A Study on the Method of Using Topographic Formations in the Landscape Design of Japanese Gardens in Hilly Terrains

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Abstract: - In modern cities, people generally have the desire to strike a proper balance between man and nature. This paper aims to discuss the method of using topographic formations in landscape design, particularly focusing on three topographic functions: enclosure forming, viewpoint settings, and view settings. We selected Japanese gardens as case studies and adopted a three-layer model to classify a landscape design based on topographic functions, site planning, and architectural planning. In Jyojyu-in, the unique topographic condition is utilized to form an enclosed space and to realize both a deep mountain view and a prospect view. In Jisho-ji, the unique topographic condition is utilized to form an enclosed space and construct three different views.

Key-Words: - Topographic formation, Japanese garden, Enclosure, View setting, Viewpoint setting, Kyoto

1 Introduction

In modern cities, people generally have the desire to strike the proper balance between man and the natural environment through the means of landscape planning or design. In many traditional Japanese gardens, it is possible to be in close proximity with the natural landscape, even though the garden is located very close to the city. Previous garden designers seem to have succeeded in properly utilizing the topographic conditions of their surroundings to create natural scenery on a large scale. It is apparent that they excel in gauging the scenic characteristics and potential of the topographic formations, planning the site, and creating designs to bring to realization this potential.

This brings us to their intention behind using topographic formations. Many researchers studied Japanese gardens in the past [1)2)3)], but they rarely discussed topographic functions.

Japanese gardens were traditionally not created merely for the purpose of visual satisfaction; they had greater significance. Gardens were sometimes used as training places by Buddhist monks and also as ideal places of seclusion for those who desired to be alone. To meet their demands, technique and pattern of landscape designing had been sophisticated a method of showing large scale and deep natural landscape, and of making an isolated place, and hiding observers not to be seen.

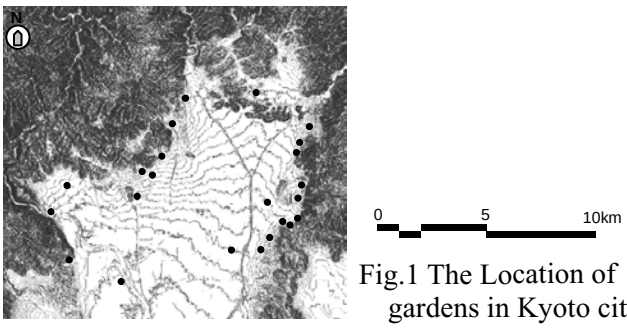


Fig.1 The Location of gardens in Kyoto city

Thus, this paper aims to discuss a method of utilizing topographic formations in landscape design. In this paper, by way of case studies, we examined two Japanese traditional gardens—Jisho-ji temple and Jyojyu-in temple—located on the hilly terrain verged to Kyoto city (Fig.1).

2 Three-layer model analysis

The characteristics of scenery can be analyzed from two viewpoints. The first type of characteristics comprises visual objects and their compositions, and the second type is the perspective wherein an observer views the scenery. It is more important to discuss the latter. Further, these properties are classified according to three scales—large to small scales—and stages of landscape planning—topographic scale, site planning scale, and architectural scale.

2.1 Topographic functions of forming scenery

In the Japanese gardens located in hilly terrains, the surrounding topographic formation characterizes the scenery in a definite manner. Garden designers are required to gauge the unique topographic characteristics of this land and its potential. Fig.2 shows the visual distance and commanding angles of mountains that are measured from different viewpoints in the garden. High, distant mountains tend to be used as visual objects, and low, distant mountains tend to be used for making ambient vision (Fig.3: Ohno,1993) as elements of space structure. Mountains commanded at a small angle tend to function as an attached element of scenery. Moreover, mountains commanded at a large angle tend to serve as the chief element of the spatial structure. Distant mountains that are commanded at a small angle are often used for making "*Shakkei*"—borrowed scenery. This paper focuses on the ambient vision and spatial functions of low mountains that are commanded at a large angle.

In order to determine potential topographic functions, we consider three functions: (1) forming an enclosed space, (2) composing a viewpoint, and (3) finding a visual object.

1. Forming an enclosure is considered to be the first condition when creating a Japanese garden (Shinji, 1986). We often see Japanese gardens surrounded by mountains or hills. Topographic enclosures may enable the conversion of a protected space into a private retreat.
2. Topographic formations on the ground, such as perches, ridges, ravines, and cliffs, have the potential of view, prospect, and refuge.
3. Topographic formations like mountains and hills and their molds serve as visual objects.

