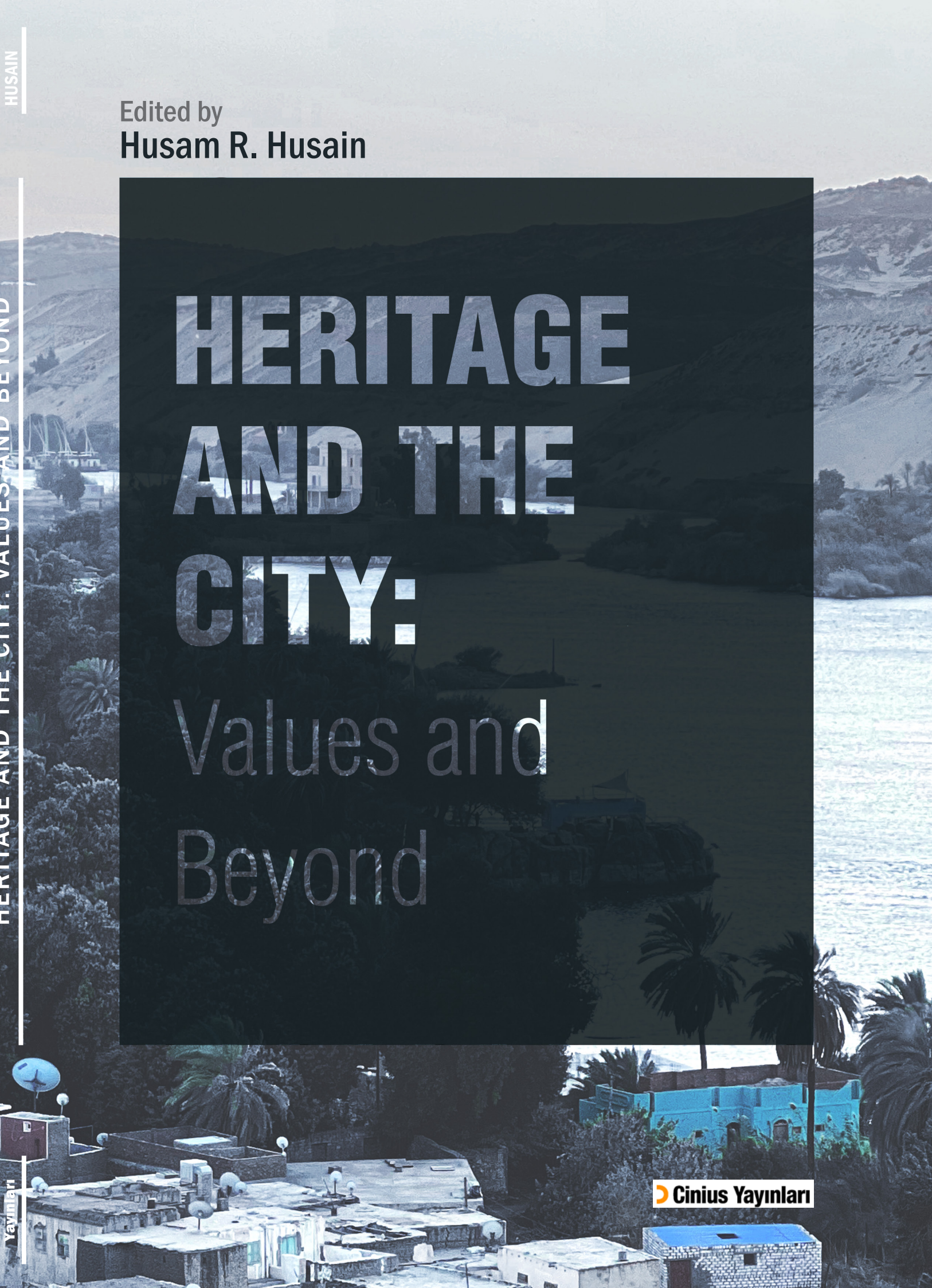
Edited by
Husam R. Husain

HERITAGE AND THE CITY:

Values and Beyond



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Husam R. Husain
Editor

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Preface

The idea of this book originated in the 5th International Conference of Contemporary Affairs in Architecture and Urbanism ICCAUA2022, held online in Alanya Hamdullah Emin Pasa University in May 2022. It was conceived as an intellectual discourse and a concise compendium of recent research in three parts; the first part comprises values of aesthetics in our everyday experiences; second part contains cultural values aspects related to heritage, and the third part focuses on urban-water values and the city.

This provocative collection of essays and contributors is concerned with underlying issues such as architectural values, heritage and the city, urban identity, conservation and preservation, water values, and climate issues. Each chapter contains several articles to enable cross-reference and comparison. This book is a useful collection of academic resource and discusses some unsolved issues that cities has to face.

Dr. Husam R. Husain

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PART 01.
VALUES, AESTHETICS, AND THE CITY

The lens of a camera usually captures a beautiful moment of a particular scene. But the value of the moment goes beyond what our eyes see. it is the unique experience of our feelings and emotions behind the camera. The little new things we experience every day, or occasionally; which makes an ordinary scene unique.

CHAPTER 1. On Atmosphere as a Visual Phenomenon in Architectural Aesthetics

Fatma İpek Ek

Introduction

Every phenomenon is experienced by using the senses. Architecture in general, and space in particular, as phenomena of building and living are also comprehended by subjective experience obtained consciously via the senses. Sensory experience, on the other hand, refers to "aesthetics," a term coined by Alexander Gottlieb Baumgarten (1750-1758, 1970) in the 18th century, in his work titled Aesthetica. In this work, aesthetics was described as a science of perception and cognition with the aim of thinking about beauty, which roots in sensory experience (Baumgarten, 1750-1758, 1970). By highlighting the Greek counterparts of the term, while describing it, Baumgarten (1750-1758, 1970) also referred etymologically to the word aisthētikos meaning "sensitive, emotional, and intuitive" in Greek, which derives from the verb aisthanesthai meaning "to perceive." Although in the period it was coined, it mainly corresponded to the objective criteria perceived by all experiencers in a cognitive process leading to the judgment of beautiful, throughout time, meanings of aesthetics have diversified in many disciplines depending on the purpose of use. If we look at the current perception of the word aesthetics in architecture, for example, we can see that it is generally perceived as a jeopardous one by many contemporary

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architects, since it is perceived as a kind of problem-child of architecture (Reisner-Cook, 2016). The reason for this may be that the word aesthetics has also been combined and related to the judgement of beautiful since the 18th century, and therefore, contains subjective criteria that vary from person to person.

The discussions based on the objective and subjective criteria in aesthetics, however, root in antiquity as we see the emphasis on objective criteria in Socrates and subjective criteria in Plato. Socrates (as cited in Plato, 2015) claims that if an object is useful then it is also beautiful; thus, the efficiency and sustainability in the use of the object can be regarded as a criterion referring directly to beauty by serving the user a lifetime performance. Therefore, in Socrates's sense, beauty has criteria related to the features of the object. On the other hand, Plato (1956) asserts that to understand beauty one should be capable of perceiving it; hence, it is something related to the qualities and abilities of the subject cognizing the object. The object- and subject-based discussions for the origin of aesthetics continued in the Renaissance period, too, by an understanding leading us to another debate, that is, the discussion of experience versus judgement, as echoed in the words of Leonardo da Vinci (as cited in Strathern, 2009). Accordingly, Da Vinci claims that one can trust in his/her senses but not his/her perception and cognition which may mistakenly interpret the data coming from the senses. Thus, he trusted in the objective procedure in aesthetic evaluation, that is, the sensation stemming from the experience while underlining the problematic part in the subjective side of the process, namely, the judgement, which may not be directly related to the objective experiment and maybe an end-product of a deception. Our judgments are more than the sum of our experiences, in this context.

At this point, it is impossible to ask what the value us subject to aesthetic judgment at the end of the spatial experience we provide our senses. According to August Endell (1995), too, this value is more than the sum of its components. Endell (1995) denotes that one should not deal with the spatial or architectural elements such as the walls, ceilings, floors, ornaments, etc. to understand the space, but with the inversion of the space, that is, the negative space, or the void which produces the atmospheric meaning by also containing the lives of the experiencers. This atmosphere is more than the elements limiting it. Here, what Endell refers to should be the same as Maurice Merleau-Ponty's (1964) understanding of all-sensory experience in space. Merleau-Ponty (1964) asserts that our perception is not formed by the sum of data provided by our senses, but it is more than that; it is our whole being perceiving the integrity and uniqueness of space which is in a dialogue with our senses. Gernot Böhme (2016) also agrees that the architectural value subject to aesthetic evaluation and judgement is the spatial atmosphere referring to the "more." In his "New Aesthetics," he asserts that the mindful and bodily presence of the subjects and objects in space is a must to have an experience of the spatial atmosphere (Böhme, 2017). And spaces diffuse atmospheres reaching the bodies mindfully present in them, and affect them emotionally (Schmitz, 1969). According to Hermann Schmitz (1969), the physical or sensory components of space lead us to the understanding of spatial atmosphere composed of the objective criteria, which correspond, in the end, to an aesthetic appreciation. Similarly, Peter Zumthor (2006) declares that atmosphere is the genius in the perception of space, which may result in an emotionally appreciated architectural solution. But in the Zumthorian aesthetics of atmosphere, we can find an interpretation referring to the subjective criteria rather than the objective ones—since Zumthor states that he appreciates the things moving him emotionally in a positive way in terms of the aesthetic appreciation.

Therefore, aesthetic effects causing the emergence of emotion—followed by a judgment—are under focus in the aesthetic experience of architectural space. Then, how can one (the architect, in this case) affect the visitor's spatial experience that shapes the aesthetic emotion? Roger Scruton (2013) believes that the expression and style may provide us with an experience of the essence of architectural space; however, again, they are not the essence, but the bridges leading us to the essence. Hence, in the perception of spatial composition, we may assert that what we experience aesthetically is the spatial atmosphere, and this atmosphere or aura—in Walter Benjamin's (2008) sense—may refer to that essence. Thus, in this work, I call this essence atmosphere, a term referring to the expression of space in the form of a composition perceived by the experiencer. That is, the objective criteria emanating from the spatial atmosphere are established partially by the visual composition of the space. This composition has certain rules based on the psychology of perception, and hence, can be understood easily by the experiencers.

In this framework, the aesthetic perception of a spatial atmosphere is related to the sensory experience we have in that space. Although this experience is led by a multisensory understanding, the dominant sense is generally the sense of sight in architectural spaces. This dominance—which is generally connected to the Modernist architects as asserted by, for example, Juhani Pallasmaa (2005)—is related to the speed of the perception, or speed of the transfer of the data amount collected by this sense. What is perceived and evaluated aesthetically via the data provided by the sense of sight comprises the composition of the spatial atmosphere in visual respect. In this visual rendition, composition principles have an important role in affecting the experiencers aesthetically in the evaluation of space by setting objective criteria. Therefore, in this paper, I aim to read and understand the relationships between architectural spaces and composition principles as objective atmosphere generators. I chose rhythm, contrast, and unity in variety as the composition principles frequently used in architectural design. To demonstrate this relationship, I firstly made a literature review to provide a base for the analyses theoretically, and secondly, I made a case study comprising the examples having visual organizations

created by the mentioned composition principles. The cases to discuss the visual qualities provided by these principles comprise the Villa Stein (Paris, France, 1927) designed by Le Corbusier, the Barcelona Pavilion designed by Ludwig Mies van der Rohe and Georg Kolbe's sculpture named the *Dawn* (*Alba*) (Barcelona, Spain, 1929), and the Brion Cemetery (San Vito d'Altivole, Italy, 1969-77) designed by Carlo Scarpa. Examining the atmospheric design and genii given by the composition principles in these cases may pave the way for understanding the lack we have in the aesthetic qualities of today's architecture.

Theoretical Examination: Looking at the Frame

Visual perception in space, like the other sensory experience manners, operates with certain procedures. We apply our senses to the spatial atmosphere, collect information, transfer the data to our minds, perceive these data, attach meaning to what we sensed, interpret the meaning to have the general message out of that experience, and raise an emotional response in some cases. In a certain space/place within a certain period, the interpretation of an individual (a set of subjective judgments) about this very space/place, as a result of the individual impressions, depends on the procedures of mindful physical interaction between the space/place and the individual/subject (Böhme, 2013). The interaction is felt by all senses, but the one quickly generated is generally the sense of sight. The effects of form, light, colour, and visual texture play an important role in communicating with us through our sense of sight, and thus, in perceiving the genius, essence, or atmosphere of the space. An aesthetically augmented (Fuller and Weizman, 2021) effect does not only come from these elements but the experience provided by the sum of all these elements and more than that. To search for the content of this "more" is important, as also highlighted by Bruno Zevi (1974). Accordingly, he claims that the essence of an architectural space is constructed by the meanings of its form and organization rather than the corporeal spatial components (Zevi, 1974). This essence is "more" in the sense that it roots in something abstract and covers the whole procedures of making spatial design.

During the confrontation of the individual with the space, s/he has come under an aesthetic effect. The creation of this effect is the result of individual experience in that space. In visual experience, this effect is provided mainly by the composition of the spatial atmosphere. This composition can be understood by all senses of the experiencer. However, since Modernist architecture, we have been introduced to an eye-based perception of architectural space, and the experiencer has become the observer. The architectural space of Modernism was designed to be perceived dominantly by the sense of sight, which has dominated the consecutive tendencies through the century, as well. Pallasmaa (2005) also highlights that Modernist architecture is an eye-based one that erase the other senses as well as the human-centred dimensioning, which led to a plain and immaterial architecture with orthogonal geometries and sharp edges seeming cold and unreal.

This criticism of Pallasmaa (2005) is for opening an all-sensory architecture in the current agenda of the discipline. Nevertheless, almost everything in the eye-based architecture is cold, plain, and seems far from reality; its language has a machinic nature provided by the geometrical/mathematical formulas. The homogeneity in architectural orders and proportions also makes the visual perception mechanized. Le Corbusier's designs can be described by the visitor's experience of the space, which is attached to a visual scenario (Colomina, 1992). But during or at the end of the experience in the spatial scenario, the visitor understands that s/he is an observer. Thus, Le Corbusier's (1923) "machine aesthetics" in some of his works exists in the same seamless universe as many other works by the other prominent architects of the same period. For example, Bruno Taut's Glass Pavilion (Cologne, Germany, 1914), one of the early examples in the same period was a colourful play of light created in the interior with different colours of glass through which the sunlight passes, designed in a prismatic fiction for more effective refraction of light, and a colourful and luminous spatial atmosphere appealing to the eye. Its aim, in this context, was not more than offering the experiencer—here, it is the observer—an aesthetic satisfaction by a visual composition. This pavilion is a crystalline example of Modernist architecture's attempt of mechanizing the visual experience in an exhibition structure since there is not any exhibition provided in the space, but it is the space exhibited in a visual festival composed of the play of light and colours. Therefore, the common criticism for many iconic structures of Modernist architecture is that they are not able to step out of a range of mechanical experiences based on the sense of sight. This approach survived in consecutive periods in many of the architectural examples.

Modernist architecture was formulizing the practical procedures in the discipline of architecture. The formulations for establishing the notions related to function, stability, and beauty in a Vitruvian language constructed the identity of this tendency. The Modernist utopias failed in time, but the formulations have survived and affected architectural space for a long-term period. But how can the notion of beauty be formulized? How can it be analysed, and what are the components of this notion in the construction of space? The beauty established in this period, as also stated by Pallasmaa (2005), has an eye-based essence. Therefore, the components of it majorly contain the elements perceived by the sense of sight, such as light, colour, visual texture, and form (Robertson, 1924). In other words, the formulation of beauty has been composed of these components, but at the same time, it has referred to more than the sum of these components. This "more" part may be possible with the help of the "correct" use of the composition principles as also echoed in Le Corbusier's

(1985) approach which prominently declares that the beautiful architecture consists of the forms skilfully organized in light.

The pertinent use should lead us to a "unity" by the method of "fusion" provided by the sensory and physical elements of space, such as the materials, light, and proportions of the masses (Robertson, 1924; Dewey, 1934; Pallasmaa, 2014). Sensing this whole, the experiencer can generate and attach a meaning to the space, which is also constructed synchronically as a memory in his/her mind. Space talks to the experiencers by their senses, one of the layers of which refers to the visual capability. Creating an architectural form mainly comprises solid-void, scale, and proportion plays assisted by the changing and stimulating effects of light, colour, and visual texture. But these plays cannot be set randomly; they require a very strong relationship network organized between them interactively with strict rules to facilitate the perception of those plays in a composition. Thus, we may claim that the visual composition of space is mainly led by the plays with the principles such as rhythm, contrast, unity and variety, dominance, balance, harmony, axiality, datum, emphasis/focus, hierarchy, growth, repetition, alignment, scale, proportion, depth, movement, rotation, and transformation. However, it is important to see that not only the elements constituting the aesthetic effect of a composition principle but also the power enabling these elements in that position giving the impression of that composition principle is crucial in the creation of space. Therefore, space may refer to a form of power, in Merleau-Ponty's (2005) sense, to bring the components together and keep them in a meaningful position in relation to each other. That is, the composition principles, their relationships with each other, and the power making these relationships possible may be the essence of spatial creation which may correspond to different modes of perception.

In terms of the modes of visual perception, on the other hand, we may state that the capability of the mind is not so restricted to only the seen world. According to Jeffrey Hildner (1996) the problem of vision in architectural space does not cover only "the visible (the aesthetic)" but also "the invisible (the poetic, the semantic, the philosophical)." Thence, the composition principles actively manage both sides of the whole; by using the layers in the visible world, the invisible genius is achieved in spatial composition. For the sake of poetic essence, for example, rhythm can be utilized on a façade by a dramatic use of daylight with an articulated depth while passing through different-sized openings—as we see in Notre Dame du Haut (Ronchamp, France, 1955) designed by Le Corbusier. Or unity and variety may be used, again, on a façade by changing tactile effects of different materials in similar colours belonging to different centuries—like the façade of Zumthor's Kolumba Art Museum (Cologne, Germany, 2008). However, rhythm or unity in variety cannot be the aim of an architectural project, but the tools to provide the poetic quality, which builds the atmosphere of space. In this sense, the aesthetic quality of the atmosphere can be felt not only because of the tools but also because of the manner of connection provided by the tools, and thus, the artistic side is related not to the tool but to the manner of using it (Eldridge, 1985).

At this point, the following question may come to mind: why are the composition principles used by the architects, or why do we need to search for their use while trying to understand space? These questions are combined in the perspective recognizing the discipline of architecture—wholly or partially—as an art branch. According to Rosalind Krauss (2012), the work of art offers a renewed perception for the experiences that become routine and mechanized as a result of an ordinary relationship with words and things. To yield a renewed perception, break mechanical experiences, set an emotional relationship with a space, and design it as a phenomenon "touching" the heart (Zumthor, 2006), tools of design help architects create in an artistic way, which was also highlighted by Le Corbusier (1985): according to him, one may construct buildings by materials and spatial components, but if one can touch to the soul of the experiencers emotionally then art happens there. We may claim that the artistic side of architecture is majorly attached to the concept derivation, translation, and development phases (Eilouti, 2018), and related to the correct, purposeful, and mindful application of the design tools or principles to make the concept legible in the spatial atmosphere—as Pallasmaa (2005) also asserted that architecture serves as an in-between layer, a kind of interface between the experiencers and the experienced (world); it emanates its spirit to be perceived by the senses. Therefore, the way a space serves as a mediator for experiencers to feel, understand, and cognize the life in that space or architectural concept within the atmosphere corresponds to the way of dialogue, a kind of touch between the space and experiencers, and in this touch, the sense of sight plays a very fast and active role. In this role of vision, the composition and Gestalt principles facilitate cognitive mediation. "Vision as a form of cognition" states Krauss (1996) while describing her prominent square diagram of visual perception by referring to one of the most important Gestalt principles, figure and ground. Thus, the Gestalt principles in architectural and urban design correspond to the perception rulers serving as a cognitive basis (Nia and Suleiman, 2018) for the establishment of composition principles. In other words, they present an operational procedure for the establishment of the composition principles constructing the atmospheric structure, or the spatial limitations having a void inside reserved for the eyes and waiting to be discovered by them, in Zevi's (1974) sense.

In this axis, to analyse the frame, we should also refer to the Gestalt principles to figure out how they were combined with the composition principles in the process of spatial creation, in the selected cases. In this selection, I mainly focused on the frequently used and easily perceived composition principles preferred in architectural creations since the Modernist period. I tried to build up a parallel track for each reading, and firstly

analysed the spatial components or layers led using a specific composition principle, and then, I looked at how this principle is constructed at the level of perception. I chose rhythm, contrast, and unity in variety (or variety in unity) as the cases of composition principles, and the Villa Stein by Le Corbusier, the Barcelona Pavilion by Mies van der Rohe with the sculpture named Dawn by Kolbe, and the Brion Cemetery by Scarpa consecutively to read these visual plays. While trying to analyse these architectural compositions, I plan to refer to some literary works quoted in Six Memos for the Next Millennium written by Italo Calvino (1988), which is one of the masterpieces to understand the essences of things such as the concepts of rhythm, contrast, unity, and variety by comparing them with each other.

The Case Study: Analysing the Frame

Rhythm

"Like snow in the mountains without wind"
Dante Alighieri

Above words by Dante Alighieri (1996) from the "Inferno" of his masterpiece The Divine Comedy describe metaphorically the lifelessness in the form of a windless/rhythmless fall of the snowflakes that can be found only in the final stratum of the hell (as also cited in Calvino, 1988). Therefore, rhythm metaphorically corresponds to life—as can also be pointed out by similar meanings referring to the connection between heartbeats and life, or some formations in nature ordered by rhythmic formulations and geometries like we see in the law of phyllotaxis (Thapa, 2017). Rhythm also brings life to architecture; thus, it has modes of movement and dynamism, and a temporal structure (Thapa, 2017). Hence, space and time are intertwined with each other within the concept of rhythm. To provide a rhythmic visual organization in architecture means to invite and abstract time to play between the spatial layers; rhythm transforms the invisibility of time into a visible layout.

Probably, for this reason, rhythm became one of the dominant composition tools utilized to bring life into the cold, plain and orthogonal (Pallasmaa, 2005) world of the Modernist language. Machine aesthetics of Le Corbusier in Villa Stein becomes attached to the regular geometries composed of rectangles and squares expanding perpendicularly in horizontal and vertical directions. According to Sir Christopher Wren (1750), having uniformity using regular geometries and straight lines results in natural beauty. This neoclassicist perspective has continued over some examples both theoretically and practically in the Modernist period, as well (for theoretical support, for example, see Robertson, 1924). Villa Stein is the pure example of providing rhythm by utilizing regular geometries and straight lines (Figure 1), as also stated in Colin Rowe's (1978) rendition comparing Le Corbusier's villa with a Mannerist functional counterpart, Villa Foscari (Venice, Italy, 1558-1560), designed by Andrea Palladio.

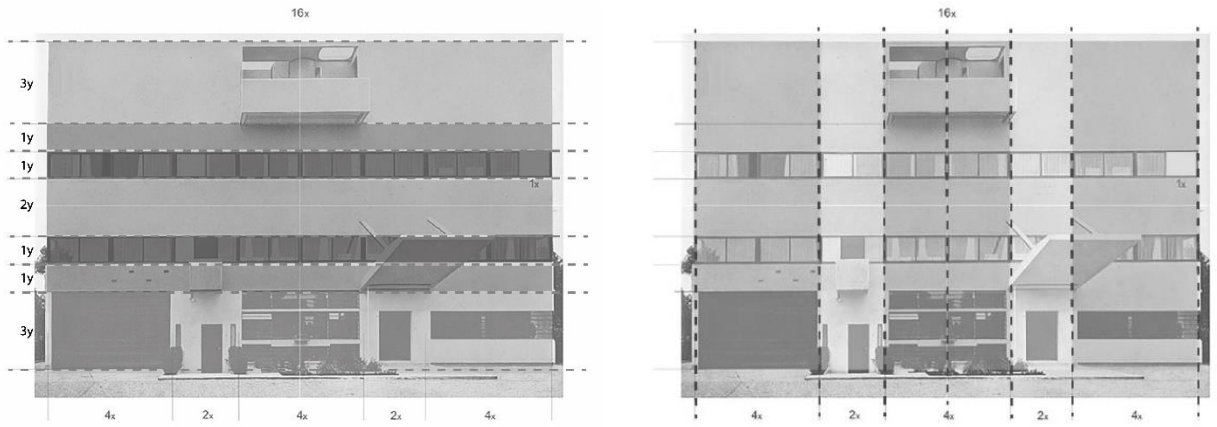

Figure 1. The rhythm provided vertically (left) and the rhythm provided horizontally (right) on the façade of the Villa Stein by Le Corbusier (Paris, France, 1927) (after Rowe's rendition in Rowe, 1978; Diagrams: produced by author)

The façade's geometric division in the vertical reading of Villa Stein corresponds to a symmetrical rhythmic set comprising 4, 1, 2, 1, and 4 units (or in a more detailed version: [3, 1], 1, 2, 1, [1, 3] units) of the whole composed of 12 units in total (Figure 1 – left). In the horizontal direction, again, there is a symmetrical balance provided by another rhythm composed of 4, 2, 4, 2, and 4 units of the total length covering 16 units (Figure 1 – right). With the help of these vertical and horizontal axes, we can establish a grid with rectangles and circles to show the rhythm provided by the sub-areas divided on the façade (Figure 2). Without the analytical diagrams in Figures 1 and 2, the geometrical harmony may not be calculated at first glance explicitly but can be felt, of course. However,

regarding the sense of Gestalt, the façade gives a harmonious impression because of the proportional similarities mainly in the divisions of stripe windows, and the sizes and shapes of the openings on the ground and top floor levels. Proportion, symmetry, and order are the other important rule-makers on the façade, although the dominance of symmetry is broken on the ground floor by projections. The continuity provided by the stripe windows and their repetition, and the common region created for the ground-floor openings by the frame of the lower stripe window, and for the top-floor opening (balcony) by the upper stripe pave the layout for rhythm to play in. Therefore, similarity, symmetry, order, continuity, and common region can be figured out as the main Gestalt principles helping rhythm be followed visually.

The front façade of Villa Stein, too, went under careful analysis in terms of the use of phenomenological transparency by Rowe and Robert Slutzky (1997), however, the rhythmic tendencies in geometry are seen most legibly in the back elevation. Thus, in the end, Le Corbusier's machine-like snowflakes composed of the vertical and horizontal regularities become vitalized by the rhythmic divisions organized harmoniously and legibly on the back façade of Villa Stein.

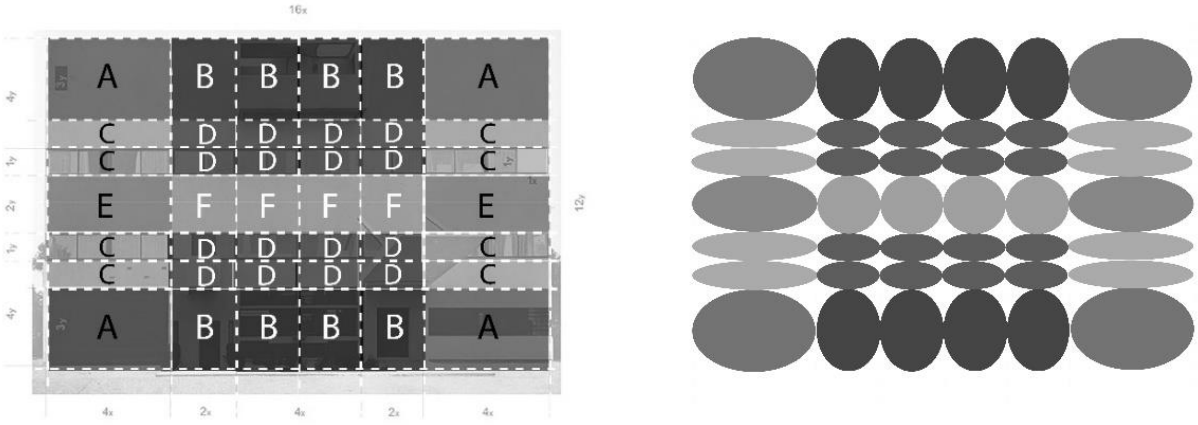

Figure 2. The grid of rhythm (left) and the visual abstraction of this rhythm (right) given by the changes in shapes, sizes and shades, on the façade of the Villa Stein by Le Corbusier (Paris, France, 1927) (after Rowe's rendition in Rowe, 1978; Diagrams: produced by author)

Contrast

> "To cut off Medusa's head without being turned to stone, Perseus supports himself on the very lightest of things, the winds, and the clouds, and fixes his gaze upon what can be revealed only by indirect vision, an image caught in a mirror. [...] Medusa's blood gives birth to a winged horse, Pegasus—the heaviness of stone is transformed into its opposite."
>
> Italo Calvino

Contrast as a composition principle is a symbiotic notion that needs the presence of opposite concepts together as bound to each other in the context to be understood. Calvino's (1988) words describing the myth of Pegasus in his Six Memos for the Next Millennium denote this kind of link between the opposite concepts of heaviness and lightness. Medusa's heavy vision is turned into a light/flying creature, Pegasus. Similar to this procedure leading the reader from heavy to light, in the Barcelona Pavilion by Mies van der Rohe, we may figure out a relationship based on a contrasting play between architectural language, gestures, and visions. The play is a metaphoric dialogue between the building and the sculpture named Dawn designed by Kolbe in the same year (1929) to be placed on the water element of the Pavilion, to be reflected lightly on the building while being a heavy stone sculpture. In architecture, the principle of contrast can be found in manifold respects comprising the contrasts in form, shape, line, direction, colour, and texture (Robertson, 1924). However, when an architectural object is put in a contrasting dialogue with an artwork, a poetic quality can be achieved as we see in the dialogue between the Barcelona Pavilion and the Dawn.

The contrasting relationships between the building and sculpture can be discovered in different respects as mentioned above. Thus, the concepts with opposite meanings such as light-heavy, hard-soft, strong-weak, firm-brittle, and transparent-opaque are expressed by the world of forms as different as possible from each other: the curves of the sculpture against the straight lines of the building, the organic form of the sculpture against the sharp planes of the building are at work (Figure 3 - left). Another important point is that all these concepts in the integrity of the building and sculpture have been designed as the concepts that cannot always be separated from each other clearly in language and in the eyes of the beholder and vary according to the context in which they are defined, and thus, can be replaced with each other. When the potential for displacement of opposing

expressions is added to the tension arising from the coexistence of contrasts in qualities, the visitor may be expected to begin to feel as if s/he is looking at a spatial phenomenon whose tension level is doubled.

The literal and metaphorical contrasts are at play interactively. The Dawn on the water and the building are personified as the headliners in this scenario in a strong figure and ground relationship regarding the Gestalt. In the play, it seems as if the Dawn tries to protect herself from being crushed under the weight of the Pavilion, being caught in the wind, being run aground, or submerged in water by raising her arms in the air while standing up against the hard and sharp-edged surfaces of the building in regular geometry. However, if she could open her eyes and look at the transparent and reflective glass surface in front of her, what she would see would not be much different from the surface she is standing on: she would see her own organic—and therefore irregular/imperfect—reflection on both sharpness of the glass surface and smoothness of water (Figure 3 - right). Originally made of heavy material, stone, the Dawn will encounter an image that rejects her weight when she looks at both surfaces; her reflection on the surfaces of glass and water in opposite directions (vertical and horizontal), that is, the only lightness she has is of her reflections. These hard and soft surfaces reflect her fragile, frightened and volatile nature.

Figure 3. The sharp-edged geometry of the building versus the organic form of the sculpture (the *Dawn* by Georg Kolbe, 1929) (left) and the reflection of the *Dawn* over the water with the probable location of her reflection over the glass surface (right) in a view from the Barcelona Pavilion by Mies van der Rohe (Spain, 1929) (Courtesy of Maciek Jeżyk; Diagrams: produced by author)

Whereas the Dawn is stone, heavy, and hard to be broken; she will never learn the fact that she is placed in a space between the lighter and fragile glass and the water whose surface changes with every breeze. She will permanently continue not to touch or look at the glass or the water so as not to break them and change them; she will remain forever as a heavy object frozen in the illusion of lightness of reflections. Perhaps, like the Medusa who once looked at one of these surfaces and met her own gaze and turned herself into stone, she froze time with herself and made it heavy in her own world in the Barcelona Pavilion. This architectural and artistic play established in the visible, therefore, refers to a symbiotic composition metaphorically based on the invisible contrasting dialogues between Mies's Pavilion and Kolbe's Dawn.

Unity in Variety / Variety in Unity

"Her waggon-spokes made of long spinners'
legs,
The cover of the wings of grasshoppers,
Her traces of the smallest spider web,
Her collars of the moonshine's wat'ry beams,
Her whip of cricket's bone, the lash of film,
Her waggoner a small, grey-coated gnat,
Not half so big as a round little worm
Pricked from the lazy finger of a maid."
William Shakespeare

William Shakespeare's (2003) lines help the reader establish a visual world in his/her mind. In this world where words turn into images, the elements are quite different from each other; each is part of a separate entity/organism. But they converge on a common point, which is the lightness, again, as Calvino (1988) points out. The differing forms are combined with the concept of lightness in this literary case. The harmony in the relationship between the parts and the whole is very important to reveal and perceive the aesthetic quality, and in this game, the dominance of the unity sets the rules and eases the appreciation of the varieties (Post, et al.,

2016). In architecture, on the other hand, we may find the use of another principle, proportion, as a tool to establish unity between the parts in a geometrical way (Robertson, 1924). Besides, considering the complexity of architectural language, this unity cannot be only set by the geometrical relationships, but also the other spatial layers should be in a dialogue with each other using harmony, as another principle. For example, we may find different projects having a variety of sub-elements changing in different aspects such as functions, geometries/forms/sizes, materials, and colours, which are designed to unify the whole, in the end, by regarding one of these aspects. In other words, an element in this kind of composition is related or combined with another one through the unifying element in a design-wisely way. This kind of aesthetic language can be called gregarious aesthetics (Eilouti, 2018).

One of the impressive examples of the use of this composition principle is Carlo Scarpa's Brion Cemetery. In the project, the variety is mainly provided by the changes in geometry and form of the sub-elements defining the space physically, and the unity can be found firstly in the selection of material (concrete), and therefore, the sameness of the texture and colour through the project. Besides, the repetition becomes another tool to bring unity in design, as we can perceive some of these repeating elements by their circular and redented geometries: the relationship between the concrete trace of water formed on a redented line with intersecting circles leading us to the redented tomb of the Brion couple and the terraced organization with the concrete curvilinear traces focusing us to the tomb is explicitly given in a geometrical intertwinement (Figure 4 – left). Although their exact forms and sizes are different, their repeating languages based on the straight redented lines and curvilinear traces, materials, textures, and colours give the impression of a unified system working for the same purpose of pointing out the tomb. Therefore, although the functions of these sub-elements are different, their purpose also unifies them and puts them in a dialogue supported by the function-, size-, and form-based varieties.

The redented and circular languages can also be found on the façade (Figure 4 – right) which is also projected into the interior organization of the building. The circular openings serving as exterior and interior vistas also refer to the circular language set in the plan layout partially, and the redented straight lines framing the building can also be found in the rest of this plan geometry. On the façade, the double intersecting circles provide emphasis and contrast, as well, as to create transparency in the form of a punch on the opaque, textured, dark, and straight surface of the building. When we look at both images in terms of the Gestalt reading, the continuity by similarity—the visible tool— that is, by repeating the similar geometries, material, texture, and colour, and by figure and ground relationships unifies the building into a poetic design language—the invisible "more." The permanent dialogue between the physical space-defining elements, between the elements and building, between the building/spatial elements and natural elements, and between the sensory experience and spatial atmosphere composes an architectural poem written for the eternal journey of the Brion family.

Figure 4. The various and similar design relationships between the curvilinear and redented geometries in the tomb of the Brion couple (left) (Courtesy of Ivo Stani; Diagram: produced by author) and the façade view showing the unification through the repeated circular and redented languages, material, texture, and colour (right) (Courtesy of Trevor Patt; Diagram: produced by author) in the views of the Brion Cemetery by Scarpa (Italy, 1969-77)

Evaluations: Looking through the Frame

In the creation of spatial atmospheres, composition principles are generally utilized by the architects to design a visual play impressing the experiencers. Turning a space into an artwork by the way of visual plays, and in this way, providing the experiencers with aesthetic pleasure refer to the artistic side of architecture. Therefore, in the background of utilizing the composition principles, there resides the recognition of architecture as an art branch. Besides, applying the composition principles consciously and design-wisely eases the way of giving aesthetic pleasure since their application necessitates geometrical formulations. In other words, the rules set via the principles facilitate the artistic play in architectural spaces.

These rules also refer to a tool-set of communication between the space and its experiencer. When an experimenter can understand the visual play in the space, communication is established between his/her and the space. The communication via the alphabet of composition principles makes the experiencers visually impressed and feel the artistic side. The composition principles in the creation of space correspond to a common language constructed by geometrical formulations, and a sort of mediation between the mind and the architectural environment to aestheticize the spatial atmosphere. Aestheticisation of the spatial atmosphere by the composition principles in visual respect becomes the language of architectural space to talk with the experiencers.

Among many of the principles, rhythm, contrast, and unity in variety may comprise the easily comprehensible ones in establishing the visual play. Rhythm can be formulized as the systematic changes in the repetition of a spatial element; the changes can be given in size, location, position, form, geometry, texture, and colour. Namely, the monotonous qualities of repetition become broken systematically by the changes in some of those qualities in rhythm. Therefore, when the principle of repetition merges with the principles of harmony and proportion, rhythm can be created and become visible as we see in Villa Stein's grid face having rhythmic qualities as well as referring to a temporal understanding in its invisible "more." Each unit in the rhythm talks to another unit in this relationship to stay connected with the other units as well as the whole, as we may also realize in the principle of unity in variety similarly.

Contrast can also be perceived at a glance in a visual play. The opposite or complementary perspectives, directions, light effects, colours, geometries, forms, and texture qualities lead us in this play to understand the contrasting qualities in a symbiotic way. That is, to apprehend the existence of a feature, we need the apprehension of its opposite quality together with it. In the structure of contrast, this symbiotic existence may create a specific narration: the tension designed by the opposing figures may invite the experiencer to think about the source and reason of this tension, which may lead to the production of narration as an invisible "more" (for a discussion of Barcelona Pavilion in this context, see Psarra, 2009). Therefore, the aestheticisation of the spatial atmosphere by using contrast as a design tool in visual respect may increase the memorability of the space by the way of the narration provided by the very use of this tool, as we may also narrate the life of Dawn in a relationship with the Barcelona Pavilion.

Unity in variety—or variety in unity—also refers to a set of relationships, especially in the sense of the Gestalt. Accordingly, while some of the features of a space are changing, at least one of these features should be repeated similarly, dominantly, and continuously to set a unified language to ease the comprehension of the whole. Similarly, if there is no change in the spatial elements, and if the qualities are repeated in the same way throughout the whole, again, we may not talk about a unity but singularity which leads us to a monotonous environment and breaks the possible poetic quality of the space referring to the "more." The relationships between the part, and between the parts and the whole should be constructed in a balanced way to prevent a visual cacophony and randomness in the perceived qualities of design. As perfectly achieved in both visible and invisible respects—in Hildner's (1996) sense—in the Brion Cemetery, the scenario of the circulation, the purpose attached to the scenario, curvilinear and redented languages, material, texture, and colour may refer to the set of unifying features, while proportions, sizes, traces, and the relationship with the environment vary.

Conclusion: Being Framed

Aesthetics is perceived by many contemporary architects as a notion having tension because of the subjectivity of the evaluation criteria and the intangible character of the term. However, especially since Modernism, the architects tried to break the historicist rules rooted in Neoclassicism in its final stage, in the traditional axis, and designed a new set of rules to provide a visual quality and legibility in their designs. This new rule set has mainly depended on the new perception of space, the new architectural understanding based on the sense of sight, and the relationships between observer and observed. The ornamentation as the visual content of traditional architecture was rejected for the sake of purity and minimalism in design to compose a new spatial atmosphere created by the organization of space in visual respect rather than the ornaments covering the skin of the building.

In this new understanding of spatial organization, the visibility of visual play has been provided via the composition principles guaranteed by the invisible geometrical formulations. In this way, the concept of space has become formulised, and aesthetic perception of it has been transformed into a mechanized process based on a specific reading hierarchy. This hierarchy differs in each composition principle: for example, in rhythm, we are introduced to the changing relationships in terms of the sizes, locations, and positions of the sub-spatial elements, while in contrast, we need to read the scheme of design within a dual perspective linking the opposite qualities permanently in a symbiotic narration. Unity in variety sets the reading hierarchy free from a specific reading line but constitutes a strong and unbreakable relationship between the parts and the whole. While the geometries, positions, textures, colours, and materials of those parts provide variety, one of these qualities is kept the same and dominant throughout the project to provide unification. In the end, while the principles frame the design layout in a visible way, the invisible power enabling the principles to work in a specific way becomes framed.

In the frame of this paper, I tried to look at the effects of the mentioned composition principles on the perception of architectural space. I focused on the designs of the Villa Stein by Le Corbusier, the Barcelona Pavilion by Mies van der Rohe and the Dawn by Kolbe, and the Brion Cemetery by Scarpa and their relationships consecutively with the principles of rhythm, contrast, and unity in variety (or variety in unity). On the way of my research, I also utilized some literary works cited in Calvino's (1988) Six Memos for the Next Millennium since those citations have explicit parallelisms leading us to the chosen principles. Thus, the clarity of the formulations of the composition principles can be followed comparatively in both visual and textual respects. The visual qualities of spatial atmospheres, essences, or genii provided by the composition principles point out that there can be objective criteria in the aesthetic aspect of design. Comprehension of this objective side may release the architects from the burden of the subjectivity of aesthetics.

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Conflict of Interests

The author declares no conflict of interest.

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CHAPTER 2. Tomb of Sultan Bokht Agha and Two Minarets of Dardasht Neighbourhood in Isfahan, Iran

Narmin Babazadeh Asbagh

Introduction

This tomb is located in the "Dardasht" neighbourhood in Isfahan, Iran, consisting of a gate with two minarets and a tomb room, belonging to "Sultan Bokht Agha", the daughter of "Amir Ghiasuddin Kaykhosrow Inju". The entrance is on the south side with the two minarets on top of it and there is also a square room with a dome above it on the west. The walls of the main façade on both sides of the entrance are covered with a decorative covering, and substructures of bricks of different sizes can be seen under this covering. Although this IL-Khanate building remains almost intact, there is little information about it on reliable resources. This research aims to introduce this historic building with the illustrations of its plans and pictures after a short biography of "Sultan Bokht Agha". The methodology of this historic survey is analytical and qualitative based on first-hand reliable references.

The present study is the result of research on the tomb of "Sultan Bokht Agha" and the two minarets of "Dardasht" in Isfahan, Iran. This research explains the history of the "Al-Muzaffar" lineage and the kings of that period briefly, including "Amir Ghiasuddin Kaykhosrow Inju", the father of "Sultan Bokht Agha", "Shah Sheikh Abu Ishaq", uncle of "Sultan Bokht Agha",

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and “Shah Mahmud Ibn Amir Mobarez Al-Din Muhammad”, the husband of “Sultan Bokht Agha”. Afterwards, a short biography of “Sultan Bokht Agha” is mentioned. Subsequently, a short history of the architectural characteristics of buildings in Iran during the IL-Khanate period is studied. Then, the “Dardasht” neighbourhood of “Isfahan” is introduced where the two minarets are located and subsequently, the tomb of “Sultan Bokht Agha”, the decorations on the façade, and the inscription engraved on the tombstone of “Sultan Bokht Agha” is explained. The research method used in this study is completely analytical and qualitative, and the research tool is using library books and reliable resources. The plan and section of the building are measured precisely with a laser meter and digitalized via the AutoCAD programme and all the pictures are taken and the figures are edited by the author.

The Lineage of “Al-Muzaffar” in Iran

“Al-Muzaffar” were the children of “Amir Mobarez Al-Din Muhammad Ibn Muzaffar”, who used to live in “Khorasan” city of Iran and migrated to the “Yazd” city and settled there (Eghbal Ashtiani, 1985, p. 412). The city of Yazd, central Iran, was founded and given the name of “Eazadan” (Easatis in Greek) or “Yazdangerd” by command of “Emperor Yazdegerd I” (A.D. 339—421) in the “Sasanian” era (224—651) which was conquered by Muslims in 642 (Abouei, 2009, p. 230). The kings and rulers of “Al-Muzaffar” or “Muzaffarid” dynasty (1314—1393) are “Amir Mobarez Al-Din Muhammad Ibn Ghiasuddin Haji” (1314—1358), “Shah Shoja Ibn Amir Mobarez Al-Din Muhammad” (1358—1364), “Shah Mahmud Ibn Amir Mobarez Al-Din Muhammad” (1364—1366) in “Isfahan” city, “Shah Shoja Ibn Amir Mobarez Al-Din Muhammad” (1366—1384), “Sultan Zayn Al-Abidin Ibn Shah Shoja” (1384—1387), “Shah Nusra Al-Din Yahya Ibn Amir Mobarez Al-Din Muhammad” (1387—1391) in “Shiraz” city, “Sultan Emad Al-Din Ahmad Ibn Amir Mobarez Al-Din Muhammad” (1387—1391) in “Kerman” city, “Sultan Abu Ishaq” (1387—1391) in “Sirjan” city, and “Shah Mansour Ibn Shah Muzaffar Ibn Amir Mobarez Al-Din Muhammad” (1391—1393) (Eghbal Ashtiani, 1985, p. 442).

