

<Summary of the Selected Master's Thesis>

# A Study on the Quantitative Analysis and Description of Landscape Character

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### I. Introduction

The objective of this study is to attempt a quantitative analysis and description of landscape character, which makes it possible to express landscape effects in objective terms and to rationalize the uses of scenic resources by providing the basic materials for natural park planning.

Recently there has been a growing interest in recreation, conservation, open space, and a myriad of other ways to improve the *quality of environment*. The landscape aesthetics, which is an important element of the quality of environment, however, has been described only in subjective artistic terms.

Where there is an apparent harmony or unity among all the natural elements, it might be said that they possess a naturally produced *landscape character*. The total reaction which the perception of landscape may have upon a man is called *landscape effects*. However the whole matter of landscape effects appear as a matter of taste and is individual to the same extent that taste is individual. Therefore, it is necessary to separate facts from emotions in relation to landscape and to make a means of quantifying landscape character to describe it objectively.

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## II. The Method of Landscape Analysis

This study is indebted to L. B. Leopold's landscape analysis technique. The method is composed of three phases. First, survey or measure the factors in the field which constitute and/or influence the landscape effects and compare these factors, and quantify the degree of differences among sites to describe the uniqueness of landscape effects of each site. Second, choose checklist factors for their particular significance with regard to the landscape effects to the viewer, to get the scale of valley character, scale of river character and scale of landscape character graphically. Finally, compare and interpret these results among each sites chosen for comparison. In this study this technique is applied to the landscape character of the Inner-Seolag(內雪嶽) Mt. Valley.

### 1. Selection of landscape composition factors.

Three factors appear relevant to landscape aesthetics. The first group involves the physical features of an area. The second group includes the biological features of the regions; and the third group encompasses, what L.B. Leopold called, *human interest factors*, which are influential in determining how the landscape impress us.

### 2. Scaling of evaluation categories

One of the objectives of the study was to eliminate personal subjectivity in landscape analysis. Consequently, the evaluation categories of all factors in the checklist have only a descriptive function: that is, to merely assign different evaluation categories to each of these location.

## III. Case Study: Landscape analysis of the Inner-Seolag Mt. Valley

Mt. Seolag which comprises an area of 344km<sup>2</sup> in *Gangweon*-province was designated as a national park in 1970. It is divided into Inner-Seolag of west district and Outer-Seolag of east by the backbone of the Taebag Mountains.

The Outer-Seolag Mt. Valley has a good access. Therefore, its scenic quality has been very much deteriorated by visitors and other users. On the other hand, the Inner-Seolag Mt. Valley has been inaccessible to the short holiday-tours and its natural landscape character is well preserved. So this study was conducted in the Inner-Seolag Mt. Valley.

### 1. Site selection and evaluation

Seven sites in the Inner-Seolag Mt. Valley were chosen for comparison. All the sites

were where the streams lie adjacent to road or crossing it. Each site was physically evaluated by standing at the river, thus providing uniformity in the way the observer looked at the environment.

## 2. Landscape analysis

The philosophy underlying the scheme is: *Landscape that is unique either in a positive way or negative way is more significant than one that is common.* A place of great scenic beauty is of importance because of its scenic qualities. On the other hand, a unique site which is extraordinarily unattractive also has a significance, but in the opposite sense.

### A. Uniqueness ratio.

Compare the sites, factor by factor, in order to determine the relative uniqueness of each factor at each site. The uniqueness ratio for the river in question is equivalent to the reciprocal of the number of sites sharing the category value.

### B. Total uniqueness ratio

Adding uniqueness ratio for all factors of a given site yields a total uniqueness ratio. The total uniqueness ratios for the seven sites may be compared with each other; the higher the ratio, the more unique impression can be obtained at the sites. The results of this uniqueness technique, when applied to the seven Inner-Seolag Mt. river valley sites, are given in Table 1.

Table 1. Total Uniqueness Value

Site Number	Location	Total Uniqueness Ratio
1.	Baegdang Valley, 200m below Kang-kyo Bridge	16.50
2.	Baegdang Valley at Baegdang Mt.Villa	16.52
3.	Gomkol Valley, 300m above junction with Suryomdong Valley	14.31
4.	Suryomdong Valley, 600m below Youngsiam Temple ruin	11.58
5.	Gayadong Valley, 200m above Sury omdong	13.09
6.	Gugogdam Valley, 1.3km above Suryomdong Shelter	13.76
7.	100m below Sangpog Fall	22.51

The uniqueness ratio technique is objective in that it does not distinguish whether a given site is uniquely aesthetic or uniquely unaesthetic.