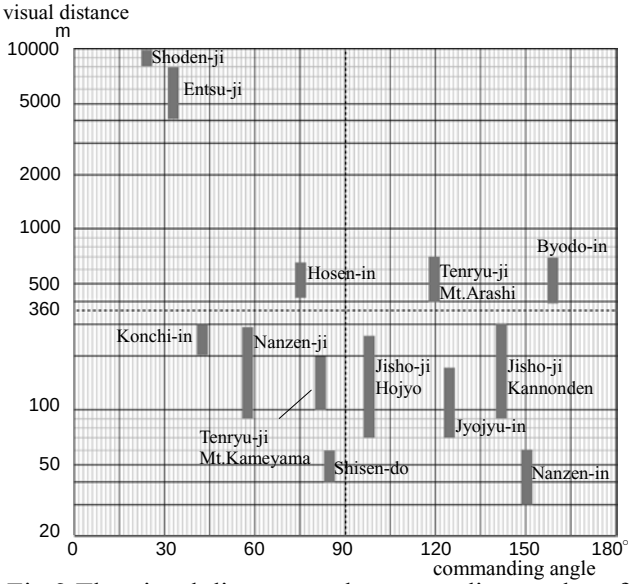


Fig.2 The visual distance and commanding angles of mountains from viewpoints in the garden

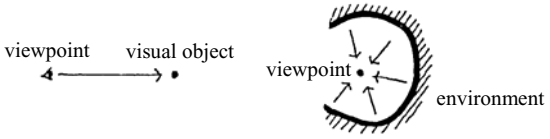


Fig.3 Two types of acceptance of visual imformation (Ohno, 1993[4])

2.2 Three-layer model of landscape design

In order to understand how to use topographic formations and their potential in landscape design, we propose an original framework of a three-layer model of landscape design. This three-layer model is a trichotomic classification of landscape planning according to its scale and stage: topographic functions,

Table. 1 Trichotomic classification of landscape design

Topographic Functions	Enclosure Forming	Topographic enclosure and shield
	Viewpoint Potential	Prospect potential: overlook, ridge, cliff, terrace
	View Potential	Visual objects: shape and surface of a mountain, ravine, field
Site Planning	Enclosure Forming	Enclosure of fence, hedge, layout of buildings, and garden plants
	Viewpoint Settings	Layout and aspect of buildings, circulating path setting
	View Settings	Layout of visual objects of a garden, rimming and leading of a look
Architectural Planning	Enclosure Forming	Enclosure of architectural elements: wall, floor, ceiling, pillar, corner
	Viewpoint Settings	Openness, screening, height of flooring
	View Settings	Rimming of view by architectural elements: window, eaves, piazza

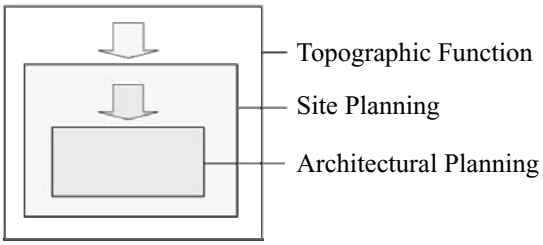


Fig4. A three-layer model of landscape design

site planning, and architectural planning. Site and architectural planning are not independent from the topographic conditions, but are hierarchically related. Site planning is generally subject to topographic conditions, while architectural planning is subject to both topographic conditions and site planning (Fig.4; a three-layer model). Therefore, we first discuss the topographic functions that characterize scenery—for instance an enclosure—and then discuss topographic potential. Second, we discuss the methods of site planning to realize the topographic potential, such as layout of elements of gardens—architecture, ponds, trees, paths, and fences—at the site planning scale. We then discuss the methods of architectural planning in order to realize this potential, by focusing on windows, pillars, eaves, piazza, and alcoves.

3 Applications and analysis

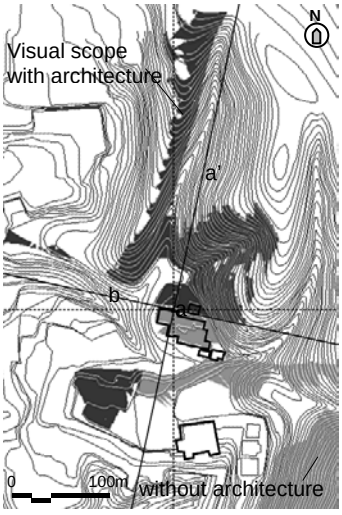
In this chapter, through case studies, we discuss a method for using topographic formations, focusing on enclosure forming, viewpoint potential, and settings as well as view potential and settings.