In 729 A.H. (Latin: Anno Hegirae, “in the year of the Hijra”), “Amir Mobarez Al-Din Muhammad Ibn Muzaffar” married “Khan Qoutloukh Makhdoom Shah”, the daughter of “Qotb Al-Din Shah Jahan”, the “Qarakhtaei” king of “Kerman” city. “Khan Qoutloukh Makhdoom Shah” was the mother of “Shah Shoja Ibn Amir Mobarez Al-Din Muhammad”, “Shah Mahmud Ibn Amir Mobarez Al-Din Muhammad”, and “Sultan Emad Al-Din Ahmad Ibn Amir Mobarez Al-Din Muhammad” (Godard, 1996, Volume 3, Part 1, p. 169). “Shah Mahmud Ibn Amir Mobarez Al-Din Muhammad” came to “Isfahan” city after the surrender of “Shiraz” city, and since he had not yet forgotten the revenge against his brother, he befriended “Sultan Oveys Jalayer” and was determined to marry his daughter. “Shah Shoja Ibn Amir Mobarez Al-Din Muhammad” moved to “Isfahan” intending to expel him, but when “Shah Mahmud Ibn Amir Mobarez Al-Din Muhammad” expressed his obedience to his brother, he left “Isfahan” and returned to Shiraz.

“Shah Mahmud Ibn Amir Mobarez Al-Din Muhammad” had married “Sultan Bokht Agha”, the daughter of “Amir Ghiasuddin Kaykhosrow Inju”. When she heard that her husband was trying to marry the daughter of “Sultan Oveys Jalayer”, despite her husband and to avenge the blood of her uncle, “Shah Sheikh Abu Ishaq”, she secretly wrote letters to “Shah Shoja Ibn Amir Mobarez Al-Din Muhammad” from “Isfahan” and promised him that if he moved to “Isfahan”, she would take her husband captured and surrendered to him and opened the gates of “Isfahan” city to him. “Shah Shoja Ibn Amir Mobarez Al-Din Muhammad” arrived in “Isfahan” and settled outside the city. No matter how much “Sultan Bokht Agha” wanted to provoke and conspire the army of the two sides, she failed. “Shah Mahmud Ibn Amir Mobarez Al-Din Muhammad” was very frightened of his brother and asked for his forgiveness, so “Shah Shoja Ibn Amir Mobarez Al-Din Muhammad” left “Isfahan” again to his brother and returned to “Shiraz” (Eghbal Ashtiani, 1985, p. 430). When “Shah Mahmud Ibn Amir Mobarez Al-Din Muhammad” realized this conspiracy and although he was fascinated by his wife’s perfection, he killed “Sultan Bokht Agha” when he was drunk on a night in Ramadan in the year 769 A.H. and she was buried in the tomb next to “Dardasht” school. “Shah Mahmud Ibn Amir Mobarez Al-Din Muhammad” died on the 14th Shawwal (the tenth month of the lunar-based Islamic calendar) in the year 776 A. H. (Haji Ghasemi, 1998, pp. 314-321).

Architectural Characteristics of Buildings in Iran during the “IL-Khanate” Period

The Tomb of “Sultan Bokht Agha” is one of the stunning buildings established in the IL-Khanate period (1256—1335) (Pirnia, 2008, p. 219). Simultaneously with the rule of the “IL-Khanate” (“IL-Khanid”), there were other dynasties that some of them obeyed “Mongols”. These dynasties are “Al-e-Kart”, “Atabakan-e-Fars”, “Atabakan-e-Yazd”, “Qarakhtaeian-e-Kerman”, “Inju dynasty”, “Al-Muzaffar lineage”, and “Atabakan-e-Lor” (Pirnia, 2008, p. 209). After the “Mogul Conquest” in the 13th century and the establishment of the “IL-Khanate” ruling system, “Tabriz” became the capital city of the state, and some major monuments were founded in this city (Polat, 2014, p. 37). Some of the most famous masterpieces constructed in “Tabriz” during the “IL-Khanate” period are “Shanbe-e-Ghazan” (Pleasure-Dome of “Ghazan Khan”), “Rab’-e-Rashidi” (an academic quarter), and “Ark-e-Ali-Shah” or Mosque of “Taj-Al-Din Ali-Shah Jilani” (Tarighat, 2009, p. 107). During this period, “Tabriz” became special commercial prosperity, and “Gikhato Khan” ordered the issuance of paper money (“Chao”) to facilitate

commercial transactions (Omrani and Esmaili Sangari, 2006, p. 63). For more information about the history of "Tabriz" city, you can read the article written by the author titled "A Short Glimpse to the Urban Development of Tabriz during the History" (Asbagh, 2019, pp. 73-83). Similarly, to obtain general information about "Tabriz" city and its historic buildings, you can read the Master thesis of the author titled "The Conservation and Revitalization of Mirza Mehdi Farashbashi's House in Tabriz" (Asbagh, 2011, pp. 5-74), and the article derived from it by the author with the title of "Adaptive Reuse of the House of Mirza Mehdi Farrashbashi in Tabriz" (Asbagh, 2021, pp. 506-520).

After the "Mongols" occupied Iran, they came under the influence of Iranian art and culture later. After accepting Islam, the "Mongols" began to build religious buildings. During the "IL-Khanate" era, religious buildings such as mosques, schools, shrines, and tombs were given more attention. During this period, the plan of the buildings and the shape of the dome in the "Seljuk" style continued with minor changes. Because the "Mongol" rulers wanted to maintain their superiority and pride, the buildings were as magnificent as possible, so they went beyond the scale of construction. The towers became taller and the inscriptions larger. More attention was paid to decorations in different colours and huge buildings were made with coloured shapes. The old and high gates were revived and brought to attention. The variety of decorative patterns and the sharpness and prominence of the turquoise blue tiles make it a beautiful example of the art of this period. The use of stone in the building was specific to the region of "Azerbaijan", which was used in the lower part of the walls and sometimes stones were used for decoration. "IL-Khanate" architecture did not create a new style in the history of Iranian architecture in terms of aesthetics. This architecture is a continuation of "Seljuk" architecture to some extent. The double-walled dome, which was first used in "Seljuk" architecture, became very popular in this period. Clay was used in building these walls and baked bricks were used for coating. Burials and funerary buildings of "IL-Khanate" architecture are more inspired by the "Seljuk" period patterns, which include the towers of tombs and shrines; the towers of the tombs were square, circular, or polygonal in plan, covered with a dome and kept out of view by a pointed roof. This conical or multi-faceted roof was adapted from the "Seljuk" pattern and was widely used in northern "Mesopotamia" and "Anatolia".

The "IL-Khanate" architecture of Iran has a special connection with the "Seljuk" architecture, and in some cases, it is even difficult to accurately distinguish these two periods in some works. However, "IL-Khanate" architecture is much lighter and more elegant than "Seljuk" architecture. During this period, mosaic art of tile reached its peak. The dome usually covers two-thirds of the building and is coordinated with the building by its special decoration and elegance. The porches are stretched and raised, and the brickwork is perfect in the buildings of the "IL-Khanate" era. The courtyards become narrower and the plan of the four porches becomes more comprehensive. Little is known about the non-religious buildings of the "IL-Khanate" architecture. One of the reasons might be the customs of these people living in the deserts. Some palaces have been mentioned in the old sources, but none has survived due to the use of unstable materials. The plans of these buildings are all similar; a rectangular courtyard with an open space with an entrance door and accommodations on all four sides. The most famous mosques of this period are "The Varamin Mosque", and "Oshtorjan Mosque of Isfahan". Some of the famous tombs of this period are "Gonbad-e Soltanieh" ("Soltanieh Dome") or "Tomb of Sultan Oljaito" in the "Soltanieh" area near "Zanjan" city, and "Ghaffariyeh Dome" (Gonbad-e Ghaffariyeh, or Dome of Ghaffariyeh) in "Maragheh" (an ancient city and capital of "Maragheh" County, in East Azerbaijan Province), and "Tomb of Aladdin" ("Aladdin Tower" or "Aladole Tower" or "Gonbad-e Ala Al-Din" or "Dome of Aladdin" in "Varamin" (a city and capital of "Varamin" County, in Tehran Province). Some of the caravanserais of the "IL-Khanate" era are, "Sarcham Caravanserai" ("Sarcham" village is an area near "Zanjan" city) and a caravanserai in "Marand" (a city and the capital of "Marand" County, in East Azerbaijan province) (Pirnia, 2008, pp. 214-269).

"Dardasht" Neighbourhood in "Isfahan", Iran

"Isfahan" is one of the very old cities of Iran; the suitable geographical and natural location of this city on the plateau of Iran and the fertile soil and the existence of the famous River, "Zayandeh Rood", have allowed it to be one of the important activity centres of "Aryan" race living in this region in all past eras. "Isfahan" city is a relatively mountainous and vast region in the centre of the "plateau of Iran", which is limited to "Kashan" city and "Golpayegan" city in the North, "Abadeh" city and "Behbahan" city from the South to "Yazd" city from the East, and to "Chaharmahal Bakhtiari" city and "Khuzestan" city from the West (Honarfar, 2008, pp. VII, 1). "Isfahan" city became the Capital of Iran in the "Safavid" era in 1006 A.H. (Shafaghi, 2004, p. 147). "Jean Chardin" (1643—1713), a French jeweller and tourist, has lived in "Isfahan" for many years (1664—1670 & 1671—1677) and claims that "Isfahan" city is as populous as London. "Dardasht" neighbourhood is one of the historic quarters of "Isfahan" locating the northern part of the city (Figure 1). It is mentioned in several history books and the original name of it in the Arabic language, "Bab Al-Dasht", (Chardin, 1983) means "the door of the plain/ desert/ field" ("Bab" means door in the Arabic language, and "Dasht" means the plain/ desert/ field in the Persian language).

Figure 1. The Location of Tomb of "Sultan Bokht Agha" and Two Minarets of "Dardasht" Neighbourhood and the Adjacent Streets for Access It in "Isfahan" city, Iran (Google Maps, Developed by Author).

Tomb of "Sultan Bokht Agha" and Two Minarets of "Dardasht" Neighbourhood

"André Godard" (1881—1965), an archaeologist, architect, and historian of French and Middle Eastern art, wrote in his book, "Antiquities of Iran" in the first part of the third volume, about the two minarets of "Dardasht": these minarets may be the same ones that "Chardin" observed near a school in the neighbourhood. Today, they stand on the ruins of a gate connected to the dome of the daughter of "Amir Khosrow Shah", the same person about whom "Mr Mir Seyyed Ali Jenab" wrote interesting articles. It is in the style of "Mongolian" buildings and its construction is made of used and second-hand bricks, raw clay, and mosaic tiles. These tiles show patterns in the form of spiral strings. In the minaret on the north side, an inscription written in perpendicular script and engraved in the form of a necklace around the minaret shaft remains. It seems that the history of the minarets and the dome of the tomb dates to the middle of the eighth century of the Lunar Hijri calendar (Islamic, Muslim or Arabic calendar) (Godard, 1996, Volume 3, Part 1, p. 169). "Godard" also continues in the second part of the third volume of his book about this building: The minarets are located on the gateway of a mansion constructed in the "Mongolian" era which is probably the same school that "Chardin" described in his description of the "Dardasht neighbourhood". This form of building which is the erection of two minarets on top of a gate, attached to both sides of it, is often seen in the buildings of the "Mongol" era. In "Isfahan", "Yazd", "Kerman", "Qom", "Abargo", "Ardestan", "Tabas" (in Iran), and even in "Nakhichivan" ("Nakhichevan" or "Naxçıvan") (in Azerbaijan Country), we can see other examples of this kind of building (Godard, 1996, Volume 3, Part 2, p. 231).

Table 1. The Plans of Tomb of "Sultan Bokht Agha" and Two Minarets of "Dardasht" (Developed by Author)

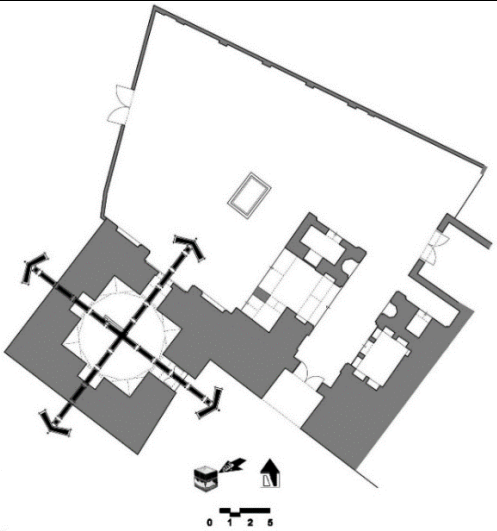
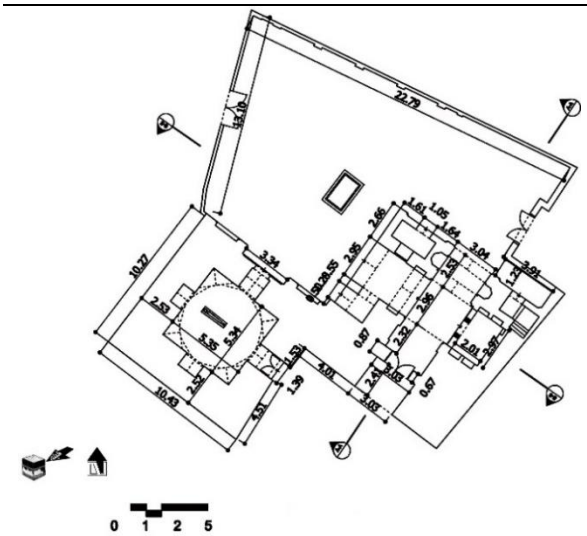
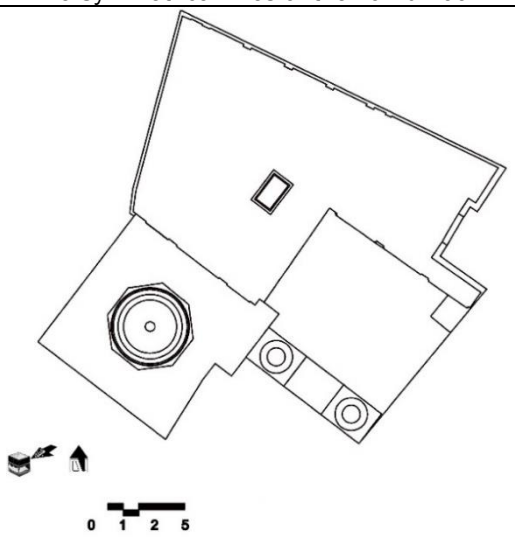
	
Location and Direction of the Tombstone in Plan	The Symmetrical Axes of the Tomb Room
	
Measurement Plan of the Complex (S= 486m^2)	Roof Plan of the Complex

Table 2. The Elevations and Sections of Tomb of "Sultan Bokht Agha" and Two Minarets of "Dardasht" (Developed by Author)

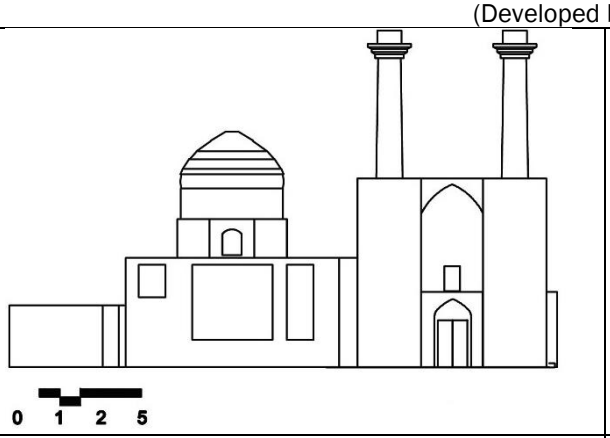
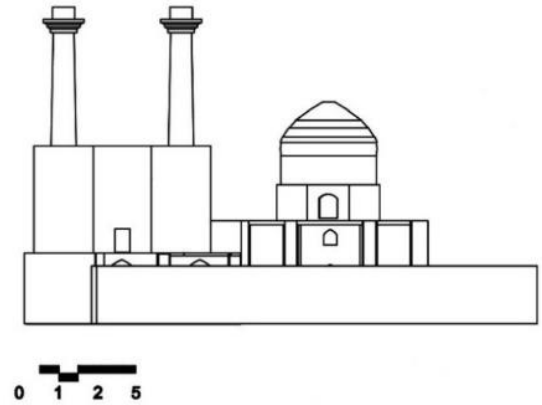
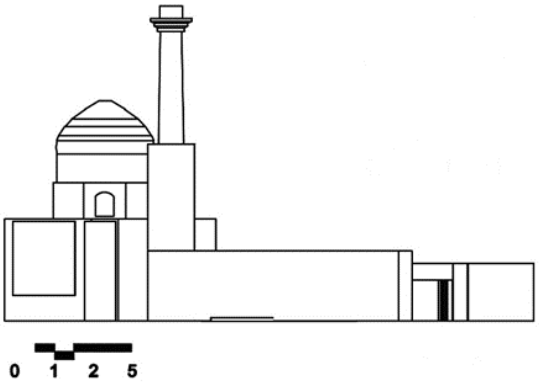
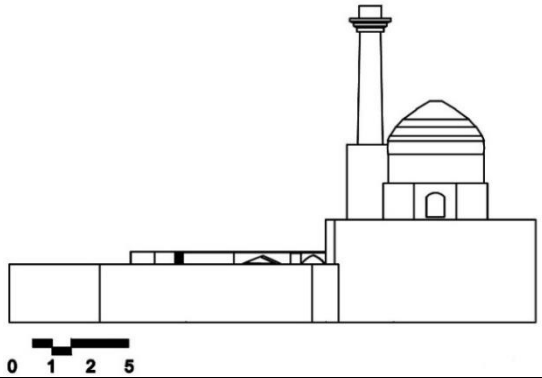
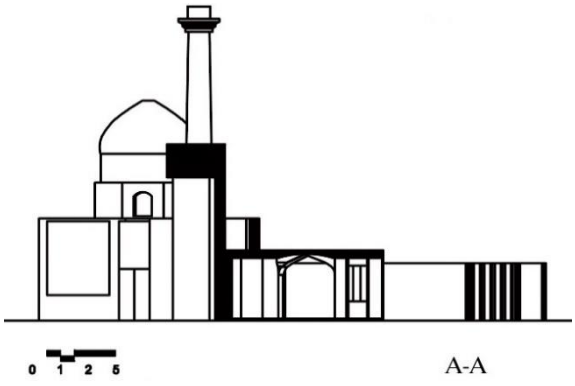
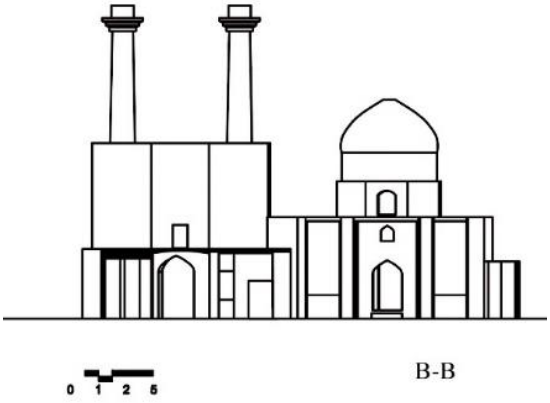
	
South Elevation of the Complex	North Elevation of the Complex
	
East Elevation of the Complex	West Elevation of the Complex
	
A-A Section of the Complex	B-B Section of the Complex

Table 3. The Perspective Views of Tomb of "Sultan Bokht Agha" and Two Minarets of "Dardasht" (Developed by Author)

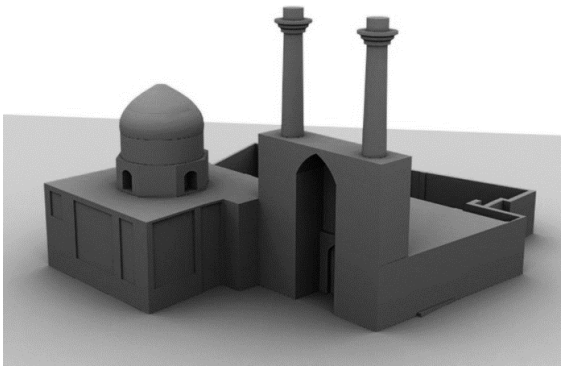
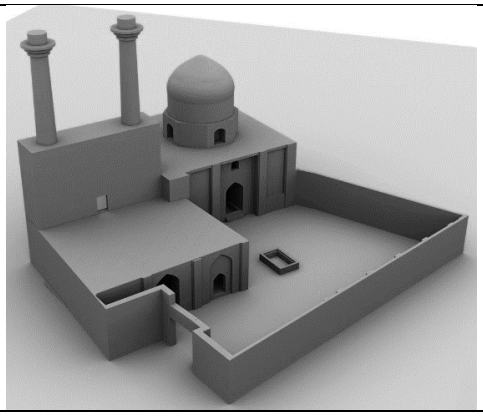
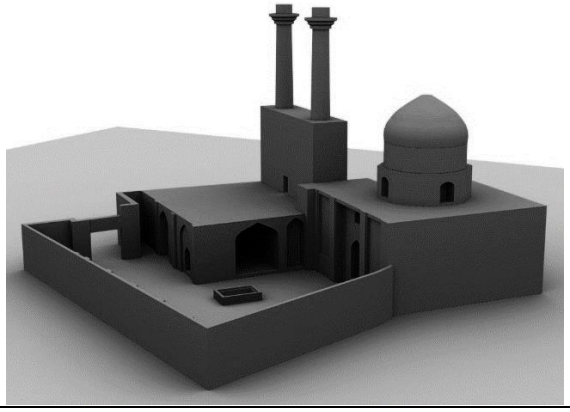
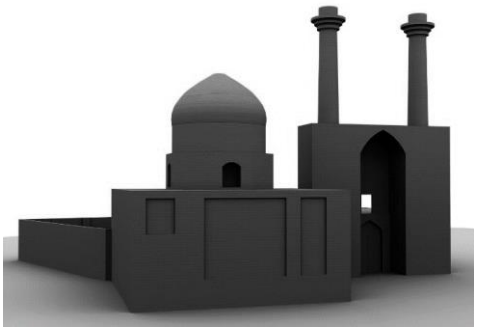
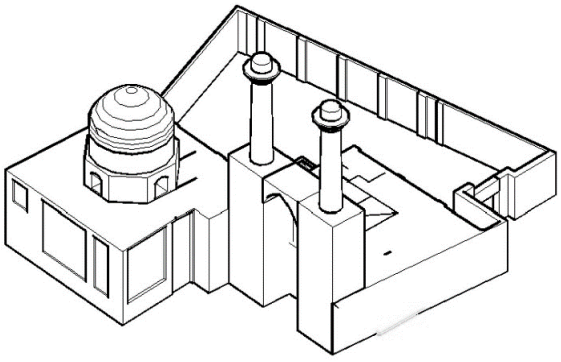
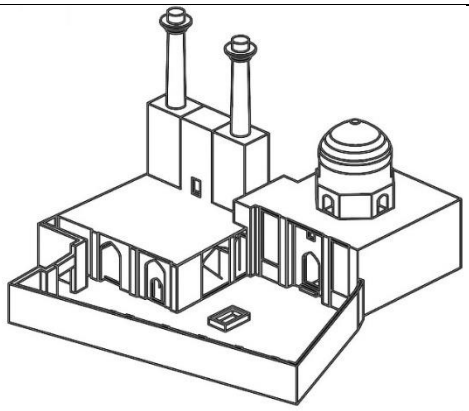
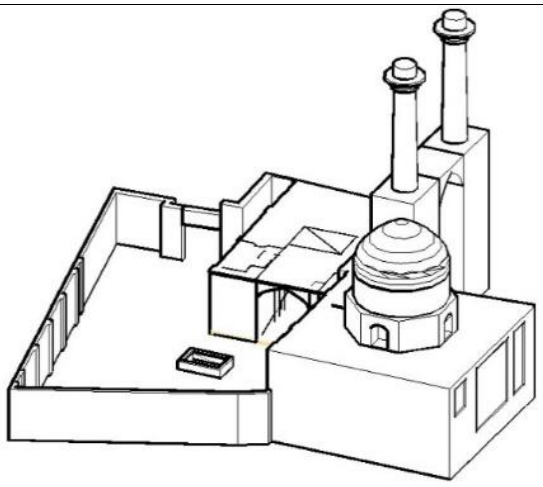
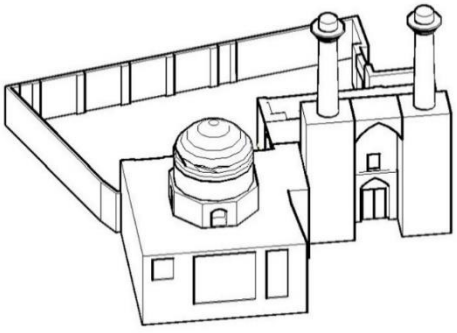
	
	
	
	

Table 4. Some Samples of the Brickwork of Tomb of "Sultan Bokht Agha" and Two Minarets of "Dardasht" (Developed by Author)

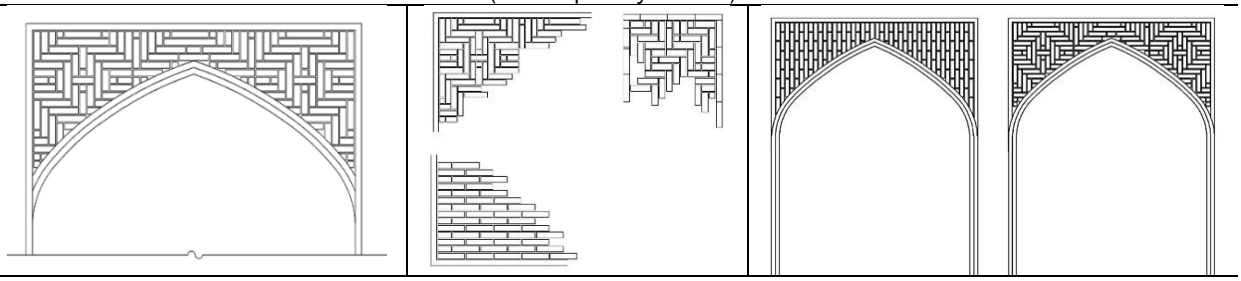
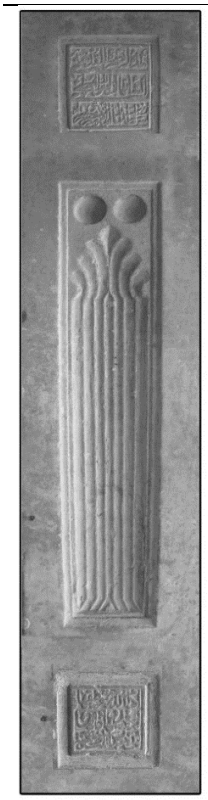


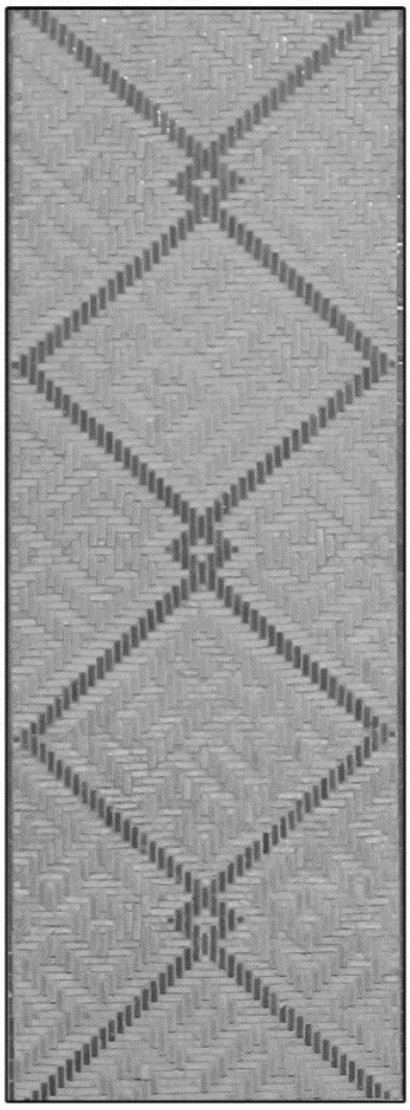
Table 5. The Inscriptions on the Tombstone and Some Samples of Brickwork of Tomb of "Sultan Bokht Agha" and Two Minarets of "Dardasht" (Photos Taken by Author)



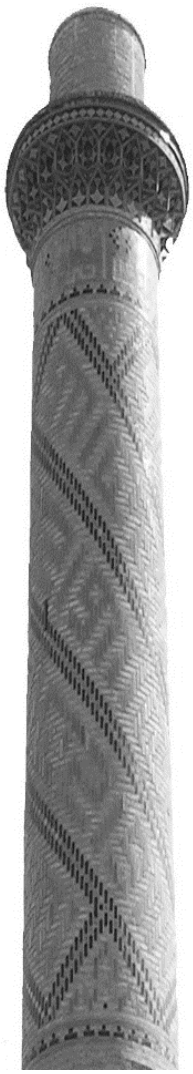
The Inscriptions on the Tombstone:

هذه الصخره المقدسه انشاتها الخاتون العظمي سلطان بخت آغا ابنه الامير خسرو شاه - ادام الله توفيقها لنفسها بعد وفاتها في رمضان سنه ثلث و خمسين و سبعمائه.

"This is the holy rock/ sacred stone, constructed by the great lady, Sultan Bokht Agha, the daughter of Al-Amir Khosrow Shah, may God grant her success to her after her death, in Ramadan 753."



"Al-Hamd-o-Lellah"
"Allah-o-s-Samad"



The Minaret

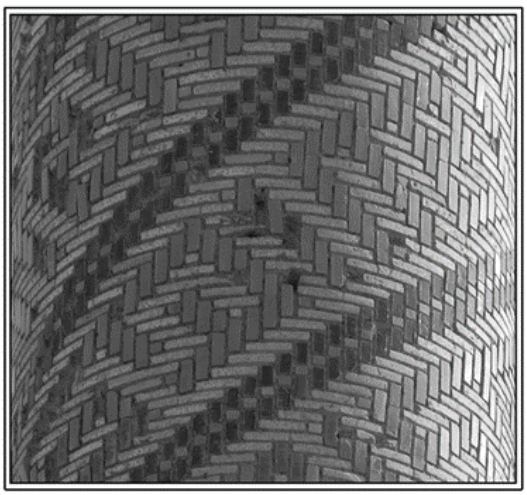
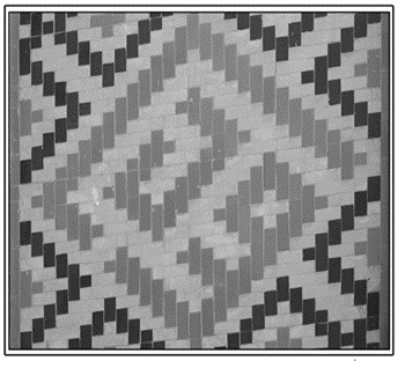
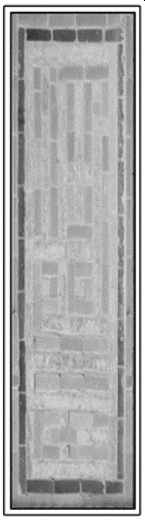
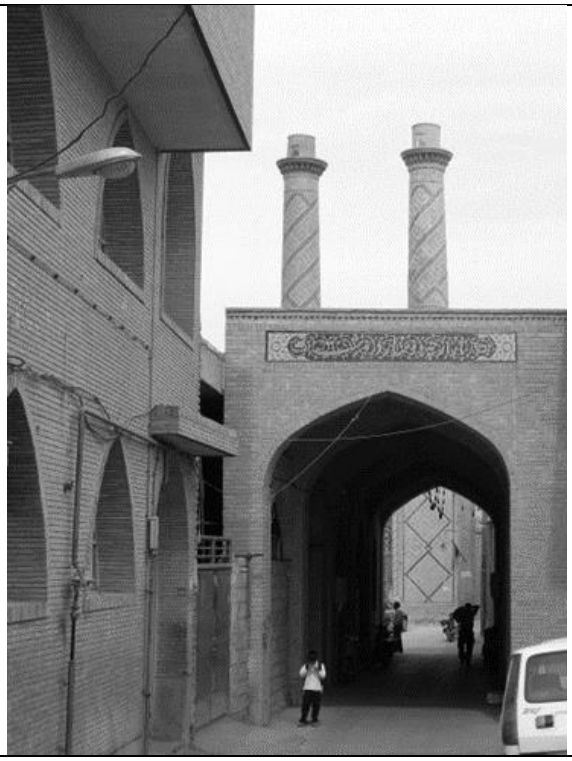
		
The Inscriptions on the Minaret	"Ya Mannan"	"La ilaha illa Allah"

Table 6. The Pictures of Tomb of "Sultan Bokht Agha" and Two Minarets of "Dardasht" (Photos Taken by Author)

	
Two Minarets of "Dardasht" in the Neighbourhood	The Main View of the Tomb of "Sultan Bokht Agha" and Two Minarets of "Dardasht"

The Entrance to the Complex

One of the Minarets of “Dardasht”

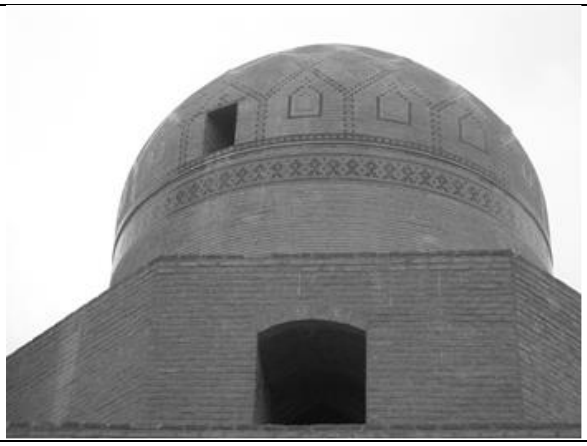
“Al-Hamd-o-Lellah” and “Allah-o-s-Samad”

“Ya Hannan” and “Ya Mannan” on the Entrance Wall

"Ya Hannan"

"Muhammad Rasoolullah"

The Dome of Tomb of "Sultan Bokht Agha" and Two Minarets of "Dardasht"



The Dome of Tomb of "Sultan Bokht Agha"

Discussion

The 4th volume of "Encyclopedia of Historical Monuments of Iran in the Islamic Period, Mausoleums" (1997), is written about the tomb of "Sultan Bokht Agha" and two minarets of "Dardasht": this tomb is located in the neighbourhood of "Dardasht" and there are two minarets next to the school. This building, which consists of a gateway with two minarets and a tomb room, is the burial place of "Khan Sultan" ("Sultan Bokht Agha"), the daughter of "Amir Ghiasuddin Kaykhosrow Inju", and on the tombstone, the name of "Sultan Bakht Agha" is mentioned (Pp. 51-54).

"Donald Newton Wilber" (1907—1997), an American writer and spy, who was a principal architect of the CIA and wrote histories, travelogues, and commentaries on Iran, was considered an authority on ancient Persia, and a specialist about "IL-Khanate" architecture. Wilber wrote about this building in his book, "The Architecture of Islamic Iran, The IL-Khanid Period" (1955): the first inquiry about the entryway and the (tomb) room is whether they both belong to the same time. Both seem to be contemporaries; but on the other hand, it is possible that the (tomb) room is older and has been repaired a lot and a new dome was built on it when the entrance was built. Determining the date of the entrance is an interesting subject. Comparing the characteristics of the entrance to some existing buildings, relatively definite results are obtained. But of course, if there were more buildings left, these results might be a little different. The main buildings in terms of this comparison are "Imam-Zadeh Jafar" and "Imam-Zadeh Baba Qasem", both of which are in Isfahan. The first date is 725 A.H. (Lunar Hijri Calendar) and it has three colours of pottery in the same stage of evolution that can be seen in the entrance. The second date, 740 A.H., has four colours of pottery. Without discussing other details of the building and the way of decorating the entrance and minarets, which confirms the following result, the date of construction of the entrance can be considered between 725 A.H. and 740 A.H. (Wilber, 1955, pp. 208-216).

"Rafiei Mehrabadi" (1973) also writes in the "National Monuments of Isfahan" about the two minarets of "Dardasht": the head of the minarets that fell were used to connect to a building that formed a complex of a school and a mosque from the time of "Al-Muzaffar", and after the destruction of the mosque and school, it was

turned into a caravanserai and now the caravanserai has become a house. The entrance is almost to the south and on top of it, two circular minarets have been built. There is nothing left of the buildings behind the entrance; but on the west side and adjacent to the left side of the entrance, there is a square room with a dome above it. The surfaces of the façade wall on both sides of the entrance are covered with a decorative covering and under this covering, substructures of bricks of different sizes can be seen. The thickness of the cover is 26 cm and includes bricks that are between 4 cm and 12 cm deep and are placed on a piece of broken brick and lime. The rope-shaped frame of the moulding, which consists of bricks and glazed brick bottoms in light blue and dark blue, is placed around the profile of the entrance arch, and the upper triangle-shaped parts are filled with a design of the same materials. At the top of the façade, a cornice-like area contains a decorated plate that is now 8 cm high (the upper part has been demolished) and contains sacred names made of similar materials. The side panels of the entrance recess have continuous decorated surfaces on which it is divided into grooves. There used to be an inscription on the three sides of the recess, but now only a part of it remains. Also, from the rear plate of the entrance recess, only one area is decorated, and part of the main arched door remains. At the top of the entrance, two circular minarets gradually decrease in diameter, and in the lower part of each, there is a rectangular opening that is connected to the minaret stairs. The decoration of the minaret consists of several parts. The lower part is regular brickwork on which a wide area and a narrow border consisting of “Kufic script” letters with light blue and dark blue bricks and tiles. Above this border, there is a base work of a carved Muqarnas cornice, the lower floor of which consists of spherical triangles on the side, and its prominent points are filled with pottery decoration. Brickwork is either laborious or ordinary work and two types of glazed and unglazed pottery have been used. The main part of the decoration includes geometric diagonal designs and large-scale “Kufic” inscriptions with unglazed bricks and light blue and dark blue glazed bricks. Some parts have been scraped to reveal the core of the brick, and these two colours have been combined with the white parts of the inscription (Rafiei, 1973, pp. 424-429).

“Honarfar” (1965) also writes about the entrance and the minaret of the building as follows: the two minarets of “Dardasht” are located on top of a high entrance about fifteen meters high, which indicates its ancient greatness. The height of the remains of the two minarets from the roof surface is not more than eight meters and indicates a large and detailed building that was located behind the minarets and its luxurious entrance. No information is available on the composition of the post-entrance buildings due to the many changes that have taken place in the area and there is nothing left of its large building, but the small space in the back. Nevertheless, as the local architects have said, the ruined rooms around the school remained until a century ago and have been gradually annexed to the surrounding houses and it was a place for the community of “Dardasht” neighbourhoods until a century ago. There are also remains around the neck of the dome of the tomb that connects the tomb to the other buildings around it which is likely the rest of a large and detailed building complex and most probably the founder of the building was “Sultan Bokht Agha” herself or her husband “Shah Mahmud Ibn Amir Mobarez Al-Din Muhammad” (Honarfar, 1965, pp. 317-318).

There is a domed room of the tomb, next to the entrance, the main building of which has been repaired in the recent period. “Wilber” (1955) writes about this room: the room has a square-shaped plan from the inside and outside with a dome above. The entrance to the building is from the east. The exterior has a recessed arch that forms a rectangular entrance at the rear of the recess. The wall plate adjacent to the entrance of the minaret and the wall plate on both sides of the room entrance and the recess of the entrance has a cover which consists of light blue and dark blue unglazed brick and glazed brick and the middle of it is made of bricks of different sizes. The dome is made of brick, and it rises on a tall brick cylinder and has the usual brickwork. The oval dome is covered with the same materials as the lower wall surfaces (Wilber, 1955, pp. 208-216).

The interior of the walls is made of clay, which is whitewashed and the effect of decorating several colours can be seen on the plinth plaster around the room. Each wall plate has a deep rectangular depression with an arch. The right wall (on the Northside) is perforated in the middle to enter the building through it and a window has been created above it. At the top of this area, a narrow row surrounds the building and above it, there is a hanging porch, which consists of four simple corner arches and four wall arches formed in this part, narrow windows. Between the corner arches and the wall arches, at octagonal angles, kite-shaped hangouts form six decagons on which the base of the oval dome rests. The building is decorated with conventional yellow bricks, cut, and glazed bricks of light blue and dark blue. These bricks form a coating on the central core of the clay and are in different sizes.

In this room, there is a tomb on the upper surface of which, in a square with a slightly shaved surface, the following inscription is inscribed in the Arabic language (Jenab, 2007, pp. 12-13):

هذه الصخره المقدسه انشاتها الخاتون العظمي سلطان بخت آغا ابنه الامير خسرو شاه ادام الله توفيقها لنفسها بعد وفاتها في رمضان سنه ثلث و خمسين و سبعمائه.

It means “This is the holy rock, which was created by the Great Khatun Sultan Bokht Agha, the daughter of Amir Khosrow Shah, may God grant her success for herself after her death in Ramadan in the year fifty-third of...” Which the number of its hundreds has disappeared. It is said that “Khosrow Shah” was the ruler of “Isfahan” in

the sixth century A.H. Hence, the date of the tombstone should be 553 A.H. (1158 or 1159), but this is not certain (Godard, 1996, Volume 3, Part 2, p. 231). Contrary to Wilber's view of the history of stone mentioned earlier, "Honarfar" considers its date to be 753 A.H., adding: "Sultan Bokht Agha" or her husband, "Shah Mahmud Ibn Amir Mobarez Al-Din Muhammad", built the extensive building complex that previously existed, and the arrangement of the tomb building next to the entrance, and having access to the school, confirms that the building of the minarets and the current entrance of the school was one of the actions of "Sultan Bokht Agha" and her private tomb was also built during her lifetime and all these construction works were carried out with complete leisure; even "Sultan Bokht Agha", according to the tablets on her exquisite tombstone, ordered the preparation and decoration of this stone during her lifetime in 753, which was issued sixteen years before she was killed. According to Wilber's dating, it seems that the date 753 A.H. is correct, and "Godard" made a mistake about the date in his attribution (Oghabi, 1997, pp. 51-54).

Similarly, "Haji Ghasemi" confirms in his book "Treasury of Culture of Islamic Architectural Works of Iran, Fourth Volume, Isfahan Houses" (1998): that the number of the year of the date of this inscription has been lost, but this number cannot be anything other than seven hundred. He also mentioned that "Sultan Bokht Agha" ordered her tombstone during her lifetime, which is an exquisite monolithic stone that was placed on her tomb after her murder. He continues that the current tomb has a way to the school from the North, which is currently blocked, and the arrangement of the tomb building near the entrance to the school confirms that the building of the minarets and the current entrance of the school were also built by order of "Sultan Bokht Agha". The special grave of her tomb was also built during her lifetime and all these construction works were carried out with complete leisure. Even "Sultan Bokht Agha", according to the tablets on her exquisite tombstone, ordered the stone to be prepared and decorated during her lifetime in 753 A.H. and sixteen years before she was killed, and after her assassination, she was buried in her tomb and the stone is also placed on her tomb. No inscription explicitly states the date of the building of this vast architectural complex, but fortunately, the precious stone of the tomb of "Sultan Bokht Agha" has not been looted. This shrine is holy and has been considered sacred by the people in recent centuries, and even today, about seven centuries after its construction, like the general shrines and holy places, the people of "Isfahan" light candles on the tomb of "Sultan Bokht Agha". There are no decorations inside the tomb of "Sultan Bokht Agha", and it is covered with a layer of plaster at the moment. Her tombstone is in the middle of the tomb and no other graves can be seen around it, but there are simple paintings under the plaster in some parts of the interior walls which is obvious that there used to be paintings inside the tomb certainly. The outer wall of the dome of "Sultan Bokht Agha" is decorated with turquoise and azure tiles on a brick background (Haji Ghasemi, 1998, pp. 314-321).

