Kurdistan Journal of Applied Research (KJAR)
Print-ISSN: 2411-7684 | Electronic-ISSN: 2411-7706

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Design Through Landscape Architecture for Residential Common Spaces in Japan

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Article Info

Volume 7 - Issue 1- June 2022

DOI: 10.24017/Science.2022.1.6

Article History:

Received: 06/04/2022
Accepted: 28/05/2022

Keywords:

Landscape, architecture, indoor and outdoor environment, structural development.

ABSTRACT

Landscape architecture focuses on studying and designing indoor and outdoor environments. It entails the elements of architecture, art, engineering, and other sociological factors. Accordingly, the landscape architects design the spaces buildings that give life to the structures. Landscape architecture is visible in parks, streets, shared paths, plazas. Shopping malls, apartment compounds, transport networks, and gardens are also examples of landscape architecture. Furthermore, the works of landscape architecture are also visible in museums, memorials, cemeteries, universities, and other schools. Modern architects have designed different permanent structures that will stand for a long period of time. Notwithstanding the preceding, the discourse on what qualifies as landscape architecture and what does not is yet to be settled. This discussion elucidates the process of research through design in landscape architecture, the literature regarding the field, and conducts a case study of specific landscape architecture to elicit applicability of the enumerated concepts. Moreover, the discourse also reveals the research method utilized in the case study and the results as well and discussion. Indeed, the landscape design illustrated the necessaries throughout the past this point is due to its role in relation to the appearance of urban and rural landscapes.

1. INTRODUCTION

Undoubtedly, landscape architecture plays an important role in modern-day civilization and structural development. The spatial design is an important aspect of landscape architecture as it generates solutions for project sites in urban and rural areas. These projects may vary from squares, gardens, and parks that are situated in a specific location. Notably, the crux of landscape architecture is based on planning and designing and thus the methods and process of researching the design are determinants of the architectural magnificence. This position necessitates the reliance on spatial design as a method of researching the specific designs that would be used accordingly. Spatial designing is also referred to as the "research by design".[1] To understand what the research by design means, the process must be viewed as a strategy used to identify the appropriate landscape architecture. This process involves working in an optimal condition that facilitates the achievement of the goal. Notably, the architect creates different designs, that are considered when establishing the most effective and efficient design to implement. Research questions related to the potential shape of rural and urban landscapes are answered through the design exploration process. Moreover, the changes in the current environment are designed using ecological and social processes. This position ensures that the infrastructure developed does not hinder specific social or ecological processes. It is also noteworthy that landscape architecture considers aspects such as culture, which are covered under the social umbrella.

2. LITRETURE REVIEW

It is equally vital to assess the scholarly and literal authorities' and their positions on the research by design process in landscape architecture. The term design bears meaning both as a verb and noun. As a verb, it means the procedure followed to develop future objects and environments through representations and drawings. The interpretation of design as a verb can be used in landscape architecture to be the development of landscapes at disparate scales that are based on the four-dimensional functionality and form. The design ought to be viewed as an analytic process that informs knowledge necessary to meet the answers to research questions. [2] Nonetheless, the term design must not always be viewed as an inquiry as the design processes may be conducted for other purposes.

The design process can be conducted based on four main worldviews. These examples ensure that knowledge is acquired satisfactorily and used to inform the specific landscape architecture. Accordingly, they include social constructivism, positivism, pragmatism, and advocacy. Social constructivism is used where the information acquired is based on some reasoning guided by the political or social context. [3] Consequently, qualitative research methods must be used in this regard including the evaluation of materials published in regards to social behavior and culture.

Positivism is the paradigm where knowledge is gained by experimenting and making observations through quantitative and empirical methods. Quantitative authority is relied on in the design process and the findings are based on empirical results. Pragmatism is the worldview where the information is gathered through combining various methods such as observation, experimentation, modeling, and others. This process utilizes qualitative and quantitative methods to gather information regarding a specific design and its impacts. Finally, the paradigm of advocacy focuses on gaining information related to the politics of a specific locality and the political agendas intended to benefit the general public.[3] This method embraces the quantitative and qualitative methods to extract knowledge and information.

