform urban, or townscape, assessments, together with Seascape Character Assessments (Briggs et al. 2011; NE 2012; Fig. 3.10). The Marine and Coastal Access Act 2009 (National Archives 2009) and the Marine and Coastal Act of 2011 are a policy statements which specifically established the concept of ‘Seascape’ i.e. landscapes with coastal/ seas views, and coasts together with the adjacent marine environment which have, natural, cultural, historical and archaeological links with each other (NE 2012).

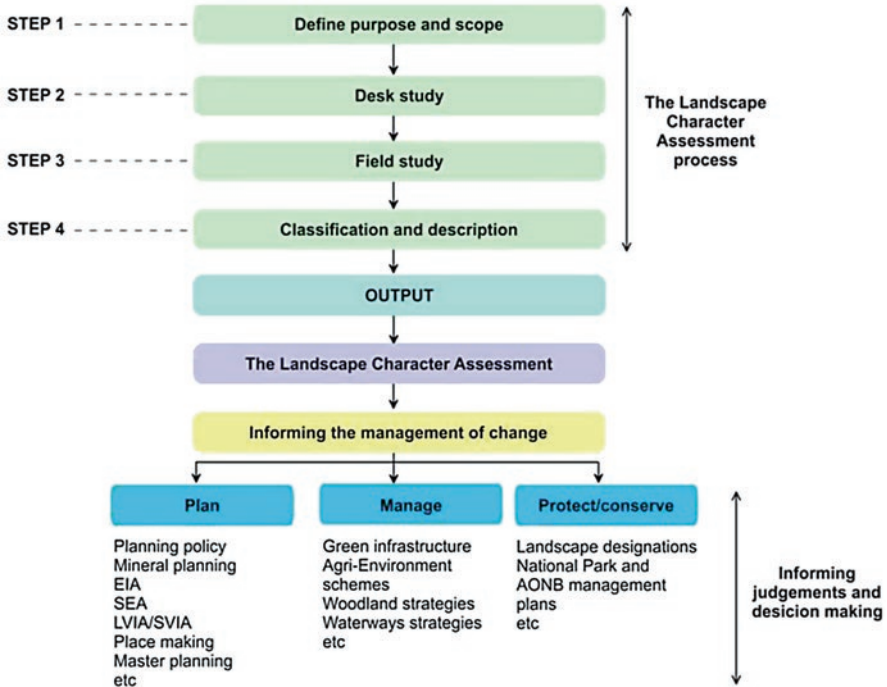


Fig. 3.10 Landscape Character Assessment and making judgements. (From NE 2014)

3.4 Conclusions

A wise man that had it for a byword, when he saw, men hasten to a conclusion. Francis Bacon, Of Dispatch, 25

Numerous scenic assessment techniques are in existence and a few have been enumerated in this chapter. Virtually all checklists used to quantify scenery or beaches have two major failings: no weighting of parameters, e.g. the annual Dr. Beach ratings of USA beaches (Leatherman 2016) and no viewers preferences are taken into account, it is usually the ‘experts’ opinion. All form a spectrum where extreme techniques are based on subjective assessments of landscape quality by individuals or groups and at the other extreme, by methods, which use physical attributes of landscape as surrogates for personal perception. The essence of attention is that it is elective. ‘We can focus on something in our field of vision, but never on everything. All attention must take solace against a background of inattention.... To see all, we must isolate and select’ (Gombrich 1965, 515). So it seems as if scenic beauty can be viewed rather as one would regard a Rorschach ink blot test!

Dearden (1985) argued that there is seemingly a considerable diversity of philosophy and approach in published landscape assessment papers/books, even though all were concerned with understanding landscape and its visual quality, concluding

that landscape quality is not a simple concept and cannot be fully appreciated through application of one universal approach or technique. It is NOT simple but some 30 years later much progress has been made. The technique given in Chap. 4 (scenic parameter selection, weightings, fuzzy logic to deal with uncertainties), is an attempt to synthesise the various strands of research mentioned above with respect to scenic analysis.

However, the basic theme of Appleton's (1975a) seminal paper still holds true today, i.e. there are many practitioners and techniques for landscape assessment but still a theoretical vacuum exists. Based on the above, Appleton's (1975b) classic book represented a search for landscapes that would incite an aesthetic response to man and covered a spectrum ranging from philosophy to ethology. Dewey (1929, 14) argued that *'a theory of the place of the aesthetic does not have to lose itself in minute details when it starts with experience in its elemental form. Broad outlines suffice.'* We still await the connecting syntax between experience and landscape, remembering that *'connecting with immediate surroundings, through tactile and sensory engagement, is so basic and constant'* (Clark and Clark 2009, 311); or as Berger (1972) put as his final comment *'all should be gauged against your own experience.'*

Therefore the relationship between what one sees and what one knows is seemingly not settled. However, the final words of this chapter should be those of one of the great pioneers in the landscape field, one who posed the question, 'what' does one like in landscape and 'why?' *'It is true that the theory underlying the judging of a fine wine or a good piece of sculpture is probably as obscure as that which underlies the evaluation of landscape. In those arts, however, we still have some faith – possibly misplaced – in the ability of the expert to recognise excellence, however defined'* (Appleton 1975a, 122).

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