The decoration of the outer wall of the minarets is a repetition of the phrase "الله اکبر" ("Allah-o Akbar") in the Arabic language which means "Allah is the greatest" in a turquoise engraving on brick background. The inscription of its luxurious entrance to the building with the turquoise tiles on a brick background is as follows in the Arabic language: "یا دیان" ("Ya Dayyan") which means "someone who is a judge and referee" in three square shapes, "یا حنان" ("Ya Hannan") which means "someone who is forgiving and very kind" in two squares, and "یا منان" ("Ya Mannan") which means "someone very good and benevolent" in two other square shapes (Dayyan, Hannan, and Mannan are all the attributes of Allah) (Moin, 1981, pp. 1375, 1589, 4375). Below the inscription of the former line of the entrance, which has nothing left, is written in two rectangular, square shapes on a turquoise engraving on a brick background on the right side the phrase in the Arabic language "لا اله الا الله" ("La ilaha illa Allah") which means "there is no God but Allah" and on the left side the phrase in the Arabic language "محمد رسول الله" ("Muhammad Rasool-o-Allah") which means "Muhammad is the messenger of Allah". It is written on a brick background in a turquoise engraving on the platforms of both sides of the entrance in the Arabic language "یا حنان یا منان" ("Ya Hannan, Ya Mannan") which means "someone who is forgiving and very kind" and "someone very good and benevolent". On the walls on both sides of the entrance, these words are written in the Arabic language: "الملک لله" ("Al-Molk-o-Lellah") which means "the kingdom is for Allah", "القوت لله" ("Al-Qovvat-o-Lellah") which means "the power belongs to Allah" and "العزت لله" ("Al-Ezzat-o-Lellah") which means "the honour belongs to Allah" (Haji Ghasemi, 1998, pp. 314-321). There are other inscriptions on the wall of the entrance to the complex written in the Arabic language as: "الحمد لله" ("Al-Hamd-o-Lellah") which means "Thank Allah/ Praise be to Allah", and "الله الصمد" ("Allah-o-s-Samad") which means "Allah is needless" (Rafiei, 1973, pp. 424-429).

Conclusion

"Sultan Bokht Agha", the daughter of "Amir Ghiasuddin Kaykhosrow Inju", was assassinated by her husband "Shah Mahmud Ibn Amir Mobarez Al-Din Muhammad" and buried in the tomb room next to the two minarets of "Dardasht" in Isfahan. Some consider that she has ordered her tombstone and the inscriptions on it and built the whole complex next to the tomb room and the two minarets during her lifetime, while others think that her husband built the tomb room for her due to his severe remorse after killing her. Either way, the building is made in the style of "Mongolian" and the date of building the complex is said to be between 725 A.H. and 740 A.H. Although some are mistaken about the date on the inscription of her tombstone as 553 A.H., the true date must be 753 A.H. which is written on the engraving which is sixteen years earlier than the date of her death in the

Ramadan of 769 A.H. As it is mentioned in the references that “Sultan Bokht Agha” and her husband, “Shah Mahmud Ibn Amir Mobarez Al-Din Muhammad” has built many constructions and restored some historic buildings, she might have been built her tomb room and even ordered her tombstone due to the knowledge of the intentions of her husband after causing so much problem for him with helping “Shah Shoja Ibn Amir Mobarez Al-Din Muhammad”, trying to revenge the death of her uncle, “Shah Sheikh Abu Ishaq”.

The tombstone, tomb room, dome and the two minarets are recorded as historic national monuments of the IL-Khanate period with the name “Dardasht Minarets and Dome of Sultan Bokht Agha” with the number 115 In the list of national monuments of Iran by the General Office of Cultural Heritage of “Isfahan” Province in “Isfahan” city, Iran. The phrase engraved on her tombstone is as follows: “This is the holy rock/ sacred stone, constructed by the great lady, Sultan Bokht Agha, the daughter of Al-Amir Khosrow Shah, may God grant her success to her after her death, in Ramadan 753.” The inscriptions of the two minarets on the brick building line on the background of the turquoise tile are as follows: “There is no God but Allah”, “Muhammad is the Messenger of Allah”, and “Ali is the true guardian of Allah”. The decorations on the outer wall of the minarets are written in turquoise on a brick background, repeating the phrases “there is no God but Allah” and on the left, the sentence “Muhammad is the messenger of Allah”. Above the platforms on both sides of the entrance, in a turquoise building line on a brick background, it is repeated “someone who is forgiving and very kind” and “someone very good and benevolent”. The inscriptions on the walls on both sides of the entrance are “the kingdom is for Allah”, “the power belongs to Allah”, “the honour belongs to Allah”, “Thank Allah/ Praise be to Allah”, and “Allah is needless”.

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Conflict of Interests

The author declares no conflict of interest.

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PART 02.
VALUES, CULTURE, AND THE CITY

In recent years, questions have been raised about the value of our [new] cities. Have our cities lost their "implicit beauty"?
The value of culture characterizes cities as it brings out their unique identities, and we often find beauty through experiencing -seemingly new- cultural elements in our surroundings.

CHAPTER 3. Public Housing Delivery in Niger State, Nigeria: A Liveability Predictive Model

Paul Baba Haruna and Remi Ebenezer Olagunju

Introduction

Residential houses given by the government, mostly for its employees, make up the public housing estates in the study area. Meanwhile, the physical structure for shelter, along with all necessary services, amenities, and equipment, such as gadgets necessary or desired for the residents' physical and mental health as well as their social wellbeing, are all components of housing, which is recognized as one of the indispensible needs of humans (Ibimilua & Ibitoye, 2015; Adeoye, 2016). Therefore, housing goes beyond simply providing a place to live or basic household amenities, because it also includes necessary services and facilities that contribute to the residential environment and tie residents to the larger community. This also implies that the package created as housing includes provisions for waste disposal, water supply, road access, and other crucial economic and social services for education, health, and recreation (Adeoye, 2016).

There have been a number of urbanization-related issues in Nigeria, including "poor housing and uncontrolled urban sprawl; environmental pollution; deterioration and deficit in basic infrastructure; and general urban decline" (Lanrewaju, 2012; Ezeigwe, 2015). Despite Waziri and Roosli (2013)'s claim that housing for government employees in Nigeria can be

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traced back to colonial rule, Ibimilua and Ibitoye (2015) observed that, despite the efforts of succeeding administrations, housing provision is frequently plagued by several issues due to widespread migration from rural to urban areas. Due to this, there is an extremely high demand for public housing in urban areas, which has increased the prevalence of substandard housing.

Liveability studies have become so crucial since the 1980s, when living standards began to decline, especially in urban areas, that public officials and policymakers all over the world now use them as a substitute tool to make decisions about how to carry out the design, planning, and construction projects of urban environments (Carr and VanZerr, 2011). Therefore, is hoped that increased interest in liveability studies among all stakeholders in the built environment may lead to the creation of liveable spaces for residents. Also, since designs have an impact on both safety and health as well as the quality of life in the environment, the architect's role in designing liveable environment is crucial (American Institute of Architects [AIA], 2005). Public housing's liveability considers the variety of factors that make it a desirable place to live and pays special consideration to elements that promote residential and neighbourhood satisfaction, a feeling of community, and environmental sustainability. This is supported by Levi and Lopez (2010), who asserts that liveable environments are locations that people enjoy because they meet their requirements by enhancing their health and fostering a sustainable ecosystem.

Thus, in this study, the various dimensions and indicators that capture the concept of liveability in the study area were studied, thereby providing literature to buttress the existing efforts on liveability studies in the area as well as giving guidance to the players in the environment as to what the liveability requirements of the residents are with respect to residential requirements. The study, therefore, aims at identifying liveability variables which can be utilised in the design as well as used for quick evaluation of the study area's public housing liveability.

Literature Review

Defining Liveability in the Living Environment Context

In the 1980s, particularly in developed nations, research on development patterns by planners as a result of the deterioration of urban living conditions brought liveability issues to the forefront (Carr and Van Zerr., 2011). As a result, several reports that questioned accepted development theories and highlighted regions that were leading a wide range of innovative new efforts targeted at improving the quality of living in environments began to appear. Depending on the purpose of the assessment and the viewpoint of those who do the measures, the word "liveability" can have a wide range of meanings (Leby & Hashim, 2010). As a result, liveability is used in a variety of research across a wide range of usage scales, localities, countries, and disciplines. While Some of the most noticeable liveability endeavours are those associated with the ranking of world cities (Lowe et al., 2013), there are others who have developed liveability indices as a measuring tool to identifying changes in public decision making to increase the quality of life of areas at the different levels (country, state, local, township, ward, and community). Therefore, depending on the objectives, the liveability approaches can either be inter-city (linked to the ranking of world cities) or intra-city (to evaluate diverse neighbourhoods or sections inside a city or region).

Liveability is defined by Carr and Van Zerr (2011) to mean the appropriateness of a place for humans to live in. Additionally, Pandey et al. (2014) defined liveability as the requirement that the place in which people live must offer them a good quality of life. This indicates the full range of residential environmental amenities made available to people in a specific area, contributing to their satisfaction in day-to-day living. Also, Pandey et al. (2010) stated in their submission that "Liveability" refers to human needs and desires that result in increased quality of life for residents in a residential area. They view liveability as a concept that conveys a full life perspective and results in a pleasant quality of life in a neighbourhood. From a design standpoint, the AIA (2005) believes that liveability is best defined in a specific context and that a liveable environment identifies its own unique characteristics and places a high value on the design processes that help in the control of growth and change to improve but maintain its unique qualities. According to Bandarabad & Shahcheraghi (2012), liveability in this context refers to an urban environment that enhances the physical, social, and mental development of all its inhabitants. For them, it has to do with creating an environment that is both delightful and pleasing and promotes the advancement of culture and sacredness.

Liveability considerations have become very important (Kotby, Khalifa, & Elshater, 2021) and in some cases, turn out to be necessary as cities all over the world re-examine their urban concerns to improve the quality of life. This is because the liveability of a residential environment is seen as the existing situation of the place which mirror the residents' discernment of the place to be healthy for living or not (Pandey et al., 2013). Thus, liveability is a measure of the wellbeing of residents and is made up of all the factors that contribute to making the environment a place to live both now and in the future. According to Lowe et al. (2013), a liveable place is one that has affordable

and diverse housing connected via practical means of transportation to employment, education, public open space, local businesses, health, and community services, as well as leisure and cultural opportunities. It is also a place that is safe, attractive, socially cohesive, and inclusive, and environmentally sustainable.

Conceptual Approaches from Previous research on liveability

There are several ways liveability can be measured but based on the objective of measurement as this determines the selection of indicators/indices (Lowe et al; 2013). The U.S. Department of Housing and Urban Development (U.S. HUD), the U.S. Environmental Protection Agency (U.S. EPA), and the U.S. Department of Transportation (U.S. DOT) collaborated on research (NARC, 2012) that was undertaken by the National Association of Regional Councils (U.S. HUD). The goal of the project was to establish a Partnership for Sustainable Communities to aid in increasing access to affordable housing, expanding transit options, and reducing transportation costs while safeguarding the environment in local communities across the country. NARC (2012) therefore developed six principles about liveability based on the stated objective. By fostering a shared understanding, another study with the working title Liveability 101 aimed to strengthen the relationship between the public and architects (AIA, 2005). To produce more liveable communities, the study's liveability approach intended to provide a sustainable framework.

In order to generate data that would shape public perceptions and lead to the development of healthy, liveable, and sustainable environments, Lowe et al. (2013) undertook a research program in collaboration with the Department of Health of the Victorian State Government and the University of Melbourne. So, to accomplish the purpose of the study, a wide and diverse range of subjective and objective liveability indicators were found that were oriented towards healthy and sustainable living. The Liveable Cities Concept was another research carried out by the Department of Infrastructure of the Australian government (Department of Infrastructure, 2012). The document then highlighted some liveability principles that could be used as a manual for designing, planning, or rating liveable cities.

The purpose of the study by Pandey et al. (2010) was to demonstrate the significance of the built environment in influencing a residential area's liveability. The conceptual approach was centred on how lifestyle interacts with the designated area to produce a residential built environment, which in turn influences people physically and psychologically. The study provided a quantitative framework to evaluate residential areas' living circumstances in relation to their physical built environment, which is crucial for ensuring liveable conditions. In a different study, Pandey et al. (2014) established liveability characteristics based on the expectations of residents in an Indian context and their opinion of the liveability of residential neighbourhoods in chosen cities.

Liveability Study in Nigeria

The quality of public housing, housing policies, housing delivery strategies, public-private partnerships in housing development, and other aspects of housing have all been well studied in Nigeria, according to Mohit & Iyanda (2015), but research on the liveability of public low-income housing in the study area has not been. However, the earliest of such study is Omuta (1988) who stated that the environmental issues, which are a combination of several mental perceptions grouped into some liveability dimensions, are how the city's liveability is expressed. In addition, Asiyanbola et al. (2012) noted that the issue of liveability is exemplified in growing environmental degradation, which highlighted the fact that urban centers are under severe strain as a result of high rates of unemployment, rapidly decreasing environmental sanitation conditions, inadequate quality and quantity of housing, declining standards of education, health services, and an inadequate transport system. The study by Asiyanbola et al. (2012) highlighted several fundamental services and amenities in urban centers that are used to measure resident satisfaction and determine the liveability of the places.

Ibiyemi & Adenuga's (2013) study sought to determine the liveability of Phase 1 of the Festac Town Housing Estate utilizing the residents' affordability, the physical and social infrastructure of the estate, and the conditions of the structures. According to Lawanson et al. (2013), Africans view a city's liveability based on cost and accessibility to fundamental needs for survival; arguing that a city must be viewed as a living organism in which equilibrium must be preserved for it to be functional. The liveable city conceptual framework and issues investigated were used to develop the variables, which include governance (representing the brain and nervous system of the city), safety and security, as well as cultural identity and global relevance (representing the heart of the city), environmental indices, and infrastructure (representing the organs and circulatory system of the city). In some public low-income housing estates in Niger State, Mohit & Iyanda (2015) looked at the quality of life regarding the living environment and developed six dimensions, including socio-economic features, economic viability, housing conditions, safety condition, neighbourhood facilities, and social interaction.

Materials and Methods

Data Gathering

The authors conducted this study using the questionnaire as the primary tool for gathering data. The questionnaire, which was divided into two parts, asked questions based on liveability indices and dimensions determined from the literature. The demographic characteristics of respondents, such as gender, age, level of education, household size, and residential environment characteristics, such as dwelling unit size, tenure type, length of residence, and former housing type, were covered in the first section on personal data and general information. Data on Residential Environment, the second section, included questions on satisfaction evaluation of the residential environment based on a three-level hierarchical construct of Housing Unit (HU), Housing Estate (HE), and Housing Estate Neighbourhood (HEN), with the liveability dimensions listed in Table 1 and each dimension containing several variables. The questions under each section were sufficient according to the content reliability of the questionnaire, which was calculated for each section and had values above 0.70 Cronbach's alpha minimum.

Table 1. The points of liveability assessment (Source: Authors based on Literature)

Level Construct	Liveability Dimensions
Housing Unit	Sizes of spaces, Physical quality of Building, Ventilation and Natural Lighting, Noise Sources, Affordability
Housing Estate	Public amenities, security, management, land usage, and relationships in the housing estate.
Housing Estate Neighbourhood	Distances of some neighbourhood amenities to the estate, Facilities in the neighbourhood, Noise, security and identity

Following the Independent National Electoral Commission's (INEC) partition of Niger State into Niger South, Niger North, and Niger East, the first step of multi-staged cluster sampling chose Bida, Kontagora, and Minna to represent the senatorial headquarters in each zone. In Minna, four housing estates were chosen at random, while Bida and Kontagora each had two estates chosen. The first, third, fifth, and seventh selections were made alternately along and across the streets as part of a systematic random sampling used to pick dwelling units within the chosen housing estates. One questionnaire was distributed to each of the 910 households, and the 797 completed forms were used for analysis.

The Location of Study

The study was carried out in Niger State, Nigeria. Niger State, with Minna as its capital, was formed in April 1976 from the previous North-Western state and is situated in Nigeria's North-Central geopolitical zone. The State can be found between latitudes 8020" and 11020" North and 3040" and 7040" East. The state's 76,363 square kilometres of total land area account for around 8% of Nigeria's total land area. Niger State is bordered to the south-east by the Federal Capital Territory, to the north by Kaduna State, to the northwest by Kwara and Kogi States. To the west, the State shares a border with the Republic of Benin. The State is one of the biggest in Nigeria and consists of 25 Local Government Areas (LGAs). The Southern Guinea Savannah, Northern Guinea Savannah, and Forest Savannah Mosaic make up the State's vegetation.

Results and Discussions

One of the respondents' features was their level of education, which showed that 99% percent of them had secondary and/or post-secondary education and just 1% percent had only primary education. This indicated a very high level of literacy and consequently high level of comprehension of the questionnaire. Also, the houses are quite populated with 77% of the housing units having 5-9 & above occupants. Since 73% of the house owners have made changes to their homes, the sizes of the houses in the estates have been significantly altered from the initial plans.

Also, 70% of the residents own the houses, and 90% have cars. According to the assessments, 95% of the people have lived in the estates for at least two years, while only 5% have stayed for less time.

Hierarchical Cluster Analysis and Factor Analysis were used to respectively group and reduce number of variables resulting into identification of Twenty-six liveability variables contained within six components. Thereafter, Multiple regression analysis (MRA) was employed to develop a model by measuring how well the variables in these components predicted the Resident Perceived Satisfaction Index (RPSI), which is a proxy for the liveability of the housing estates. The regression analysis utilised 80% of the data on liveability collected from field surveys; the balance of 20% was kept as holdout data to be employed in the validation of the developed model. Also, five of the variables in the framework were automatically excluded by the Stepwise method of regression—serving as outliers.

The result of the MRA using Stepwise method and presented in Tables 2 revealed that all of the 21 variables in the framework were positively correlated with the RPSI and could be used to predict the RPSI successfully. However, four variables in Model four were identified as possessing superior prediction abilities. These were the variables represented by SATGRENRELAXAREA_62 (Satisfaction with Green Area for Relaxation), SATMEDFACILT_69 (Satisfaction with Medical Facilities), SATDISTFIRESTATN_85 (Satisfaction with distance to Fire Station), and SATPHYQUALWAL_39 (Satisfaction with physical quality of Walls), which appeared in models 1, 2, 3, and 4. These models are differentiated as bold face type text in Table 2. The reason for preferring these four variables was because of the contribution of the variables to the predictive ability of the models as indicated by the coefficient of determination (R2 value). This clearly showed that these four variables are the main predictors of how satisfied residents will be with the housing estates that they live in. The rest 17 variables only contributed between 1% and 4.1% individually to the R2 value of the derived models, i.e., less than 5%.

Model 4 appeared to be the most suitable model for use in predicting the RPSI; it combined high predictive ability with low number of inputs required. This was because Model 4 produced an R2 value of 71.3%, which indicated that only 28.7% of factors causing variation in the RPSI were outside the prediction domain of the model. At the same time, Model 4 required the input of data for only four variables (Variables 62, 69, 85 and 39) to achieve the aforementioned prediction level. It was also observed that after Model 4, the marginal utility derived from adding more variables to the model decreased markedly. From Model 5 onwards, additional variables added less than 5% to the R2 value of the model. Additional values were also responsible for changes of less than 100 points in the F-statistic value. This was the reason for adopting Model 4 as the most efficient of the developed models, because of its relatively high predictive ability, and low input requirement.

Table 2. Summary of MRA models developed for Liveability Variables

Model	Independent variables	R	R^2	Change in R^2	Change in F-statistic
1	**62**	**.604**	**.364**	**.364**	**338.221**
2	**62, 69**	**.726**	**.527**	**.162**	**202.245**
3	**62, 69, 85**	**.809**	**.655**	**.128**	**218.265**
4	**62, 69, 85, 039**	**.844**	**.713**	**.058**	**117.577**
5	62, 69, 85, 039, 93	.868	.754	.041	98.610
6	62, 69, 85, 039, 93, 034	.888	.788	.034	94.616
7	62, 69, 85, 039, 93, 034, 91	.902	.813	.025	77.514
8	62, 69, 85, 039, 93, 034, 91, 54	.913	.834	.021	75.632
9	62, 69, 85, 039, 93, 034, 91, 54, 79	.923	.853	.018	71.639
10	62, 69, 85, 039, 93, 034, 91, 54, 79, 045	.931	.866	.013	58.283
11	62, 69, 85, 039, 93, 034, 91, 54, 79, 045, 97	.938	.879	.013	63.539
12	62, 69, 85, 039, 93, 034, 91, 54, 79, 045, 97, 73	.944	.892	.012	65.299
13	62, 69, 85, 039, 93, 034, 91, 54, 79, 045, 97, 73, 82	.949	.900	.009	50.194
14	62, 69, 85, 039, 93, 034, 91, 54, 79, 045, 97, 73, 82, 037	.953	.907	.007	45.190
15	62, 69, 85, 039, 93, 034, 91, 54, 79, 045, 97, 73, 82, 037, 88	.956	.914	.007	43.668
16	62, 69, 85, 039, 93, 034, 91, 54, 79, 045, 97, 73, 82, 037, 88, 56	.959	.919	.005	34.338
17	62, 69, 85, 039, 93, 034, 91, 54, 79, 045, 97, 73, 82, 037, 88, 56, 044	.961	.923	.004	31.341
18	62, 69, 85, 039, 93, 034, 91, 54, 79, 045, 97, 73, 82, 037, 88, 56, 044, 77	.962	.926	.003	23.546
19	62, 69, 85, 039, 93, 034, 91, 54, 79, 045, 97, 73, 82, 037, 88, 56, 044, 77, 042	.963	.928	.002	12.420
20	62, 69, 85, 039, 93, 034, 91, 54, 79, 045, 97, 73, 82, 037, 88, 56, 044, 77, 042, 009	.964	.929	.001	8.487
21	62, 69, 85, 039, 93, 034, 91, 54, 79, 045, 97, 73, 82, 037, 88, 56, 044, 77, 042, 009, 003	.964	.929	.001	5.008

Dependent Variable: RPSI (Resident Perceived Satisfaction Index)

Predictors: (Constant), SATGRENRELAXAREA_62, SATMEDFACILT_69, SATDISTFIRESTATN_85, SATPHYQUALWAL_039, SATPETROFILSTATN_93, SATSIZESTORG_034, SATMAJOACESROD_91, SATNOISEQUIP_54, SATDISTSCH_79, SATNATVENTLIVDIN_045, SATENVIRONTIDINES_97, SATHOUSTYPEMIX_73, SATDISTLOCAMAKET_82, SATDISTHOUROD_037, SATMAINWATASUPLY_88, SATPROPCOST_56, SATPHYQUALTOIPROV_044, SATGUDNEIBOLINES_77, SATPHYQUALCEIL_042, NATEMPLY_009, AGERES_003

The coefficients in the first four high-performing models are presented in Table 3, along with the 't' values and 'sig' values associated with each of the variables. The extremely low values of 'sig' supported the inference that the ability of the variables to predict the dependent variables was not due to chance effects only, given the very low (almost non-existent) probability (0.000) observed. The normal form of the equation for multiple regression analysis is y = a + b1x1 + b2x2 +…. bnxn. When properly substituted, the regression equation for Model 4, which has been identified to be the most preferred model, was as follows.

RPSI = 1.254 + 0.147(SATGRENRELAXAREA_62) + 0.149(SATMEDFACILT_69) + 0.154(SATDISTFIRESTATN_85) + 0.127(SATPHYQUALWAL_039).

Table 3. 't' and 'sig' values for coefficients of variables in MRA models

Model	Constant			SATGRENRELAXAREA_62			SATMEDFACILT_69			SATDISTFIRESTATN_85			SATPHYQUALWAL_039		
	Coefficients	't' value	'sig' value	Coefficients	't' value	'sig' value	Coefficients	't' value	'sig' value	Coefficients	't' value	'sig' value	Coefficients	't' value	'sig' value
1	1.975	48.119	.000	.315	18.391	.000									
2	1.701	42.202	.000	.232	14.603	.000	.188	14.221	.000						
3	1.455	37.984	.000	.172	12.133	.000	.179	15.844	.000	.169	14.774	.000			
4	1.254	31.697	.000	.147	11.173	.000	.149	13.923	.000	.154	14.676	.000	.127	10.843	.000

Dependent Variable: RPSI (Resident Perceived Satisfaction Index)
Predictors: (Constant), SATGRENRELAXAREA_62, SATMEDFACILT_69, SATDISTFIRESTATN_85, SATPHYQUALWAL_039

The application of MRA thus enabled the focus of the framework to be narrowed down to just three clusters of four variables, rather than six clusters of twenty-one variables. The clusters containing the needed variables are shown in Table 4, while the names of the relevant variables are put in bold face type.

Table 4. Liveability variables in the model

S/no	Components	Variables in Model
1	Internal Building Environment	Focus on satisfactory quality of Walls.
2	External Building Environment	Focus on satisfactory provision/access to Medical Facilities, and Green Area for Relaxation.
3	Accessibility	Focus on ensuring reasonable distance of Estate to a Fire Station in Neighborhood

The predictive model of liveability was validated using the holdout data technique. The entire data set obtained from field work was split into two subsets, comprising 80% and 20% of the original data set. The larger subset was employed in the development of the predictive model, using the multiple regression analysis technique – this subset comprised responses from 634 respondents. The smaller subset has been applied to the validation of the predictive model that was developed. This presented the results of the validation, which employed responses from 159 respondents as displayed in Table 5.

Findings in the table 5 represent only a small part of the entire 159 pieces of holdout data; only 21 responses from Housing Estate 1 were displayed in the table. Prediction statistics were however computed for the entire 159 pieces of holdout data. The second to fourth columns of the table contained the actual observed values of the four variables that make up the Predictive Liveability Model. Columns 7 to 10 displayed the predicted values of the same four variables. Columns 11 and 12 show the predicted and actual values of the dependent variable (RPSI). The last column of the table showed the percentage difference between the dependent variable's predicted and actual values.

Only 1.032% was the average difference between the RPSI's predicted and actual values. The prediction model's accuracy is underlined by the fact that 50.94% of predictions lie within +/- 5% of the actual observed values. In fact, 77.99% of predictions lie within +/- 10% of the actual observed values. Only 1 out of 159 predictions (0.63%) lay outside the +/- 25% range of accuracy.

Table 5. Actual and Predicted values of Liveability variables and RPSI

HOLDOUT SAMPLE NR	Actual Variable Values				*Predicted Variable Values*							
	SATGRENRELAXAREA_62	SATMEDFACILT_69	SATDISTFIRESTATN_85	SATPHYQUALWAL_039	*Constant*	*SATGRENRELAXAREA_62*	*SATMEDFACILT_69*	*SATDISTFIRESTATN_85*	*SATPHYQUALWAL_039*	***Predicted RPSI***	**Actual RPSI**	**Difference (Prediction Gap - %)**
					1.254	*0.147*	*0.149*	*0.154*	*0.127*			%
1/83	1.00	2.00	1.00	3.00	*1.254*	*0.147*	*0.298*	*0.154*	*0.381*	*2.234*	2.56	-12.88
1/84	2.00	3.00	2.00	3.00	*1.254*	*0.294*	*0.447*	*0.308*	*0.381*	*2.684*	2.81	-4.53
1/85	1.00	3.00	3.00	2.00	*1.254*	*0.147*	*0.447*	*0.462*	*0.254*	*2.564*	2.43	5.51
1/86	3.00	2.00	2.00	2.00	*1.254*	*0.441*	*0.298*	*0.308*	*0.254*	*2.555*	2.80	-8.68
1/87	1.00	3.00	1.00	4.00	*1.254*	*0.147*	*0.447*	*0.154*	*0.508*	*2.51*	2.70	-7.19
1/88	2.00	3.00	2.00	3.00	*1.254*	*0.294*	*0.447*	*0.308*	*0.381*	*2.684*	2.67	0.37
1/89	2.00	3.00	2.00	3.00	*1.254*	*0.294*	*0.447*	*0.308*	*0.381*	*2.684*	2.53	5.89
1/90	2.00	3.00	3.00	2.00	*1.254*	*0.294*	*0.447*	*0.462*	*0.254*	*2.711*	2.62	3.35
1/91	2.00	2.00	2.00	2.00	*1.254*	*0.294*	*0.298*	*0.308*	*0.254*	*2.408*	2.24	7.35
1/92	1.00	1.00		2.00	*1.254*	*0.147*	*0.149*	*0*	*0.254*	*1.804*		
1/93	1.00	3.00	3.00	3.00	*1.254*	*0.147*	*0.447*	*0.462*	*0.381*	*2.691*	2.32	15.87
1/94	2.00	3.00	3.00	2.00	*1.254*	*0.294*	*0.447*	*0.462*	*0.254*	*2.711*	2.59	4.81
1/95	2.00	4.00	2.00	2.00	*1.254*	*0.294*	*0.596*	*0.308*	*0.254*	*2.706*	2.64	2.43
1/96	2.00	2.00	1.00	4.00	*1.254*	*0.294*	*0.298*	*0.154*	*0.508*	*2.508*	2.51	-0.11
1/97	1.00	4.00		4.00	*1.254*	*0.147*	*0.596*	*0*	*0.508*	*2.505*	2.90	-13.56
1/98	1.00	4.00	1.00	1.00	*1.254*	*0.147*	*0.596*	*0.154*	*0.127*	*2.278*	2.12	7.61
1/99	2.00	3.00	2.00	2.00	*1.254*	*0.294*	*0.447*	*0.308*	*0.254*	*2.557*	2.61	-2.06
1/100	3.00	2.00		2.00	*1.254*	*0.441*	*0.298*	*0*	*0.254*	*2.247*	2.56	-12.32
1/101	2.00	2.00	2.00	4.00	*1.254*	*0.294*	*0.298*	*0.308*	*0.508*	*2.662*	2.71	-1.61
1/102	2.00	3.00	1.00	2.00	*1.254*	*0.294*	*0.447*	*0.154*	*0.254*	*2.403*	2.83	-15.05
1/103	3.00	3.00	2.00	4.00	*1.254*	*0.441*	*0.447*	*0.308*	*0.508*	*2.958*	3.05	-3.05
							Prediction gap statistics			**Mean**		**-1.032%**
										Std Dev		**8.616%**
										Max		**52.744%**
										Min		**-23.640%**
									Count	**0 - 1%**	**13**	**8.18%**
										0 - 5%	**81**	**50.94%**
										0 - 10%	**124**	**77.99%**
										0 - 25%	**155**	**97.48%**
										>25%	**1**	**0.63%**
										Blanks	**3**	

The RPSI's predicted and actual values were then plotted into a line graph to show the accuracy of the Predictive Liveability Model. This was presented as Figure 1; the thick line represented the predicted RPSI values while the slim line represented the actual, observed values of the RPSI. Visual inspection of the graph revealed that the predicted values followed the trend, direction, and size of the actual RPSI values.

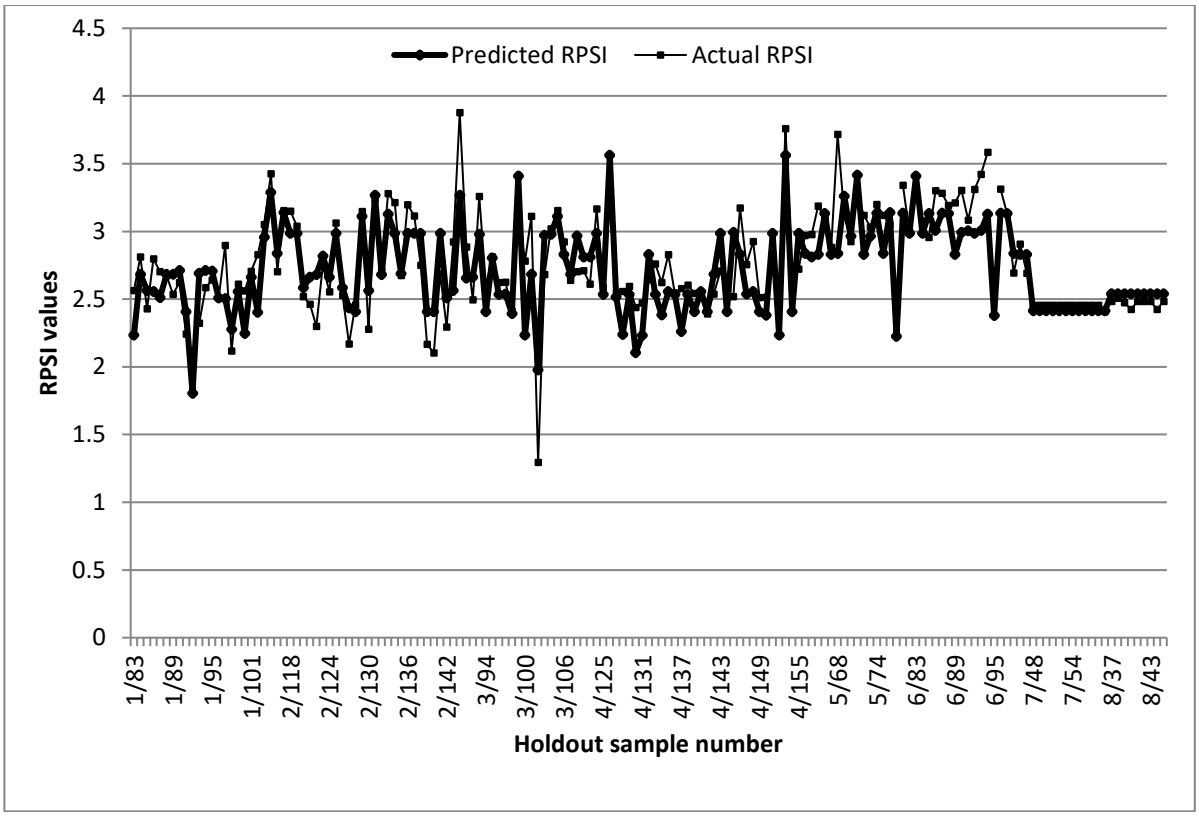

Figure 1. Line graph of actual and predicted values of RPSI

Conclusions

The model produced an R2 value of 71.3% indicating that only 28.7% of variables causing variation in RPSI were outside the prediction domain of the model. Thus, the analysis produced evidence that similar levels of accuracy in predicting the RPSI can be obtained with fewer numbers of variables in the model which can predict 71.3% of the variation in the RSPI with the use of only four variables, rather than 21. This showed that these four variables are the main predictors of how satisfied residents will be with the housing estates that they live in.

Finally, this study's findings demonstrated the indiscriminate modifications made to public housing after residents had moved in, with the results revealing that 73% had made changes to their houses to improve the living conditions of the units and the surrounding area. The resulting consequences may be seen in the efforts made by residents to alter the interior and exterior of their houses as well as the environment around housing estates leading to the loss of architectural composition of the housing and the aesthetic landscape the housing is meant to convey to give the users a feel of satisfaction in owning a house. Also, there is cost and pain such changes bring to the housing owner in trying to make the houses liveable after paying whooping sums of money to acquire them. While the variables identified serve as the basis for design and planning considerations for the delivery of public housing in the study area, the model thus generated can be utilized as a quick liveability assessment tool for the residential environment. The study identified twenty-six liveability variables contained within six components which include (i) Internal Building Environment (ii) External Building Environment, (iii) Building Finishes and Services, (iv) Associated Costs and Utilities, (v) Accessibility, and (vi) Occupiers' demographics.

There are many different definitions for the word "liveability", but the term is used to describe an urban setting that promotes the social, physical, and mental growth of all its residents. Therefore, all the elements that make an area a desirable place to live are included in the concept of "liveability," which is also a measure of residents' satisfaction. The studies of growth trends in the 1980s by environmental planners, especially in developed countries, pushed liveability concerns to the fore. While the most prominent liveability initiatives relate to the rankings of world cities, others have created liveability indices as a measuring tool to discover changes in public decision-making to improve the quality of life of communities at different levels. (Country, state, local, township, ward, and community). In Nigeria, the increasing demand for public housing as a result of urbanization has resulted in the prevalence of poor housing. And despite the efforts of successive administrations, the uncontrolled

movement from rural to urban areas continues to cause several problems with housing availability. However, all stakeholders' increased interest in liveability research can result in the development of liveable settings which considers a range of elements that contributes to its desirability as a residence.

There are several ways liveability can be measured but based on the objective of measurement. Therefore, in order to identify model liveability factors that may be used to evaluate liveability in the delivery of housing, this research looked at the liveability in public housing estates in the study area based on the factors which impact on safety and health as well the quality of life in (i) the housing unit, (ii) between the various housing units that makeup the estate, and (iii) the housing estate with respect to neighbouring public facilities. It is believed that further research from different approaches can yield substantial indices for assessment of liveability. Also, this study has a drawback in that the findings only apply to low-income housing estates provided by the government in the study area and cannot be generalized to housing estates developed by the commercial private sector, which are growing in popularity.

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Conflict of Interests

No conflicts of interest are disclosed by the authors.

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CHAPTER 4. Comparative Analysis of House Typologies in Different Climate Regions of Anatolian Geography in Terms of Shading Concept

Fethi Can Halıcı and Furkan Sağdıç

Introduction

Climate has numerous effects on houses built to satisfy the need for shelter in the natural environment. Whereas climate forms house design directly because of affecting external weather conditions, it also influences house design indirectly on account of shaping plants and the structure of soil utilized for the construction of the houses. Anatolia containing most parts of Turkey has several climate varieties thanks to its geographical formations. Owing to including various climates, Anatolia is so convenient in order to observe the effects of climate on house design. One of the considering factors in house design is shading. Shading is related to the creation of shadows on facade elements and providing shady areas. Depending on the climate and season, it is necessary to provide shading in order to increase the comfort of the users by preventing overheating. Shading can be achieved in buildings with different structural elements and methods.

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Shading

The Sun, which is the main energy resource causes all creatures to heat up. Buildings, meeting all necessities of people requiring closed spaces, like sheltering, create comfortable or uncomfortable spaces by being affected by the sun. The facade of a building is exposed to sunlight directly or indirectly during the day. Even though sunlight brightens the rooms of a building, they result in overheating of buildings via greenhouse effects happening on transparent surfaces.
Shadow is a silhouette that occurs after light hits an opaque object. Shading is the formation of shadow on the surface intentionally or unintentionally. Plants, isolated glass surfaces and shading elements should be used in order to prevent solar radiation from overheating the building. Shading elements are artificial environment components which allow the effects of the sun to be lowered and to be controlled by time (Yüceer, 2004).

Shading Methods in Buildings

It is possible to examine the structural elements that create shadows in buildings under nine headings. These methods are the form of the building, shading elements, eaves, the position of the window relative to the wall, iwan, open sofa, balcony, plants and courtyard wall.

Form of Building

The form of a building varies according to the decision of the architect and the form of land in which the building will be located. A building having a quadratic or rectangular form cannot create any shadow on its own facade, but a building having protrusions like a bay window or cantilever can create a shadow on the facade.

Shading Elements

A shading element is a building element which may be made from different kinds of materials and prevents sunshine from coming to transparent surfaces directly and overheating. Shading elements fixed in any direction are utilized so as to shade surfaces of windows or walls by being produced from various materials (Zeren, 1959). In traditional Anatolian houses, shading elements are made from wood and they are openable. They contribute privacy and insulation for cold weather.

Eaves

The eave is defined as protruding part of the roof in Doğan Hasol's Encyclopedic Dictionary of Architecture (Hasol, 1975). Thanks to protrusion, sunshine is prevented from reaching the facade and shading is provided.

Position of Window Relative to the Wall

A window consisting of glass and profiles is a translucent part of a wall in order to get clean air and sunlight. A window can take place on different sides of the wall. Thick walls especially seen in masonry buildings, can create shading on the window if the window takes place inside of the wall.

Iwan

Iwan is a slightly high semi-open space that is covered with a dome or vault (Hasol, 1975). Iwan provides shaded spaces for users because only one side of iwans is open.

Open Sofa

Sofa that connects different parts of houses and can be used for different functions is varied as the open sofa and closed sofa. The open sofa is surrounded by rooms and exterior spaces like a courtyard and is covered with a roof. So, it provides shaded places which are so comfortable in summer for residents.

Balcony

A balcony is an open or semi-open space that enables residents to become outside without going out. A balcony might be built as a protrusion or a recess. Whereas protruding balcony shades facade, recess balcony is shaded by external wall.

Plants

Plants, which are usually located in gardens or courtyards of the building, can be defined as natural shading methods. As well as plants can be applied on facades like ivy, and bigger plants shading both facade and courtyard such as trees can be utilized.

Courtyard Wall

A courtyard is defined as a walled area in the middle of a building or group of buildings in Doğan Hasol's Encyclopaedic Dictionary of Architecture (Hasol, 1975). Courtyard walls, separating the courtyard and street or any space, create shaded areas in the courtyard.

Climate Regions in Turkey

Located in the middle belt, Turkey is surrounded by seas on three sides. Even if this situation brings about a mild climate, mountains which are parallel to the sea reduce the area of the mild climate region, and cause climate change in a short distance. In addition, altitude change increases climate variety. In Turkey, five different climate regions exist. These are, hot moist, hot-dry, mild-moist, mild-dry and cold climate regions (Zeren et al., 1990). The map below indicates where the climatic zones dominate.

Figure 1. Display of the climate regions in Turkey (Erdemir, 2014)

Bodrum Gum House (Khios House)

Figure 2. Bodrum, Gum House (Khios House) (Bektaş, 2004)

Gum houses, where gum merchants used to live generally consist of two rooms divided by a stone wall. The entrance takes place in the long facade and service spaces and stairs exist in front of the entrance (Aysel, 2001). There is a veranda which is named ayazlık in Turkish, above the entrance. This veranda creates shadows on the facade and shaded balcony and shaded spaces in the garden. Openable shaded elements provide shading on windows. This house was built with the masonry technique by using rough stone.

Figure 3. Bodrum, Gum House (Khios House) _Photograph_ (Bektaş, 2004).

Foça House Sample

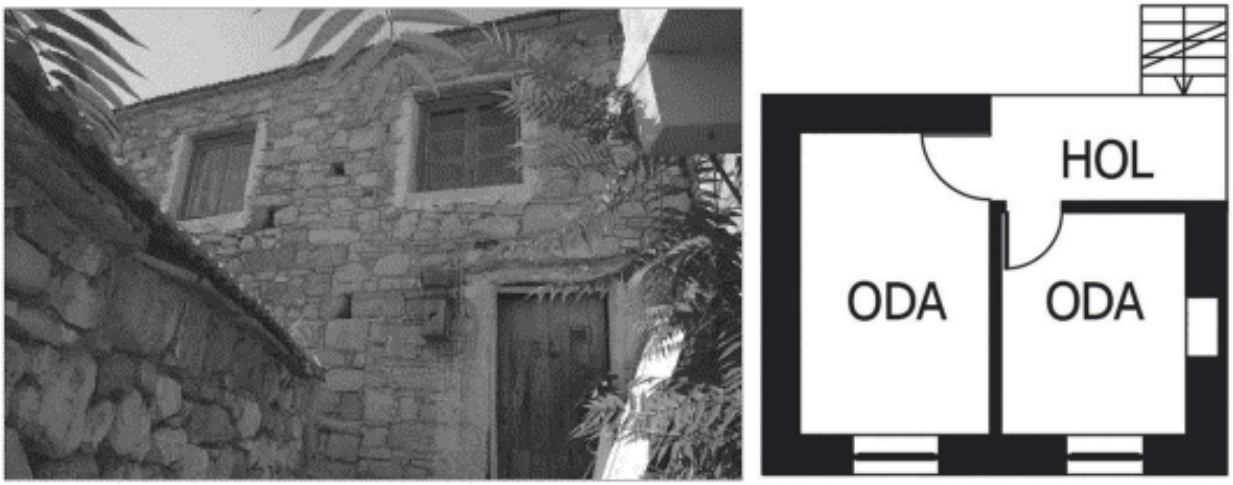

Figure 4. Foça Parcel No: 883 View (Left), Plan (Right) (Çınar et. Al., 2012).

This house located in Foça, has a tower house plan type and it consists of two spaces on the high entrance (Çınar and others, 2012). The house with a quadratic form has no feature creating shadows such as protrusion, eave or bay window. Some hours of the day corridor can be shaded. This house was built with the masonry technique by using stone, and it can be said that windows taking part inside of the thick masonry wall are shaded by the wall.

Antalya Abdi Ülgen House

Figure 5. Abdi Ülgen House Views (Yazar, 2010).

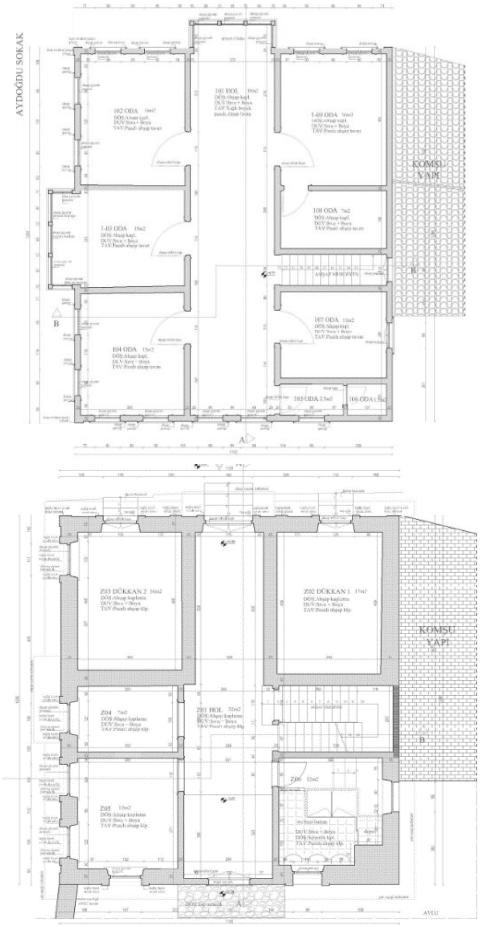

Figure 6. Abdi Ülgen House Plans (Yazar, 2010).