It is equally essential to elicit the various ways in which the research through the design process can manifest. Primarily, the design and research can be related to each other through several mechanisms. This correlation exists through research for design, research on design, research through design, and research about design. In particular, these relations must be inquired when establishing the proper type of design to be implemented. [3] The correlations can also be combined to produce a spectacular spatial design for landscape architecture.

Research on design is conducted where the study conducted inquires and focuses on the organized operational designs. Specific concepts are interrogated to determine the future design. They include precedents, principles, foundation types, and other[3] concepts. The research for design is conducted where the information sought is for the design's validation. Precisely, knowledge acquired in the process is used as the design's input. Overall, the research for design is the most common correlation between research and design. The research through design also suffices as another relationship of design and research. This strategy employs different designs to determine the final design and outlay. Consequently, the process is responsible for exploring and identifying the possibilities that can be used in future designs from other designs. The final relationship between research and design is research about design that focuses on understanding the processes of design by conducting interviews, observations, and their aspects. [4]

To understand the correlation that can be used in a research process, assert that the purpose and conduct of the research must be considered. Research is basically conducted to acquire knowledge from new sources or existing facts. Deductive reasoning ranks is utilized to establish a hypothesis, which is proven by conducting experiments or adducing evidence in this regard. Contrastingly, the inductive reasoning observes various occurrences and seeks to explain them by developing and analysis to these occurrences and making a hypothesis that is evidentially based at the end of the process.

The aim of the design must also be contemplated to determine the success of the landscape architecture. All designs are conducted for the purpose of invention aimed at establishing solutions in the spatial development and planning. In the design process, the hypothesis is extremely dynamic and must be adjusted time and time again based on the observations established from the research process. This method of conducting the design is referred to as abduction. [5] After the abduction process has been conducted accordingly, the final solution is determined by weighing the probabilities and possibilities and how they can solve problems experienced in the spatial planning and design.

The design process must be perceived as a way of inventing and discovery. It involves three key processes namely the analytical stage, synthesis stage, and evaluation stage, which cannot be viewed separately as they are all interconnected. In the analysis step, the information is collected and interpreted to enhance how the possibilities are identified, understood, and designed. Further, the synthesis step is also conducted to ensure that the resolutions are introduced, notwithstanding their temporary nature. This process acts as the incubation process that furthers the idea and ensures greater accuracy, specificity, coherence, and completeness is attained.

The research and design process can reveal disparate types of information and knowledge. These types of knowledge are classified according to the idea, form, and project. Consequently, the idea-based knowledge type is subdivided into the conceptual and strategic dimensions. The former involves assessing the situation and creating future plans. In other words, the problem is structured according to the proposed solutions. [6]

The form-based type of knowledge manifests in visual or material forms. Visually, ideas are fabricated, developed, proposed, and translated by the architects. Material information is gained through assessing, exploring, and realizing the landscaping qualities with regards to the technical constructions that will be implemented in the spatial designs. Remarkably, the project-based knowledge is comprised of the integrated and situational knowledge. The integrated knowledge is obtained where the contradictory interests are synthesized and conflicting agendas limited by applying different operation methods. Conversely, the situational knowledge is obtained through the engagement in deliberations regarding the political, legal, cultural, economic, functional, and ecological contexts. [3]

2.1 Landscape Urbanism:

Another form of emergent urbanism is a self-aware design-led approach in which the design object is landscape rather than structures. The argument is that 'landscape' is a better foundation for urban planning than 'architecture' (though one could argue that the initial premise is itself dubious). 'Landscape is the lens whereby the current region is depicted and the medium via which it is built, substituting architecture as the edifice block of contemporaneous urbanism. As it is more limited visual-aesthetic meanings, 'landscape' is the main focus in this section, despite its narrower definition than landscape. Landscaping is routinely an addition in municipal design, something to be included (if money permit) after the key choices have been made, to hide and conceal low-quality architecture-buildings or to give the impression of extra space.