On further consideration of the list of forty-seven factors, some are far more important than others, and therefore, selected groups of the factors can be used for other analysis.

### C. Landscape effects resulting from landscape character.

In this study checklist factors were chosen for their particular significance with regard

to the landscape effects to the viewer. Although the selection of factors does involve personal judgment, the selected factors themselves remain independent of this judgment.

(1) Scale of valley character

Valley character might be conceived as a combination of the scale or grandeur of the landscape, the availability of distant vistas, and degree of urbanization.

The method of obtaining a scale of valley character for each of the seven sites is dependent upon a diagram, as shown in Figure 1. "Height between the site and the highest point within visual range of the adjacent mountain" plus "width of valley" equals "landscape scale". This value plus the length of straight portion of the valley floor where one can see up and down for long distance, so called "scenic outlook" equals "landscape interest". When this is combined with "degree of urbanization", it yields

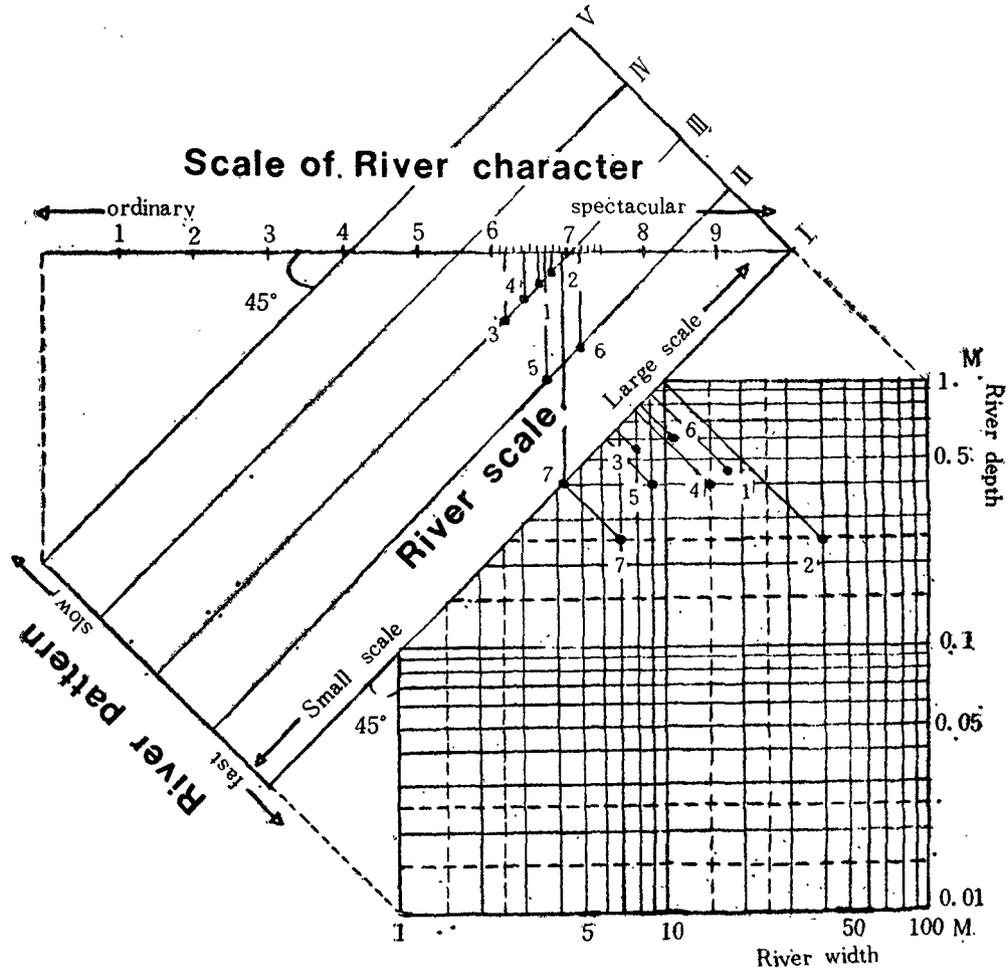


Fig.1. Scale of valley character.

“scale of vally character”, which is a measure of the viewer’s aesthetic impression of the landscape at each site.

(2) Scale of river character.