Abdi Ülgen House which is one of the registered houses in Kaleiçi Antalya, was built in 1907 according to the date written on the keystone above the entrance door (Devren, 1997). In Abdi Ülgen House having quadratic form, it is observed that two bay windows and eaves cause shading on the facade; also, it was analyzed that windows of the ground floor are shaded because of the thick wall. The ground floor of the house was built with wood masonry infill wall technique, and the first floor of the house was built with wooden carcass systems by plastering baghdadi plaster (Yazar, 2010).

Ula Şevki Alem Evi

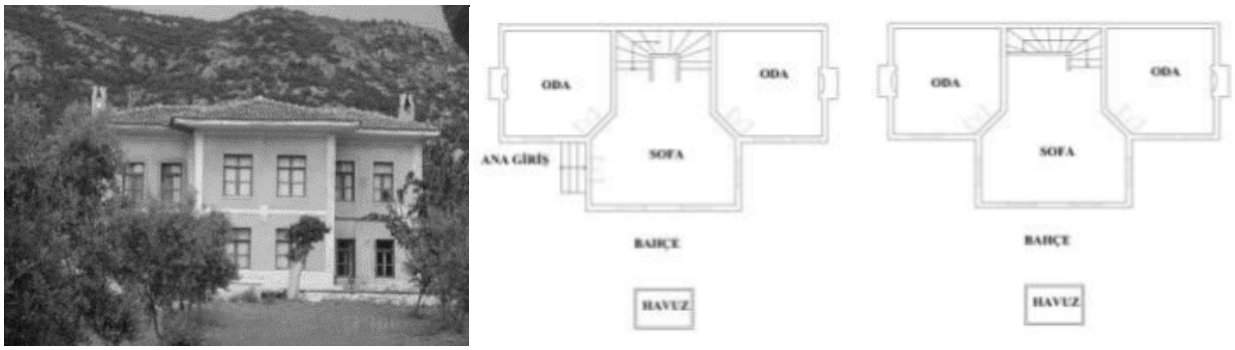

Figure 7. Şevki Alem House Photos(left), Ground Floor Plan(middle) 1st Floor Plan (right) (Değer, 2012)

Şevki Alem House has a closed sofa, T plan scheme and symmetric facade. Thanks to the T plan scheme and protrusion formed by the closed sofa, the house can shade its own facade. Also, wide eaves bring about shadows on the facade. While the ground floor of the house was built with masonry technique by using stone, the first floor of the house was built with mixed technique (Değer, 2012).

Tarsus Karaahmet House

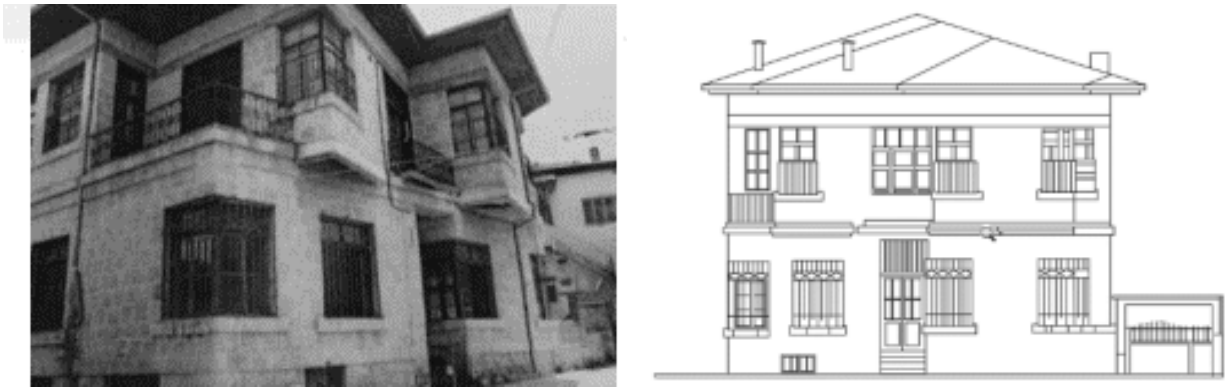

Figure 8. Karaahmet House Photo(left), View (right) (Topbaş,2022)

Figure 9. Karaahmet Ground Floor Plan(left), 1st Floor Plan (right) (Topbaş,2022).

Karaahmet House located in Tarsus is one of two buildings surrounding a courtyard, and it takes part on the north side of the courtyard. Two apartments exist on each floor, and all apartments have an interior sofa. The ground floor was built with masonry technique and the first floor was built with mixed technique (Topbaş, 2022). Differences between floors which are detected in the plan, result in protrusions. Console protrusions, balconies and wide eaves cause shading on the facade.

Houses of Hot-Dry Climate Region

Five different traditional houses were analyzed from Diyarbakır, Urfa, Hatay, Mardin and Gaziantep within the scope of this study.

Antakya Fehimpaşa House

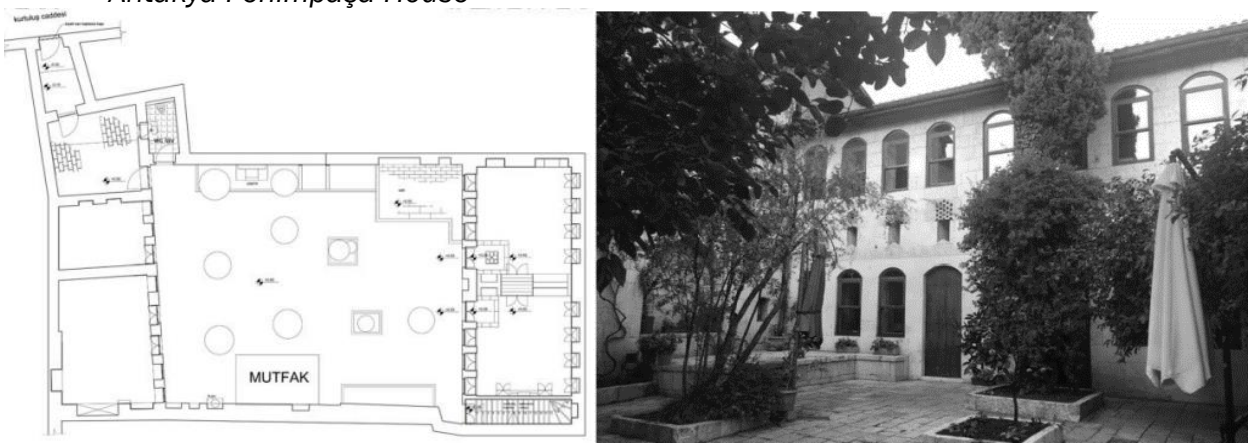

Figure 10. Fehimpaşa House Plan (left), Photo (right) (Emir,2017)

Figure 11. Fehimpaşa House View (left), Section (right) (Emir,2017)

Fehimpaşa House located on Antakya Kurtuluş Street consists of two buildings surrounding a courtyard reciprocally. The courtyard is surrounded by high walls. Different buildings, walls and plants create shaded spaces in the courtyard. Moreover, the eaves of the house shade facade. The house was built with the masonry technique by utilizing face stone.

Gaziantep Bey House

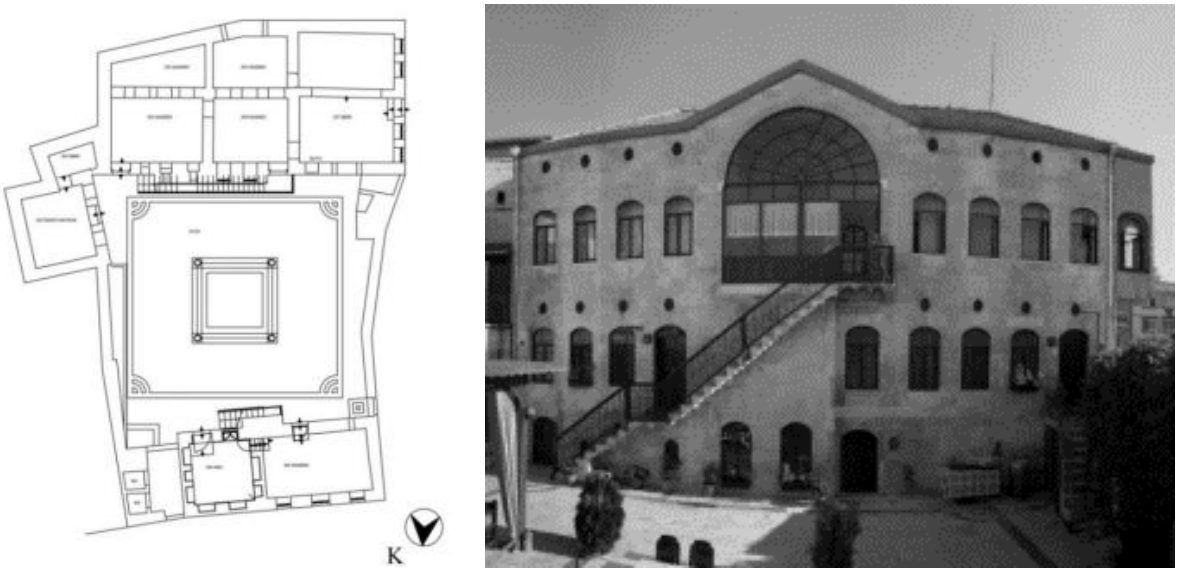

Figure 12. Bey House (left) (Kudeb Archive), Photo (right) (Gezinmez, 2019)

Figure 13. Bey House Photos (Gezinmez, 2019)

Gaziantep Bey House consists of two main buildings located north and south sides of a courtyard. The courtyard is surrounded by high walls on other sides. Buildings having different heights create shadows on the courtyard.

External stairs on the facade shade the facades. It can be inferred from the photos that face stone was utilized for the construction of masonry house.

Urfa State Guest House

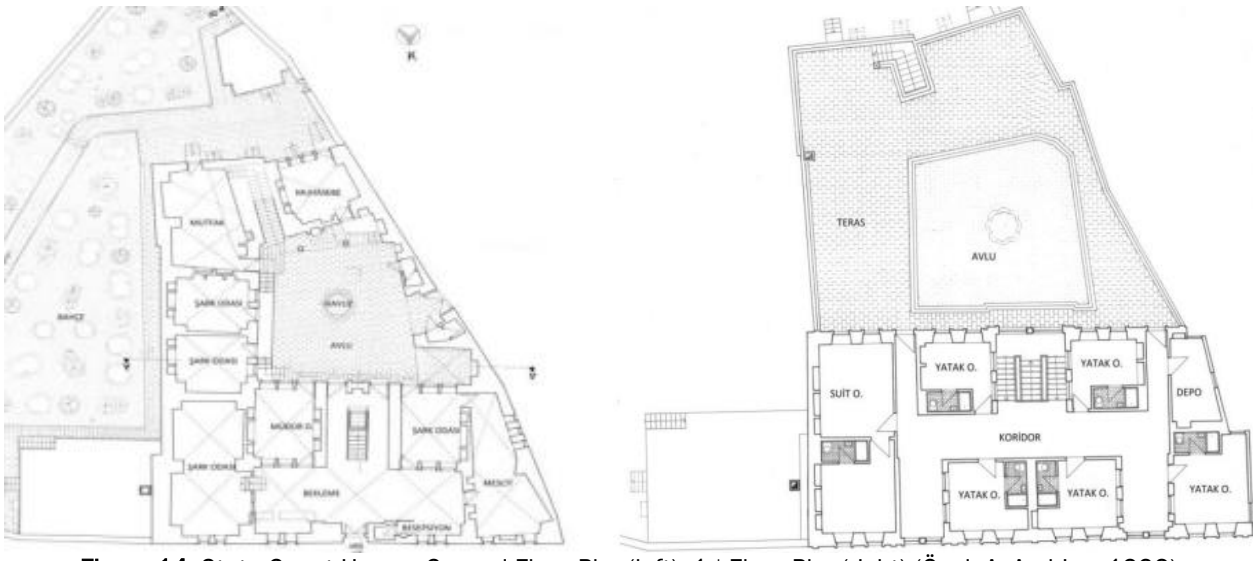

Figure 14. State Guest House, Ground Floor Plan(left), 1st Floor Plan(right) (Öcal, A. Archive, 1992)

Figure 15. State Guest House, Courtyard Photo (left), Terrace Photo (middle), North Façade (right) (Kürkçüoğlu C., 1995)

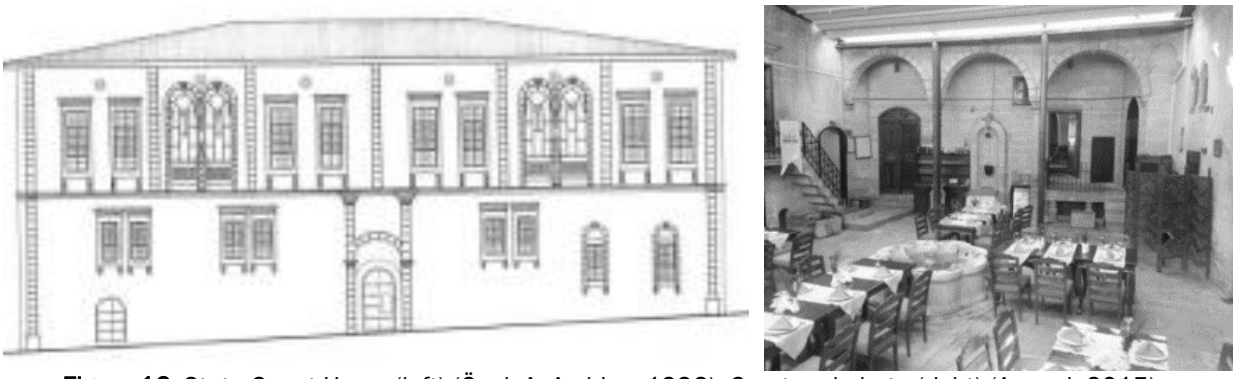

Figure 16. State Guest House(left) (Öcal, A. Archive, 1992), Courtyard photo (right) (Açanal, 2015)

Urfa State Guest House which is one of the first houses converted to a guest house had been mentioned as Hacıkamilzade Küçük Hacı Mustafa Efendi House before it was converted to the guest house, and it is predicted that the house was built in the second half of the 19th century and the early 20th century (Açanal, 2015). The guest house consists of a ground floor including a courtyard and the first floor including a wide terrace. Various parts of the house surrounding the courtyard shade courtyard. Porticos and iwans provide shaded spaces for hosts even at noon. Some windows of the house can be shaded by thick walls. The house was built with masonry walls including face stones.

Diyarbakır Esma Ocak House

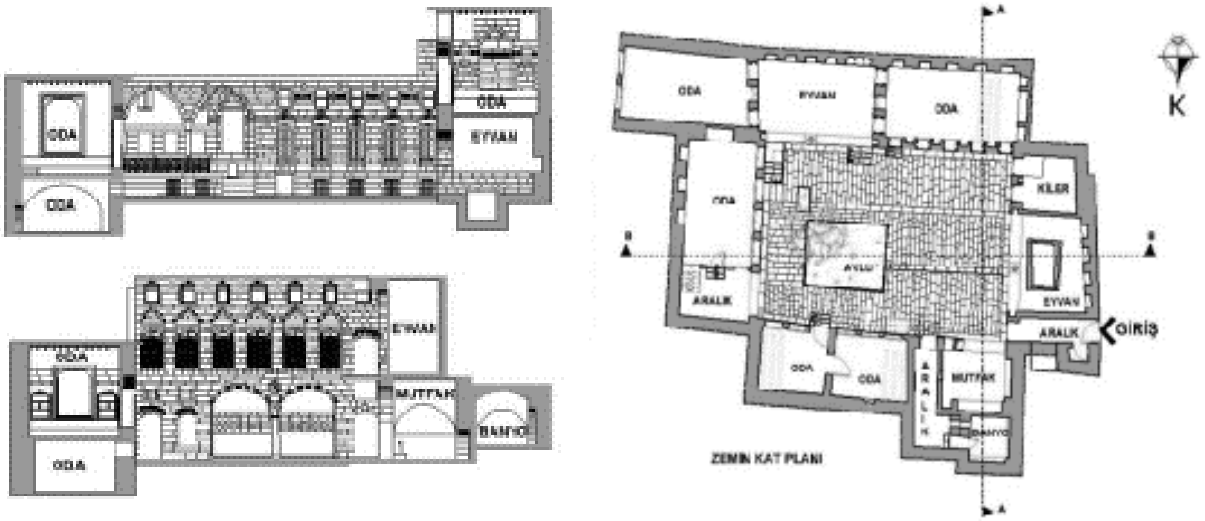

Figure 17. Esma Ocak House Sections(solda), Plan(right) (Yıldırım Et. Al., 2012)

Esma Ocak House which is a traditional Diyarbakır house consists of various spaces surrounding a courtyard such as iwans, kitchen, cellar, toilet, etc. The courtyard is a circulation and gathering place for residents. The house has different rooms for different seasons, and rooms for summer have more windows (Payaslı Oğuz & Halifelioğlu, 2017).

The courtyard of the house can be shaded by various spaces lined up around it and trees. It is detected that building in the south and west of the courtyard is higher, so scorching sunshine can be prevented more effectively. Two iwans facing directly the courtyard provide shaded spaces even at noon. Also, it is analyzed that the windows of the house take part inside of thick walls, so they are shaded by the wall. The house was built by utilizing basalt stone which is used extensively in Diyarbakır traditional buildings.

Mardin Enver Aras House

Enver Aras House located in Savur, Mardin includes two floors, one terrace, one courtyard and two iwans. The house having a terrace roof was built with masonry technique by using rough stone. The courtyard of the house is shaded by the house and wall of the courtyard. The house having an L plan scheme is capable of shading its own facade. Iwans of the building provide shaded spaces always for users. A small protrusion exists on the facade facing the street.

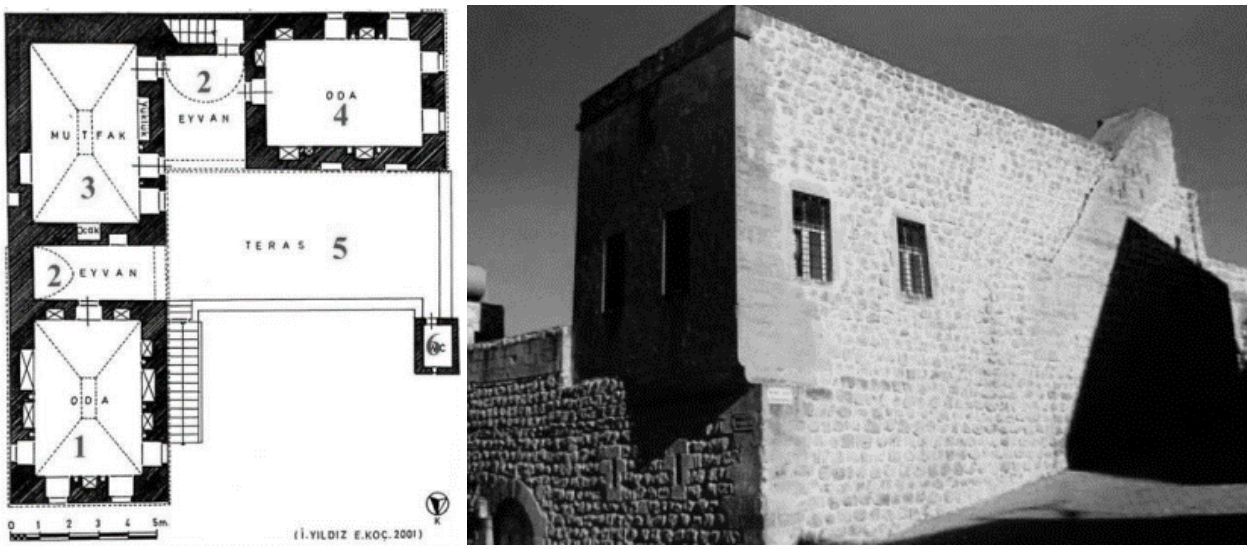

Figure 18. Enver Aras House 1st Floor Plan(left), Photo(right) (Yıldız, 2011)

Houses of Mild-Moist Climate Region

Five different traditional houses were analyzed from Amasra, Samsun, Trabzon, Mudanya and Safranbolu within the scope of this study.

Amasra Boztepeliler House

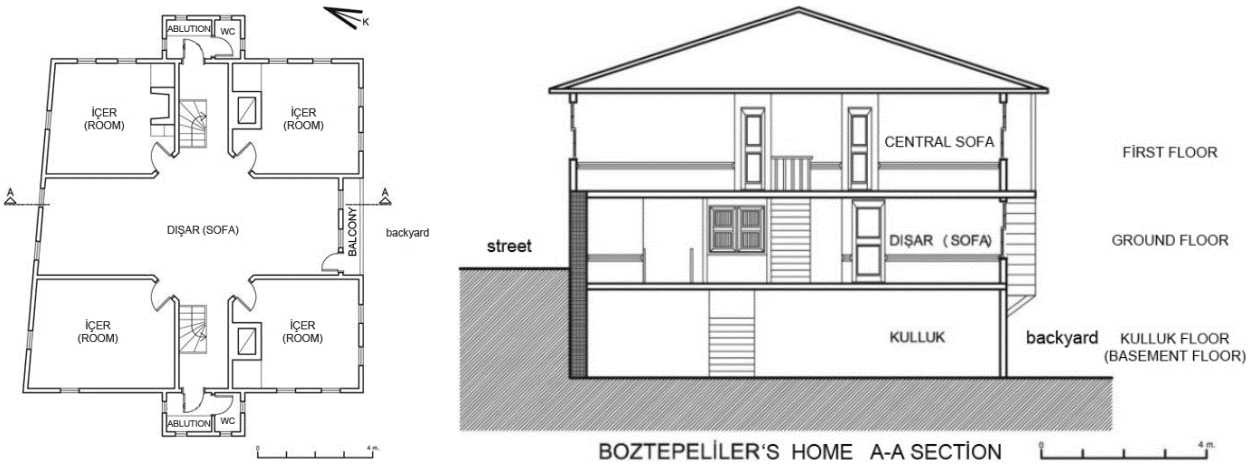

Figure 19. Plan With Central Sofa and Section Example (Erarslan&Dağ, n.d.)

Boztepeliler House located in Amasra has a central sofa plan scheme, and spaces take part around the sofa. On the south facade, protrusions and a balcony create shading on the facade. Bathrooms take part in the east and west facades and they give rise to the shading on the facade. Also, eaves create shading on all facades. It is inferred from drawings that stone was utilized for the construction of the basement, and wood was utilized for the construction of other floors.

Samsun Naile Öz House

Naile Öz House having a quadratic form owns an interior sofa surrounded by rooms on both sides and a bay window. The house having hipped a roof includes escalated entrance. The first shading method is the bay house taking part above the entrance. Also, a small protrusion exists on the west facade. The house is also shaded by eaves protruding on all facades. It can be inferred from the photo that the house is made from wood and plastered with Baghdadi plaster.

Figure 20. Naile Öz House Ground Floor(left) 1st Floor plan(right)

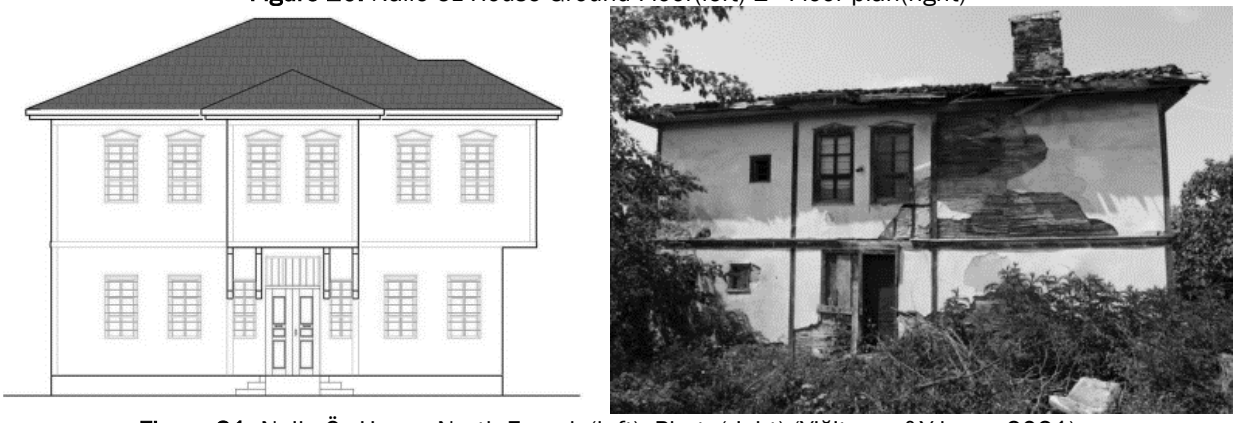

Figure 21. Naile Öz House North Facade(left), Photo(right) (Yiğitpaşa&Yılmaz, 2021)

Safranbolu Köşeliler House

Figure 22. Köşeliler House Southwestern Photo(left), sofa photo(right) (Parlakkaya Mimarlık Arşivi, 2010-2014)

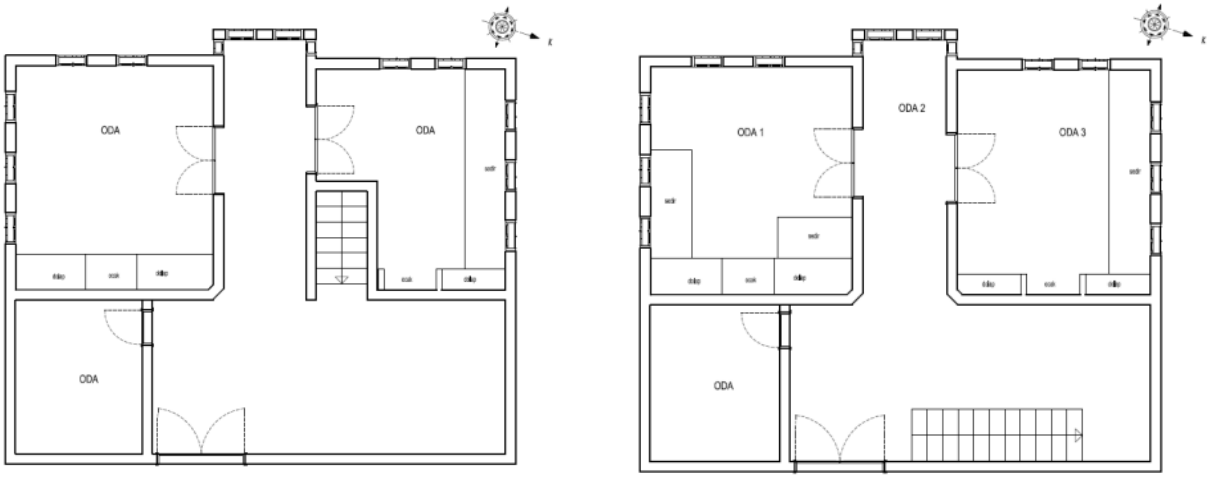

Figure 23. Köşeliler House 1st Floor Plan(left), 2nd Floor Plan(right) (Parlakkaya Architecture Archive, 2010-2014)

Köşeliler House having a quadratic form includes interior sofa connected with a bay window. The sofa is surrounded by rooms and external walls as big as other rooms. The house built in the 1900s includes a barn on the ground floor and various spaces on the first and second floor; also, the house was built with wood carcass technique in accordance with the local architecture (Sayın, 2014). Bay windows located on the west facade and some small protrusions located on the southwest facade contribute to shading for this house.

Rize Hacı Rıfat Tavukçuoğlu Evi

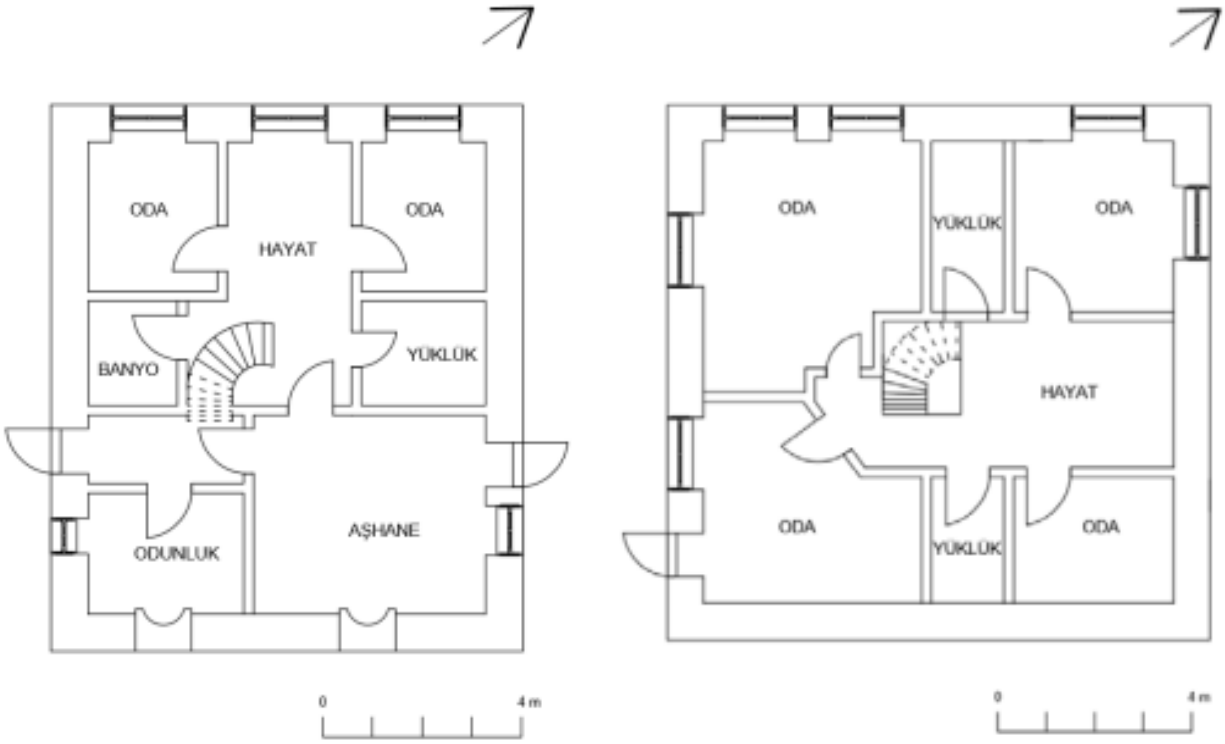

Figure 24. Hacı Rıfat Tavukçuoğlu's House Ground Floor Plan(left), First Ploor Plan(right) (Demirrenk, 2017)

Hacı Rıfat Tavukçuoğlu House which is not known when it was built exactly, is considered to be over 100 years old (Demirrenk, 2017). The main entrance of the house is in the soup kitchen, and the house owns an arched door another side. The house having quadratic form contains two floors and rooms which are arranged around the sofa. The first shading method is openable shading elements on windows. Moreover, small protrusions, a tiny balcony and eaves result in shading on facades. Whereas some parts of the house were constructed with stone, some parts were constructed with wood infill wall technique.

Figure 25. Hacı Rıfat Tavukçuoğlu's House Photos (Demirrenk, 2017)

Mudanya Tahirpaşa House

Figure 26. Tahirpaşa House Photos (Evran, 2018)

Figure 27. Tahirpaşa House Ground Floor Plan(left), 1st Floor Plan(right) (Evran, 2018)

According to the inscription in the main room, Tahirpaşa House was built in 1724 (Evran, 2018). It is necessary to pass through a small courtyard in order to enter the house. The house consists of two floors, and these two floors differ from each other. The differences between floors result from protrusions which cause shading on facade. Also, eaves surrounding the house shade facade. Construction tecnique of the house is masonry walls on basement floor and the wood carcass systems on other floors.

Houses of Mild-Dry Climate Region

Five different traditional houses were analyzed from Merzifon, Ankara, Konya, Kula and Malatya within the scope of this study.

Merzifon Hamdi Basmacı House

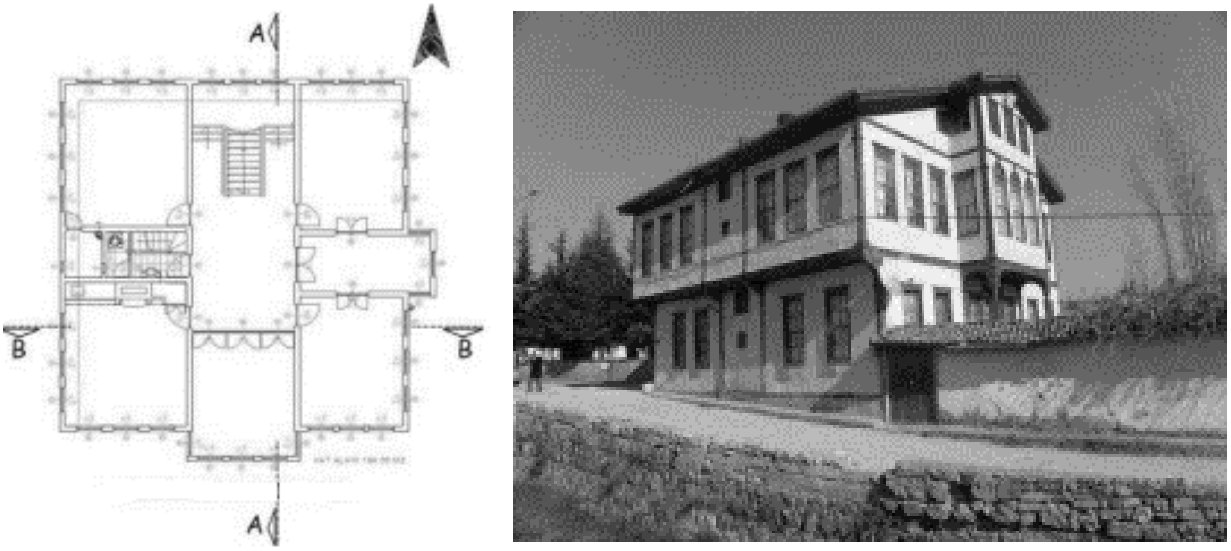

Figure 28. Hamdi Basmacı House Plan(left), Photo(right) (Boy, n.d.)

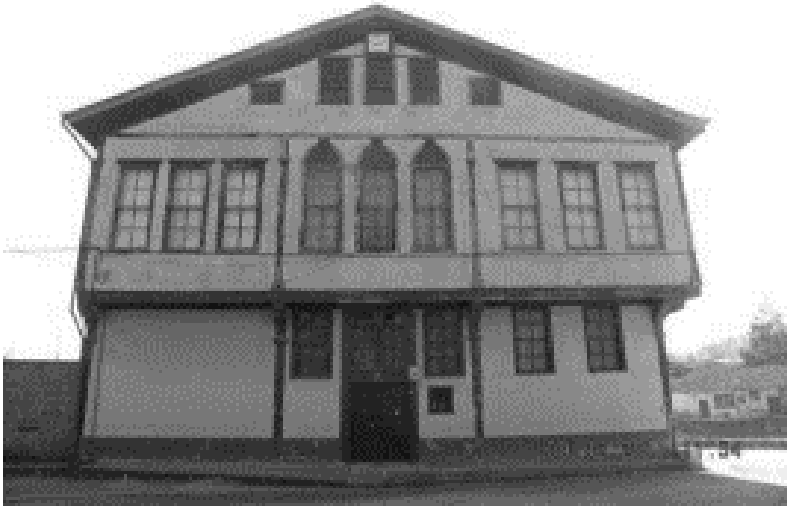

Figure 29. Hamdi Basmacı House Photo (Boy, n.d.)

Hamdi Basmacı House was built in 1923 according to the inscription of the house (Boy, n.d.). The house including a courtyard was built on an inclined area and consists of a basement floor and two floors. In the house which owns quadratic form, rooms are arranged around the sofa. The facades of the house are shaded by a bay window, console protrusion and eaves protruding from the saddle roof. It is inferred from the photos that the house was made from wooden wall.

Ankara Ulus House Sample

Figure 30. Ground Floor Plan(left), Photo(right)

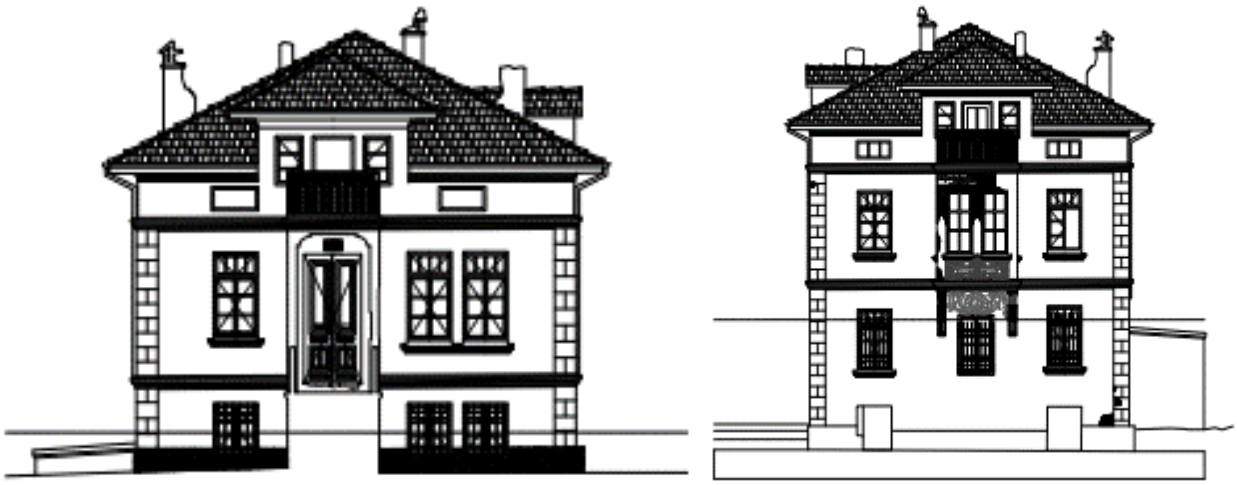

Figure 31. Southwest Facade(left), Northeast Facade (right) (Karaçağ, 2017)

Figure 32. Southeast Facade(left), Northwest Facade(right) (Karaçağ, 2017)

According to the Ottoman inscription taking place on the ground floor, the house was built in 1926 (Karaçağ, 2017). The house located in an inclined area consists of three floors. Spaces of the house are arranged around

the interior sofa. The facades of the house are shaded by a bay window, balcony and eaves. Furthermore, openable shading elements exist on windows. Whereas rough stone and brick were used in the basement and the ground floor, ground floor was built with wood infill wall (Karaçağ, 2017).

Konya Ömer Yeşilyurt House

Ömer Yeşilyurt House, consisting of one floor includes four spaces arranged around the interior sofa. The house, constructed with masonry rubble stone walls, has a hipped roof. The entrance of the house takes place at the back of the external wall slightly, so the entrance can be shaded. Space that protrudes causes shading on the right facade. Some windows are shaded by openable shading elements. The house was built with masonry walls by using rough stones (Kunduracı, 2005).

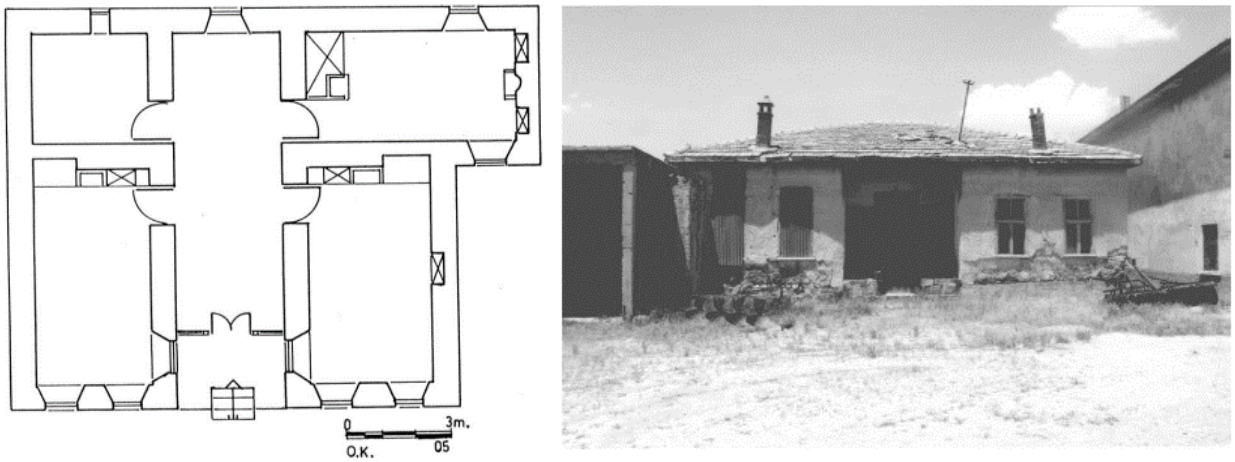

Figure 33. Ground Floor Plan (left), Photo (right) (Kunduracı, 2005)

Kula Bekir Beyler House

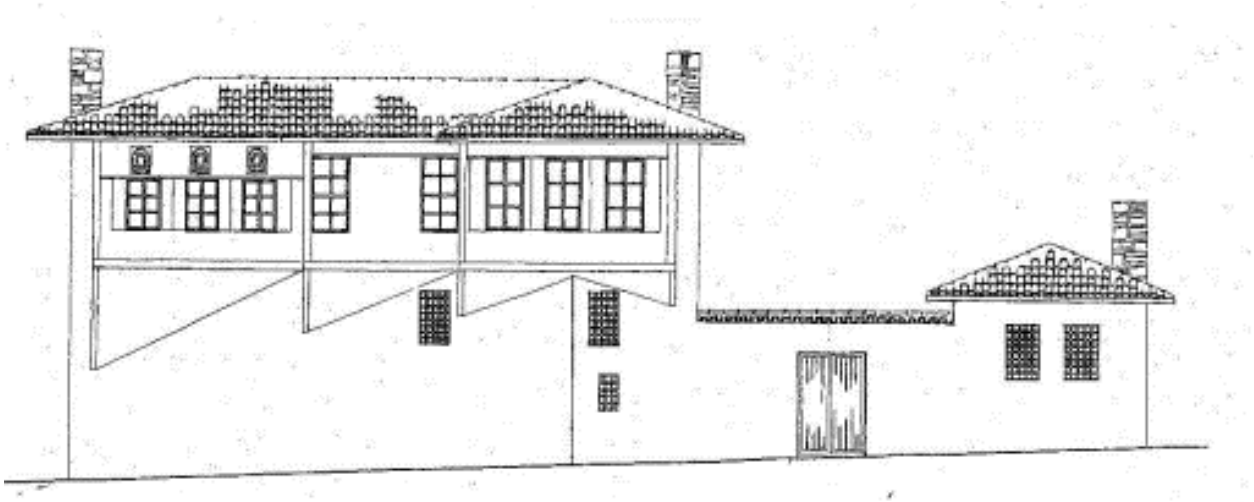

Figure 34. Bekir Beyler House North Facade (Tosun, 1969)

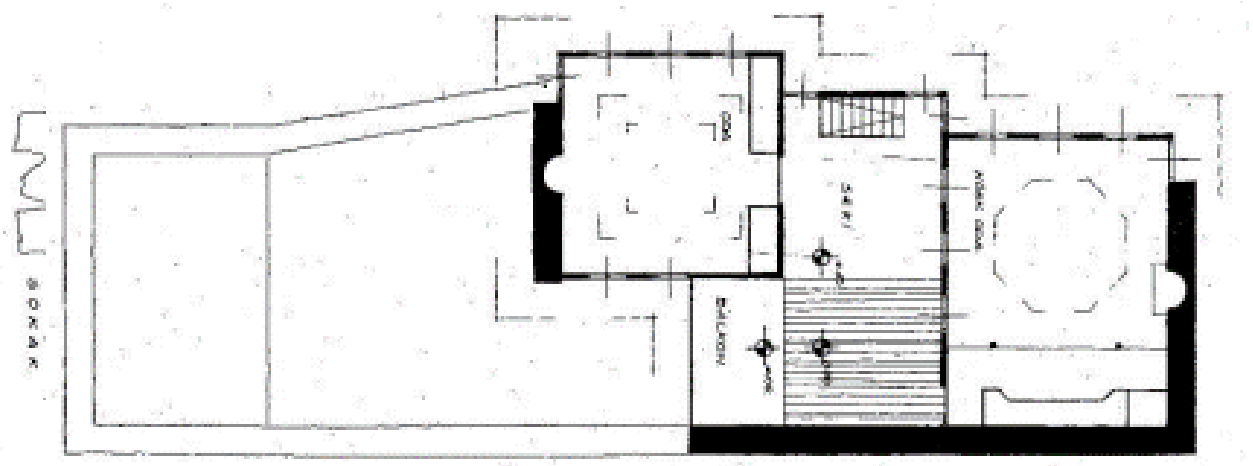

Figure 35. Bekir Beyler House 1st Floor Plan (Tosun, 1969)

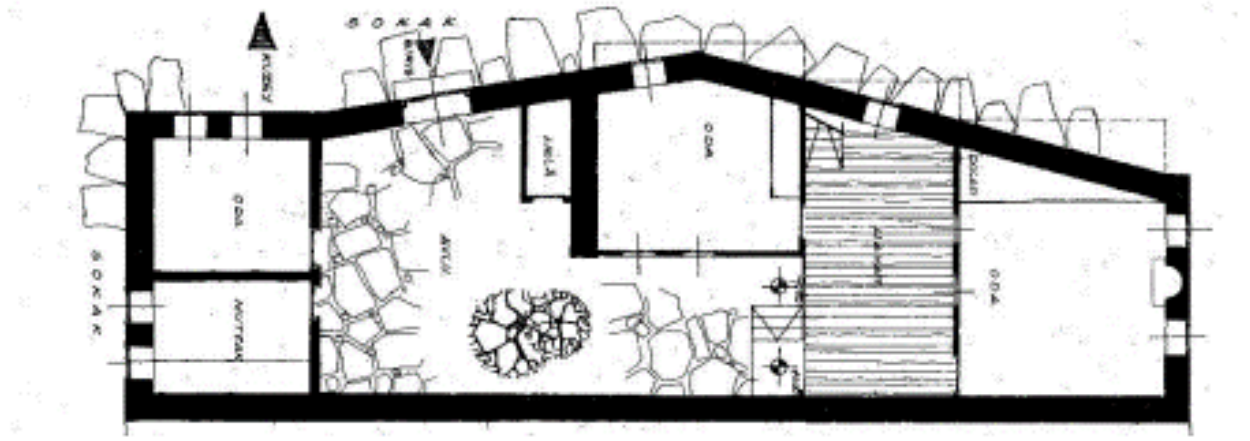

Figure 36. Bekir Beyler House Ground Floor Plan (Tosun, 1969)

Bekir Beyler House consists of two main reciprocal buildings surrounding a courtyard. High walls exist on other sides of the courtyard. Thanks to two buildings, high walls and trees, the courtyard can be shaded. The open sofa facing the courtyard provides shaded spaces for residents on the first floor. Eaves and protrusions on the north facade create shadows on the facade. Whereas the ground floor is constructed with masonry walls, the first floor is constructed with wooden walls.