Figure 1: Soft landscape can bring colour and joy to urban landscape

If a finished building requires landscaping, the act of paisley-wrapping the pig has already failed as a design. While well-designed landscaping enhances the development's quality, graphic interest, and colour, badly-designed landscaping shifts from otherwise well-planned structures. Landscape plan includes four important drivers, according to Neal and Hopkins:

- Operating on the land – art.
- Functioning with the land – ecology
- Operating through the land – society
- Working for the land – sustainability

The diagram depicts three different urban forms, each with the same density (75 dwellings per hectare) but different public and private space arrangements.

(a) At the base of high-rise development, there is open space.

- There are no private gardens, and the inhabitant's direct access to amenities is limited.
- There is no direct connection between the structure and the adjacent streets.
- A large open space area necessitates administration and upkeep.

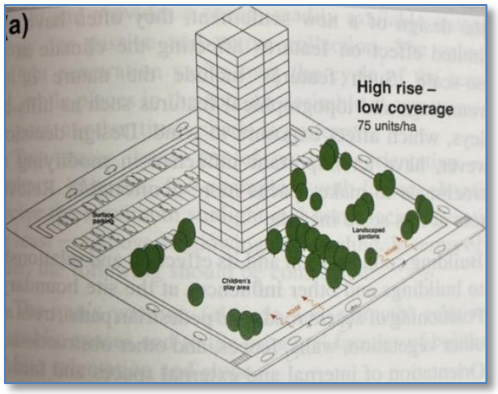

Figure 2: High-rise density [7]

(b) Houses with 2-3 stories in a street layout

- There are gardens at the front and back of the house.
- The public space is defined by continuous street frontages.
- Streets create a distinct pattern of public space.
- The opportunity for social spaces is reduced due to the high site covering.

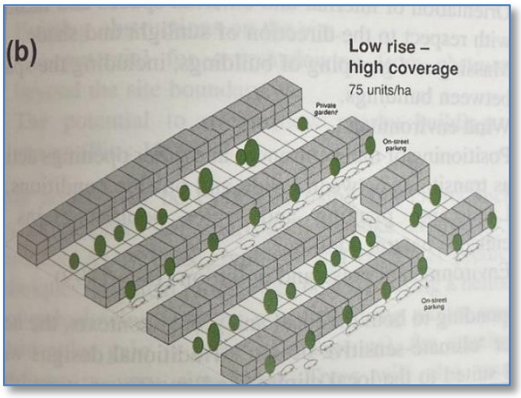

Figure 3 Low-rise density [7]

c) Urban boundary block

- The surrounding structures might be of various heights and configurations.
- A landscape open space is surrounded by buildings.
- A community-based facility can be housed in an open space.
- Commercial and public facilities can be scattered across the bottom floor, keeping the street frontage alive.
- There is space available for use (including rear gardens, communal areas, park, etc.) [7]

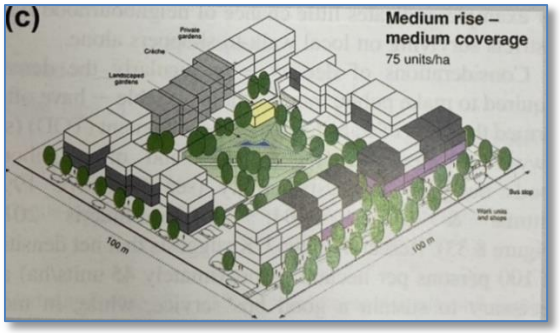

Figure 4: Medium-rise density [7]

2.2 Designing Play Principles:

Play spaces that are well-designed have a significant impact on children's lives by stimulating physical activity, socialization, and learning via play. They are also adult-oriented spaces that serve as gathering spots and places to unwind. A successful play space is a place in and of itself, constructed specifically for its location to deliver as much play value as possible. A place space should be:

1. Created to complement its surroundings.
2. Located in the finest possible location for natural play by children.
3. Close to nature.
4. Designed to allow youngsters to play in a variety of ways.
5. Designed to encourage children with disabilities and youngsters with normal bodies to play together.
6. As a result of a successful community participation approach, the community loves it.
7. A place where kids of all ages can play together.
8. Designed to encourage children to stretch and challenge themselves.
9. Made of environmentally friendly materials.
10. Designed to be adaptable, with the ability to grow and change. [7]

Figure 5: Play spaces for children [7]

2.3 Types of Japanese Landscape Garden:

Landscape gardening has a long history in Japan, dating back to 600 AD. Karesansui, Roji, and Kaiy-Shiki-teen are three different types of gardens. Each of these gardens has a distinct appearance and serves a distinct purpose. When visiting a Japanese landscape garden, you

must adopt a different mindset and imagine that one is entering another planet in search of peace.