3.1 Jyojyu-in temple garden

Traditionally, Jyojyu-in temple was Akamatsu's villa; in 1469–87, it was converted into a temple, where the monks of Kiyomizu temple resided. "*Tsukiyama teizo-den*," a book published in 1828, described the garden of this temple as an "elegant and obedient garden." However, the origin and the designer of this garden are not well known.

3.1.1 Enclosure Form

Jyojyu-in temple is surrounded by mountains from the northwest to the north and in the east. The mountains form an enclosed space and converge within a 100–200 m distance (Fig.5). The garden is enclosed by mountain ranges and the building, where the viewpoint is located, lies to the south of this site. It is notable that the building leans 12° from north to



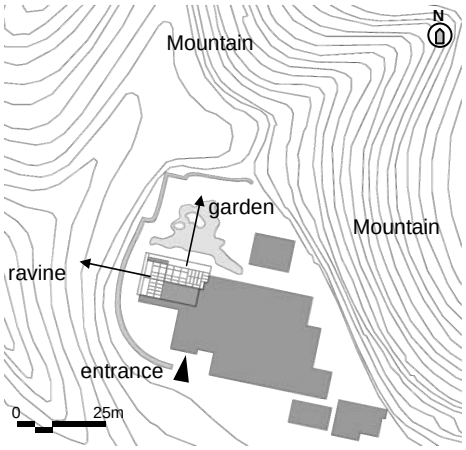


Fig.6 A ground plan of Jyojyu-in

Fig.5 A visible scope and An enclosure form in Jyojyu-in

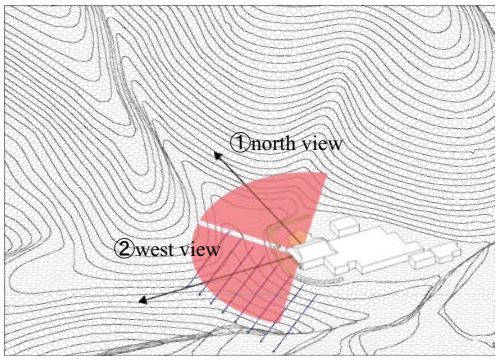


Fig.7 View structure of Jyojyu-in

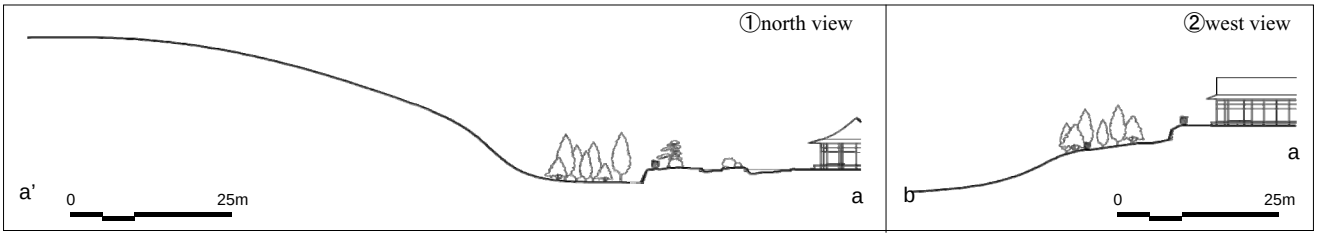


Fig.8 Cross sections of Jyojyu-in to a Mountain

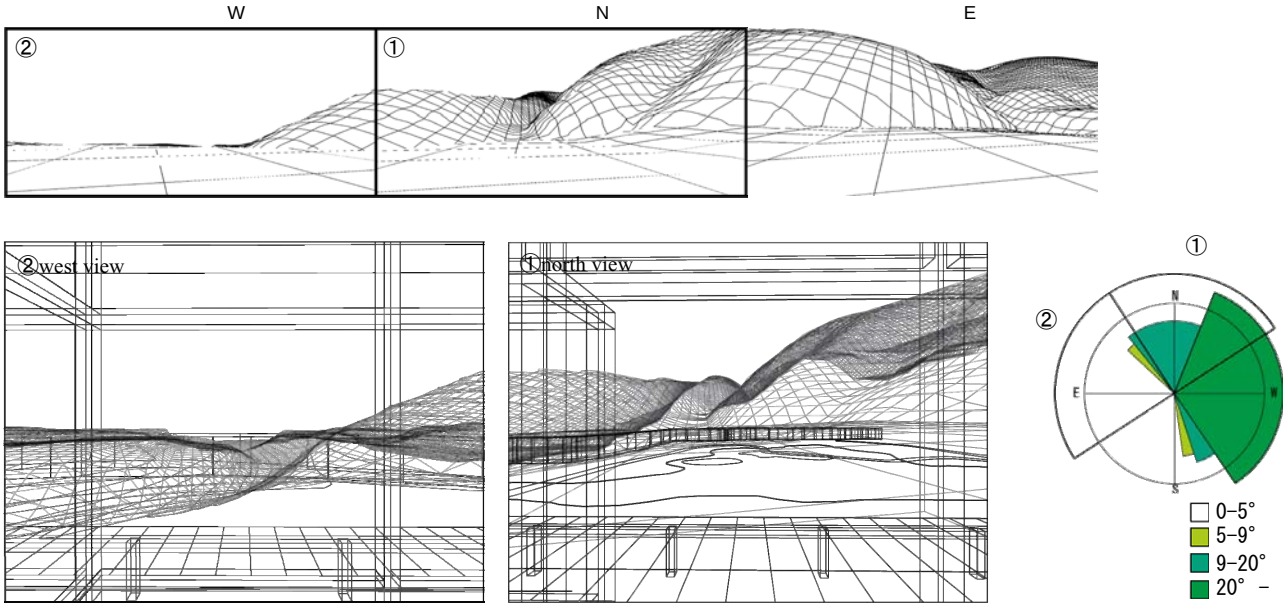


Fig.9 Framing scenery at viewpoints of Jyojyu-in

east. (Fig.5,6) This makes for a stronger enclosure of mountains. In this enclosed space, it is possible to develop an open building. The north commands a panoramic view of the mountains, which spread almost 180° and not visible from outside (Fig.6,7).

3.1.2 Viewpoint Structure

The site is located on a ridge. The building is situated on the west boundary of a cliff. This makes a stronger prospect to the west. Although the site cannot be seen from outside, we can have a view of the mountains in the north and fields in the west (Fig.8).

3.1.3 View Structure

The building opens to the north and the west, and we have two different views. To the north, we can see the main garden with ponds, clipped plants, a panorama of mountains, and a deep ravine in the center, which is emphasized by two garden lanterns. Although the garden is small, the view looks panoramic through the utilization of the verged mountains (Fig.9, Pic.1,2).

To the west, a small and simple garden is designed to emphasize a view of the fields. By utilizing the topographic conditions, these two different views are completely separated by the layout of the building and the garden.

3.2 Jisho-ji temple garden

Jisho-ji temple was formerly the temple of the *Tendai* sect of Buddhism; it was called Jodo-ji in the Heian period. However, it was razed to the ground during a battle between 1467 and 1477. Later, General Yoshimasa Ashikaga chose to reside there and built a mountain villa on this site in 1482. The garden was developed during the Edo period.

Pic.1 Jyojyu-in temple garden (north view)

Pic.2 Planting on a slope in Jyojyu-in (north east)