Malatya Hanifi Tanbay House

Figure 37. Hanifi Tanbay House Photos (Yariş, n.d.)

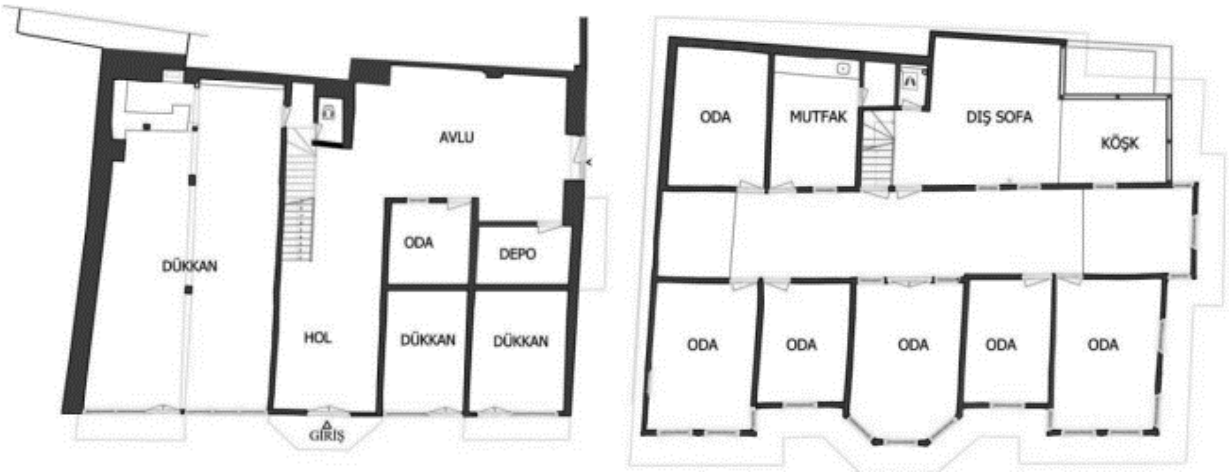

Figure 38. Hanifi Tanbay House Ground Floor Plan(left), 1st Floor Plan(right) (Yariş, n.d.)

Hanifi Tanbay House including two floors is the only house which owns a pinnacle. Even though it is not known exactly when it was built, it can be predicted that the house was built in the Late Ottoman Age (Yaris, n.d.). The ground floor containing shops has a flat facade, but the first floor has a protrusive facade including bay windows. These protrusions and eaves give rise to the shading on the facade, and pinnacle creates shadow on the roof tiles. Also, the exterior sofa provides shaded spaces for users by creating semi-open places.

Houses of Cold Climate Region

Five different traditional houses were analyzed from Ahlat, Bayburt, Erzurum, Erzincan, and Van within the scope of this study.

Ahlat Mahmut Aksüt House

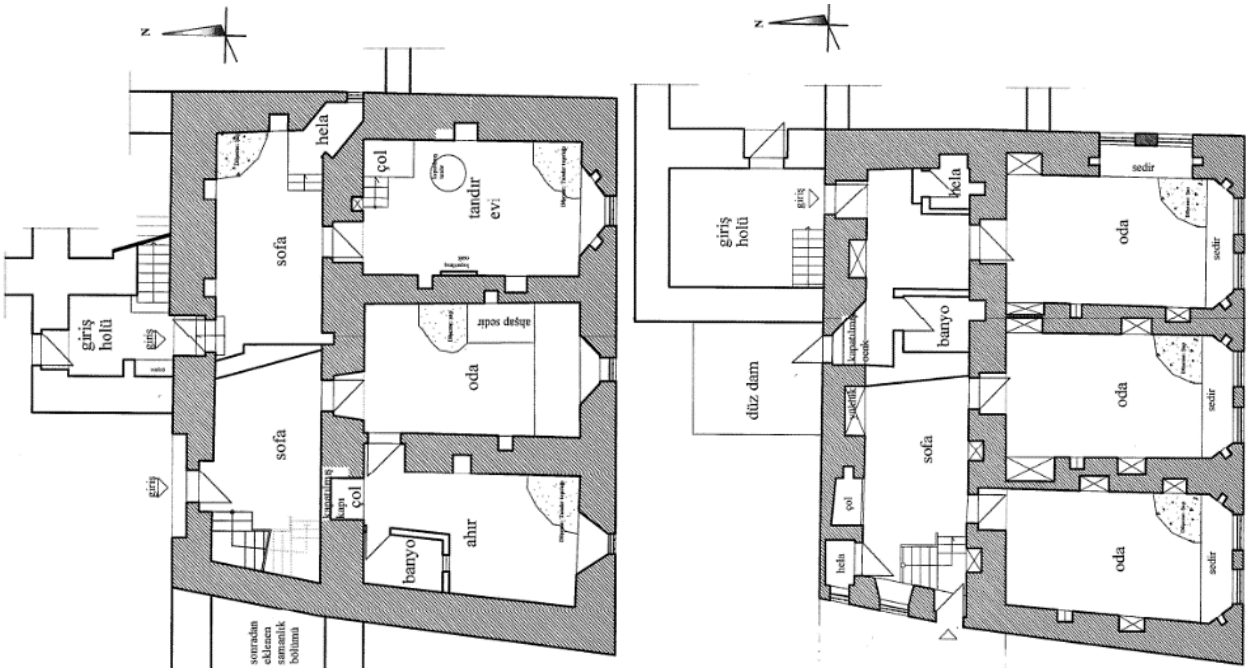

Figure 39. Mahmut Aksüt House Ground Floor Plan(left), 1st Floor Plan(right) (Karakuş, 2008)

Figure 40. Mahmut Aksüt House Photos (Karakuş, 2008)

Mahmut Aksüt House having a quadratic form consists of different spaces arranged on one side of the sofa. The house built with face stone has two floors and is covered with a flat roof, and white walls in drawings were added to the house afterwards (Karakuş, 2008). The entrance lobby added to the house afterwards protrudes from the house and causes shading on the facade. The house was built with the masonry technique by utilizing face stone.

Bayburt Cevriye Mangan House

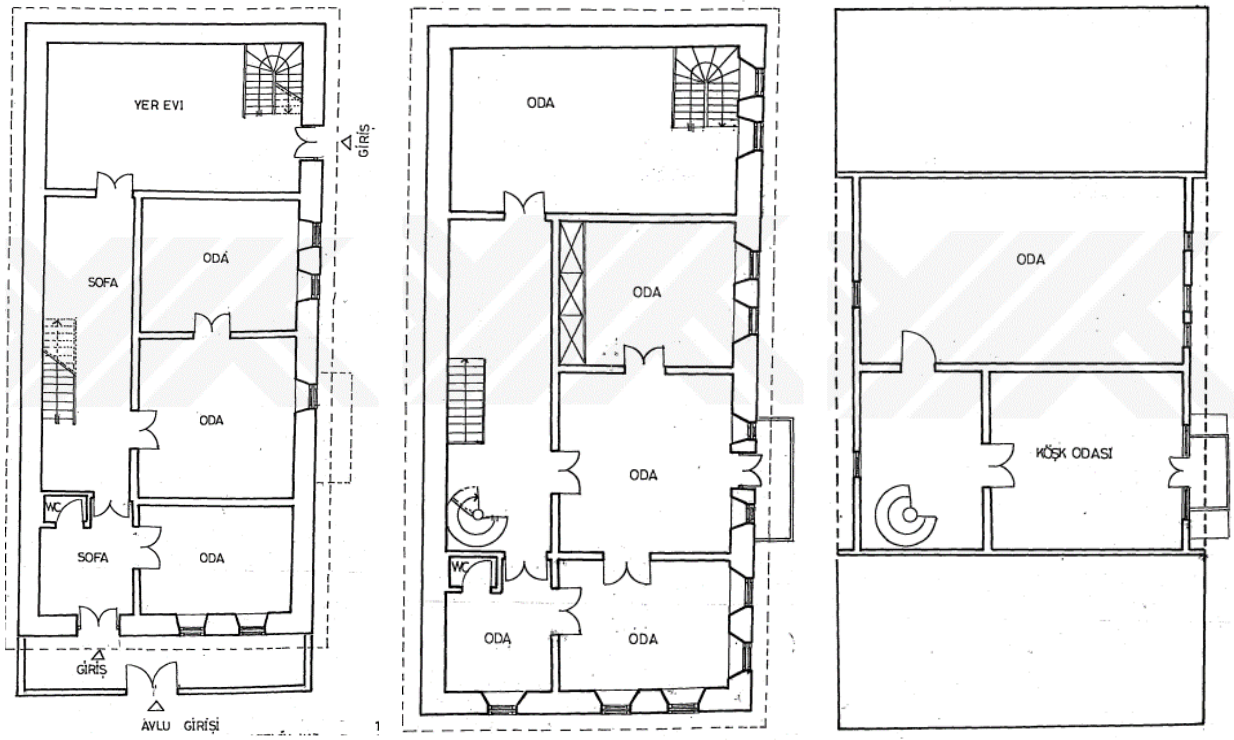

Figure 41. Cevriye Mangan House Ground Floor Plan (left), 1st Floor Plan (middle), Roof Plan (right) (Uçar,1998)

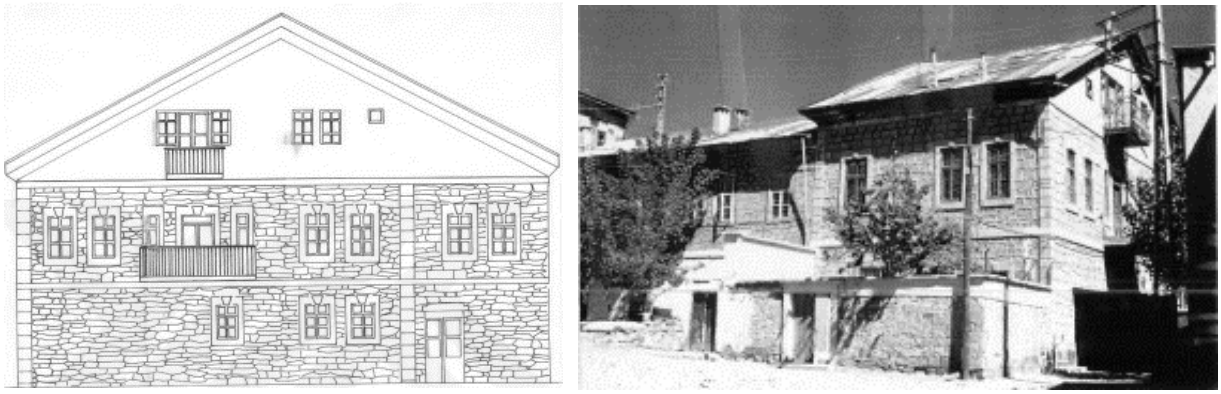

Figure 42. Cevriye Mangan House Front View(right), Photo(right) (Uçar,1998)

Cevriye Mangan House having a rectangular form, contains a ground, a first and a roof floor. Spaces of the house are arranged on three sides of the sofa. So as to enter the house, it is needed to pass through a small courtyard shaded by a tree and high walls. Eaves protruding from the saddle roof and a balcony bring about shading on the facade. There are jambs around the windows and doors, but these jambs are not big enough to create a shadow on the facade and windows. The house was built with the masonry technique by utilizing rough stone.

Erzurum Yaşar İkizler House

Figure 43. Yaşar İkizler House Photos (Köşklü&Kındığılı, 2018)

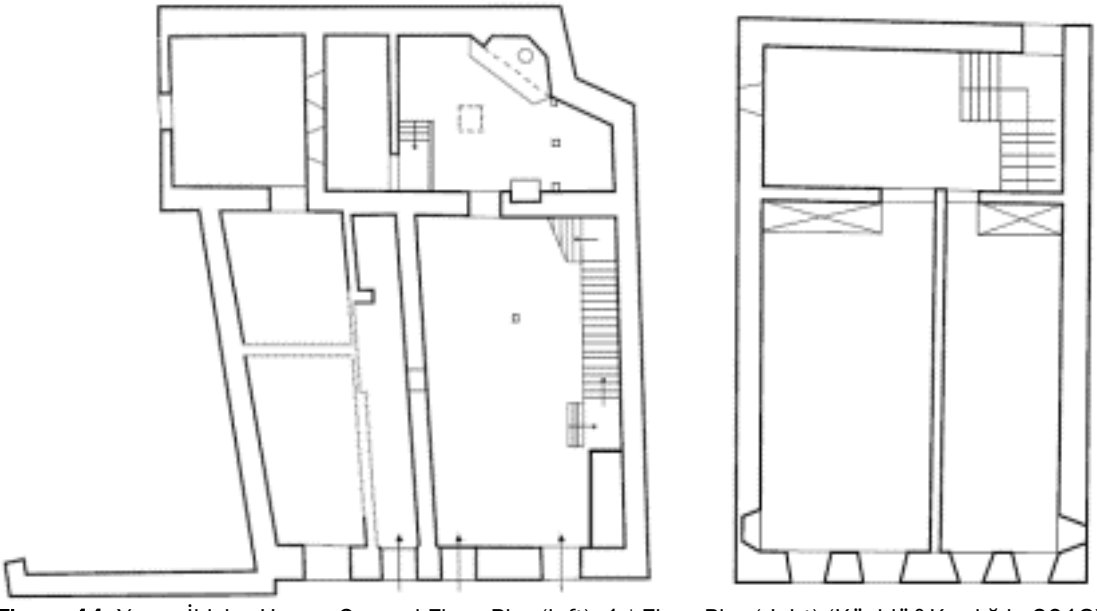

Figure 44. Yaşar İkizler House Ground Floor Plan(left), 1st Floor Plan(right) (Köşklü&Kındığılı, 2018)

Yaşar İkizler House having a rectangular form consists of two floors. It is predicted that the house was built in 1896 thanks to an inscription fixed on the kitchen wall, and the house includes a barn, kitchen and rectangular rooms (Köşklü&Kindığılı, 2018). It can be observed that the floors of the house are not the same exactly. Differences between floors can create shading on the surface of the house. This house is a sample where shading occurs so rarely.

Erzincan Etem Kılıç House

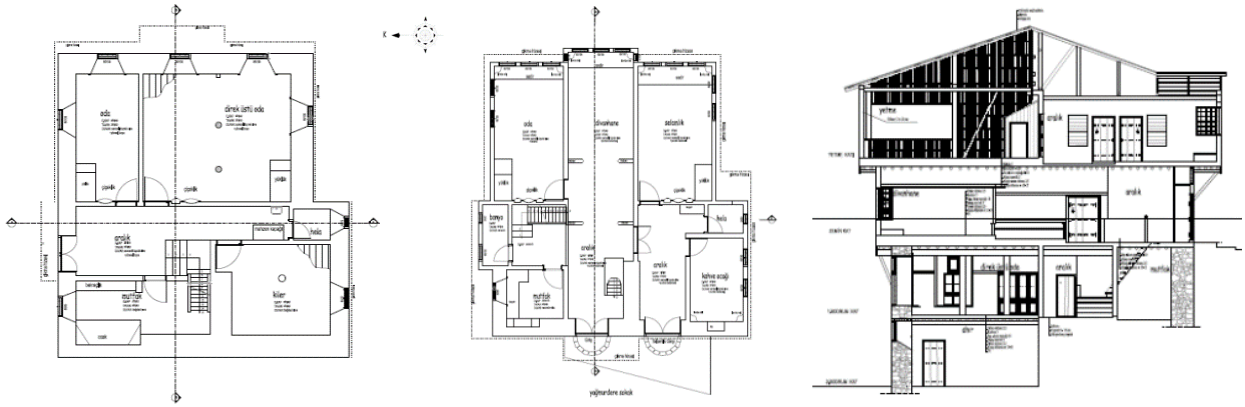

Figure 45. Etem Kılıç House Basement Plan(left), Ground Floor Plan(middle), Section (right) (Parlakkaya Architecture Archive)

Figure 46. Etem Kılıç House Photos (Parlakkaya Architecture Archive)

Etem Kılıç House located in Kemaliye consists of two basement floors, a ground floor and a terrace. It is thought that the house was built in the second half of the 19th century by utilizing stone for the construction of the basement and ground floor; and by utilizing wood for the construction of the first floor (Sayın, 2014). Bay window above the entrance, console protrusion and eaves result in shading on the facade. The terrace of the house provides shaded spaces for residents.

Van Abdurrahman Yörük House

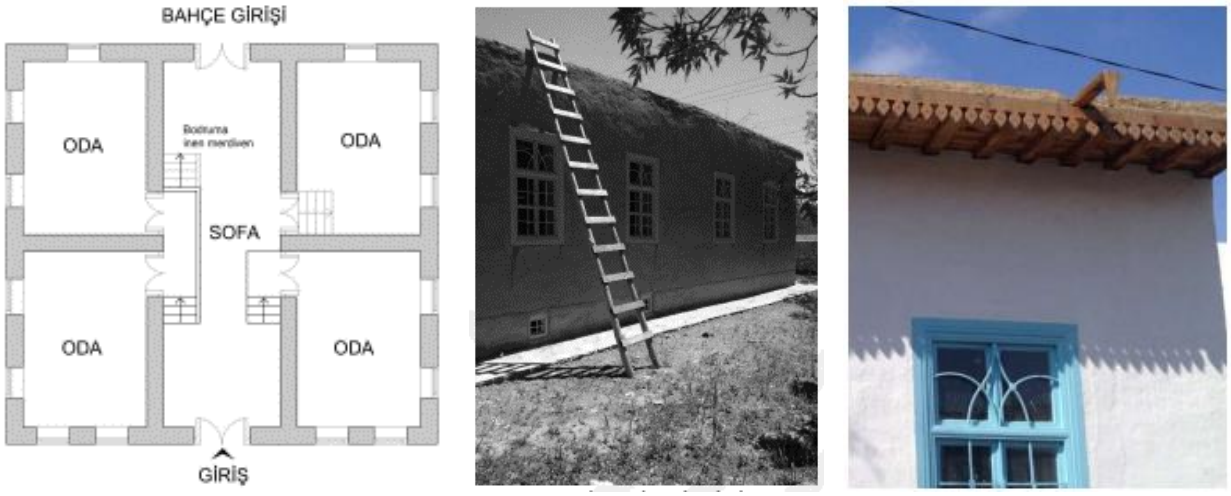

Figure 47. Abdurrahman Yörük House Ground Floor Plan(left), Northwest Facade(middle), Eaves(right)

Single storey Abdurrahman Yörük House includes an interior sofa, and rooms face the sofa directly from the left and right sides. The house which was made from adobe has gargoyles on the roof in order to remove rainwater and snow water (Uşma, 2018). The house is so poor in terms of shading methods, and the eaves create small shadows on the facade.

Findings

The following table has been prepared based on the information and visuals.
As a result of the examinations of houses in terms of shading, it is realized that shading methods are applied at different levels in different regions. The form of house method is so common that this method is applied in almost all houses. The houses in the cold climate region shade their own facade less than in other regions. All houses located in hot climatic regions create shadows on their facade. Furthermore, the usage of shading elements which are usually made from wood is nearly equal in every region except the hot-dry climatic region in which shading elements never exist. Also, eave is one of the most common shading methods that is seen in every house examined in mild climate regions, and three out of five houses in other regions. Moreover, the position of the window relative to the wall is a rare method that is mostly seen in the hot-dry climate region. However, this method is seen in one or none out of five houses in other climatic regions. The open sofa is also an infrequent shading method, and it mostly exists in mild-dry climate region. Despite the fact that a balcony is seen in almost all regions except the hot-dry climate region, it is encountered in one or two out of five houses. Another uncommon shading method is iwan which is a semi-open space, and it is only seen in the hot dry climate region. In spite of the fact that plants are seen in every region, usage of plants is more frequent in the houses of hot climate regions. Plants are seen in every climate region, but they are more common in hot-dry and cold climate regions, and this method is observed in one out of five houses in mild climate regions.

Table 1. The following table has been prepared based on the information and visuals.

Climate Area	Name of the House	Form of the house	shading facade element	eaves	the position of the window	open sofa	balcony	courtyard wall	iwan	plants	Contruction Materials		
											Basement	Ground Floor	Upper Floor
Hot-moist	Bodrum Sakız House (Khios House)	x	x				x			x	none	stone	stone
	Foça House Simple	x				x					none	stone	stone
	Antalya Abdi Ülgen House	x		x	x			x			none	wood	wood
	Ula Şevki Alem House	x		x						x	none	stone	mixed
	Tarsus Karaahmet House	x		x			x	x			none	stone	stone
Hot-dry	Antakya Fehimpaşa House	x		x				x		x	none	stone	stone
	Gaziantep Bey House	x						x		x	none	stone	stone
	Urfa State Guest House	x		x	x			x	x		none	stone	stone
	Diyarbakır Esma Ocak House	x		x	x				x	x	none	stone	stone
	Mardin Enver Aras House	x							x		none	stone	stone
Mild-moist	Amasra Boztepeliler House	x		x			x	x			stone	mixed	wood
	Samsun Naile Öz House	x		x							none	wood	wood
	Safranbolu Köşeliler House	x		x							none	wood	wood
	Rize Hacı Rifat Tavukçuoğlu House		x	x			x			x	none	stone	mixed
	Mudanya Tahirpaşa House	x		x				x			stone	wood	wood
Mild-dry	Merzifon Hamdi Basmacı House	x		x				x			mixed	wood	wood
	Ankara Ulus House Simple	x	x	x	x		x				stone	stone+brick	wood
	Konya Ömer Yeşilyurt House	x	x	x							none	stone	none
	Kula Bekir Beyler House	x		x		x		x		x	none	stone	wood
	Malatya Hanifi Tanbay House	x		x		x		x			stone	adobe	adobe
Cold	Ahlat Mahmut Aksüt House	x								x	none	stone	stone
	Bayburt Cevriye Mangan House			x			x	x		x	none	stone	stone
	Erzurum Yaşar İkizler House	x						x			none	stone	stone
	Erzincan Etem Kılıç House	x	x	x			x			x	stone	stone	wood
	Van Abdurrahman Yörük House			x							none	stone	none

Results and Discussion

The study including an analysis of twenty-five traditional houses from five different climate regions located in Anatolia tries to explain how the effects of climate had been diminished in Anatolian traditional architecture via the shading concept. Within the scope of the study, twenty-five houses were compared with each other by analysing their drawings and photos. Shading its own facade which is seen in almost all houses, is provided with console and protrusions. Whereas bay windows and consoles are seen in wooden houses, O and L plan schemes creating shadows on facades are seen in stone houses. From this point of view, which materials were used for the construction of houses affect how shading is provided whether plan schemes or protrusions. Moreover, it is realized that any shading facade elements do not exist in Hot-dry climate regions, even if it is expected those shading elements are utilized in hot climate regions more than others. In hot climate regions, it is observed that most of the houses were made from stone and wood usage is pretty limited. So, shading elements which are generally made from wood are not widespread as expected. Also, shading elements might be used for different purposes like insulation and privacy, so they can be preferred even though shading is not necessary. All of the shading facade elements seen between analysed houses are openable, and they are made from wood. Any other shading facade elements like awning have never been encountered. Eave, which is one of the most seen shading methods is more common in mild climate regions, even though it is considered that eave is more necessary in hot climate regions for shading and in moist climate regions which are rainier, to remove rainwater. In the table, it can be seen that houses of mild climate regions are made from wood, which is also used for the construction of eaves, so eave is common in mild climate regions because of made from wood. The position of the window is so rare that it is mostly seen in hot-dry climate region. This method seen in four houses requires thick walls to create shadows on a window, so the windows shaded by this method take part in only masonry thick walls. Open sofa coincided in only three houses is seen in mild-dry climate region mostly. Except for Foça House Sample, the other two houses are made from wood, and the roof above an open sofa of Foça House Sample is carried by wooden columns. So, it is understood that wood is the carrier for open sofas, and these are seen in wooden structures generally. The balcony is a shading method that is seen almost equally in all regions. Except for Amasra Boztepeliler House, all of the balconies shade facade as protrusions. After analysis of houses including a balcony, it is observed that these houses which are made from stone, do not have a big courtyard and open sofa. So, it can be claimed that houses which do not have enough areas for a big courtyard or open sofa, may have a balcony to reach outdoor. Plants, which are seen in more than half of the houses including a courtyard, shade courtyard rather than the facade of the houses. All the plants in the houses analysed are woody plants like a tree. Herbaceous plants like ivy have never been seen in the analysis of the houses.

In conclusion, in houses from five different climate regions, it is tried to decrease the effects of the climate so as to overcome its uncomfortable conditions. In order to prevent overheating and greenhouse effects of the sun, several shading methods and elements emerged. Even though it cannot be said that the main purpose of these methods and elements is shading, the shading is provided with these methods and elements. The form of the building, shading elements, eaves, the position of the window relative to the wall, iwans, open sofa, balcony, plants and courtyard wall result in shading on facades or other open space. Shading is provided via different elements and methods in different climate regions. The existence of the shading methods is influenced by the material of the house and local architecture, and these factors can cause shading more or less than expected.

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Conflict of Interests

The author declares no conflict of interest.

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CHAPTER 5. Numerical Investigation of the Form Effect on Wind Induced Pressure Distribution on Roofs

Elif Gizem Yetkin, Murat Aksel, Mehmet Dikici and Cengiz Ipek

Introduction

Climate change is the most severe global problem humanity faces in our age and will affect the future of humanity. The increase in extreme climate events resulting from climate change is now confirmable in our daily experiences/observations, and the research community recognizes that this will become increasingly dramatic (Balasubramanian et al., 2022, Christensen et al., 2013, Darkoh, 2010, Fakhruddin, 2021, Graham et al., 2008, Gullino, 2021, Harris & Özerdem, 2012, Lisboa et al., 2015). While solutions such as reducing emissions and developing carbon capture technologies to slow down climate change are being discussed, governments/decision-makers can act according to possible situations and adapt to the changing climate. Buildings, airports, coastal structures, hospitals, and infrastructures of urban and rural cities should be improved to adapt to climate change. Besides, extreme weather events (i.e., storms, heavy rains, floods, fires, heatwaves) force the new regulations on the structures' design limits and standards. United Nations Development Programme (UNDP) published a practical guide to underline the challenges and impacts of a changing climate on the built environment and define how to adapt our buildings and communities to this challenging environment (UNEP, 2021).

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The potential risks and priority hazards of climate change are regional. Alanya, which is located in Antalya, Türkiye, is vulnerable to sea-level rise, drought, flood, and storm hazards due to its climatic region and location. Previous studies show that the number of storm events and the severity of destructiveness increase on an annual basis for the Antalya region, which includes Alanya (Cramer et al., 2019; Masson-Delmotte, V., P. Zhai, A. Pirani, et al., 2021; Michaelides et al., 2018; Türkeş, 2019, 2015). This severe windstorm event in the Mediterranean region is named Medicane (Mediterranean Hurricane) (Michaelides et al., 2018). Raveh-Rubin and Wernli investigated the extreme weather events which appeared in the Mediterranean basin and affected the southern coast of Türkiye (Raveh-Rubin & Wernli, 2016). They pointed out that 3/5 of the storm events between 2003 – 2011 hit Antalya. Various researchers investigated the spatial pattern of cyclones over the Mediterranean (Alpert et al., 1990; Lionello et al., 2016), and Antalya Bay has a high cyclone track density.

Potential changes in frequency/intensity of medicanes would increase the physical damage risk on the buildings. Various research focus on risk calculation and mitigation (Alduse et al., 2022; Friedland, 2009; Nawari, 2011). Damages mainly occur on the external building fabric, coatings, and roof-mounted installations (i.e., solar water heaters, satellite dishes, chimneys) (Adan et al., 2009; Douglass & Dixon, 2012; Marshall, 2004; Massarra et al., 2021; McDonald & Lea, 1978).

In the Antalya district, it is important to adapt the structures against the storm or to evaluate the new structures in this context, especially due to the increase in the frequency and intensity of the madicanes. During the planning and design stages, experimental tests (Aly et al., 2012; Jagbir & Kumar, 2021; Ntinas et al., 2017) and computer-aided engineering tools are useful for detecting damage take precautions to prevent/mitigate the risk. Experimental studies are not economical in small-scale structural planning. Computational fluid dynamics (CFD) is a widely used method to calculate velocity patterns and pressure distribution around/over buildings with entire environmental conditions in a low-cost way (Liu et al., 2017; Mukherjee et al., 2014; Revuz et al., 2012; Roy et al., 2021; Singh & Roy, 2021). Various researchers have investigated the shape and form effect of pressure field on the roof of the building to engender the damage risk using CFD tools (Li et al., 2022; Mahdavinejad & Javanroodi, 2016; Ozmen et al., 2016; Paluch et al., 2003; Roy et al., 2018; Singh & Roy, 2021; Wu et al., 2015).

Material and Methods

Study Area

This study examines the relationship between the damage caused by the pressure distribution difference on the roof surface of the building due to the wind and the shape factor of the building. Considering the storm wind conditions of the Alanya region, three roof types in different forms (i.e., barrel, curved and hipped roof) were studied.

Alanya is located on the eastern side of Antalya, Türkiye (Figure 1), and has started to urbanize by receiving significant immigration in recent decades. The urban growth rate of the Alanya is increasing due to internal migration or birth rate and global events like COVID pandemics or the Russian-Ukrainian war. Variation on land coverage classification for Alanya district was prepared by Yetkin et. al., (2022) using CORINE satellite data and they calculated growth rate of the urban area was 2 for the last 20 years.

Figure 1. Location of Alanya, Antalya (Developed by Authors using Google Earth Images)

Alanya is placed in a location where the Mediterranean climate predominates. The topographical slope is high in the study area, which shortened the distance between the high mountains and the Mediterranean Sea. That causes rapid variations in wind patterns and produces destructive wind gusts and cyclones. Statistical climate research showed that the 50 years return period mean wind velocity is higher than 40 m/s (Fırat and Yücemen, 2012).

Design Procedure and Assumptions

The geometry of the building was selected as a typical four-floor with a rectangular-based plan which is presented in Figure 2a. The width is 31.5 m, the length is 14.4 m, and the height of the building is 16.6 m. According to the municipality's data (Yetkin, 2022), this building type is the most used in Alanya. Roof types are given in Figure 2b. The height (h)/ width (w) ratio of the roofs was selected as 0.285 for type 1-2 and 0.162 for type 3.

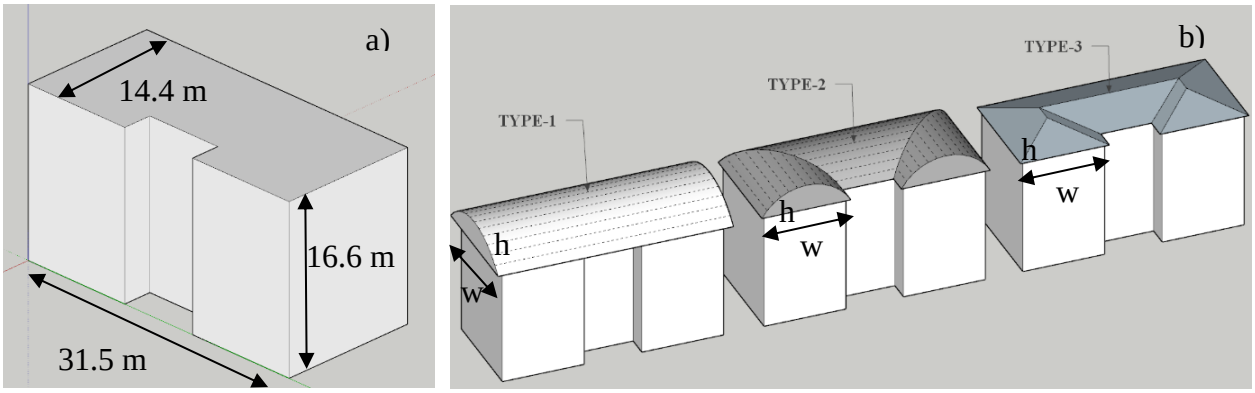

Figure 2. a) Building dimensions and b) types of the roofs (Developed by Authors)

The various researcher worked on the gust factor to define the correlation between mean wind velocity and the gust. The wind gust factor was selected as 1.48 because the study area is near the coast (Davis and Newstein, 1968).

Computational Fluid Dynamics (CFD) Method

Flow-3D software was used for numerical analysis that solves governing equations of fluid motion. General forms of the governing equations employed in numerical calculations, which applies the volume of fluid (VOF) methodology, are given below in closed form. Incompressible flow conditions were used during the calculations.

Mass continuity:

1) $$\frac{\partial}{\partial x}(uA_x) + \frac{\partial}{\partial y}(vA_y) + \frac{\partial}{\partial z}(wA_z) = 0$$

Momentum:

2) $$\frac{\partial u}{\partial t} + \frac{1}{V_F}\left\{uA_x\frac{\partial u}{\partial x} + vA_y\frac{\partial u}{\partial y} + wA_z\frac{\partial u}{\partial z}\right\} = -\frac{1}{\rho}\frac{\partial p}{\partial x} + F_x$$

$$\frac{\partial v}{\partial t} + \frac{1}{V_F}\left\{uA_x\frac{\partial v}{\partial x} + vA_y\frac{\partial v}{\partial y} + wA_z\frac{\partial v}{\partial z}\right\} = -\frac{1}{\rho}\frac{\partial p}{\partial y} + F_y$$

$$\frac{\partial w}{\partial t} + \frac{1}{V_F}\left\{uA_x\frac{\partial w}{\partial x} + vA_y\frac{\partial w}{\partial y} + wA_z\frac{\partial w}{\partial z}\right\} = -\frac{1}{\rho}\frac{\partial p}{\partial z} + F_z + G_z$$

Herein these two equations; VF is the directional flow volume, u, v, and w are components of the fluid velocity along the x, y, and z directions, respectively, ρ is the density of the fluid (air was taken as 1.25 kg/m3), Gz presents the earth gravitational acceleration (9.81 m/sec2), Ax identities the fractional flow area in the x-direction, while Ay and Az represent similar in the other two relevant directions and Fx, Fy, and Fz represent the viscosity caused accelerations (Flowscience, 2019).

Three different types of the roof were modelled within the scope of this study. Roof types are introduced in previous subsection. detailly. The model flow domain with a 250 m length, 100 m width, and 50 m height is presented in Fig. 3a. and the nesting zone is zoomed with a black rectangle inset figure. Mesh size was selected as 1 m in the far-field zone, and in the near-field region, nesting was applied, and mesh size was decreased to 0.5 m. This nesting operation kept the aspect ratio as 2. In Fig. 3b. the layout of the history point probes is given, and the sampling frequency was selected for these points as 100 Hz to make a precise calculation in time.

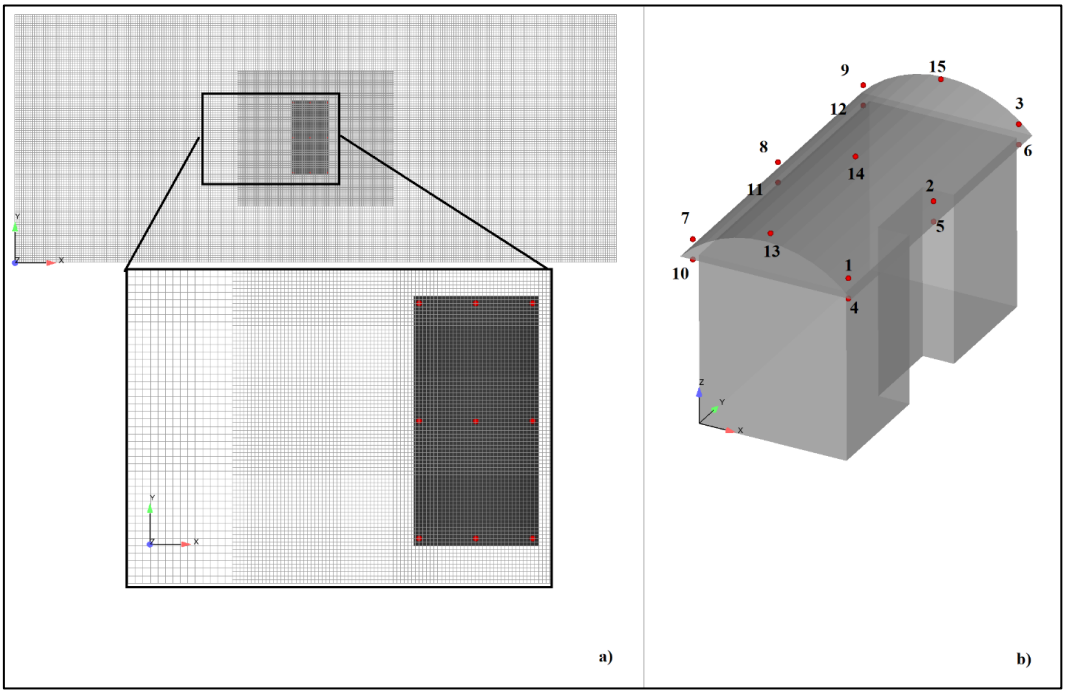

Figure 3. Model characteristics a) flow domain with mesh nesting zone b) layout of calculation point probes (Developed by Authors)

The bottom boundary was defined as wall condition, the x-min boundary was configured as velocity boundary, which magnitude was taken as 63.64 m/s, and the rest four boundaries were chosen as open atmosphere conditions. The Renormalization Group (RNG) k-epsilon model was employed to define turbulence closure. The simulations were performed until the mass-averaged kinetic energy of the numerical model domain was get stabilized (i.e., 20 seconds on the numerical model scale per each condition). Once the numerical stability was achieved, the results of the models were post-processed using Tecplot which is a useful postprocess tool.

The numerical results of three different formed roofs were compared to understand the effect of the roof-form on flow structures and aerodynamic conditions around the roof. In Figure 4, half-barrel-formed roof-type results are presented. Figure 4b. the variations of instantaneous streamlines around the building are depicted using the normalized velocity contours. The effect of the contraction produced an acceleration around the body. During the simulations, a secondary flow element was detected which is defined as large-scale counter-rotating streamwise vortices (LSCSV) dictate the flow field behind the building. An increase in velocity gradient brought out a negative pressure pattern over the roof (Figure 4c). In this scenario, the shear stress magnitude was calculated as 7.5 times higher at the center than at the corners of the roof. In other words, the roof was exposed to suction pressure (Figures 4c-4f-4g).

Results for curved type roof, which covers the entire structure according to the base form, are pictured in Figure 5. Maximum negative pressure was calculated center of the upstream side of the roof (Figure 5.c). The suction zone was narrower than in the previous scenario (Figures 4g and 5g), but the area ratio of the highest negative pressure values area occupied a more significant proportion. 7.5 times higher shear stress values were determined on the entire roof surface.

Hipped-type roof results are given in Fig. 6. In this model, the negative pressure zone dominates a minimum area compared to the others. The width of the vortices downstream side of the structure was limited according to the curved and barrel typed roofs.

Dimensionless pressure values were calculated during simulations and are given in subfigures of Fig. 7 to make a direct comparison. Each subfigure belongs to a point probe. Time series shows that types 1 and 2 (curved and barrel type roofs) block the flow domain and produce much more negative pressure than the hipped one. The hipped typed roof is more streamlined, and in general, this form is more aerodynamic than the curved and barrel-type roof.

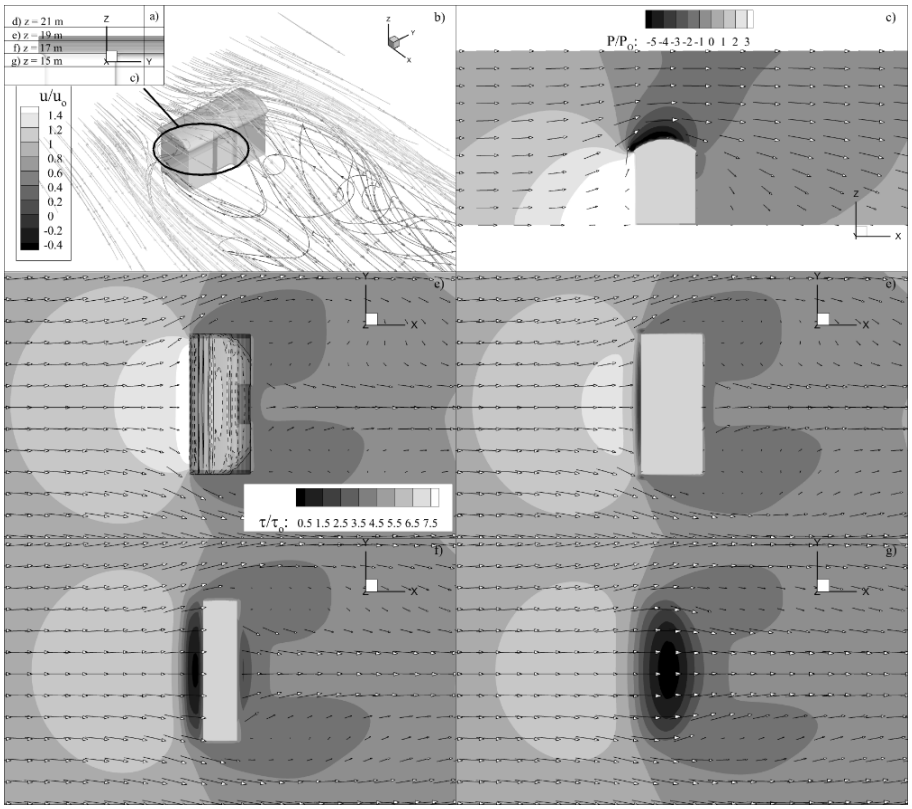

Figure 4. Barrel type roof model a) elevations of the presented sections in the figure, b) the instantaneous streamlines around the building, instantaneous pressure distribution contours on, c) centreline of the body, d) z = 15 m with over the roof shear stress distribution, e) z = 17 m, f) z = 19 m, g) z = 21 m.