Using a similar analysis on the rivers themselves, we can obtain a measure called scale of river character. Experience indicates that the grandeur or majesty of a river is dependent upon a combination of it’s size and the speed of flow. The method of obtaining a value for scale of river character is shown in Figure 2. “River width” plus “depth” equals “river scale”. This value combined with “river pattern” yields the “scale of river character”, a measure of the viewers aesthetic impression of the river at each site.

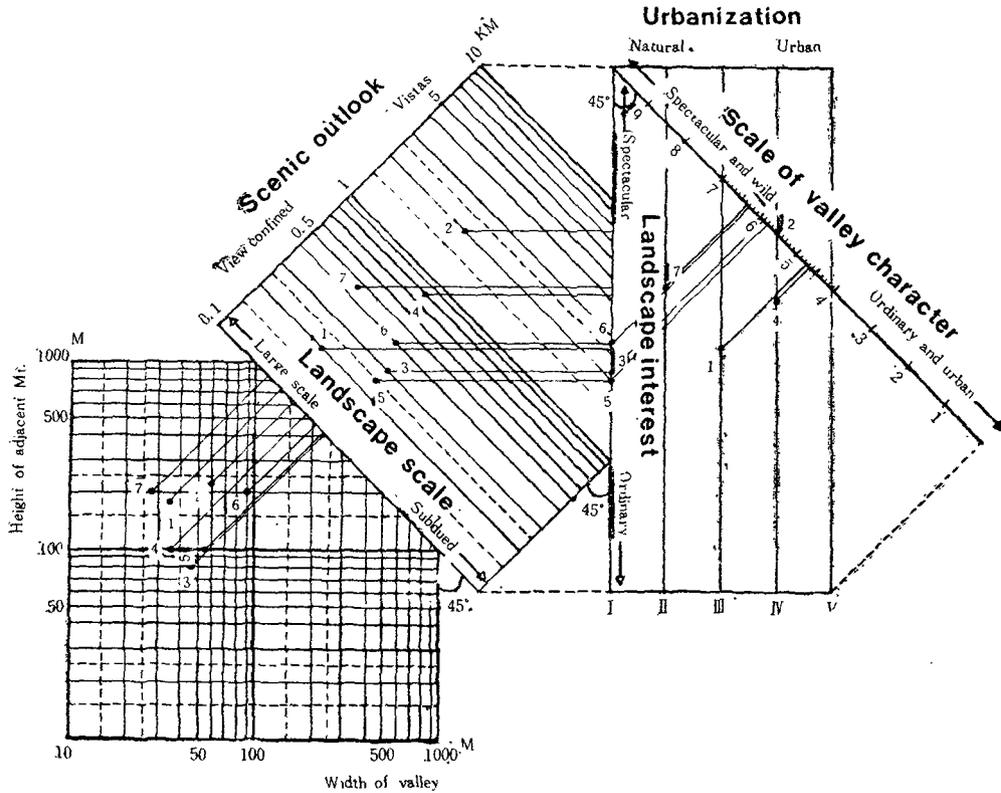


Fig.2. Scale of river character.

(3) Scale of landscape character.

Landscape character of a river valley can be conceived as the combination of valley character and river character. Using a graph to compare the seven sites according to both valley character and river character Fig. 3, and thereby obtain a final rank reflecting a total of seven of the factors chosen from among the forty-seven on the

initial checklist.

D. Comparison of the Inner-Seolag Mt. Valley with valleys in the other national parks.

We have discussed the landscape character of Inner-Seolag Mt. Area. It is useful to compare this area with valleys in the other national parks to learn more vividly the landscape character of Inner-Seolang Mt. area.

The same kind of data that were used in the construction of the graph just described were tabulated for two best and worst sites from Inner-Seolag Mt. area, each in combination with four other valleys, two from Outer-Seolag Mt. and one from Mt. Gaya and Mt. Jiri each, where famous for its scenic beauty. A similar set of graphs was derived, the final results are shown in Figure 4.

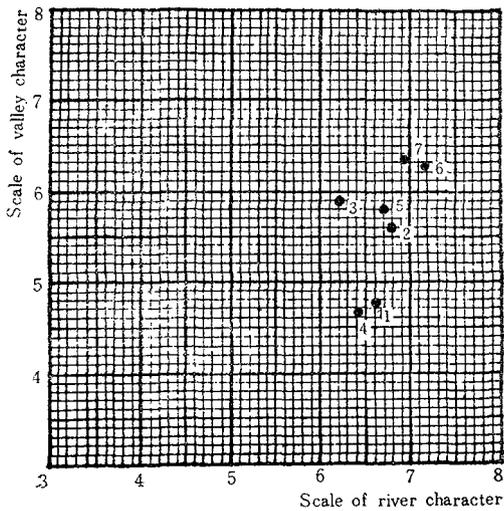


Fig. 3. Landscape character of Inner-Seolag Mt. Valley.