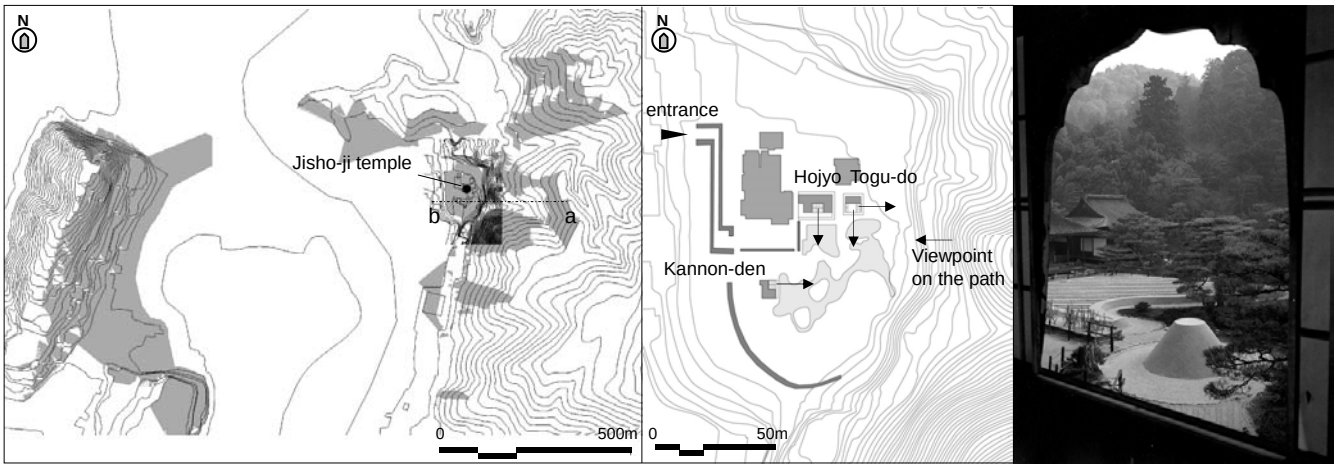


Fig.10 A visible scope and and An enclosure form in Jisho-ji

Pic.3 A view from Kannon-den[5)]

3.2.1 Enclosure Form

Jisho-ji is surrounded by mountains in the north and from the east to the south. The mountains form an enclosed space and converge within a 100–300 m distance (Fig.10). The mountains in the east rise steeply. At this site, three buildings are constructed in order to enclose the garden with the mountains. The southern part of the garden is topographically open; however a high tree forest has been planted to form an enclosure based on the topographic conditions.

The buildings in the north are called Togu-do and Hondo, and that in the west is called the Silver Pavilion or Kannon-den. These are open, albeit only toward the garden. The garden is divided into three parts, accompanying the three buildings. In front of Hondo, there is a white sand garden enclosed by trees. In front of Togu-do and Kannon-den, there is a pond garden enclosed by trees. These three parts are clustered and are invisible to each other.

3.2.2 Viewpoint Structure

The site is located on a terrace, higher than the surrounding sites. It can be viewed in the west and is invisible from the outside. However, there is no view of the outside from the garden on the ground level. Instead, there is a winding path that reaches a high spot on the mountain. Here, we finally get a panoramic view of the field and Kyoto city. Formerly, there was a viewing point here; however, now, nothing remains.

3.2.3 View Structure

From all sides of the garden, except on the mountain, we only have a view of the mountains (Fig.11). The setting is intended to be entirely natural. However, the view from each viewpoint is different. The view from Kannon-den mainly comprises high mountains

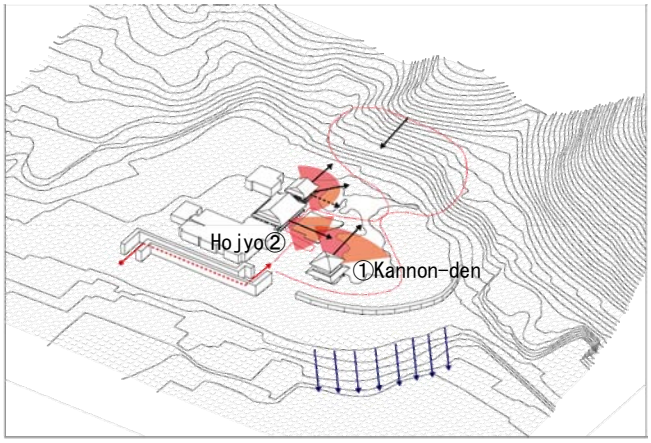


Fig.11 View structure of Jisho-ji

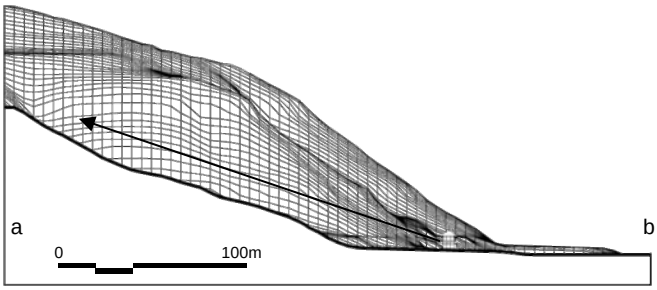


Fig.12 A cross section of Jisho-ji to a Mountain

(Fig.12). The *Tsukimachiyama* mountain (which means “a mountain waiting for the moon”) lies in the central field of vision; the mountain ranges in the north and south give the impression of a folding screen.