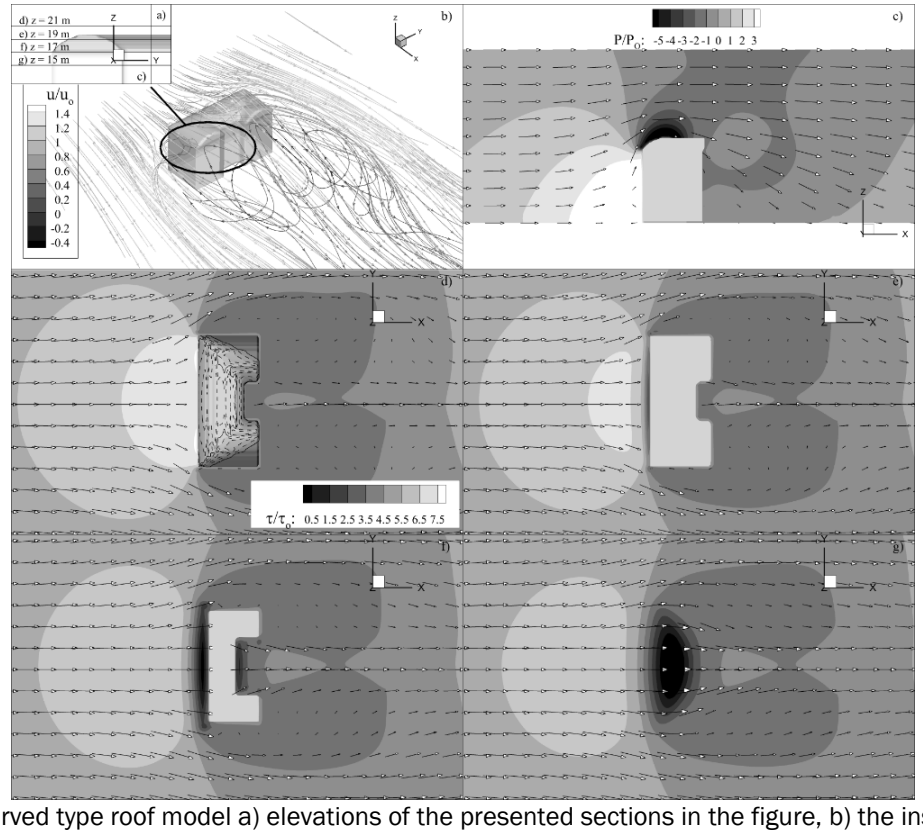

Figure 5. Curved type roof model a) elevations of the presented sections in the figure, b) the instantaneous streamlines around the building, instantaneous pressure distribution contours on, c) centreline of the body, d) z = 15 m with over the roof shear stress distribution, e) z = 17 m, f) z = 19 m, g) z = 21 m.

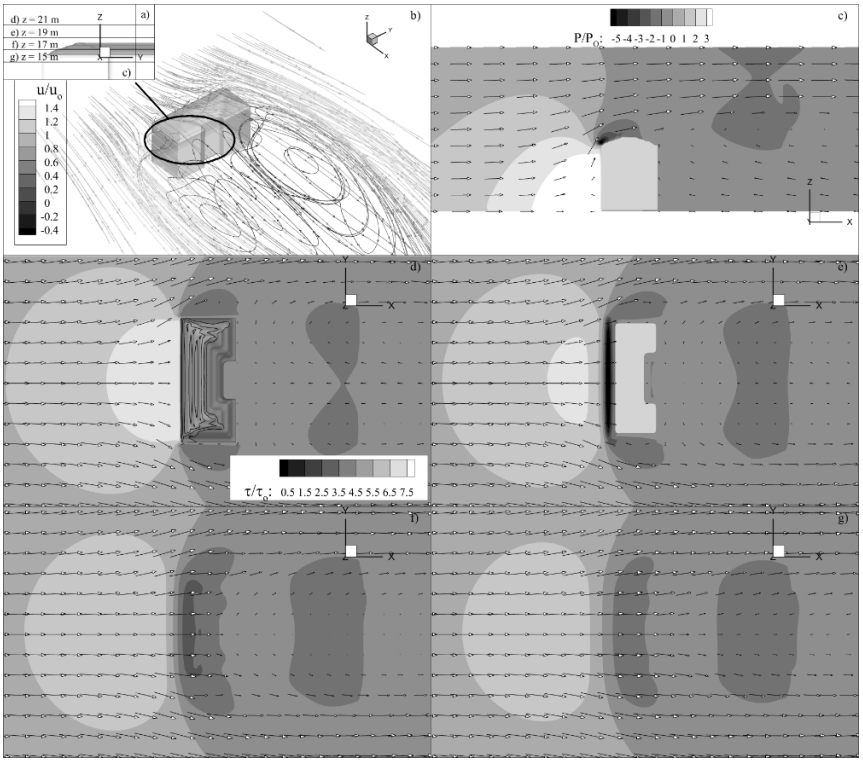

Figure 6. Hipped type roof model a) elevations of the presented sections in the figure, b) the instantaneous streamlines around the building, instantaneous pressure distribution contours on, c) centreline of the body, d) z = 15 m with over the roof shear stress distribution, e) z = 17 m, f) z = 19 m, g) z = 21 m.

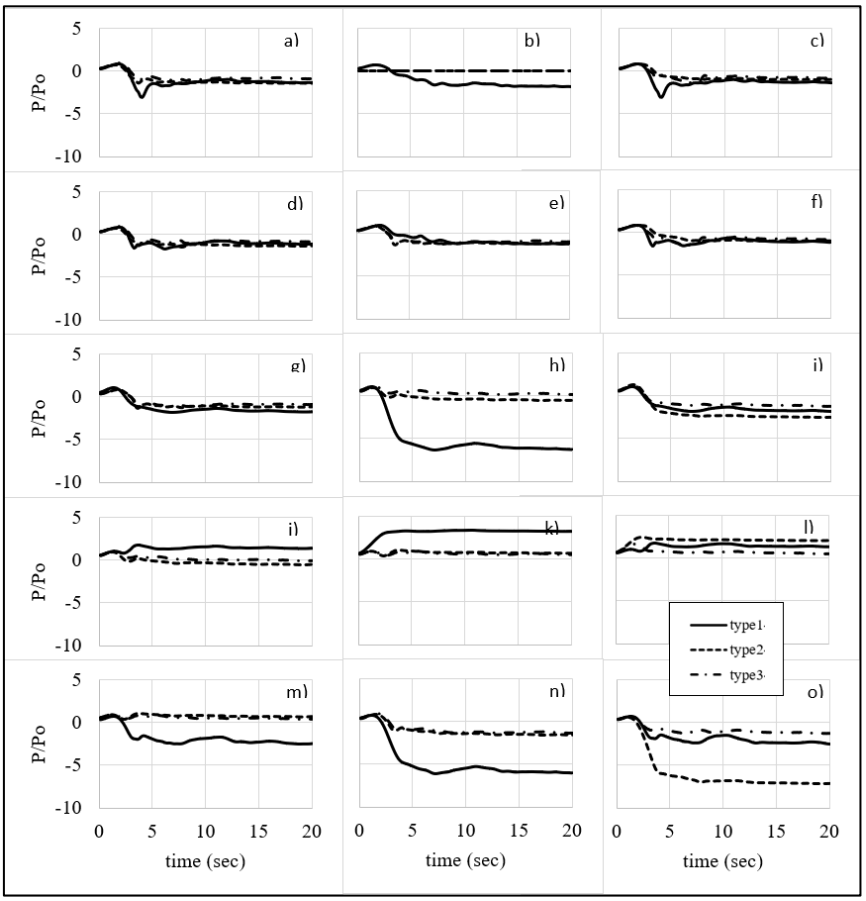

Figure 7. Calculated dimensionless pressure at point probes whose layout is given in Fig. 3b. The subfigures follow the probe numbering in the layout alphabetically (i.e., Figure 7a. belongs to the point 1)

From Figure 7, the barrel type roof is vulnerable to wind induced failure depending on the high number of pressure gradient between the roof top and the eave. Figure 7h. and 7k represent the points 8 and 14 respectively. Positive pressure load was calculated on the surface of the roof in the centreline and suction pressure was determined downside of the eave of the roof at the same line.

Conclusion

This numerical investigation focused on three common roof types: barrel, curved, and hipped type roofs as types 1, 2, and 3, respectively. Aerodynamic conditions, pressure, and shear stress distributions were calculated and compared on the roof type. The following outcomes can be summarized from the results of the study.

- Hipped roofs are more aerodynamic than the curved and barrel-type roofs.
- Curved type roof (type 2) was the most disruptive for the wind flow and generated the highest suction zone and shear stress.
- According to these results, damage may occur to non-structural elements, such as coatings, and roof-mounted installations (i.e., solar water heaters, satellite dishes, chimneys).
- CFD calculations help investigate the storm-caused effects on buildings.

Adaptation is essential to the changing climate conditions. Especially more investigation is necessary to detect the destructive effects of climate in the south of Turkey.

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Conflict of Interests

The author declares no conflict of interest.

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CHAPTER 6. Effect of Architecture on the Cultural Perception of the Palestinian Society: The Example of Nablus

Dr. Ahmad Khalilia

Introduction

While making the architectural analysis of Nablus, we will go through many historical stages that will enable us to understand "the political and cultural structure" that led to the emergence of this architectural style, which has a negative role in affecting the political and social life of the city. These factors, which affect the "social, political and cultural life" of the city, vary from period to period in terms of their area of influence and power of influence. This influence sometimes comes from the people themselves, as families with political power emerge, increase their influence over rival families, or try to destroy them. In some cases, this situation can be clearly seen.

In addition, the occurrence of political changes at the regional level also affected the architectural development of the city. The changes that took place after the entry of Îbrahim Pasha, the commander of the Egyptian forces, who occupied Palestine in 1831 and had a great impact on the emergence of a historical stage that could be considered a turning point in the region, are also noteworthy in this direction. Another important stage affecting Nablus was the earthquake that occurred in 1834. This disaster caused the destruction of many buildings from the Ayyubid and Mamluk periods. In the following periods, most of the buildings destroyed in this

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earthquake were repaired and rebuilt. The analysis of the structures in this construction process has been one of the main elements in understanding the transformations affecting the architecture in the period following the earthquake. In addition, the direct intervention of the central government in local conflicts and struggles in 1864 played an important role in making political and social changes that were also reflected in the architectural field (See picture below).

Again, some edicts and international agreements caused changes in the economic structure of the region. One of these is the agreement with the UK, which provides for tax exemption. As a result of this agreement, the markets of the region were opened to foreign goods. Thus, new forms of trade were created, and some old forms of trade disappeared. These changes also reflected and affected the traders and their living conditions.

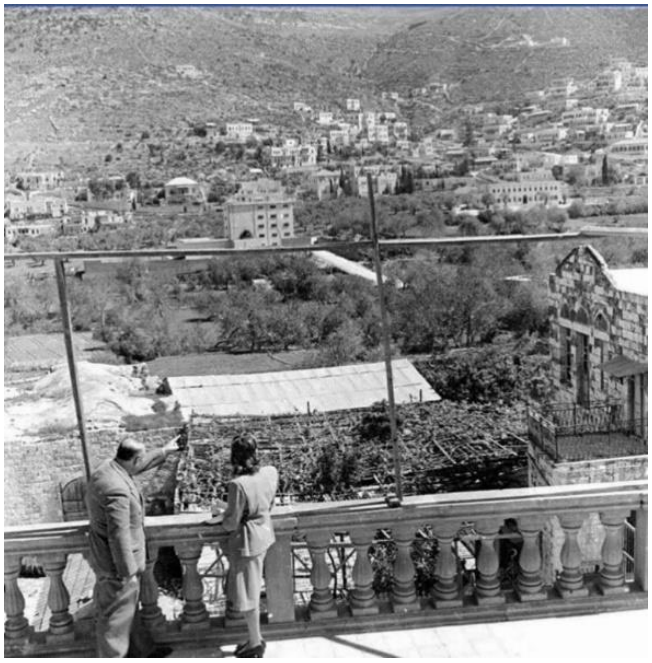

Figure 1. As a reflection of and as a result of cultural and social changes, houses started to open to the outside, unlike the houses of the Ottoman period (Library Of Congress)

Another turning point in the transformation was the dethronement of Sultan Abdulhamid II, who had a significant impact on the architecture of Nablus. The dethronement of "Abdulhamid II" played a role in the emergence of a new struggle and conflict between those who supported him and those who opposed him in the region in question. When we talk about “the collapse of the Ottoman Empire and the withdrawal of the 7th Army and the entry of British forces into Nablus, we are talking about a critical point in the architectural history of the city of Nablus”. Because urban development and growth manifested itself in a different way than seen in the Ottoman period. The earthquake in 1927 created a turning point in this area, and many old buildings and houses belonging to the Ottoman period were destroyed by the earthquake. These architectural structures were replaced by new and different forms and styles, which were influenced by the invading British on the one hand and other countries such as Egypt (Cairo) on the other.

This situation continued until the enactment of new laws and regulations by the occupying British. Zionist influences began to show themselves increasingly. This led to Nablus taking the lead in the fight against the British “in the 1936 general strike”.

In 1947, the British withdrew from Palestine and immediately afterwards, the Zionists declared that a Jewish state would be established. For this purpose, deportation activities were started in 1948 and genocides were carried out. Nablus was adversely affected by the consequences of these genocide and forced migration activities, as it received great immigration from the occupied areas in 1948. As a result of these migrations, the densely populated “Askar and Balata camps” emerged. This created a new architectural form that had significant political, economic, and social implications in the city's architecture. After 1948, Nablus came under the administration of the State of Jordan. This period, which was under the rule of the State of Jordan, brought its own architectural style. This style manifests itself in the "town hall", which was used as a "royal palace" and has an architectural identity that influenced the next period.

This situation continued until the complete occupation of Palestine by the Zionists in 1967. Subsequently, a new phase was entered in the new administration and planning, and as a result of this phase, densely populated settlements and refugee camps began to appear all over the city. Closer ties have been forged with Palestinians who have been living in isolation from their families in the West Bank for more than two decades. It

was greatly influenced by the imperialists and their political and economic lifestyle, as well as the western architectural form adopted by the Zionist invaders. The effects of this will be clearly seen in the following periods.

By 1994, parts of the West Bank and urban centres such as Nablus fell under the "Palestinian Administration". As a result, a new era began in which Palestinian politicians sought to shape Palestinian life in a new way. This was a policy adopted to prove itself against the West. Because the Palestinian authority saw the West as a just international community trying to fulfil its desire to establish an independent Palestinian state. For this reason, the Palestinian Authority developed a policy of proving itself to the West. However, such a policy shows that the Administration acts with orientalist thought. “Because the orientalist mentality wants to change the view of the exploited people towards the colonialist and shape it according to itself”. This understanding tries to give the idea that the colonizer is trying to bring civilization to the colonized cities and to realize the development of these cities. Twenty years after the establishment of the Palestinian Authority, it will be revealed and understood that the West has failed to fulfil any of the demands and desires for the establishment of a sovereign and independent Palestine. In this period, Palestinian architecture, unlike the aforementioned periods, entered into a dead end and lived an indefinite form. In previous periods and stages, each of the administrators was able to create an architectural form with a certain style and spirit, which in our opinion has not been possible in this recent period. This is due to the chaos or confusion experienced, the inability to create a certain social and economic consciousness and culture, and the inability to reflect this clearly on architecture. Therefore, we sometimes see a confusion in architecture, that is, forms that are opposite and conflicting with each other.

Comparison

The coexistence of different communities in the region and the social life that continues until today reflect the commitment of the residents of the region to each other. However, after the Ottoman rulers built new service institutions in the western region, the exit phase from the old city started, and new neighbourhoods began to emerge in an unusual way outside the city walls. This situation shows how effective the state can be in directing the planning and architecture of the city. Münşiya District has become a symbolic place in the minds of the people of Nablus and has been perceived as the neighbourhood of the rich. Because wealthy people, merchants and capital owners tried to build new houses for themselves outside the old city, especially in the western region, at the foot of the mountain in the north, next to the National Hospital we mentioned earlier.

Figure 2. First settlements around the hospital

In this way, living outside the borders of the old city has come to mean a social and economic superiority, which is reflected in the cultural aspect and collective memory of Nablus society.


Figure 3. The picture on the left belongs to the last days of the Ottoman administration. The picture on the right was taken during the Jordanian administration. The reflection of the cultural change between the two paintings is very clear

These newly built buildings draw attention as detached buildings, similar to villas in style. Because these newly constructed buildings were built in the middle of a garden and are surrounded by walls from all four sides. The entrances of the buildings were also built in an imposing and attractive architectural style, reflecting the economic and social power of the owner. This style observed in buildings is completely different from the style seen in buildings in the old town, where the garden is surrounded by buildings. In buildings in the Old Town, the doors of the rooms opened into this garden. The garden was the place where the family took air and cooled off on hot summer days. With this style, the buildings were compatible with the social and religious structure of the inhabitants, who adopted the principle of inward opening, as in the harems. In addition, considering the air currents caused by the pressure difference between the interior and the exterior, such a style is considered a sustainable element in the architecture of the old city.

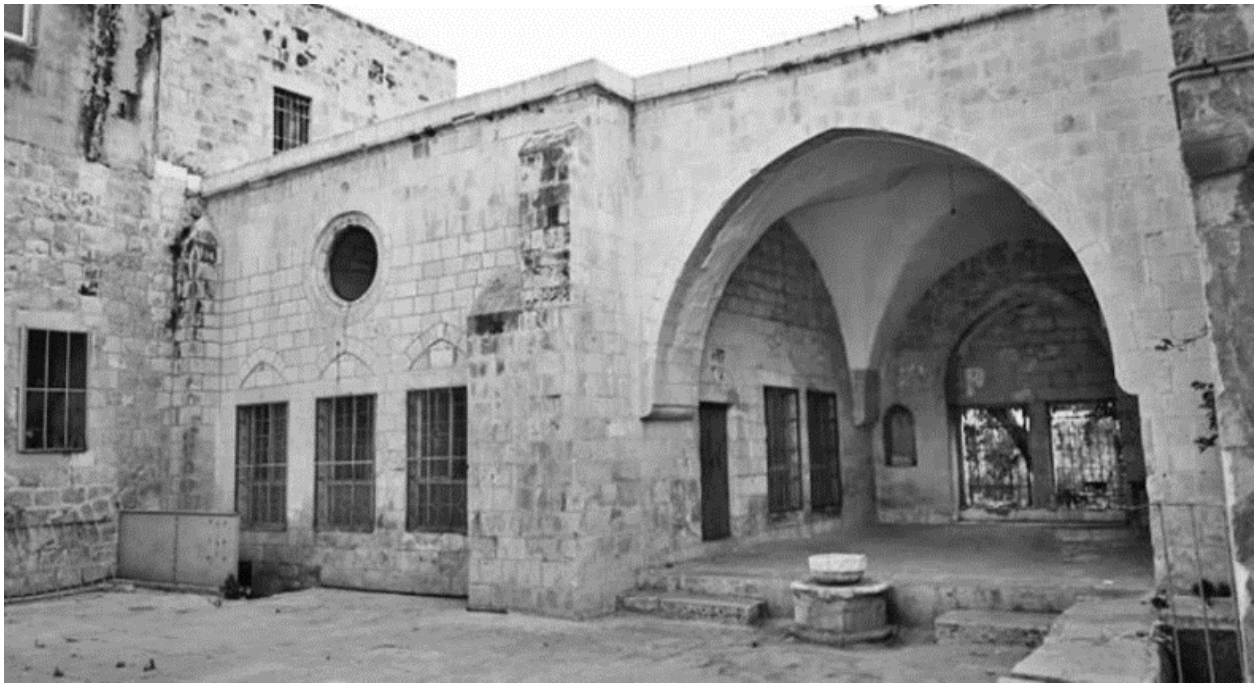

Figure 4. Courtyard and divan in the Abdulhadi family house

However, this element gradually disappeared in the buildings built in the outward opening style, which began to emerge around the city. Because balconies and terraces have started to take place in these new buildings, which overlook the city and the surrounding gardens. This, in a way, shows the social and political changes in the new neighbourhood residents. The emergence of terraces is an indication that the houses open outwards. This type of building is a result of the cultural and social changes that have taken place in Nablus society. The reason for this is that capital owners and wealthy people generally send their children abroad for education or go themselves. Being educated in Western countries or in Egypt or Damascus made them acquire some behaviours and habits different from the Nablus society.

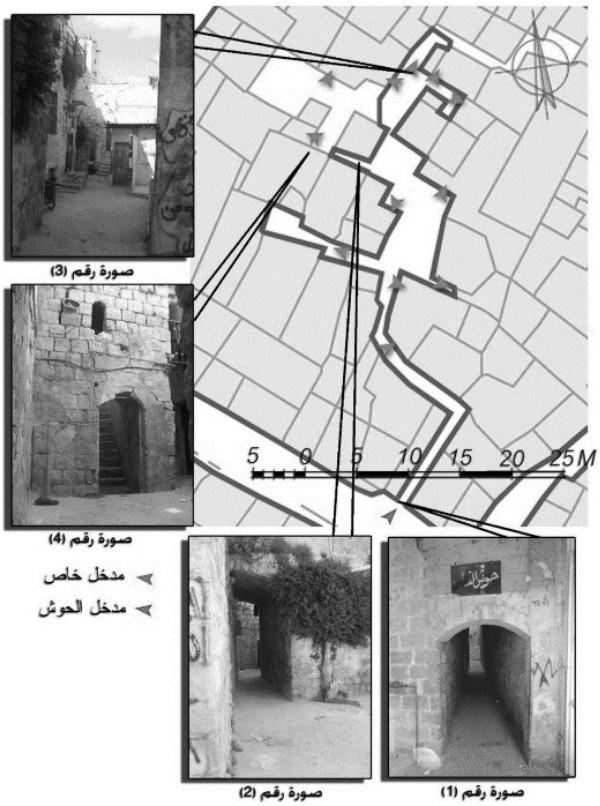

Figure 5. Private street is entered from the main street. Houses can be entered from Private Street.

In addition, bathrooms and kitchens have begun to take place in new buildings in newly built neighbourhoods. This is a concrete change reflecting the new social view that aims to provide all the services of the house inside, unlike the old city. The residences in the old city were sitting and resting places, in this context, the courtyard was the area where activities such as gathering, and night sitting were carried out. Bathrooms and toilets would also be on one side of the courtyard. The practice was different in new buildings constructed in areas outside the city walls. The houses have been transformed into places, not just sleeping places, but also living rooms with kitchens, bathrooms and living and meeting places under their roofs.

Figure 6. The windows are now enlarged, and the terrace system has emerged

From the point of view of the number of floors, new buildings were built as one, sometimes two and, if necessary, three floors, architecturally. This is due to various factors such as the existence of suitable lands for the building and the necessity of special tools and equipment that increase the cost to build high floors. In addition, factors such as being closer to the ground and feeling safe as a requirement of social culture and human character have also been effective in not increasing the number of building floors. Because the presence of more and larger windows in the new buildings located outside the walls of the old city is striking compared to the old city buildings. This is due to the social life understanding that tries to open outward more than the old city in terms of architectural style, with the capacity to reveal different and new structures due to the conditions. Since private

life is of great importance in the residences of the old city, sections called "haremlik" were built accordingly. There are gardens and open spaces around the houses built in the new neighbourhoods, and the neighbouring houses are farther away compared to the old neighbourhoods. This allowed the construction of more windows in the residence. It is also noteworthy that more attention is paid to the external appearance of the new houses built in the neighbourhoods established outside the old city.

Figure 7. Exterior View of Houses

The power of private ownership became more apparent with the exterior of new buildings. This situation was different in buildings in the old city. The exterior doors in the residences of the old city were similar to each other and also reflected the spirit of the city. Because the exterior doors, on the one hand, showed that the rich and the poor were equal and that there was no distinction between them, on the other hand, they ensured the security of the residents. There were no windows opening to the outside on the ground floors of these residences. As we mentioned earlier, this was related to the social aspect of society. Besides, the entrance behind the outer door would be roundabout. In this way, the person looking from the outside door would not be able to see anything from inside the house. In new buildings, there is usually a garden between the outer door and the entrance door of the house. The person entering through the outer door would have to walk through this garden until he reached the entrance door of the house. Since there is a large area similar to a garden or a garden between the outer door and the entrance door of the house, it was not necessary to make winding entrances as in the houses of the old city. The privacy of the house has been tried to be protected in this way in new buildings.

Main and Side Causes

In this in-depth analysis of the city based on different historical periods and stages, the role and impact of foreign policies on the social and political reality of Nablus society is revealed. We can still see and analyse these effects, which are also reflected in the architectural style of the city. It would have been difficult for the orientalist influence to take place if there were no official directives that helped the spread and easy implementation of orientalist activities and practices.

In our opinion, the most important elements that played a role in the formation of different architectural styles are "local administrators of the region, the Ottoman State, tribal leaders, sheikhs, big traders, capital owners, leaders of the British occupation and the rulers of the Jordanian State." After these, the main role in this direction was played by the Israeli occupation. Finally, this responsibility is now in the administrative part of the city, which is represented by the City Council. Because these elements, which ruled the region, had great power in those times. These ruling elements played a political and social role in shaping the architectural style to reflect the development of the stage the city was in. This development did not come about suddenly, nor was it made by force by holding a gun to the heads of the residents. On the contrary, it has evolved and developed gradually, and it has connected the stages, each of which reflects the spirit of the city.

There are motifs and touches specific to Nablus in the buildings and architectural style. However, it can be said that this situation stems from "traditions, cultural, social and religious principles" that take root in society and are not affected by new changes. It should be emphasized once again that these changes develop gradually, not in the form of rapid and sudden explosions.

When we review our previous explanations regarding the laws enacted by the Ottoman State regarding the ownership of lands, and the reforms and regulations it imposed, we see that a new architectural approach has emerged. Because functional buildings made in modern style such as "police stations, cafes, squares, schools and hospitals" have emerged. These structures reflected a new architectural style compared to the buildings in the old city. Most of these buildings were also two-story. Their roofs were "not domed, not tiled, and not sloping," but flat. Its windows were large and wide. Unlike the existing buildings in the old city, they were not adjacent to each other but detached. It was surrounded by gardens or a wall that indicated that the place was private property. These walls were a new element "incompatible with the way in which the old city was used to express property". Most of these buildings were located outside the boundaries of the old city. This paved the way for a new phase that would be taken as a basis for the next administrations and continued until the collapse of the Ottoman Empire.

The withdrawal of the Ottoman army from Nablus was a turning point for that period. Because with the withdrawal of the Ottoman army, the British Occupation Army entered and seized all the institutions and facilities of the city. With the establishment of hotels outside the city, a new phase has been entered in the planning. In addition, the wealthy class and the capital owners started to move out of the city slowly. This was also an expected result. Because they were property and landowners. Here the "orientalist role" has entered a collaboration with the power of institutional influence and ownership to change the basic features of the culture and traditions of the society. During this period, the Jacob's Well was restored. The 1927 earthquake was a factor that encouraged and accelerated the extension and expansion beyond the boundaries of the old city. As we mentioned before, the British tried to organize the expansion attempts of the city by drawing up a detailed map of the city.

Influence of Institutions

The fact that the Ottoman governor acted as if he had a clear order to come up with a plan for the development and reconstruction of the city, reflects his view of planning. Until 1883, Nablus did not have an officially designated public and private town square. The Ottoman governor bought a part of the garden opposite the Nasr Masjid from the Tokan family and transformed it into the main square of the city with the name Nasr Square. Later, this square became a place used by state institutions such as the Government House (the place rented by the Ottoman government for the governor), inns, cafes, and restaurants (Bishavi 1999/108). This is a major change in the Ottoman city concept. Because in the past, the mosque square was used as a public square. It can be said that this work is the result of an attempt to imitate the Western style. Because most of the decision makers in the Ottoman Empire kept their relations with the West tight, grew up with the understanding of the West, and tried to imitate its style on the way to development. However, the place chosen for the square was a place used as a temple for ages before the Nasr Masjid. The purchase of the land and its use as a square was an act of planning, but relatively unusual for the city of that time. This was actually an act of the state to open people up and a pre-planning of the clock tower to be built twenty years after the land was purchased. With the opening of the square, cafes also emerged, and a new social model emerged in architecture that opened outwards. You can see the picture below for this. As a result, the urban planning and expansion structure was affected.

Figure 8. The situation before the clock tower square was built (Library Of Congress)

After the British occupation, there was an economic recession with the deterioration of the soap trade (Qamheih, 1992, p. 43). This economic downturn caused trade lines to change and traders to turn to more profitable items, and these conditions plunged Nablus into a major economic recession. The earthquake that took place further deepened this situation and increased its impact on the society of Nablus. This contributed to the establishment of settlements beyond the borders of the old city (Abdulhamid 2009).

Figure 9. Nablus East Neighbourhood (Library Of Congress)

City Squares

If we talk about public spaces and squares, before 1880, in the city of Nablus, public squares were located close to mosques, in areas where bazaars are located, and at the intersections of roads and streets leading to semi-private gardens. These semi-private gardens were also places where the inhabitants of those streets used to sit, and foreigners could not use these spaces. This is due to the features of Islamic cities, which adopt a gradual hierarchy in city planning, from the largest institution of the city to the smallest house, as public/semi-public, private/semi-private. This gradual hierarchy, which reflects personality and social behavior and also has a religious dimension, is also evident in Nablus.

After 1880, as we mentioned before, the Governor, one of the executive elements of the state, succeeded in putting forward a new method in planning the city of Nablus. Because the first square, which is intended to be the social, cultural, and economic centre of the city and open to the public, was built through places such as "government mansion, inn, clock tower and cafe". his situation continued until the British mandate period. From the very first moment of the British mandate (the first plan for the city of Nablus was drawn in 1926), planners began to make drafts to reshape the structural plan of the city and allow the city to expand beyond the walls in the future. The idea of a new square that would become the political and social center for the city began to sprout. This new square has remained the center of the city until today. The square is located where the main intersection of the city is located. This main intersection has also gone through several development phases. As an indicator of the urban development of Nablus during the Jordanian rule, the work in this area reached its peak with the demolition of a Latin church in 1954 and the expansion of the area.

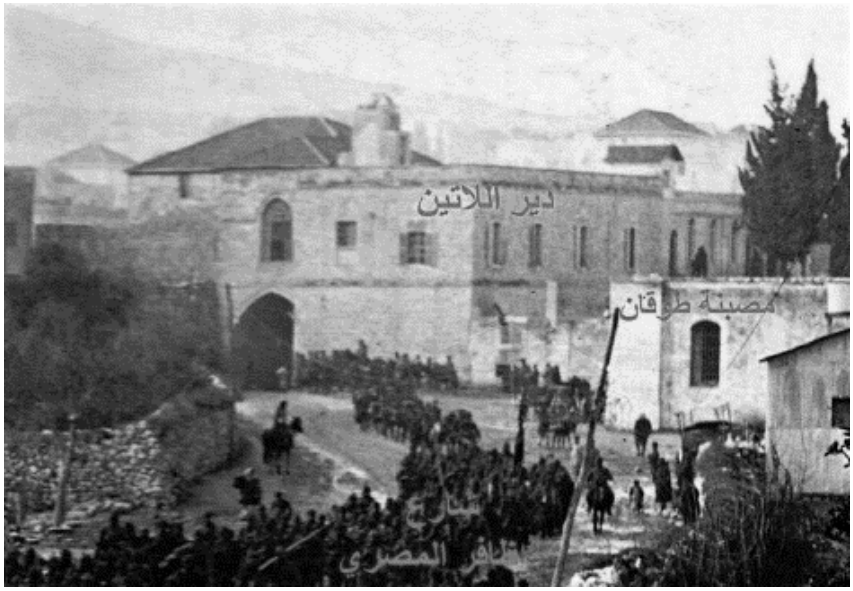

Figure 10. A cropped and enlarged image showing the Touqan soap factory, which was one floor, and the Latin Monastery and its school. The monastery and the school were removed for 15,000 dinars paid to the concerned religious authority where the current roundabout was established (1917)

During the Jordanian rule, the King Hussein Palace, which is now a municipality building, was built. The construction of the palace was an architectural landmark at this stage. This initiative was the starting point of a new phase in which a new Jordanian-supported architectural style was also promoted, as seen in the picture below. During this period, the modern architectural style became widespread, and this style continued until Nablus fell in 1967 with the Israeli occupation.

Nablus began to be administered by military commanders during the Israeli occupation. In this period, a new era began, which revealed the global architectural style based on the construction of high-rise buildings to meet the housing need in general. This situation, with a little shyness in the beginning, showed itself in a way that also carries the traces of modern Egyptian architecture. However, the entry of the Israeli occupation and its increasing influence in Nablus accelerated the shift towards a capitalist style in architecture. We can see this trend in the Nablus Municipality's construction of a large commercial complex in a sensitive place, which caused the destruction of Roman artifacts and overshadowed the natural landscape and beauty of the city. This situation led to the emergence of an architectural environment in which three main elements in the field of planning and construction contradict each other. One of them is the traditional elements represented by the buildings of the old city. Another is the elements that show themselves in the structures and drafts of the colonial periods in the regions close to the old city. The third is the modern architectural elements based on capitalism represented by shopping malls and commercial complexes.

Figure 11. King Hussein Nablus House (Library of Congress)

Examining the picture above, we can see the first lines of modern planning for the city of Nablus and the expansion of settlements outside the old city walls. In the picture we can clearly see the street known as

Jerusalem Street today. This street was shaped in the Ottoman period with its main lines. This street connected the barracks building and the military areas in the eastern region. It extends to the borders of the old city from the south, reaching the road to Tulkarim. In the picture, the building of Âişiyye Madrasa, which was destroyed during the Israeli occupation in 2002, can also be seen. It is also striking that the roof of the building is inclined, which, as we have explained before, has an architectural socio-political dimension. The train station building is also seen in the picture. It seems that there were more than one model and design for the construction of train stations. Because it is seen that there are train stations in different designs. For example, the train station in Nablus is similar to some train stations, while it differs from the train station in Afula.

Figure 12. Nablus, 1918 Picture Taken from Air (Library Of Congress)

In the middle of the Yâsmine neighbourhood, there is the Atout courtyard. Yâsmine is a small neighbourhood connected to a big neighbourhood. The neighbourhood is reached through a narrow and dark street. There are more than 25 houses in this small neighbourhood with 4 or 5 people in each house.

Figure 13. Yasmine neighborhood

The geographical structure of Nablus made it necessary to expand and grow in the form of a strip. When leaving the old city, it is seen that the settlements extend heavily in all directions in the east and west. However, in the forties and sixties, the development increased even more, and the expansion also grew. It is also noteworthy that the expansion is mostly on the east and west sides. Expansion in these directions was more dominant, as the topographical structure helped to construct buildings at lower cost.

Figure14. Soap workshops are considered to be the main power of the place they were in at that time

Refik et-Temîmî and Muhammed Behçet have a book on the region called "Beirut Province Southern Region". This book of Refik and Muhammed is one of the important books describing the region during the Ottoman period. Refik and Muhammed were sent by the Ottoman State to research and examine the general situation of the people of the region, the services available in the region and the deficiencies in this direction and to report to the state on this issue. As can be seen in the table below, they also made an inventory of the neighborhoods that make up the city of Nablus. From the table, we understand that the population in the western region, which includes the Ğarb District and the Şuvaytira District, is predominantly Christian. This region was also a region that began to expand beyond the boundaries of the old city.

The entry of the Egyptian forces into Nablus under the leadership of Mehmed Ali Pasha brought about fundamental changes in terms of administration and economy. The most important of these was opening the doors of the city to the commercial and cultural activities of the Europeans and bringing the Shura Council to the fore. This situation further strengthened the position of cities compared to rural areas. This situation had many negative consequences for the history of Palestine in general and the history of Nablus in particular. Economically, the city has become centralized and the dependence of rural areas on the city has increased. This allowed the new ruling family to make great fortunes. The opening towards the West also led to the emergence of new cultural and urban influences in the city. The Egyptian administration bloodily suppressed the families who tried to oppose it. This situation brought the Abdulhadi family forward as a new competitor. New influences and elements emerged in the palaces of this family, and this led to these changes in both appearance and decoration.

The dominance and influence of local families in the region continued until the Ottoman State decided to take over the administration of the region and the fall of Araba in 1959. The state rented Cemil Merdam Bey's house in the square in the city centre for Trustee/Governor, who was from out of town. This house was used as both the government house and the residence of the trustee. When the Ottoman Empire took over the administration, the dominant families in the city turned to trade, which they had invested heavily in previous periods (p. 35).

Conclusion

Examination of societies, knowing their identities and cultural background is the main factor in understanding these societies. The architecture of the society is also an important and effective element that affects and is affected by societies, reflects the components of their civilization and cultural awareness.

This understanding increased its influence by imposing its power and authority; has forced us unconsciously to live in areas where we do not belong and do not reflect our selves and identities. As a result, we have become almost strangers in our countries, in our homes and in our neighbourhoods. Not only do we no longer belong to these places of which we were once a part, our history, our culture, and even our beliefs have become completely alienated from it. By this we see the great chasm in which these societies live as a result of the will that we must refuse to continue living in this melting pot. With this study, a starting point has been established in this field by making great efforts to make the Palestinian society understand even a small part of its architectural identity. It

is very clear that there are factors that make great efforts to direct and shape the society in a way that does not comply with the goals and expectations of the society and its individuals. Main goal is to pioneer the formation of a new architectural theory that helps shape a cultural awareness that reaffirms its identity to Palestinian society to create a reality that reflects the aspirations, goals, and hopes of this community despite these factors.

Architectural is a tangible and impressive symbol of property used to prove existence and ownership, to establish sovereignty over a piece of land and to show the authority of the owner.

Ownership continued to exist as an ongoing struggle between the powerful parties. Civilizations grow with the expansion of their possessions, the size of their territory, and the length of their borders. These factors are the same as those that destroyed civilization and accelerated its destruction. “It is the nature and nature of states”, as described by Ibn Khaldun. Valuable and powerful buildings, often built by powerful rulers or influencers, survive, perpetuate, and live as successive civilizations. Thus, it expresses the time they are in and shows the majesty, property, and power of their owners. However, the architecture of the ordinary and the poor is renewed and continued with some changes that reflect the new reality experienced. Thus, contrary to all assumptions and despite the strength of the architecture of authority, it is usually a solid architecture that reflects a particular period and time. However, the architecture of the inhabitants and individuals living in that place is a renewed, continuous architecture that breathes, speaks, and lives on in the spirit of its people. And unlike many researchers, the researcher analyzed the architecture in Nablus from this perspective, which does not think that the architecture of the strong is the only existing one and does not believe in the rhetoric that "the strong write/record the architecture" based on the idea that "the strong write the history".

As the researcher identified; while examining the architecture in Nablus as a case study reflecting Palestinian architecture; The powerful sides have made a constant and determined effort to write history as they see or want to see and to design the facts accordingly. However, successive dominant authorities were trying to come up with an architectural model that would be influenced by the architecture developed by ordinary residents from the residence of a particular group, as initially explained from a government building.

The study of Palestinian architecture is a complex study that requires examining all Palestinian buildings, to understand its nature and learn about its cultural background. Because some buildings differ according to their geographical location, the structure of their inhabitants and the purpose of their construction. Due to the limited research period, the researcher tried to understand the nature of Palestinian architecture based on some samples/examples.

Buildings and architecture in Palestine constitute an important element of the cultural heritage. These were expressed with the concept of chastity and honour, and foreigners were not allowed to insult, humiliate these cultural structures, and search them without permission. At the same time, they are an extension of the religious, familial, and tribal nature of Palestinian society. On the other hand, research in this field will play a decisive role in understanding the nature of Palestinian society, which protects its architectural values against foreign elements and does not allow foreign culture to destroy its own values and original traditions.

The geographical location of the buildings and the architecture play an important role in the formation of the buildings. Coastal, plain, mountain and desert buildings in the Jordan Valley show remarkable differences in terms of "number of floors, nature of windows, size, building materials and wall thickness" due to these geographical features.

Social status plays a fundamental role in the nature, size, location, and materials of the building. The difference is also striking between the merchants' buildings and the buildings of politicians and local leaders, built in central, high, and spacious areas with huge stones that reflect their power, status, and authority. These buildings were used as residence, administration and military gathering places. In addition to soap shops, which are seen as the source of money and economy, there are places to welcome guests and open gardens in these types of buildings. These buildings were built outside the city to ensure easy entry and exit, security, and easy withdrawal of soldiers and commanders.

The Evangelical Hospital and the Ottoman Bank building in the western part of the city set a turning point in pushing the residents outside the city walls. These examples are about the effect of authority on architecture and the use of architecture to influence society. The earthquake disaster in 1927 further increased this wind of change and effect. Most of the prestigious social classes did not remain indifferent to the practices of the "British occupation", which was the new dominant authority, which strengthened the idea of settling outside the borders of the city. With the effect of these practices, most of the members of the prestigious social class moved outside the city walls. The British occupation provided many high-standard public facilities and services to those who settled here. It is also possible to see this in the practices made to increase the importance of the new city centre established by the municipality during the Jordanian administration period after 1948. During the Jordanian Rule, a house was built for the king in the immediate vicinity of the new city centre. Thus, it was possible to see the reflections of this new architectural understanding on later architectures. The Zionist occupation authority also adopted an approach based on the logic of destruction, not building and construction. In doing so, the said authority assumed a different role in reshaping the architectural identity by using the architectural method based on the invading colonial powers, who "trying to replace one people with another". These forces tried to destroy the unique architectural spirit of the city by destroying a significant part of the symbolic architectural structures.

They did this by opening wide roads, cancelling the narrow streets and passages of the city that reduced the area of tracking, control, and influence, and demolishing some elements. We see the idea of using the architectural methodology that will realize the tendencies of the authorities in the architectural activities carried out by the Palestinian Authority through the Municipality of Nablus. In this context, it has built a large shopping centre to reflect its tendency to enter the world of contemporary capital and globalization.

Thus, the political exploitation of architecture stands out at every stage of urban formation, including the streets and suburbs of the city until today. This situation expresses the importance of architectural spaces in creating a new cultural and social awareness about the city and its inhabitants, even though they are sometimes used in an unplanned and method-less way.

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Conflict of Interests

The author declares no conflict of interest.

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CHAPTER 7. Assessment of the Service Delivery at the Internally Displaced Persons' Camps (IDPS) in the Federal Capital Territory, Nigeria

Idowu, Olusegun Owoeyen; Danlami, Gideon and Ohadugha, C. Bernhard

Introduction

Urbanization is a global challenge causing different types of problems across the world (UN Habitat, 2015). Problems of urbanization have engineered natural and man-made disasters, which have in turn, threatened the lives and properties of the people living in both urban and rural areas. This is because, the urban population interacts with the environment which is enhanced by the change infused by the urban dwellers through consumption of food, energy, water, and land (UN-Habitat, 2016). This has affected the health, wellbeing, and quality of life; and has also caused many environmental problems such as global warming, flood, desertification, land slide, earthquake, and drought, thereby causing displacement of persons both locally and internationally.

Internally displaced persons have attracted global interest owing to the level of its occurrence; and the adverse effect that it has on the social, cultural, political and economic life of the affected persons (IDMC, 2014). In the early 1950s, it was predominant to hear issues of refugees owing to the rise in conflicts between nations. This resulted in the establishment of the United Nations High Commission for Refugees (UNHCR), which began operations in 1950. (UN-Habitat, 2015). This Commission was saddled

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with the responsibility of protecting and supporting the refugees (UNOCHA 2014). Thus, Internally Displaced Persons (IDPs) is on the front position of both national and international discussions and policies in most affected countries and regions of the world.

IDPs are caused by either artificial or natural disaster which has made many flee the borders of their communities. Not like refugees, IDPs are affected by conflicts or natural disaster, but have not gone out of their countries borders into another. It has been argued that the rise in the number of IDPs can be attributed to two broad factors which are man induced and natural disaster (UNHCR, 2005; UNOCHA, 2014; Azazi, 2011 and UNCHR, 2015). Principally, the man's induced causes are war and urbanization coupled with crime and violence such as terrorism, communal/ethnic clashes, and electoral crisis and so on. Furthermore, exploitation of natural resources by man has triggered conflict have made man to flee from his original place of abode to seek shelter in other places within the country as IDPs or outside the country as refugees (UNCHR, 2015).

Surprisingly, unlike the refugees, IDPs remains the major concern of their home country (UNHCR, 2005) Failure of government at all levels in service delivery has contributed to violence across the countries in the world (UNCHR 2016). Omar (2009) observes that poor service delivery in the areas of potable water supply for dinking and domestic use, poor waste disposal practice, poor healthcare and insufficient housing, poor educational facilities, inadequate recreational facilities, telecommunication facilities and electricity are attributed to different countries including Nigeria cities. These problems are exacerbated by uncontrolled population growth resulting from increase in the rate of rural urban migration without expansion of the available infrastructure (UN-Habitat 2015). Omar (2009) admitted that poor service delivery is largely a factor of poor planning; he further stressed that, good plans and policies are bedevilled by poor implementation. He went on to say that this problem is visible because of a lack of openness and accountability in governance, a lack of qualified and professional staff in local governments, and a poor link between metropolitan areas and local governments (Omar 2009). This study assessed the forms and effect of the services provided at the two IDPs camps at the Federal Capital Territory (Kuchigoro and Durumi camps). The scope covers the investigation on the socioeconomic characteristic of IDPs in each of the camps, forms of services made available at the camps and the performance of the services provided in meeting the needs of IDPs.

Governance and Service Delivery

This problem is visible, owing largely due to a lack of transparency and accountability in administration, a shortage of qualified and professional people in local governments, and a shaky connection between metropolitan regions and local governments (Omar 2009), which have exposed the urban areas to insecurity. In the same vein, UN-Habitat (2017) added that, urbanization contributes to land erosion within the urban areas and sometimes causing flood and making residents to compulsorily flee their place of abode. Studies by the United Cities and Local Governments (UCLG, 2013) shows that more than 40% of waste is collected in large amount in the affluent part of the urban areas and dumped in poorly managed landfills. This most at times backs the water ways and in turn causes flood which have led to so many internally displaced persons issue across the world (UN-Habitat 2017) .