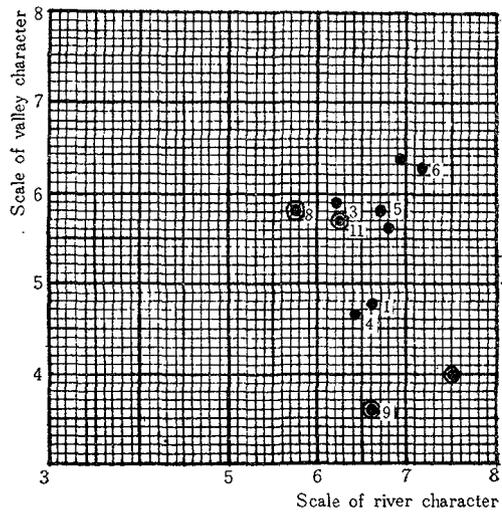


Fig. 5. Comparison with Others.

- 8. Yangpog Fall(Outer-Seolag)
- 9. Bisundae Butt(Outer-Seolag)
- 10. Hongryu-dong(Mt. Gaya)
- 11. Piagol Valley(Mt. Jiri)

3. Interpretation of the results.

A. Landscape character of the Inner-Seolag Mt. Valley.

As can be seen in Table 1, the site 7, near the Sangpog Fall, showed the highest total uniqueness score, and the site 4, 5, and 6 the lowest. Site 7 is characterized by narrow valley floor, high adjacent mountains, availability of distant vistas, and the fall itself. But site 6, from Gugogdam Valley, has more spectacular scenery in the scale of landscape character, far less score in total uniqueness ratio.

The reason is as follows. Site 6 and 7 are the two most spectacular spots in Inner-

Seolag Mt. area, site 6 as typical natural landscape (low score of total uniqueness ratio), and site 7 as spectacular but deteriorated by human use (high score of total landscape ratio and scale of landscape character).

The low score of total uniqueness score is the sites where the natural landscape is well preserved, and the high score is the sites where the landscape character is deteriorated to some degree: high in total uniqueness score is mostly caused by high score in human interest factors.

B. Comparison of the Inner-Seolag Mt. Valley with valleys in other national parks.

Site 6 and 7, from the Inner Seolag, Mt. Valley is the most spectacular points. Site 9 and 10 are more unattractive than site 1 and 4, the two least spectacular points from Inner-Seolag Mt. area.

Though the sites chosen for comparison may not be proper representations of all the national park valleys, at least we can conclude that the Inner-Seolag Mt. Valley is not inferior to any other place in Korean national parks, also what the standard deviation of total uniqueness ratio between sites of the Inner-Seolag Mt. Valley ( $s=1.93$ ) is bigger than other valleys selected for comparison ( $s=1.23$ ) tells us that this area has more diverse landscape character.

## IV. Conclusions

### 1. Landscape character of the Inner-Seolag Mt. Valley

The natural landscape character of the Inner-Seolag Mt. Valley was more or less deteriorated. But this region is far well preserved than any other sites selected for comparison from other national parks of Korea. The landscape character of the Inner-Seolag Mt. Valley is characterized by high mountains, narrow valleys, distant views, least urbanization and the grandeur of river itself, which means that this area is a very attractive place to experience change and variety.

### 2. Direct expression of landscape effects.

Environmentalist or preservationist describe social interest in landscape integrity in monetary terms or visitor day. But the aesthetic quality of landscape is not in direct proportion to the amount of time or money spent in the given area. Landscape effects is based on behavioral relationships between the observer and his visible environment. As this study is one of the method to describe the landscape character objectively, it is

possible to express the landscape effects directly through the analysis of correlation between the result of this study and degree of satisfaction or achievement of the visitor.

### 3. Recommendations for the development of the Inner-Seolag Mt. Valley

There are often some conflicts between preservation and use. Usually the quality of natural landscape character deteriorates by intensive use. The Inner-Seolag Mt. Valley has one of the most well preserved natural landscape and value of maintaining its high scenic quality. So, it is desirable to control mass uses and installation of artifacts, to save the best of this area and the facilities instilled with diversity in the mass facility area, and to repeat these qualities in the construction materials that go into the new.

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