The view from Hondo is a vista view that comprises the slope of a mountain and the Kannon-den building. The view is open to the sky and is moderately enclosed. Its vista view and openness is emphasized by a flat sand garden. The view from Togu-do mainly comprises a pond, which leads to the bottom of the mountain with a waterfall. The mountain is used as a

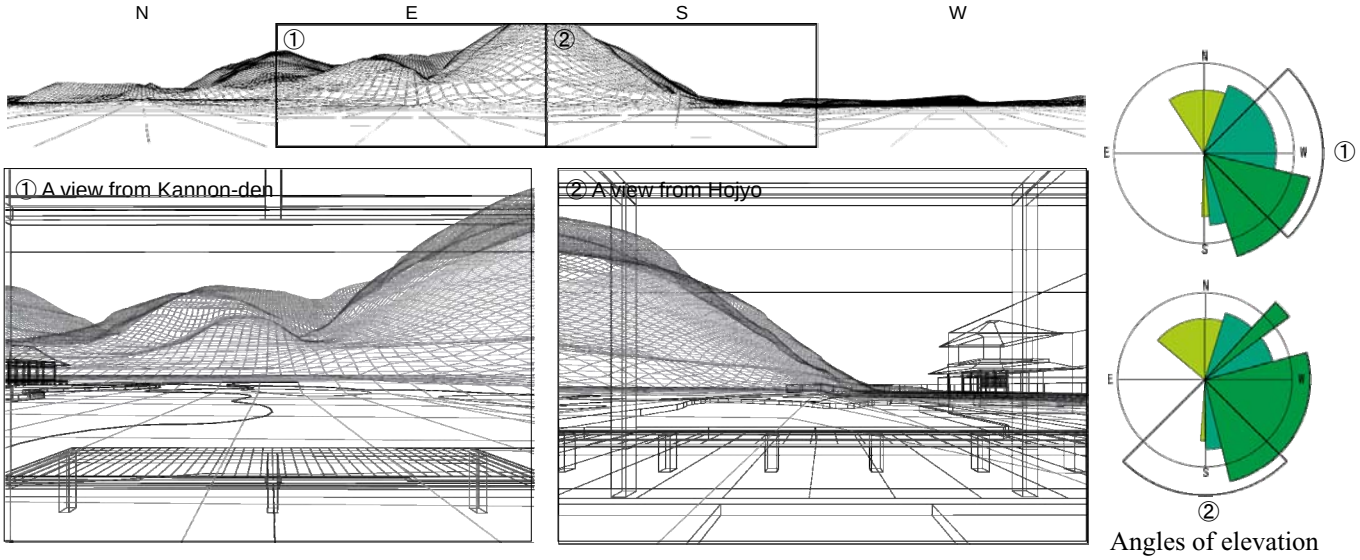


Fig.13 Framing scenery at viewpoints of Jisho-ji

chief element of the garden. These three views differ, although they have the same visual objects (Fig.13). This shows that there are many views and possibilities in using a topographic formation.

Pic 4. A vista view from Hojyo (with garden elements)

4 Conclusion

We have discussed the method of using topographic formations in landscape design, particularly focusing on three topographic functions: enclosure forming, viewpoint settings, and view settings. We adopted a three-layer model to classify a landscape design based on topographic conditions, which is restricted the most, site planning, and architectural planning.

The gardens selected as case studies are those belonging to the Jyojyu-in and Jisho-ji temples, both of which command a wide view of mountains situated at close proximity.

Jyojyu-in temple garden is located close to the city. However, the garden designer utilized the unique topographic condition to form an enclosed space and enabled a panoramic view on a large scale without being visible from the outside. Further, site planning and architectural planning provide two different views, the north view is of a deep mountain, and the west view is the prospect view of the field and the city.

Jisho-ji temple garden is also close to the city; however, the garden designer realized a large garden surrounded by a natural environment to utilize the topographic condition. Each building has three viewpoints. These viewpoints are designed separately in a cluster and share the mountains as their background. One provides a deep mountain view and the other provides an open vista view. The last one provides the view of a pond and a waterfall. Thus, three different views are dramatically produced.

References:

[1] Isoya Shinji, A Study on “Shakkei” –borrowed scenery-, Journal of the Japanese Institute of Landscape Architects, vol.50(2), 1986, pp.77-88

[2] Mitchell Bring, Jesse Wayembergh, Design and Meaning in Japanese Gardens, McGraw Hill Higher Education, 1981

[3] Toshiro Inaji, translated by Pamela Virgilio, The Garden as Architecture, Kodansha, 1998

[4] Ryuzo Ohno, Concept Of Ambient Vision and Description Method of Ambient Visual Information, Journal of Architecture, planning and environmental engineering,No.451,1993,pp.85-92

[5] Makoto Motonaka, Shakkei, Nihon no Bijyutu vol.372, 1997, pp.1