Good governance practices are tools to effective security of our urban areas, Danmole (2004) retracted that good urban governance means that the city government must and are also accountable to residents, including the poor. Thus, this means inclusiveness and participation by each group and stakeholders (Danmole, 2004). It could be said that tackling insecurity is fundamental issue of good governance of urban and rural areas. Good governance and safe cities are reciprocal; where residents are free from fear, and where safety is guaranteed for the citizens, interaction with public institutions becomes possible. If Governance is well delivered to the citizens, there will no need for violence in the urban areas which will in turn cause displacement of persons. Because according to (Adebayo et al., 2011), addressing urban violence is the duty of good governance if it involves the use of solidarity practice, city consultation process and institutional reforms which leads to citizenship participation.

The lack of official institutions to control and eventually manage the lawful use of force is the primary cause of urban violence that leads to displacement. According to Muggah (2014), there are three interlocking factors that are playing a critical role in fostering city fragility, particularly in Sub-Saharan African regions and the world at large, which are rapist and unregulated urbanization, failure in national and city level governance, and the monumental shift in internet connectivity and empowerment. The importance of this theory to this study is summed up in the observation of Muggah (2014) who noted that where governance failure is incessant partisan violence possibly create an overt and convert from intimidation and management. Thus, an outbreak of violence in any city usually leads to displacement of persons to the place where it is perceived to be safe. This theory is significant because of its ability to point out the role of governance in urban centres to avert out brake of violence that may lead to displacement of persons.

Concept of Violence

Several scholars have looked at violence from various perspectives, all with divergent stand on the definition of what violence is. Adesote & Peter, (2015) conceptualized violence from the angle of human right and social justice. In their philosophy, they viewed violence as the display of aggression to achieve a social balance. According to the World Health Organization (WHO), violence is defined as the threat or use of physical force and power against oneself, another person, a group of people, or a community that results in or has a high likelihood of causing injury, death, physical harm, mal-development, destruction of lives and property, or deprivation.

Marshall (1969) asserts that, violence of one sort or another cannot be ruled out of man's history. In their own view, violence is as old as man himself. They both maintained that, in one way or the other, we must adapt to the phenomenon. DeWell & Anderson (2011) added that violence is a product of aggression. From the above, it could be said that what leads to internally displaced person is chain of deprivation leads to frustration, while frustration leads to aggression and aggression gives birth to violence and violence gives birth to internally displaced persons.

Persons Internally Displaced Around the World

Around the world currently, over 40 million people have been displaced from their homes due to natural disasters or confrontations that result in violence, loss of lives and property, and certain human rights violations, either inside their nation as internally displaced persons (IDPs) or from outside their region as refugees (World Bank 2015). In 2013, thousands of internally displaced individuals remained at danger in Iraq, with just a tiny number able to go overseas. There may be 10 internally displaced people for every refugee in some African humanitarian crises. Conflict has displaced an estimated 1.4 million people in Uganda, at least 1.5 million in the Democratic Republic of the Congo (DRC), and one million in Sudan. However, just 30,000 displaced persons in Uganda have become refugees, compared to 469,000 and 703,000 in the DRC and Sudan, respectively. A considerable number of individuals are displaced indefinitely, with no way of returning (World Bank, 2015).

United Nations (2015) states that forced relocation is a humanitarian catastrophe; yet, it also has a developmental influence, both good and bad, on human and social capital, economic growth, poverty reduction initiatives, environmental sustainability, and societal instability. War et al., (2004) viewed that, either refugees or IDPs both are burden on the host community from whichever angle you view it. In other words, the negative impacts outweigh the positive contribution. Losses sustained by relocated populations strengthen views of fragility and reliance, as well as beliefs about the cost they may impose. This supports the World Bank's (2015) contention that finding sustainable solutions to displacement situations is a critical development issue for nations hosting refugees and internally Displaced Persons, as well as the international community, including the World Bank.

Internally Displaced Persons: Abuja Scenario

There are 2.2 million internally displaced persons (IDPs) in Nigeria (IOM, 2018). Despite huge government investment and budgetary projections produced annually, IDPs across the world have encountered governance inefficiencies and infrastructural shortages (Mohammed, 2017). Policymakers and government institutions must address this issue immediately. In Nigeria, government officials appear to have taken a hands-off attitude to governance and infrastructural requirements in IDP camps. Internally Displaced Persons (IDPs) are growing because of the Boko Haram insurgency, particularly in Northern Nigeria, armed banditry in the northern states, and disputes between herders and farmers. According to a 2018 estimate by the International Organization for Migration (IOM) study on IDPs in Nigeria, 13.3 percent of people were displaced due to communal disputes, less than 1% due to natural disasters, 1.2 percent due to herders'/farmers' clashes, and 83.8 percent due to Islamist insurgency attacks.

Abuja, Nigeria's capital, has been viewed as a haven by crisis-affected states due to the presence of all security architecture that constitutes the nation's armed forces and paramilitary groups that ensure protection. Furthermore, Abuja is regarded to be attracting the attention of the government, non-governmental organizations (NGOs), and philanthropists. These have sparked the relocation of displaced people to the nation's administrative capital, resulting in a dramatic increase in the host community's population. The available infrastructure, including as power, piped water, and educational institutions, has been overstressed as the population of the host communities has grown. As a result, the impact of IDPs on education is felt not only by the displaced population, but also by the host communities. Because the majority of IDPs attend school in their host communities, education activities in those areas have been disrupted. However, many studies have been conducted on the socioeconomic, demographic characteristics, and types of shelter of IDPs by researchers such as IDMC, (2015), Edem-Nse et al., (2017), and World Bank, (2015), but little has been done on the types and effectiveness of the basic services required by IDPs. As a result, the research tries to fill a gap.

Theoretical Views of the Origin of IDPs

The concepts and idea surrounding the issue of IDPs is traceable to several theories, including theory of relative deprivation, theory of aggression and frustration and concept of violence.

Relative Deprivation Theory

Primarily, violence or conflict in urban and rural area could be triggered by persistent deprivation from basic social amenities, ethnic politics, and lack of inclusiveness in government. According to Gurr (1971) relative deprivation is the tension that arises from a difference between the "ought" and "is" of social value fulfilment, which exposes people to violence. Relative deprivation, according to his definition, is the difference between what people want, their value expectation, and what they stand to obtain, their value accruing capabilities. To put it another way, relative deprivation is the discrepancy between what is observed and what is expected. As a result, it is reasonable to conclude that where there is relative deprivation, violence and conflict will erupt.

Saleh, (2012) pointed out that in a state where there is racial discrimination, economic discrimination, inequalities in the economy, in standard of living as opposed to other ethnic group; and a lopsided access to state resources such as land, wealth and other economic opportunities, ethnic conflict is more likely to occur. When there is a high level of social discrimination, the ethnic group that enforces a nationalist creed becomes aggressive, and minority groups are barred from expressing their cultures and languages. Where the practicing of religion is restricted or prohibited, or where groups harbour animosity toward one another or see themselves as victims, the likelihood of conflict increases accordingly. This type of environment leads to ethnic politics, which raises the likelihood of conflict or bloodshed because of existing ethnic tensions (Saleh, 2012).

According to Bushman & Huesmann, (2010), ethnic ideology is a strategy used by elites to attain political power and achieve their objectives. As a result, they tend to cooperate with only the ethnic or socio-cultural groups that support them, denying the other ethnic or socio-cultural groups of political benefits.

As a result, violence breaks out, causing people to flee their homes. While any shift in the power balance between the state and its people, according to Saleh (2012), triggers ethnic grievances and mobilizes people against the regime, Gurr (1971) argued that a state can survive for as long as possible despite widespread discontent because it monopolizes cohesive control and institutional support. This indicates that the essence of social insurgency is frequently due to rotation calculations based on power imbalances between oppressed communities and oppressor states. As a result, a nation's ability to have a free ethnic rebellion state is heavily reliant on the calculation of the balance of political, military, and economic power on a rotating basis. The relevance of this theory to this research therefore is that it exposes this research to the origin, nature and direction of violence and conflict in our urban and rural area. Political, regional, sectorial, and ethnic deprivation has landed our communities into different conflicts. Resource and power rotation could go a long way in ameliorating conflicts.

Aggression and Frustration Theory

Doob et al., (1939) proposed the frustration-aggression hypothesis in a monograph that has since become known as the frustration-aggression theory. It turned out to be quite important in security studies. This idea has had a greater impact on contemporary Western thinking on aggression than any other recent article. According to Seig, (1971), this idea provides a foundation or rationale that might be described as a ready-made excuse for unrestrained (or deliberate) hostile or aggressive behaviour. As reported by Bushman & Huesmann (2010), who said that the presence of aggressive acts always implies the presence of frustration, which usually leads to violence, and that the typical reason is "being irritated made me do it." As a result, this rationale has been observed as a ready-made justification for uncontrolled (or intentional) hostile or violent behaviour (Anderson and Bushman, 2002).

Aggression, according to Anderson and Bushman, (2002), is invariably the result of dissatisfaction. With the preceding remark, it is unclear whether frustration is a necessary and sufficient condition of violence, or if it is both. In most circumstances, these conditions are distinct. For example, if frustration is a sufficient but not sufficient condition, we must expect aggression to always follow frustration but may also occur otherwise; if frustration is a necessary but not sufficient condition, aggression cannot occur until frustration occurs but does not need to occur after frustration. They also claimed that it does not appear correct to presume that aggressive behaviour of the unusually known sorts is always traceable to and caused by some form of frustration based on everyday life observation. The frustration and aggressiveness idea has been observed and interpreted by many anthropologists and sociologists. People in various situations behave in a variety of ways toward one another. In some communities, there is a strong sense of interpersonal overt violence, but in others, it is almost unheard of (Seig, 1971).

According to Anderson and Bushman, (2002), aggressiveness is always the result of frustration. With the preceding statement, it is unclear if frustration is a necessary and sufficient condition of aggression, or whether

it is both necessary and sufficient. However, the implications of the requirements are diverse. If frustration is a sufficient but not a necessary condition, we must expect aggression to follow frustration but not necessarily: if frustration is a necessary but not sufficient condition, violence cannot occur until frustration arises but does not have to occur after frustration. They also claimed that it does not appear correct to presume that aggressive behaviour of the unusually known sorts is always traceable to and caused by some form of frustration based on everyday life observation. However, Amaraegbu, (2011) took an alternative approach to this notion, claiming that dissatisfaction often does not lead to aggressiveness, and that frustration might have other negative implications as well. Aggression is defined as behaviour that is intended to damage another person who does not wish to be injured (Anderson and Bushman 2002; Bushman and Huesman, 2010). Violence, on the other hand, is any hostile act aimed at causing severe physical harm, such as injury or death (Anderson and Bushman, 2002; Bushman and Huesman, 2010).

It is safe to state that while minor kinds of hostility have an adaptive role in socialization and social control in today's culture, more serious types of violence are more influencing or controlling than adaptive. Violence fosters more aggression and creates more issues than it solves. According to Tedeschi and Felson, (1994), the reason for today's aggression can be traced back to genes. This genetic perspective on aggression and violence, however, has yet to be established conclusively.

Psychologists have come up with a variety of theories which will help understand the reason behind why people behaving aggressively. Frustration and aggression socio-ecological models (Heise, 1998), cognitive neo-association theory (Berkowitz 1989), social learning theory script theory (Huesman, 1986), excitation transfer theory (Zillmann, 2008), and social interaction theory (Zillmann, 2008) are some examples of these theories (Tedeschi and Felson, 1994). Each of these hypotheses contributes to a better understanding of why people act violently. Most of this mini – theories did not provide a clear explanation on human aggression and violence, but a clear and better understand can be gotten from the figure below which was modelled by Dewell et al., (2011), to give an understanding of the aggression and violence theory.

The relevance of this theory to this study is to expose the researcher on what really leads to violence which then causes displacement of persons in our societies. This theory reveals the links between frustration and aggression and how they lead to violence in the society. Amaraegbu, (2011) took a different approach to this notion, arguing that frustration does not always lead to aggressiveness, and that frustration might have other negative implications as well. The relevance of this theory to these studies is to expose the researcher on what really leads to violence which then causes displacement of persons in our societies. This theory was able to reveal this link between frustration and aggression now leading to violence in the society.

Location of Research

The Federal Capital Territory is in the geographical centre of the country at 9°4N 7°29E / 9.066667°N 7.483333°E and covers an area of around 8000 square kilometres. It is bordered by Kaduna state to the north, Niger state to the west, Nasarawa state to the east and south-east, and Kogi state to the south-west. It is located between latitude 7 45' and 7 39'. FCT, like many other Nigerian states, experiences two weather conditions every year. These are the rainy season, which starts around March and lasts until October, and the dry season, which starts in October and lasts until March. The northeast trade causes a brief period of harmattan within these times.

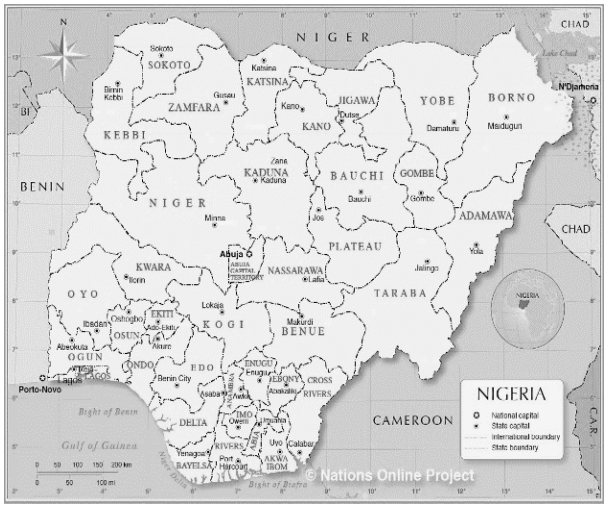

Figure 1. Map of Nigeria

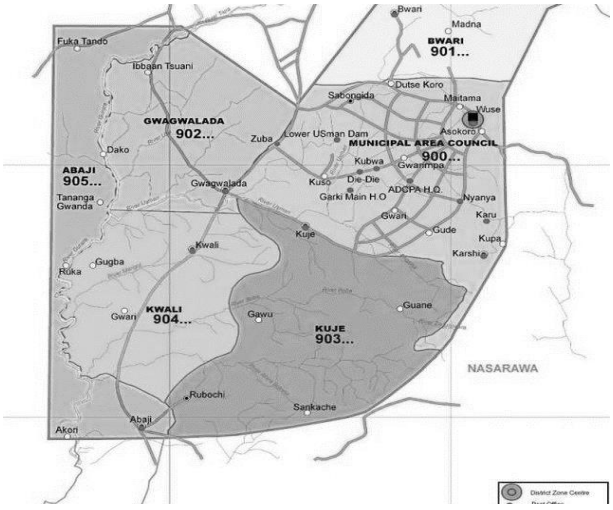

Figure 2. Map of FCT, Abuja

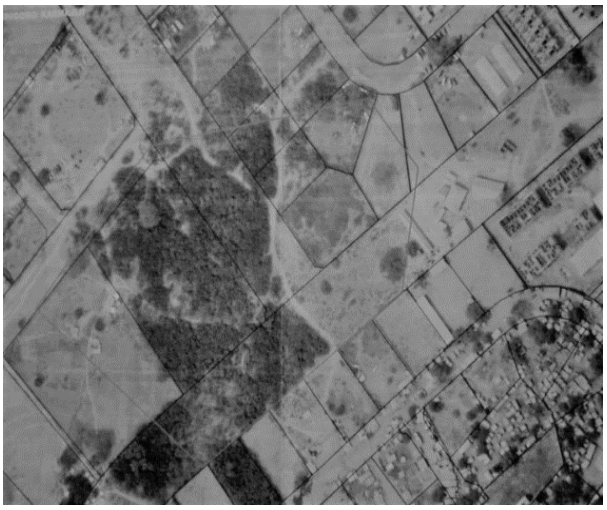

Figure 3. Kushigoro Camp

Figure 4. Durumi Camp

Kuchigoro/Karmajiji and Durumi are both suburbs of the Federal Capital Territory both villages are in Abuja Municipal Areal Council (AMAC). Kuchigoro/Karmajiji camp which is just 5 minutes' drive from the central area is located immediately after the city gate along the outer southern express way (OSEX) which is popularly known as the Airport Road. Durumi which is bounded by Kaura District to the North is also 10 minutes' drive from the central area. The predominant settlers of both settlements are the Gbagyi's who are well known with farming as their primary source of leaving. However, other Nigerians are fund amidst them who are workers in the city of Abuja. The Nation's states Capital has become a home to Internally Displaced Persons from different part of the country like Borno, Yobe and Adamawa. This is hinges to the fact that, the displaced persons feel a sense of more protection in the capital city. Abuja has a total number of displaced persons to be 15,154 with 2,510 households (IDMC, 2018; Camp Management 2019). These displaced persons are spread in Kuchigoro/Karmajiji and Durumi IDPs camps in FCT.

Methodology

The following data are required for this study: socioeconomic characteristics of the camp, types of services supplied in the camps, environmental conditions of the camps, efficacy of service delivery to IDPs in camps, and influence of service delivery on the well-being of the IDPs. These data were sourced from both primary and secondary means. A reconnaissance assessment of the IDP camps was done to provide a synoptic view of the camp and to aid in determining the best approach for data gathering. 331 questionnaires were sent to household heads in both camps for data collection. As a probability, a multistage sampling strategy was used, which ensures that each sample at any stage has an equal chance of being picked. The purpose of using a multi-stage sampling technique was to reduce subjectivity by providing each IDP in the sample an equal chance of being chosen. Using this technique, 215 copies of the questionnaire were distributed to IDPs at the Kuchigoro camp, while 115 copies were distributed to IDPs at the Durumi camp. The data obtained from the two camps was analyzed using descriptive and inferential statistical methods. The descriptive statistical approach used to examine data on socioeconomic features, physical and environmental circumstances, and the types of services offered to IDPs, as well as their efficacy. The Likert scale rating approach was used to assess data on the efficacy of service delivery. Data on the influence of service delivery on IDPs' well-being.

Results Discussion

The Socioeconomic Features of IDP Camps

This section highlights the socioeconomic features of displaced persons in camps; age, state of origin, sex, marital status, and reason of displacement, period of stay in the camp, as well as education attainment, occupation and income level of the displaced person in the camps. It provides the respondents view or opinion on the likely situation of the research location

From Table 1, the socioeconomics characteristics at the study location. Research area are Kuchigoro and Durumi Camps. The Kuchigoro camp has about 62% of the IDPs while the Durumi camp has 37% of the IDPs. This shows that there are more displaced persons in Kuchigoro camp than Durumi, because of the available space to house the IDPs in the study area. 98.6% and 74.8% of the displaced persons in the Kuchigoro and Durumi camps are from Borno state respectively. This implies that most of the IDPs who are camped in Abuja are from Borno state, it is so because of the insurgent activities in the area. Consequently, 59.3% of the IDPs in Kuchigoro camp are

within the ages of 28-37 while 29.6% who are in Durumi camp are within the ages 18-27 this implies that the IDPs in Abuja is composed of young and active work force.

Research also shows that 58.3% of the IDPs in Kuchigoro camp are female also, 61.7% in Durumi are also female. This shows that male who happens to be household heads are worst hit by the insurgency. Furthermore, 58.3% and 64.3% of the women in Kuchigoro and Durumi camps are widowed. This percentage, corroborate the reason for the high percentage of women to men in the camps. 96.7% and 92.2% of the respondents in Kuchigoro and Durumi camps were both displaced by Boko Haram. However, 60.6% of the displaced persons have lived in the camp for about 2-4 years unlike the Durumi camp (84.3%) who have lived in the camp for about 5-7 years. This is because of the proximity of Durumi to the central area of Abuja and the attention it is getting from philanthropist and nongovernmental organisation. The educational attainment of the two camps shows that 0.5% of the people camped in Kuchigoro have attained tertiary education while 2.6% of the respondents in Durumi have attained tertiary education. In addition, 35.2% and 13.9% have attained Islamic and Bible schools in Kuchigoro and Durumi respectively. The predominant occupation of the IDPs in Kuchigoro is (59.7%) farming while 61.7% of the IDPs in Durumi is artisans. Therefore, they are faced with low level of income with about 11.1% of the respondent in Kuchigoro earning about 61-80,000 monthly while 8.7% in Durumi camp earns between 21-40,000 respectively.

Table 1. Social and Economic Variables of IDPs

Variables	Kuchigoro	%	Durumi	%
Camps	216	62.0	115	37.0
State				
Borno	213	98.6	86	74.8
Adamawa	2	.9	15	13.0
Yobe	1	.5	14	12.2
Total	**216**	**100.0**	**115**	**100.0**
Age				
18-27	16	7.4	34	29.6
28-37	128	59.3	25	21.7
38-47	10	4.6	27	23.5
48-57	59	27.3	3	2.6
58 above	3	1.4	26	22.6
Total	**216**	**100.0**	**115**	**100.0**
Sex				
Male	90	41.2	44	38.3
Female	126	58.3	71	61.7
Total	**216**	**100.0**	**115**	**100.0**
Marital status				
Single	45	20.8	19	16.5
Married	46	21.3	11	9.6
Divorced	44	20.4	11	9.6
Widowed	126	58.3	74	64.3
Total	**216**	**100.0**	**115**	**100.0**
Reason of displacement				
Farmers/headers clash	4	1.9	106	92.2
Boko haram	209	96.7	5	4.3
Others	3	1.4	4	3.5
Total	**216**	**100.0**	**115**	**100.0**
Duration of stay in the camp				
Less than 1 year	85	39.3	14	12.2
2-4 years	131	60.6	4	3.5
5-7years	85	39.3	97	84.3
Total	**216**	**100.0**	**115**	**100.0**
Educational attainment				
Primary school	115	53.2	79	68.7
Secondary	12	5.6	14	12.2
Tertiary	1	.5	3	2.6
Islamic or bible school	76	35.2	16	13.9
Non formal	11	5.1	3	2.6
Total	**216**	**100.0**	**115**	**100.0**
Occupation				
Student	17	7.9	8	7.0
Civil servant	3	1.4	4	3.5
Farmer	129	59.7	32	27.8
Others	67	31.0	71	61.7
Total	**216**	**100.0**	**115**	**100.0**
Income				
5-20000	145	67.1	85	73.9
21-40000	43	21.8	13	8.7
61-80000	24	11.1	20	17.4
Total	**216**	**100.0**	**115**	**100.0**

Necessity of facilities in Kuchigoro and Durumi camps

The entire average rating for the necessity of amenities required in Durumi and Kuchigoro camps is 3.532, and Kuchigoro is similarly 3.532 (Table 2). However, if a facility score is higher than the overall average score, it implies that the facility is extremely important in the camp, whereas the facility with the lowest value shows that

the facility is not important to IDPs in their camps. As a result, relief materials (4.35), and kitchen placement (4.051). The drainage system (4.051) in that area the infrastructure that is desperately required in the Durumi camp. While respondents in Durumi cams are extremely satisfied with healthcare (2.906), toilet location (2.906), and bathroom condition (2.906), (2.974). The response of the respondent in Kuchigoro (3.523) overall average score suggests that relief materials (4.333) and kitchen Condition (3.880), Assess Road (3.806) in that order, are the amenities that are extremely important to the IDPs in Kuchigoro camp. While bathroom condition (2.880) scored the lowest in the camp, indicating that IDPs in Kuchigoro do not regard bathroom condition to be a necessary. According to the above analysis, service delivery in the areas of relief materials is highly necessary to the IDPs due to the government's neglect and the daily increase of the IDPs in the camps; whereas Healthcare is not necessarily due to the proximity of the camps to the National Hospital, which is only a few kilometres away from the camps.

Table 2. Necessities of IDPs in Camps

FACILITIES	DURUMI CAMP	KUCHIGORO CAMP
	MEAN	MEAN
shelter	3.760	3.806
Source of water supply	3.248	3.167
Frequency of water supply	3.726	3.602
Source of power supply	3.556	3.509
Frequency of power supply	3.556	3.194
Drainage system	4.051	3.778
Assess road	3.709	3.806
Security	3.744	3.704
Type of toilet	3.385	3.435
Toilet location	2.906	2.898
Toilet condition	3.197	3.222
Location of kitchen	3.744	3.880
Kitchen condition	4.051	4.352
Location of bathroom	3.162	3.102
Condition of bathroom	2.974	2.880
Education	3.538	3.953
Healthcare	2.906	2.972
Relief materials	4.359	4.333
AVERAGE	**3.532**	**3.532**

Form of the services available in the IDPs Camps

The result in Table 3 was obtained from the research shows that 97.6% of the respondents in Kuchigoro camp acknowledged that waste management facilities are not available in the camp while only 19.9% acknowledged the availability of the facility. 89.0% of the respondents in Durumi camp also, acknowledged the non-availability of the facility but 11.0% acknowledged the availability of the facilities in their camp. The respondent who acknowledged the availability of the facilities maybe because of their lack of knowledge about what waste management facilities. More so, electricity in Kuchigoro camp (96.8%) is not available in the camp likewise in Durumi camp (99.5%) is not available in the camp which is an indication that the camps are suffering from energy poverty. Water supply facilities in Kuchigoro camp is (61.6%) not available also in Durumi camp, (67.0%) water supply facilities are not available. The implication of this is that water supply in the study area is provided by philanthropies and religious organisations.

Consequently, sewage disposal facilities in Kuchigoro camp are (84.3%) not available also in Durumi camp, (99.5%) of the respondent indicated that the facilities are not available in the camp. However, in the aspect of drainage facilities in Kuchigoro camp, (53.0%) admitted that the facilities are not available in the camp while in Durumi camp, (98.3%) of the respondents indicated that the facilities are also not available in the camp. This, however, is an indication that service delivery in the areas of sewage disposal and drainage facilities in the camps is very poor; hence, the IDPs are vulnerable to disease outbreak; thus, a threat to their wellbeing since the camps are haphazardly arranged with no trace of physical planning. Security in Kuchigoro camp is (96.3%) not available as well as Durumi (94.8%). Access road in Kuchigoro camp (84.7%) is not available also in Durumi (95.8%) security facilities are not available. This shows that security service by the government is not available in the two camps as well as access road thus, the lives and properties of the IDPs is vulnerable to both internal and external attacks. Furthermore, Education facilities in Kuchigoro camp is (57.0%) not available and Durumi

(80.9%) is also not available. Education been a cardinal indicator of human development index is lacking in the study area which exposes them to weak capacity and low productivity. Healthcare is equally (95.8%) not available in Kuchigoro camp while in Durumi camp, (80.9%) of the respondents indicates the non-availability of then facility. Relief materials in Kuchigoro is (91.6%) not available as well as (90.4%) in Durumi. This shows that the camps are not supplied with relief materials.

Table 3. Form of Services/Facilities available at the IDPs Camps

Variable /Facilities	Response Availability	Kuchigoro Frequency	Percentage %	Durumi Frequency	Percentage %
Waste Management	Available	43	19.9	12	11.0
	Not Available	172	79.6	103	89.0
Total		**216**	**100.0**	**115**	**100.0**
Electricity	Available	7	2.3	1	.5
	Not Available	209	96.8	114	99.5
Total		**216**	**100.0**	**115**	**100.0**
Water supply	Available	83	38.4	38	33.0
	Not available	133	61.6	77	67.0
Total		**216**	**100.0**	**115**	**100.0**
Sewage Disposal	Available	34	15.7	1	.5
	Not Available	182	84.3	114	99.5
Total		**216**	**100.0**	**115**	**100.0**
Drainage System	Available	102	47.0	3	1.7
	Not Available	114	53.0	112	98.3
Total		**216**	**100.0**	**115**	**100.0**
Security	Available	8	3.7	8	5.2
	Not Available	208	96.3	107	94.8
Total		**216**	**100.0**	**115**	**100.0**
Access Road	Available	33	15.3	5	4.2
	Not Available	183	84.7	110	95.8
Total		**216**	**100.0**	**115**	**100.0**
General Security	Available	52	24.1	18	15.0
	Not Available	164	75.9	97	85.0
Total		**216**	**100.0**	**115**	**100.0**
Education Facility	Available	5	2.4	50	43.0
	Not Available	211	97.7	65	57.0
Total		**216**	**100.0**	**115**	**100.0**
Health Care	Available	9	4.2	23	19.1
	Not Available	207	95.8	92	80.9
Total		**216**	**100.0**	**115**	**100**
Relief Materials	Available	18	8.4	11	9.6
	Not Available	198	91.6	104	90.4
Total		**216**	**100.0**	**115**	**100.0**

Figure 5. Shelter Condition at Kuchigoro Camp

Figure 6. Drainage System at Kuchigoro Camp

Figure 7. Toilet Facility at Kuchigoro Camp

Figure 8. Water Storage in Durumi Camp

Figure 9. Shelter Condition at Durumi Camp

Figure 10. Environmental Quality at Durumi Camp

Performance of Services in the Camps

The performance of services in IDP camps in Abuja is summarized using Likert scale rating and ranking. The variable, whose performance is greater than the total average score of a camp, has the lowest level of performance. As Table 3 indicates, food provision in Kuchigoro (4.154) and Durumi (4.037) scores the highest as such the camps are faced with food insecurity. Consequently, accessibility (2.803) in Kuchigoro camp is sufficient because it is the variable with the lowest score in the camp; while in Durumi camp, electricity scores the lowest (3.180) indicating that electricity is also not a challenge even though not available.

Table 4. Performance of Services in the Camps

Facility	Durumi camp	Kuchigoro camp
	Mean	Mean
Water supply	3.350	3.788
Electricity	3.145	3.180
Education	3.316	3.502
Healthcare	3.744	3.862
Security	3.009	3.410
Accessibility	2.803	3.530
Relief Materials	3.744	3.770
Food Provision	4.154	4.037
Shelter	3.504	3.631
Sanitation	3.214	3.475
AVERAGE	3.398	3.618

Conclusion and Recommendations

The service delivery to IDPs at the FCT cannot be over emphasized. Hence the research concludes that, the IDPs in Abuja camps does not have access to adequate service delivery in areas of potable water supply, healthcare, education, relief materials and security services. In view of this situation, the study recommended a sustainable good governance strategy in line with the relevant goals of the SDGs; also, sustainable physical planning principles be introduced in the arrangement of space at the camps; in the provision of basic services, partnership with the non-governmental organizations should be encouraged for better service delivery.

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Conflict of Interests

The author declares no conflict of interest.

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CHAPTER 8. Industrial Archaeology in the era of Nasti's Family from Napoli: Manufacturing Gelato Under its Mondial Gelo Division

Salvatore Polverino

Introduction

A Humble beginning: the Agricultural Heritage of Marano di Napoli behind the Familiar aspects of the Nasti's rising entrepreneurial framework; The suburb of Marano town was not yet acquainted with its archaeological riches which have nevertheless been modestly valued over recent time. The 19th century rhythm was marked by the Piedimonte Alifana railway (Caracciolo, G.) and Belgian Societé Anonyme de Tramways du Nord de Naples tramway network (Bevere, E. et al., 1998) that accompanied its dynamism together with the metallic noises from the workshops operating night and day in a piecework regime.

The peasant life of the hills of Marano of Napoli, as historically documented for the small-scale and parochial bourgeoisie, was regulated until the mid-twentieth century by the production of cherries, currently a recognized product, and on the consequent cleaning of the branches of these trees carefully chosen for the making the baskets. The malleability of these woods is due to the historical selection of the arecca cultivar, of which the hill where it rises, from the Spanish lands by the hand of Princess Cartina Manriquez.

Until the first half of the last century, a multitude of mules shuttled

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between the Arecca hill and the processing areas, where dozens of workers combined the rectangular boxes also called varriate. The trees were up to twenty meters high and required a long and narrow staircase called scalillo with a special indentation on which the collector rested his knee in such a way as to be free in the use of both hands during the gathering.

Figure 1. *Ciaurro*'s excavation: residency of a Cicerone's scholar
Figure 2. Plaza of the *Starza*. Upper-right: house of Nasti family (Source: Barleri, P. La Starza e il suo Castello)

In synergy with the cherry harvest, Marano town was one of the cradles for the creation of the first mutual aid worker societies of this type of branch unions. Before the advent of plastic, baskets were the only means of transporting food products, such as panari bread, for sportoni melons and the reefs exported to Sardinia, whereby they were used for sending fresh ricotta cheese. The artisans peeled a barrel without pause strip after strip, previously fired to soften it. This action was operated with the incisor teeth and the fall of these teeth was a price to be kept in the accounts.

Figure 3. Citizen of Marano with handmade wooden baskets (Source: Barleri, P. Arti e Mestieri a Marano: 64)
Figure 4. Artisan of *sporti* baskets (Source: Barleri, P. La Starza e il suo Castello: 51)

Nasti's family was focused on this economy and lived in the Piazza della Starza. Some components were woodcutters, others basketball artisans, called sportellari, but also horse transporters (e.g., Mr. Giuseppe Nasti, brother of the progenitor Ciro, registered under the English-speaking name Joseph at his arrival at Ellis Island, New York), and salesmen with representation in the vast area of the central railway of Naples, performed by Mr. Gennaro Santoro at the port of Napoli (Potito, S. 2013). The agrarian background had led to the imbalance between resources and population in a context of profound social disintegration. The

community of Marano delle ceste, (Marano of the baskets), on the other hand with the Nasti family, was instead a virtuous example of a family business.

The value of this rural economy of restoration and the social safety net was recognized starting after the Second World War, as it supported the nascent heavy industry (De Seta, C. 1983).

The artisanal and industrial memory included primarily the memory of Mr. Ciro Nasti (Barleri, P. 1999, 2000) whose figure operated in a period that starts from a period of steady growth, protectorship, pecuniary assessing, great recession, and self-sufficiency, (1929-39) up to a long period of catch-up growth (1951-73) (Gomellini and Toniolo).

Between these two historical periods, the profound social, human, and economic impact during the Second World War is reported as a period of annihilation of hopes, with a production rate reduced to a quarter in 1941-42 and decimated between 1943-45.

Between 1944-45, despite a lack of raw materials and the annihilation of infrastructural transport in an atmosphere of familiar fervor, the family, following the refuge aboard his Fiat Balilla car, occasionally used as an extempore auto ambulance whereby requested, and nestled at the foot of the scenic beauty of the hills of Villa Santa Croce of Caserta city near Caiazzo town (Busino, N. 2017) along the Viktor line, escaped the Nazi massacre of Monte Carmignano a few hundred meters away (Napolitano, G. President, 2012. Sorbo, Lehnigk-Emden 1995. Hume, D. 1990. Walsh, W. 1995-2018. Klinkhammer, L. 1997. Schreiber, G. et al. 2000).

In the wake of the allied bombing end, the family finally returned to the social life of Napoli city (Rossi E. Bradley F. Smith), so Ciro N. used to attend.

The progenitor Mr. Ciro N., continued to assume the role of a police commissary in a period of great commitment after World War II. He was, like many other police officers, committed to reforming the new post-fascist Italy, capturing significant criminals in sophisticated law enforcement operations, i.e. heading the arrest of the most dangerous bandit of Italy at that time, Giuseppe La Marca in Nola of Napoli, protected by 3,337 highly armed outlaws (Sidoni, Paolo, e Paolo Zanetov, 2013), and collaborating in the eradication of the fascist collaborators network as driven by the O.V.R.A. (Opera Volontaria di Repressione Antifascista) establishment. Crime posed a negligible alert to trade baskets; Nasti's family was often prevented along the provincial roads from Villa Literno, locality three bridges, so much so that the criminals devised tricks to pull the ropes at the appropriate time, and consequently injure the horses for the rights of way.

A flavored water (gassosa) merchant, Mr. Coppola, attracted the attention of Mrs. Concetta Santoro, wife of Mr. Ciro Nasti. With his modest cart pulled by horses from Giugliano of Napoli town, unwittingly, he became the forerunner of the concept since Mrs. Concetta speculated: "shall we run this production?".

Another prompter was a friend of Ciro based on the Riviera of Napoli, Mr. Petrazzuolo, who called him to invoke help with some equipment so that a on a Friday of January 1957 the factory Fratelli (brothers) Nasti emerged in Calvizzano, following a long series of historical ups and downs and entering in the commercial register.

From that day forward, Fratelli (brothers) Nasti enterprise was officially on the commercial books of every corner of Italy. The first orders were guided from the impressive neoclassic architecture of the Nasti Palace in via Merolla of Marano to the neorealist suburbs of the crowded shops in the hinterland. The young brothers observed the trading with curiosity, through the veil of the handmade curtains of the noble story of their residence, in their own collective room, embellished with stuccos, frescoes, and 1800's tromp d'oeil.

Mrs. Concetta gathered the presence of her friends who collaborated on her project, by cleaning and gathering the first stocks of bottles and basins. The peak of production coincided with the historical period of 1970, a period which was characterized by emerging Italian manufacturing that reached 5 times over the value of 1950, with an average of 8.3 percent in the two decades; at that age, the factory assumed content of great depth with hundreds of workforces.

The list of the initiatives promoted by this family is impossible to be reconstructed nowadays, i.e., the laboratories and relative deposits, road reclamations, and asphalting initiatives. However, the following map tries to recall the main landmarks of the nascent corporate framework which was the only industrial reality among the municipalities mentioned and over the decades has led to i.e.: the urbanization of roads, the reclamation of some canals and fords, and improvement of the railway boundaries of the Alifana route.

The main factory was allocated in the noble avenue of Calvizzano, where the magnificent Church Santa Maria delle Grazie stands (Campone, M.C. 2011), an important religious complex surrounded by the artistic expression of its aristocratic boulevards.

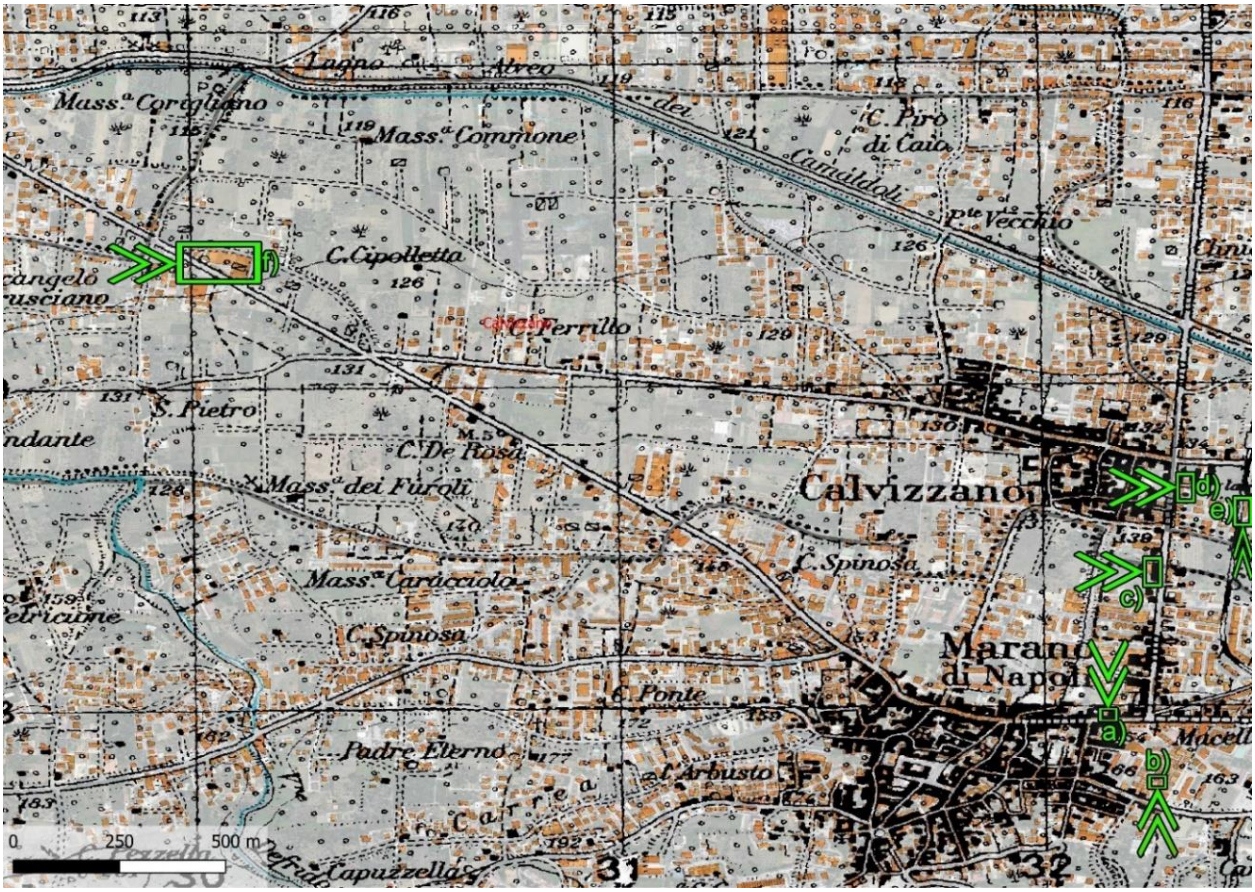

Figure 5. Map of industrial entities and urban comparison between the ancient footprint (black blueprint) and current urbanization (orange blueprint)

Reference to Figure 5:
a) Nasti's palace in via Merolla
b) baskets' workshop in via Napoli
c) beverage's warehouse in viale della Repubblica,
d) cash and carry in viale della Repubblica
e) secondary warehouse in via Raffaele Granata
f) Mondial Gelo ice cream factory in viale della Resistenza. Carthography:
ArcGIS REST Services Directory I.S.P.R.A. Ambiente, Agenzia Entrate.

Material and Methods

Limits of the research and survived industrial lecture of the complexes

The purpose of this research is to distinguish between intrinsic values in archival material throughout an exploration of a time- and space-bound phenomenon encompassing a discrete-known artisanal and industrial memory of the Napoli periphery.

The depth of the findings and complexity of the case study brings the readers to understand the intrinsic values occurring in a period whereby human relationships, communities, and industrial genesis have been consigned in a manner not easy to be distinguished.

The findings belong to complex scenarios and have been put into the discussion wherewith the author has embraced various methodologies by sampling, adapting, interviewing, comparing, deconstructing (Baxter, P., & Jack, S. 2008), and reconstructing different entrepreneurial phenomena.

This reference paragraph depicts a structured Qualitative Case Study Methodology, so that the research has been filtered through a Multiple-Case Studies 1), even though the whole industrial evolution could have been identified as a unique Single Case with Embedded Units 2). The first observation made it evident that there were similar and therefore replicable results, but once the diversification emerged, as the interviews described the individual processes, the robustness of the type of study emerged, so the choice fell on the first method 1).

Furthermore, the depth of the photographic archives has underlined specific propositions: what has inspired the managers to choose this line of business? Which personal qualities and technical experience could have been invested into this business? Was it evident the need for this product? Did the founders manage this business in the short, medium, or long period?

At a further point, it was clear that the different production lines were not reconcilable, undertaking their own advantages and disadvantages but above all, behaving by increasingly vertical decision-making processes. While outsourcing and triangulating their validity with the last revenants of the enterprises, to avoid the uncertainty, the author has limited certain boundaries and herewith some intrinsic criteria (Soni, P. Stake, 2014) whether to be included or not in the scope of the research.