2.3.1 Karesansui Garden (Karesansui Garden)

Set aside your pet rocks and begin cultivating a Japanese rock garden. The Japanese rock garden Karesansui (English: Dry Mountains and Water) is also described as a 'dry landscape.' This garden-style embodies all of the traits of Japanese aesthetics: minimalism, elegance, and simplicity. All credit goes to Musö Soseki, a Buddhist monk who popularized this garden style in the 14th century. This garden is packed with rocks, sand, and beautiful gravel, as the name implies. Entering a Japanese rock garden, on the other hand, will leave someone befuddled by the precisely arranged stones and sculptured raked gravels.

Figure 6: Karesansui garden common sight [8]

The typical Japanese rock garden is contained and limited to a limited palette of greys. The Zen garden's main feature is the rocks and gravel. No, the stones are not meant to be thrown at each other to vent your anger.

The sand is also not suitable for making sandcastles like you would at the beach. It is important to remember that this is a sacred space where you can practice calm meditation. The rocks are interpreted as rock or island formations, and the sand is interpreted as the sea. The crevices between the stones exude a sense of renewal and tranquility. Tending monks generally scrape water ripples into the gravel. Raking gravel is a different concept than you might have imagined.

Figure 7: The length of the garden by span of ripple rake mark patterns [8]

You will be astonished at how much time and effort the Buddhist monks devote to raking. It is almost as if you are staring at a one-of-a-kind work of art. In addition, in a traditional Zen Garden, there is usually no live element. You might notice grass, but flowers are very impossible to come across in this garden. This Japanese rock garden's ultimate purpose is to produce a small-scale cliff-top perspective of a seaside scene. As a result, you are expected to appreciate the garden from the outside. (If you do not, you will be wasting your time raking the sand.) [8]

2.3.2 Kaiyū-Shiki-teen Garden:

If you travel back in time to Japan in the 15th century, you will notice Kaiy-Shiki-teen gardens at the homes of most aristocrats and warlords. The 'strolling garden' or 'promenade landscape' garden is the best translation. This garden style was designed to match the new Sukiya-Zukri architectural style, which is based on the Japanese tea house concept. As a result, it has many of the characteristics of a Roji Garden but does not strictly adhere to the Roji Garden's rigorous standards. The well-known Suizenji Park, which is a form of Kaiy-Shiki-teen Garden, is the greatest site to enjoy a beautiful view of Mount Fuji.

Figure 8: Kumamoto, Suizenji Park, Japan [8]

Suizenji Park appears to be larger than it is due to the use of the mountain as a scenic backdrop. It is what a Kaiy-Shiki-teen Garden aspires to be. You will find yourself wandering

along a clockwise trail around a lake, passing from one stage to the next, to take in the complete view of Mount Fuji. Furthermore, your view will be continually impeded by bushes or fences, forcing you to walk to the greatest Mount Fuji viewing spot. This is a technique known as 'Miegakure,' or 'Cover and Reveal,' in which heavy foliage, buildings, or walkways hide a particular view until you reach the appropriate viewing spot. So, if you cannot see Mount Fuji clearly, do not panic; it is supposed to be 'hidden' until you find the right place. The drawback is that the ostensibly excellent location is almost certainly overrun with tourists. If you ever decide to try your hand at Japanese landscape design, be aware that it is a time-consuming procedure. Because nature is fluid and ever-changing, most Japanese landscape designs are never completed. [8]

Research Aim:

Establishing the aim or goal of the research is essential to understand the process of landscape architecture. Spatial planning and design are an inevitable field in the contemporary world. The research revealed was conducted to understand how spatial design is actually conducted. This process involves interrogating the research through design process, where design is viewed as a process rather than a destination. Remarkably, the research also reveals the varying perceptions of obtaining information to use in the design process. The research was also keen on revealing the how the research through design works. All in all, the research aims were fulfilled through the qualitative research methods employed for the research and the case study elicited regarding the project of setting up of residential spaces in Japa

3. CASE STUDY AND RESEARCH METHOD

3.1 Case Study (Kurobe-city, Toyama, Japan):

Understanding the research through the design process requires a specific case study that reveals different research and design concepts utilized in a project. In this case, the case study takes an in-depth look into the passive residential districts' projects in Japan where a landscape design and building architect were selected to design the project. Notably, the landscape design is projected for residential common spaces in Japan and will run until completion in 2025. [9] Further, the design of the residential space was to be conducted using a thermal simulation tool.

Figure 9: Alluvial_fan,_Kurobe.jpg (1280×960) (wikimedia.org) retrieved December 2021 [10]

In this process, various research through design mechanisms and concepts must be utilized. The design concept is to be established on the rice paddies, which are the target area.

Furthermore, this spatial design of the houses considered several ecological aspects including the consideration of wind direction. Solar radiation is also maximized when setting the distance between houses. Finally, the landscape design concept also considered providing tree shades on other sides of the houses that create a comfortable outdoor area. [9]

Indeed, the process of analyzing, synthesizing, and evaluating is evident in the project's design. The relationship between the landscape architect and the simulation engineer was used. Further, the landscape architecture's numerical analysis was done twice during the basic stage and during the execution stage respectively. The landscape concept was applied at the basic design stage with regards to a thermal environment. Some trees were planted and ground surface materials were also produced in this regard. Additionally, this phase involved the sharing of basic knowledge regarding thermal environments. Simulation tests were also conducted for different seasons. The surface temperature was also recorded as well as the solar radiation on doors and windows was also interrogated.

The execution stage required a numerical analysis to ensure determine the landscape use in the residential area. It simulated the presence of fully grown trees, which was used to make changes to the planted trees. Moreover, the Landscape Architecture also changed the sitting area and walking area layouts. Simulation results were undertaken during summer to check the surface temperature, solar radiation, and MRT distribution. [9] The two analyses done at the basic phase and execution phase revealed a lot of information about the incorporated design of the project.

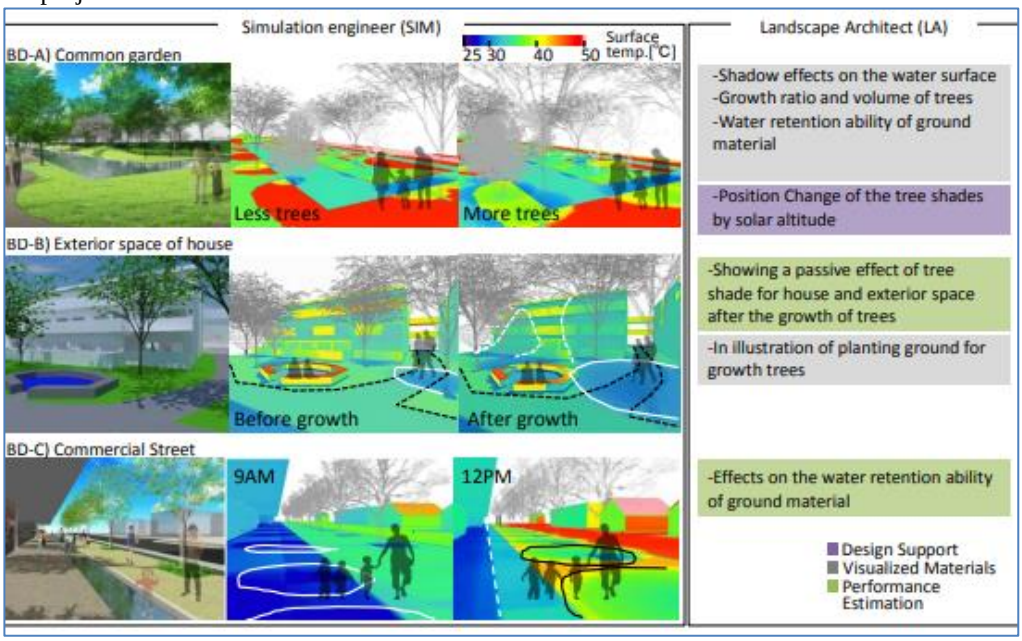

Figure 10: Main simulation area in basic design phase [9]

3.2 Research Method:

The preceding reveals detailed insights about the common space landscape residential designs proposed in Japan residential districts. This information was obtained through the qualitative research method. In particular, the case study is an analysis of journal materials that provide an in-depth analysis of the Landscape architecture in the Japanese common spaces. Other methods of conducting the research were also utilized including reliance on credible information from books published on the case study

The justification for this methodology is important in establishing why it was relied for the case study. First, the geographical barriers of the research hindered actual observation of the project. It is also noteworthy that the information elucidated in the case study has been

garnered over time and thus the best source for such information was in the records of credible sources. Additionally, the quantitative research methodologies would necessitate a high cost of travelling and facilitating the study as it involves activities such as surveys, observation. The final justification for the qualitative research methodology is the time effectiveness of the process in comparison to the other ways of conducting research.

4. RESULT AND DISCUTION

The case study reveals several aspects regarding the research through design process in Landscape architecture. The project has been conducted over some time and is expected to run until 2025. [9] Consequently, several phases have been accomplished in regards to design processes. The first result of the case study is the identification of a design concept by the landscaping architect. Notably, the landscape architecture concept in this case is the residential spaces integrated to a thermal regulatory tool.

After identifying the concept, several efforts have been undertaken to actually develop the infrastructure. This position is evident in the basic phase and execution phases. Subsequently, some steps were modified in the basic step such as planting of trees and identifying the direction in which the houses would face as well as the distance between the houses. [9] It should be noted that the findings of the basic stage and the execution stage are different and thus modifications were made to the design at the execution stage. The main adjustments were related to the trees and other features that had to be changed to fit the developmental progress.

A keen analysis of the case study reveals several aspects regarding research by design utilized in spatial design. The initial aspect is the identification of a landscape design concept. This process may often involve combination of researches on design and about designs. For instance, the case study reveals that some research was conducted in the basic and execution stage regarding the radiation impacts on windows and surface temperature. [9] Such information represents research about the design, that is necessary in the spatial design process. Furthermore, the case study reveals that the design concept also considered the ecological factors, such as wind direction and solar radiation levels. This element suffices as the research for design as the information obtained was used to validate the direction of the proposed houses.

Overall, the case study also revels the paradigmatic worldview used in conducting the research through design. Pragmatism is evident in the case study as various methods are used to achieve the goal. These methods include experiments and observations such as planting trees and later removing them due to new modifications. Furthermore, other aspects such as the solar radiation levels were conducted through observation of the temperature levels recorded by state-of-the-art equipment. These observations were integrated with other research processes such as the use of numerical analyses in the basic and execution stages.

5. CONCLUTION

In conclusion, the landscaping architecture has proved to be important throughout history. This position is attributed to the role it plays in regards to the outlook of the landscapes in rural and urban areas. Notably, the architects involved in landscape planning design most of the parks, gardens, social spaces, pathways, roads, and other infrastructural designs. It is important to inquire on the process undertaken by these individuals when determining the designs to use.

The primary strategy used in spatial planning is referred to as the research through design process. It involves interrogating the relationship between research and design to establish the specific design outcome. In particular, the distinct categories include research through design, research about design, research on design, and the research for design. The research through design also incorporates some views towards information used for design. Notably, these views include the positivist, social constructionist, advocacy, and pragmatism. Furthermore, the discourse utilized varying qualitative research methods such as reliance on journal articles and books as well as other peer-reviewed materials in this regard. The study proceeded to

conduct a case study of the process of landscape design in a project for residential living spaces in Japan that is set to run until 2025. This case study is essential to establish the research through design in a real situation.

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