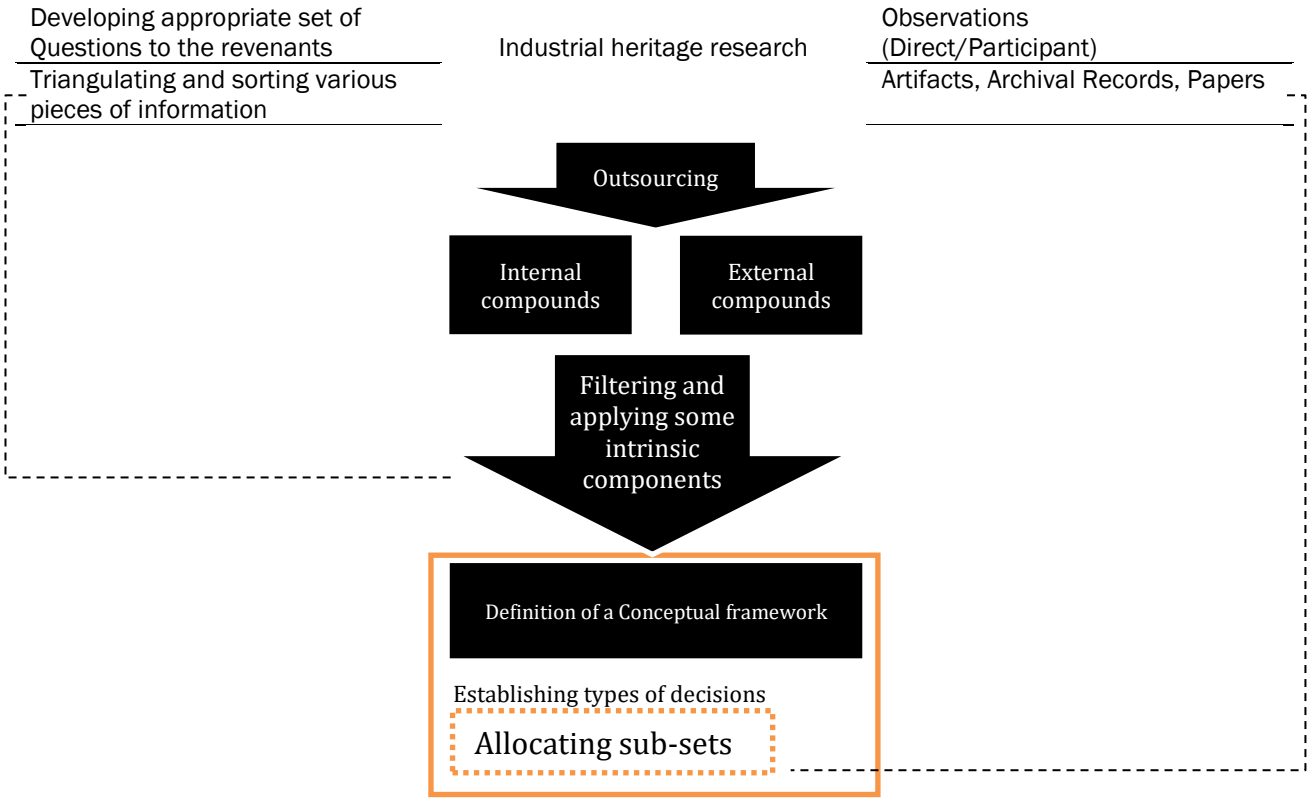

Chart 1. Adaptation from the study design and implementation paper (Developed by author)

The limitations of this research are attributable to a common aspect of oral sources (Romagnoni) which require continuous maintenance as a common problem of the Italian historiography that did not invest important funds in favor of its duration and maintenance of these magnetic items. This inobservance has derived from several reasons: a) because of the coincidence of the figure of the producer with that of the user; b) due to the evidence that research is conceived outside scientific institutions; c) because the institutions discounted the designation of any delegate to their conservation. In Italy, the voluntary deposit of artifacts is rare than the in the rest of the European zone equally intended as a public initiative to preserve the industrial heritage, so the author has preferred to open, in a regime of prohibited reproduction of images, backed up by their original negative supports, due to his ownership of such archives and in accordance with the law, his personal archives to let the historical support happen and spread this book chapter for the industrial heritage, through an open-access regime, also sponsored by the international conference of contemporary affairs ICCAUA, in Turkey.

The second post-war, Italian economic miracle and its social contrasts

While increased, Nasti influence was rapidly felt in the development, and its status spread by the progenitor Ciro as a chief investor. Gassosa product dominated against many industrial counterparts. In their home race, the rapid acquisition of machines was promoted, among Nasti brothers, year by year.

Machines were of non-standard manufacture (Antonelli, C. et al. 2007), and thus the drinks were semi-industrial, enriched by a refined silk-screen printing of the glass bottles, a real collector's item with a specific branch of the family engaged in the assembly of the chain, of the rudimentary machines then gradually more and more refined with joints, monopoles, timers, and valves. A consequent list of the satellite companies revolving around Fratelli Nasti, suppliers arose in the neighbourhoods of the workshops.

Commercial relations with other beverage producers, were consequently extended between Rome and Venice, i.e. San Pellegrino industry, and traded secondary beverages as the customer's drinking habits differentiated: to mention that the ingredients of the Nasti factory came from highly agricultural regions of southern Italy, Sicily and Calabria, to produce candied fruit: i.e. sicilian citrus candied fruit and other aromas obtained from boiling seasonal fruit, carefully chosen from the supply chains, peach, lemons, oranges, cinnamon and licorice.

Sugar was particularly high-priced in those days, and the enterprise used to summon supervised convoys to protect the precious cargo from delinquents, guappi, during transport operations from the few industrial sugar mills available in the Campania region.

Increasing the volume over time, the agency of politics on conditions marked a new capital to the entrepreneurship of the emerging Italian superpower. At that moment, a parliamentary debate described in detail the Nasti industrial complex, which was served by a staff of over 63 workers and Mr. Ciro Nasti was sympathetic to the improvement of their condition, women in first place. The text of this parliamentary act appears controversial, as it declares of inhuman conditions, which are questionable to comprehend according to the numerous cheerful testimonies. The political aspiration of those who had addressed this blue collar's question, accounted the condition of women in southern Italy, particularly well documented, a specific moment in which we consider Italy's adhesion to N.A.T.O. military organization and the aegis of the patriarch, well away from the left currents of northern Italy, known as a knot of trade unions and strikes.

Attitude handmaking: the uprising artisanal beverage chain

The food and wine heritage of the Camaldoli hills benefited from the culture of life: in particular, the wine and this new product, gassosa, a flavoured and sparkling water, capable of improving any other drink, energizing and vaguely healthy, that defined a cornerstone of this family society. It was considered the perfect combination to harmonize effervescent water and wine to exalt the quality of both beverages, particularly well-remembered among the interviewers for its sequence of gustatory emotions.

The sugar, manufactured by the Eridiana industry, was one of the raw materials implemented in the food processing: every time a convoy of two or more double trailers was prepared to reach the Eridiana factory, and hundreds of 50 kg bags were unloaded. In the absence of electronic invoicing, the monetary capitals were moved under guard and weapons were an important deterrent.

Another crucial supplier was the Lanfranconi enterprise from Sicily in the matter of citrus paste, and syrup for drinks, under the management of Mr. Tamanti, who in addition represented the food components, also supplied machinery, caps and other production graphic merchandise. Nasti group benefitted from this supplier, by producing beverages all carefully selected, delightful to the tongue and according to tradition, from a blend of herb infusions, plants, and parts of fruits.

To incentivize the visual acceptance by its customers, the bottles were selected among those used to store wine. The glass bottles were authentic collector's items that are still available online today at high price and were carefully bodied by the Gimmelli company, operating nowadays under the name Meridecor s.r.l.

This model of entrepreneurship might be, according to an article by Mr. Arrighetti, interpreted as a form of advanced offshoring, considering the limited and slow logistics of that era, among many other forms of local outsourcing, whose decentralization relied upon a domestic radius.

The printing screen portrayed the Nasti brand and was studied in detail. In addition to the gassosa drink, the inventiveness of some brothers, in first place Mr. Pietro Nasti, led to the creation of the Spuma (foam) beverage, to accommodate emerging demands, with distilled essences from fruit, in a zero alcoholic in 1-liter format, with the market denomination of orange, lemon, artichoke (alike the Cynar and San Pellegrino company rivals), bitter cola, all enriched by a screw crown cap (they were designed and supplied from specific manufacturers' programs).

Yearly, the proportions were changed on behalf of the indication of the bottler who contributed to the tailored style. To avoid counterfeiting, a pioneering security system has been mentioned by some key witnesses, that consisted of a glass sphere inside the bottle that chopped it with internal pressure. After that, the application with the rubber seal and ultimately the crown cap, completed the packaging operations. With one pressure the crown cap felt into the bottom of the bottle and freed the neck, to fit inside the bottleneck: when empty the small roll made noise within a minuscule chamber.

The whole industrial process of the Nasti's beverage department consisted of two parallel chains of production followed by exits to the outside where packaging took place in plastic boxes or in retro-retractable film on pallets. The disturbance of these workings was deafening and clearly distinguishable across the Calvizzano neighbourhoods.

At the height of business, this company delivered numerous quantities of beverage on the American aircraft carrier Saratoga docked at the port of Napoli; Nasti's beverage became hence an icon for fine dining lovers across mid-southern Italy, following out-region export to the centre-north of Italy so that the logistic planning and driving were personally directed and operated by Mr. Renato Nasti.

Regarding the visual trademark, its designation was addressed to brand equity for the object identified, leading to the affection of the brand's customers. The logo was headed by a capital N, with the subtitle tagline Fratelli Nasti with the headquarter in Calvizzano of Napoli; the blue background, delimited by a bevelled rectangle, graphics, to reflect the sea of the city of Naples and the serenity and transparency aimed at evoking human-like characteristics of the whole family (Lude, M. et al. 2018). "a business governed and [...] managed with the intention to shape and pursue the vision of the business held by [...] members of the same family".

Figure 6. Flagship brand: visual trademark on Nasti Business card. Uniqueness and warmth (Beck & Kenning, 2015) (Photo copyright: Author)

The cards (Figure 6) were delivered in every house and restaurant of Napoli city as a sign of trustful relations whereby every family member could trust this brand, imagine that this brand was predictable, dependable, reliable, truthful, competent, and its integrity.

Figure 7. Mixing of sugar (Photo copyright: Author)

Figure 8. Bottler machine manufactured by WAGNER GMBH, Mannheim (Germany): monobloc 32 taps bottling machine capacity 12,000 bottles per hour (Photo copyright: Author)

The maximum of production was set at 4,000 bottles for an hour served by an automatic dispenser, oil pistons and crown cap capper.


Figure 9 and 10. Bottling and Packaging with Nasti layout (Photo copyright: Author)


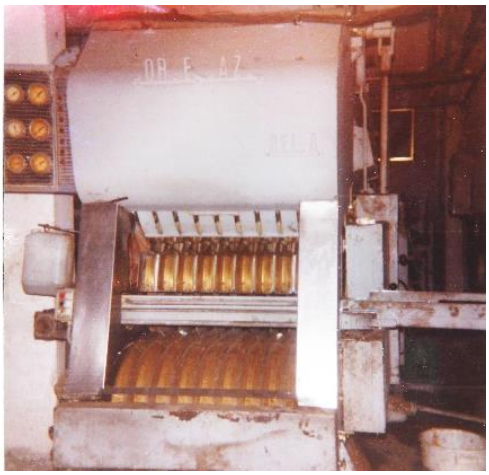

Figure 11. Pressurized washing chamber (Photo copyright: Author)
Figure 12. Bottle drying (Photo copyright: Author)




Figure 13. Secretary and mechanical details of the supply chain (Photo copyright: Author)
Figure 14. Machine with license plate M.A.G.A. s.r.l. Milano [Macchine Acque Gasate e Affini] was the second bottler for one-litter bottles with crown caps to which an aluminum screw cap capper was added (Photo copyright: Author)
Figure 15. Solution homogenization tank (Photo copyright: Author)
Figure 16. Bottler by E.B. FORM DI BARTOLA M. E C. S.A.S., which operates in the General Mechanics sector and as Third-party works. It is also present in the manufacturing and metallurgical steel industry sectors, Ancona, Italy (Photo copyright: Author)

Figure 17. Primary warehouse (Photo copyright: Author)
Figure 18. Entrance Cash and carry (Photo copyright: Author)

Marshall plan and the technology behind ice cream products

In the immediate after-effects of the world conflict, the United Nations Relief and Rehabilitation Administration brought massive volumes of supplies also consisting of skimmed milk excess production. The industries behind this ingredient were located in northern Europe (Gillespie, J. 2003). According to the Food and Agricultural program, led by the United Nations and in conjunction with the recent World Health Organization, dietary standards were lacking significant proteins among infants, therefore a new scientific feeding was included with the Marshall plan in Italy under the supervision of the Italian Amministrazione per gli Aiuti Internazionali (A.A.I.) whose mission was aimed to harmonize this new nutritional culture during the fifties and the sixties, so the atlantist paradigm benefitted with the promotion of a modern food education (Gillespie, J. 2003).

The technology behind the pulverization of this surplus milk was mandatory for the new ice cream, whose primary manufacturer was the Unilever Group (Jones, G. e Miskell. P. 2007). Nevertheless, the forerunners of this sector were not convinced by ice creams, so they started their ambition to produce in first place in the United States, therefore relatively late.

In accordance with the Anglo-American context, ice cream consumption was initially acceptable thanks to an empirical cold chain distribution system that implemented systematically hordes of vans to supply vendors, and it insisted with a massive retaliation of shops and restaurants supplied systematically with electric freezer cabinets, as well mounted on Ford Model T vans. Originally, the attrition among national producers led this company to new types of investments regarding the hygienic protocols that carried a depreciating Anglo-American campaign, also amplified by the foreign propaganda at the expense of Italian ice cream makers. This model of Americanization was common throughout the globe in the matter of market-domesticating (Talamayan, F. 2019).

In the last years of the fifth decade of the twentieth century, on the occasion of the European Economic Community, Unilever shifted strategy by embracing the protocol of a new accelerated European integration that occurred in the matter of internal investigations of the emerging potential of national mass diets and the edible fats that were addressed to their fabrication. The Food Study Group, after probing the basin of customers, concluded that the incoming well-being would have impacted positively on the affordance of diversified living standards: at this point, Unilever Group considered eligible the investment (Tipton, Linwood E. 1979) to afford Italian ice cream makers and their satellite firms as described as follows (Jones, G. e Miskell. P. 2007). Due to the extraordinary historical moment, and according to a wide range of references with fragments of oral pieces of information, the author of this paper is convinced that the Mondial Gelo industry benefitted from this Anglo-American technology in large anticipation, guaranteeing a remarkable geographical standpoint, as the southernmost industry of ice creams in Europe during the sixties.

Gelato and ice cream, misconception

A common misapprehension between the two products was related to the initial phase with pasteurization of the milk and cream (Panciera, D. Backer, Kellen. 2011. Food Science and Technology, 2021). This research highlights the processes of ice cream by the Mondial Gelo factory, which implemented specific types of machinery for the emulsion. The challenge behind this industrial complex, as we can observe, interested the emulation of artisanal gelato accomplishing new models that embrace delicate flavours in dessert creations.

The mechanics and chemistry of this chain are needed to overcome important problems as the emulsions incorporated more air. According to stratified literature over the decades, we might be able to conclude that the industrial production had incentivized new forms of engineering and sustainability (Kanse, Sarang & Rani,

Rekha & Shingh, Shuvam & Chopde, K. 2020. Celotto, D. 2021), from the design of gelato to the marketing and distribution of the finished product.

Ice cream structure	
▪ More than 10% milkfat	Or Milkfat between 10% and 16% in certain premium ice creams
▪ 9 to 12% milk solids-not-fat (MSNF) or serum solids: whey proteins, caseins, and carbohydrates (milk sugar)	▪ 12 to 16% sweeteners: obtained by combining sucrose and glucose-based corn syrup sweeteners
▪ 0.2 to 0.5% stabilizers and emulsifiers	▪ 55 to 64% water derived from the milk or other ingredients

Table 1. Organic components of the ice cream product (Food Science, Goff, Prof. Douglas)

As pointed out by an eminent paper (Zinni, M. 2016), the benchmark of production was highly dependent on the machines and therefore vulnerable if we consider the determined operational threshold instructed by the constructor. The demand was hence structured following periods of the year and assumed with high predictability per capita income as the risks to vanish maximum savings of scale (Arrighetti A. et al. 2014) could undermine the mass production of this innovative food.

Gelato da passeggio for the masses: a success named Mondial Gelo

Among Mr. Ciro Nasti's industrial initiatives, the ice cream division was undoubtedly the most advanced: Mondial Gelo s.n.c. was established by Mr. C. Nasti in conjunction with Knight of Labor Mr. Raffaele Simioli in a ratio of 50% -50%; the management was entrusted to Mr. C. Nasti as regards the administrative part, while the industrial and commercial part was managed by Mr. R. Simioli. Together, of course, they decided on strategic issues so that the rest of the Nasti family was not involved in this business; in the last stage of Mondial Gelo's timeline, these two owners decided gradually to acquire, small-medium enterprises (S.M.Es.) to enrich the market attractiveness in view of a potential acquisition at the gates due to the troubled blue-collar period.

Thereafter the Second World War, an extraordinary model of welfare encompassing regular salaries and paid holidays, enabled free time and the cult of wellbeing (Castronovo, V. 2014) with a hedonistic lifestyle that emphasized the recovery of the ancient sense of vacation, and consequently, a new dimension of socialization (Capuzzo, P. 2015) endowed with an innovative graphical aesthetic that highlighted the botanical, coastal, and morphological landmarks in synergy with the layout of the interior architecture (Napoli, A. 2020).

The accessibility was finally guaranteed by a modern infrastructural network brought into a new interior design language that welcomed high numbers of users during the summer season on the emerging model of Italian villeggiatura holiday plan. New architectural experiences pushed for the first linear subdivisions, sometimes upsetting the regulatory plans, and the places of consumption of ice cream dotted every corner (Corsini, B. e Legoprint. 2004. Napoli, A. 2020. Mangone, F et al. 2015); gelato product was hence possible to be consumed in a versatile way at any location (Gentili, M. 2020), under an umbrella or hammock, and it was the maximum to conclude a summer day and emblem of well-being for a family so that it became often depicted in Italian films of the second post-war era (Guareschi, G. 2020) "The session ended with a multitude of Tanara ice creams [...] because a Tanara ice cream actually represents the best end of any adventure". Tanara brand was part of the roman Toseroni flagship, commonly known for Eldorado and Algida partnerships, so Mondial Gelo name became another satellite trademark depending on this group.

An assortment of ice cream layouts by Toseroni and Tanara's was thus reproduced according to the Mondial Gelo design department at its factory on the Qualiano-Calvizzano avenue, that was architecturally characterized by a double-trussed iron vault still visible today and was assisted under the maintenance of specific key-role technicians switched with other eminent ice cream firms of the Italian second post-war era.

Figure 19. Blending of mixed ingredients (Photo copyright: Author)

Liquid and dry components of the early stage, were the main ingredients carried out from the trucks, chosen, weighted, and fallen inside the stainless-steel silos. Subsequently the rapid agitation ground down the amalgamation and pulverized it into powder. The result was chopped and fluidified with a liquid injection passing through a separate inlet that leads to a first dispersion. Furthermore, homogenization of mixed components included the aggregating and clustering of globules, by defining the displacement of fat that was reduced in the matter of a thinner and continuously modified whipped mix. The ice cream dough was hence mechanically structured and refined according to the appetency of consumers. Another stage was the pasteurization of blended amalgamations: to destroy the pathogenic bacteria, the entire biological control point of the system was entrusted to an advance electronic console for monitoring the inputs of the production chain. This phase is nowadays crucial to legally reach the biological control point. According to the Ontario (Canada) regulations, pasteurization occurs between 69° C/30 min. 80° C/25s for which the ranges involved heat exchangers, regulated by valves and automatic timers, which allowed necessary holding time.

Figure 20. Freezing/Whipping of ice cream (Photo copyright: Author)

The processed mix was poured down into a flavour tank in combination with any other liquid, fruit purees, and colours and injected across a dynamic freezing process that had the function to freeze the desired percentage of the water and whip air into the icy amalgamation in a matter of half a minute for portable ice creams, longer than ten minutes for batch freezers. To facilitate its characteristic portability and lightness, a considerable amount of air named overrun, and efficient stacks of dashers were implemented. The appearance of this semi-frozen slurry was analogous to artisanal gelato, with the addition of particulate substances such as pieces of nuts, fruits, candies, and cookies.

Figure 21. Injection of the blended amalgamations (Photo copyright: Author)

They passed in the matter of plate or double or triple tube: once the proteins were hydrated and the organisms spoiled, they crossed large, jacketed vats.

Figure 22. High-speed mechanisms (Photo copyright: Author)

The final injection into the ice-cream cups was entrusted to complex coordination of tolerances which granted a repetitive mechanical action. The springs were particularly designed to respond to the recoiling.

Figure 23. Molded Novelties of Mottarello design similarly Motta based ice cream (Photo copyright: Author)

The stacks were grouped in 16 stacks of shafts at once. Afterword the hardening, the operator had the duty to methodically transfer the arrays for the next stage of the bath of hot dark chocolate.

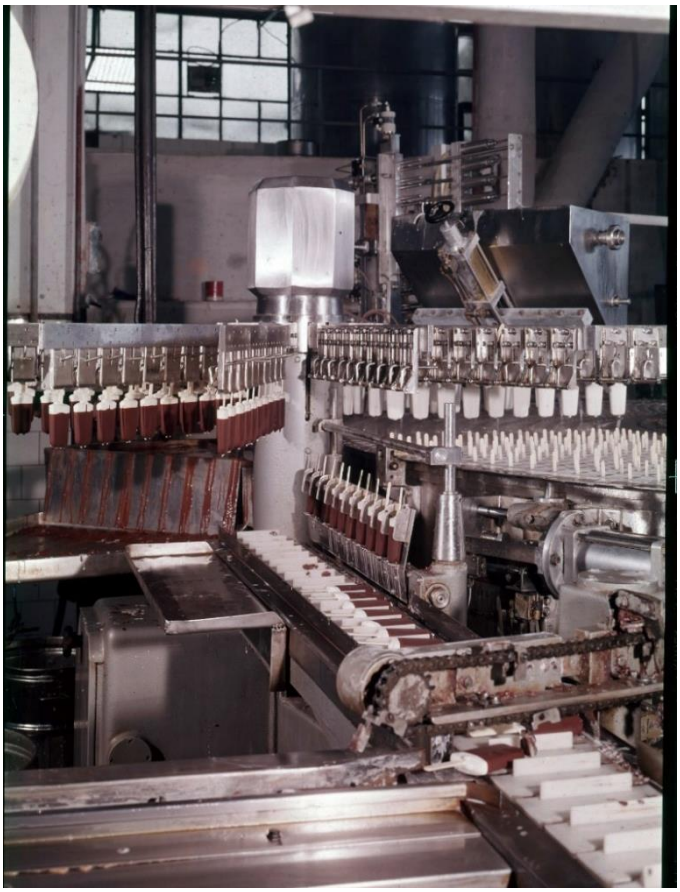

Figure 24. Hardening of ice cream (Photo copyright: Author)

The stacks were slowly dropped in the bath of dark chocolate, e.g., the wooden slats. The arrays were disjointed in the plastic conveyor belt once the new layer hardened and dried.

Figure 25. This electronic reporting system at Mondial Gelo industry (Photo copyright: Author)

This electronic reporting system at Mondial Gelo industry was specifically designed to monitor crucial steps of the food safety chain. In particular, the stage regarding the maturation of the mix. Hereby the globules were aged for a period of a few hours to overnight. The maturation allowed for crystallization of fats and hydrate the proteins and polysaccharides. The viscosity was also improved, and the protein/emulsifier interaction became rearranged. The performance of the aging process relied on insulated or refrigerated storage tanks, and silos below zero Celsius. Mondial Gelo industry was a pioneer in the ice cream manufacture, being capable at that

time, to provide an effective response to the temperatures and cycles of production under the warning of these analogue and digital indicators.

Figure 26. Another branch of Mondial Gelo products consisted of ice cream novelties that were disposable serving items that occupied the shelves from vendors to street consumption (Photo copyright: Author)

The variety was appealing and included icons of the Italian economic miracle on its packaging. The exchange with other factories regarding the ice cream models and their market share led to new improvements, that were constant at this point of Mondial Gelo trade and crucial to compete and attract foreign competitors.

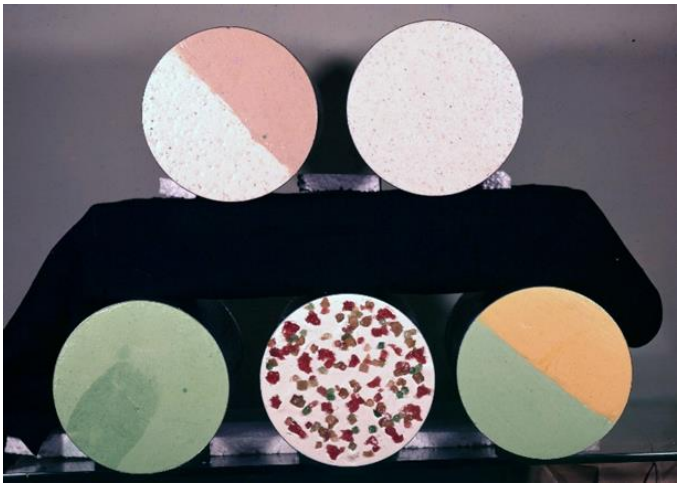

Figure 27. Among the features brought by Mondial Gelo company, a solid demand consisted of ice creams with no sticks which guaranteed versatility of design with the addition of syrup and other particulate matters (Photo copyright: Author)

Figure 28. Corporation design and quotas for women (Photo copyright: Author)

Mondial Gelo industry advocated the introduction of numerous women among the lines of its workers. Safety food code in this industry was a priority before the advent of modern H.A.C.C.P. (Hazard Analysis Critical Control Point) norms so that we can read distinctly the white hats and the logo on their uniforms. Packaging was a distinctive component of the brand, as emphasized by the ice cream box design, here ready to be inserted for the next delivery.

Acquisition and its foreign industrial shift

Mondial Gelo s.n.c. was acquired by Tanara S.p.A. in 1973, under the mention of Italgel S.p.A.
In the seventies, Motta S.p.A. was sold to S.M.E. Group, the financial company of the agro-food branch belonging to the I.R.I. group. Following the acquisition by S.M.E. also of Alemagna, the Motta ice cream division was fully incorporated into Italgel S.p.A., while Motta and Alemagna formed the Unidal (Union of confectionery and food industries) also known as Gruppo Dolciario Italiano, contributing to the S.M.E. group. In the following years the interviewees still remember the last employees in the administrative department of the headquarters, working in the ghostly and empty spaces stripped of advertising, industrial machines, and plant engineering.

It must be contextualized that this year was decisive for the liquidation, despite the vast success of the industrial enterprise with a production estimated at 57 models of product, due to the Energy crisis of the Kippur War (6-25 October 1973) which interested the OPEC countries involved in the embargo action. Furthermore, Knight of Labor Mr. R. Simioli's vision of cession was also a precursor of the difficult times ahead as two years later the unionist coup took over with the stiffening of leftist workers' policies in 1975 in Italy through the Workers' Statute by the politician Donat-Cattin, as promoted by strikes and occupations by left-wing syndicates between 1971-72.

Subsequently, Unilever acquired the partnership Motta-Nestlè S.p.A. and this model of acquisition was a typical example of the Unileverization strategy (Jones, G. et al. 2007) for which the ice cream companies were acquired, directly from the former family owners under the expertise of other managers, by offering company accountancy methods, technologies, and retirement income systems, which were usually exceptional to those employees from the purchased businesses.

So, the sovereignty to build market commodities was alluring and opposition to the Unileverization absorption, was uncommon so the Mondial Gelo's last traces ceased to exist under the control of foreign industries in 1977 (Jones, G. et al. 2007 page 10, chart by Reindeers, Licks). Gradually, the transformation of the whole Nasti's initiatives dropped the production of all drinks and relative products. This type of foreign incorporation arose from the seventies and included most of the Italian firms, demonstrating to be a solid practice by adopting long-term strategic goals for adapting the over-diversification of the opening post-war era, and allocating lasting technology to forward upcoming competitivity.

Conclusions

Cultural incompatibilities and employee resistance caused well known problems. Nevertheless, this environment was well managed with the supervision of Mr. Ciro Nasti, who allowed the introduction of pedagogical teaching of the working process addressed to the food-science and administrative traineeship

(Lude. M. e Reinhard P. 2018). His paternalistic and human-centered figure has promoted a strong leadership facing off workers' movements (Cappelli, L. 2016. Benenati E. 1997. Cappelli, L. 2016) that culminated in a parliamentary debate (Risposte scritte ad interrogazioni. Discussioni. Atti Parlamentari, 1972) for unstated and unconfirmed reasons that cited 63 workers and traineeship programs. Despite of the unclear demonstrations, the senior founder introduced a higher percentage of female laborers (Betti, E. 2010. Bellassai, S. 2021), and endorsed a modern balance of men and women in decision-making bodies, in contradistinction to other realities of Northern Italy that were far from approaching atlantist family's vision (Patton et al. 2000. Craveri, P. et al. 2004), thus embracing collectivist separation of the working class.

This aspect led to urban separations among working classes in northern Italy (Maggioli, M.) clearly an industrial macro-region, but in the periphery of Napoli we do not assist in a remarkable proletarian ghettoization (Gomellini, M. e G. Toniolo, 2017), because of the harmonization of small manufacturing workshops within the inherited nineteenth-century town planning.

However, the emerging set of normatives did not fully meet the existing conditions: many were the problems concerning the production of gassosa beverage, that afflicted the adapting to newer H.A.C.C.P. regulations herewith the premises, such as the location of the machines, the ambiances heights, the building materials, and general occupation, would not have guaranteed all the safety standards that were later much more stringent; the evolution of the notion of food safety not by chance switched from the Italian to EU legislation and pushed the acquisition of newer industrial machines adhering to emerging safety planning.

The residual machines, although functioning, did not offer an adequate level of performance in the race with other competitors, so the competition for new ingredients and the relocation of this industry did not meet to find its location within an industrial area in a different place, accordingly to the remaining entrepreneurs in charge of this family, so that their financial willingness, the surviving beverage and ice creams chains remained abandoned within this urban periphery, followed by transformations for the residential and tertiary sector.

The managerial preparation for the new questions, as to whether to join important reform initiatives at an economic level, was not fully satisfied and an emerging cabinet of professionals was chosen among the components of Nasti family, forwarding to the Società di gestioni e partecipazioni industriali (G.E.P.I.) from 1971 (Landolfi, A. et al. 2011) in order to avert serious employment crises, and that nowadays continues the mission of this family, to produce the Italian breakfast in the matter of fine pastries on an international scale with significant success, as well as other minor and independent agro-food-making enterprises.

In conclusion, the economic renaissance occurred between the sixth and seventh decade in Italy, led to a awoke and contrasted society, characterized by class divisions, forums, and new thinkers in the Italian scenario, for instance the writer Pasolini, who self-doubted, whether this Italian miracle led to a significant wealth or not, at the expenses of the environment and society, or merely promoted an elusive feeling of freedom (Pasolini, P. 1975).

Figure 29. Industrial archaeology of the other initiative of Mr. Ciro Nasti: *Fratelli* Nasti factory in Calvizzano during the late '80s (Photo copyright: Author)

The offices were gradually emptied by the spoiling of the last accounting machines at the mezzanine. The corners were very well remembered by the witnesses for the scattering of hundreds of papers, modern Olivetti and IBM computers equipped with printers, commercial adverts, and barrels of oil. Copyrights, all rights reserved: Author.

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Conflict of Interests

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PART 03.
VALUES, WATER, AND THE CITY

Water tells the story of humankind in all its stages. Its value arose as server of societies over time until our present day. Although water bodies act today as a significant spine which preserves a life system, yet it reveals several challenges that we need to improve in our urban life.

CHAPTER 9. The Grid that Remained: Redating the Coastal Urban Morphology of Ayvalık

Hasan Sercan Sağlam

Introduction

Ayvalık is a coastal Aegean district of Balıkesir Province in the northwest of Turkey. It is surrounded by Gömeç in the north, Dikili in the south, and Bergama in the east. The natural environment of Ayvalık has enabled it to have a small inland sea enclosed by the Cunda (Alibey) Island in front, which serves as a sheltered natural harbor. Its wider geography is delimited by the Madra Mountains (1341 m) in the mainland.

The historical city center of Ayvalık with approximately 1500 listed buildings is an urban protected area since 28.10.1989 (BKTVKK, 1989/795). Having numerous monumental examples of the celebrated West Anatolian civil architecture, it has a grid planned urban layout all along the plain coastline that are at right angles to each other. On the other hand, the surrounding neighborhoods of this area towards hilly parts have a morphological character with an irregularly arranged road network. That particular coastal zone covers an approximate area of 13,2 ha, including the Republican extensions, and to a large extent has the industrial core of the traditional olive oil production. In this case, it was substantially subjected to a UNESCO World Heritage Tentative Listing decision in 2017 about the industrial landscape of Ayvalık, and is internationally

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appreciated (UNESCO, 2017). From a national heritage protection perspective, the 1/1000 and 1/500 scaled conservation master plans of the Ayvalık historical city centre were initially approved by Bursa Cultural and Natural Heritage Preservation Board (BKTVKK) on 22 January 1994 with the decree no. 3622 (Ayvalık Municipality, 1994). However, both of them were annulled on 23 November 2018 by Balıkesir 1st Administrative Court, based on the decrees no. 2017/1352 and 2018/1635 (BBB, 29.09.2020/642). Meanwhile, work on the new conservation master plan is still in progress.

The urban and architectural heritage of Ayvalık, which is mainly from the late 19th and early 20th centuries, is a popular research subject. However, the origin of its regular urban morphology along the coastal plain was hardly explained. It was superficially interpreted as a new development from the 1850s, which as a whole was supposedly formed on reclaimed lands after the return of inhabitants from exile starting from 1824 and with the help of debris that appeared after the complete destruction during the Greek Revolution in 1821. This curious, though unfounded hypothesis of a massive fill area was initially put forward and championed by Psarros (2004; 2007; 2017) basically after vague evidence and seemingly a stylistic conditioning for the main zones of Ayvalık with different morphological characteristics. Afterwards, the aforementioned hypothesis set basis for a group of later urban studies about Ayvalık and was appreciated, mainly by Uztuğ (2006), Terzi (2007), Özel (2011), Çakıcı-Alp & Aykaç (2017), Kabukçu (2018), and Özaydın et al. (2018). Therefore, as if a well-established starting point for every new study about Ayvalık, it has eventually become a significant phase of the urban chronology despite its fundamental flaws, and was not questioned since then.

This chapter presents new research for the grid coastal urban morphology of Ayvalık through primary sources, while the literature was also criticized. The consulted archival sources include a so far unstudied cadastral plan as a remarkably earlier Ottoman practice (BOA, HAT, 01219-47728, H. 29.12.1243). Moreover, after a compilation of demographical statistics for the 19th and 20th centuries and measuring the expansion of the historical city center, an experimental population density survey was carried out as a retrospective crosscheck for the approximate area of the city and the number of inhabitants it could house around 1821.
According to findings, the present grid urban layout of Ayvalık certainly predates 1821 and presumably appeared during the 17th-18th centuries. The surface area of reclaimed lands on the coast in the later 19th century is in fact roughly 3,7 ha. The supposed pre-1821 layout of the city in the literature is actually insufficient to house the approximate population at that time. The paper also raises the question about the implementation of grid plans in the Ottoman territories before modern urban planning practices starting from the 19th century, such as in Kuşadası. The paper additionally underlines the importance of interdisciplinary methodologies in urban studies instead of stylistic assumptions as well as basic comparisons after preconditioning without consulting authentic primary sources.

Methodology

Five main steps were followed during this research, accompanied by relevant sources for each of them and a critical reconsideration of the related literature. In the beginning, the hypothesis of Psarros (2004; 2007; 2017) about a massive land reclamation followed by a grid urban development in the mid-19th century was questioned by origin. The written sources that the scholar consulted for this assertive argument, namely the testimonies of Apostolakis (1914) and Karamplias (1949) were obtained and reinterpreted in terms of contents and reliability from an urban point of view, in comparison to the final argument in the literature.
A thorough archival research was then carried out for the Ottoman, Greek and Western primary sources in order to find evidence about the urban layout, preferably plans, and also reliable population statistics of Ayvalık throughout the 19th century. A formerly unpublished and unstudied cadastral plan dated 1823 formed the core of this research, which shows the cadastral layout, road network and partially land use of the city right after its complete destruction and abandonment in 1821 (BOA, HAT, 01219-47728, H. 29.12.1243).
Thirdly, the aforesaid cadastral plan was redrawn and separately analyzed by the contents it has. In order to detect the course of the former coastline, the main arteries and the coastline were highlighted and compared with the present layout of Ayvalık. Because of the distorted linear layout of the old cadastral plan, the comparison was done one after the other instead of a direct superposition.

Afterwards, a retrospective experiment was done for historical population densities and surface areas of Ayvalık. With the help of a series of population statistics between the mid-17th century and early 20th century in comparison to the historical city center area at its greatest limits, an average household size and approximate gross population density were calculated for the whole urban core by the early 20th century, which allowed projections for earlier periods in terms of surface areas that needed certain numbers of inhabitants.

In the end, to support the possibility of the grid plan usage before the 19th century in Ottoman territories, a search was carried out for another case study from West Anatolia. Moreover, Turkish urban planning practices in the 19th century were briefly examined to discuss the problem and to assess the Ayvalık cadastral plan.

Historical Background of Ayvalık

It is not yet possible to talk about a direct positional correspondence between the main modern settlements within the administrative borders of Ayvalık and ancient Herakleia / Elateia, Por(d)oselene / Nasos, and Chalkis that existed in the region (Talbert, 2000, p. 851, 856, Map 56). As a matter of fact, especially for the exact locality of Ayvalık historical city center, there is a chronological disconnection that can be expressed with centuries. As of 1574, there was no settlement in the locality of Ayvalık that remained within the Ayazmend District (Sevim, 1993). Local sources briefly argue that Ayvalık was founded around 1580, called "Κυδωνίες" (Kydonies = Quince) by the Greeks (Şahin-Güçhan, 2008, p. 55). The former building inscription of Taxiarches Church in the center of the oldest quarter of Ayvalık is dated 1753, which is on display in its courtyard (İnce-Güney, 2016, p. 42-43). The main neighborhoods of Ayvalık were founded one after another until the mid-19th century including central parish churches with rich architectural elements, which had subsequent reconstructions (İnce-Güney & Uçar, 2011, p. 166-169; Özel, 2011, p. 23-25; Psarros, 2017, p. 104). It has been said that Ayvalık first developed around Taxiarches Neighborhood that its present church building from 1844 is now a museum (Uçar, 2013, p. 58-59; İnce-Güney, 2016, p. 43; Büktel, 2018, p. 68-69). By the mid-17th century, Saint Demetrius Neighborhood appeared towards its north that Panagia Portaitissa from 1899 as a secondary shrine of this quarter is in an abandoned state today, in the northern fringe of the settlement (İnce-Güney, 2016, p. 40-41; Psarros, 2017, p. 104). The aforesaid quarters were followed by Saint John and Mesi Panagia in the mid-18th century towards the south. In the further south, Kato Panagia appeared around the same time that its present church building from 1850 serves as Hayrettin Pasha Mosque, while the former Saint John Church from 1870 is Saatli Mosque (İnce-Güney, 2016, p. 40-44; Büktel, 2018, p. 73-75). Saint George and Saint Nicholas linked the northern and southern parts in the beginning of the 19th century that the final church building of Saint George dated 1881 now functions as Çınarlı Mosque (İnce-Güney, 2016, p. 41-44). Afterwards, the neighborhoods of Saint Basil, Prophet Elias, Saint Charalambos and Holy Trinity appeared until the mid-19th century, around the hills and also towards further south. Being a secondary shrine of former Saint Charalambos, the Neoclassical Panagia Phaneromeni (Agiasma) Church dated 1890, with a holy spring, is now a museum (Uçar, 2005, p. 50, 55; İnce-Güney & Uçar, 2011, p. 170-180). The Church of Holy Trinity from 1846, then used as a depot, is recently in a ruined state (Uçar, 2014a, p. 8-9). Most of the existing buildings in the city today, including churches were built 1850 onwards, as their building inscriptions display (Özel, 2011, p. 19). Ayvalık historical city center eventually reached its greatest extent with 11 parishes by the early 20th century, all along the coastal plain and also towards the hills that rise above lower parts (Figure 1).

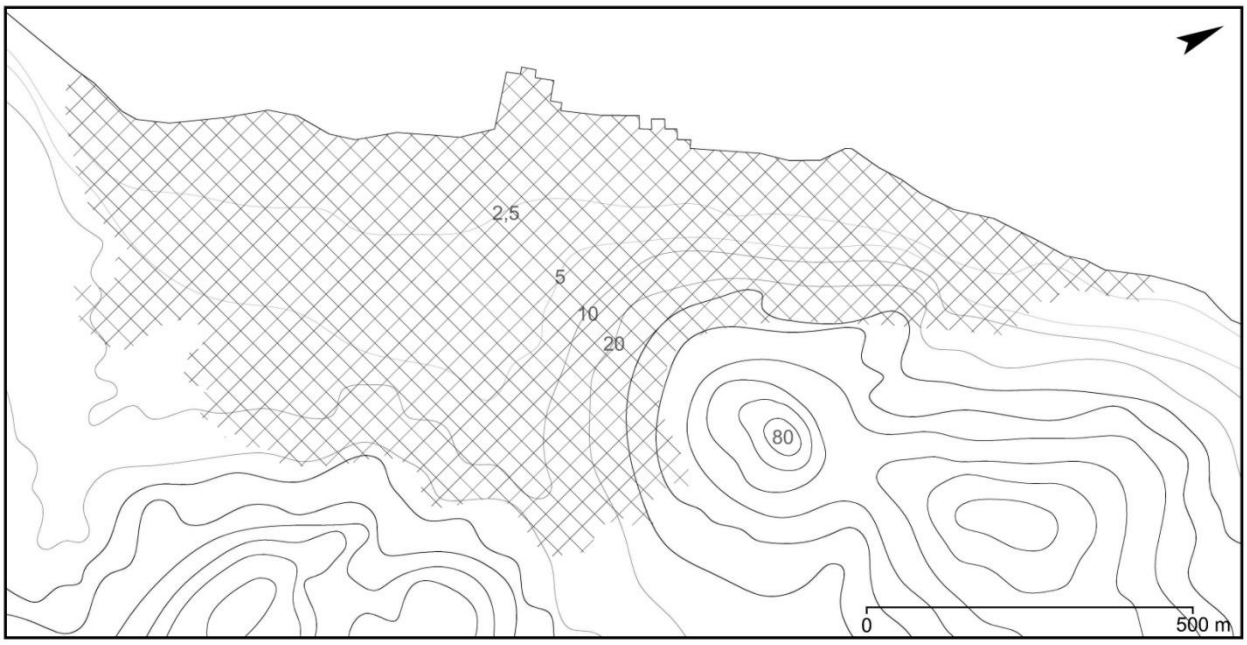

Figure 1. Topography of Ayvalık (Sağlam)

A local tradition indicates that a priest called John Demetrakellis-Oikonomos set relations with Hasan Pasha of Algiers, Grand Admiral and then Grand Vizier (r. 1770–1790), and enabled Ayvalık to gain autonomy with an imperial edict around 1789. Accordingly, Turkish families would be transferred and only Greeks would live there, exempt from the kharaj and jizya taxes, but would pay a fixed annual tax (Aka, 1944, p. 23-26; Gücü, 2012, p. 119-121). Even though such an edict has not yet been found in the archives, the homogeneous Greek population and urban development with an exceptional acceleration indeed recall a privilege. For

instance, the Greeks of Ayvalık were able to build new churches even before the Tanzimat Period, where fundamental architectural restrictions for the shrines of non-Muslims were eventually lifted (Gümüş, 2008, p. 222-223; Karaca, 2008). Yet, this situation has also been interpreted simply as a result of the Treaty of Küçük Kaynarca dated 1774 (Bayraktar, 1998, p. 10). In addition, there were curiously no Turkish residents and also no mosque until the end of the 19th century (Özel, 2011, p. 34-36). It should be still noted that sources describing the efforts of Demetrakellis-Oikonomos about an autonomy date back to 1817 (Firmin-Didot, 1821, p. 376-377). In any case, this period of Ayvalık continued with prosperity even after the devastating Greek Revolution in 1821 and it developed with the Tanzimat Period on the foundations laid during the so-called autonomy. When combined with the commercial potential of olive oil industry and infrastructural improvements, Ayvalık transformed from a small coastal village into a major commercial harbor city within a century (Uçar, 2014b, 21-23; Akın-Akbüber, 2015, p. 15-17).

After the conflicts of 1821 that caused complete devastation and abandonment, an effective restoration policy was introduced in November 1823 with an imperial edict, which allowed the emigrated residents to return, and provided them tax exemption. The returns began in October 1824 and the confiscated properties were gradually given back. Yet, olive groves as the most important potential of Ayvalık were included in this process only in 1831, which lasted until 1834 (Genç, 2007, p. 295-302).

Ayvalık was a district of Karesi Sanjak under Hüdâvendigâr Vilayet during the Ottoman period. It was one of the major harbor cities of the Aegean coast, had high commercial circulation based on fruitful olive oil industry and tanneries, and also had a cosmopolitan demography in a characteristic urban layout with dense industrial and residential clusters (Uçar, 2014b, p. 22-25; Akın-Akbüber, 2015, p. 10-14; 2020, p. 811-814). Due to armed conflict conditions during the Turkish War of Independence (1919-1922), the city once again faced with destruction and abandonment. With the forced population exchange in 1923, Ayvalık permanently lost its initial residents, who were replaced by the Turks from Lesbos, Crete and Thrace (Turan, 2008; Anastassiadou, 2012). The arrivals were less than half of the population by the beginning of the 20th century, which caused decay in the urban fabric, including the loss of 6 parish churches. The historical city center reached that population only in the 2000s (Balcı-Akova, 2011, p. 59; Yaman-Kocadağlı, 2011, p. 103). The construction of Atatürk Boulevard with a widening through successive demolitions in the northern quarters, and also a longitudinal strip of land reclamation (approx. 1,2 ha) along the southern coastline can be mentioned as the most significant work that had impact on the urban fabric in the mid-20th century (Şahin-Güçhan, 2008, p. 64-66) (Figure 2).

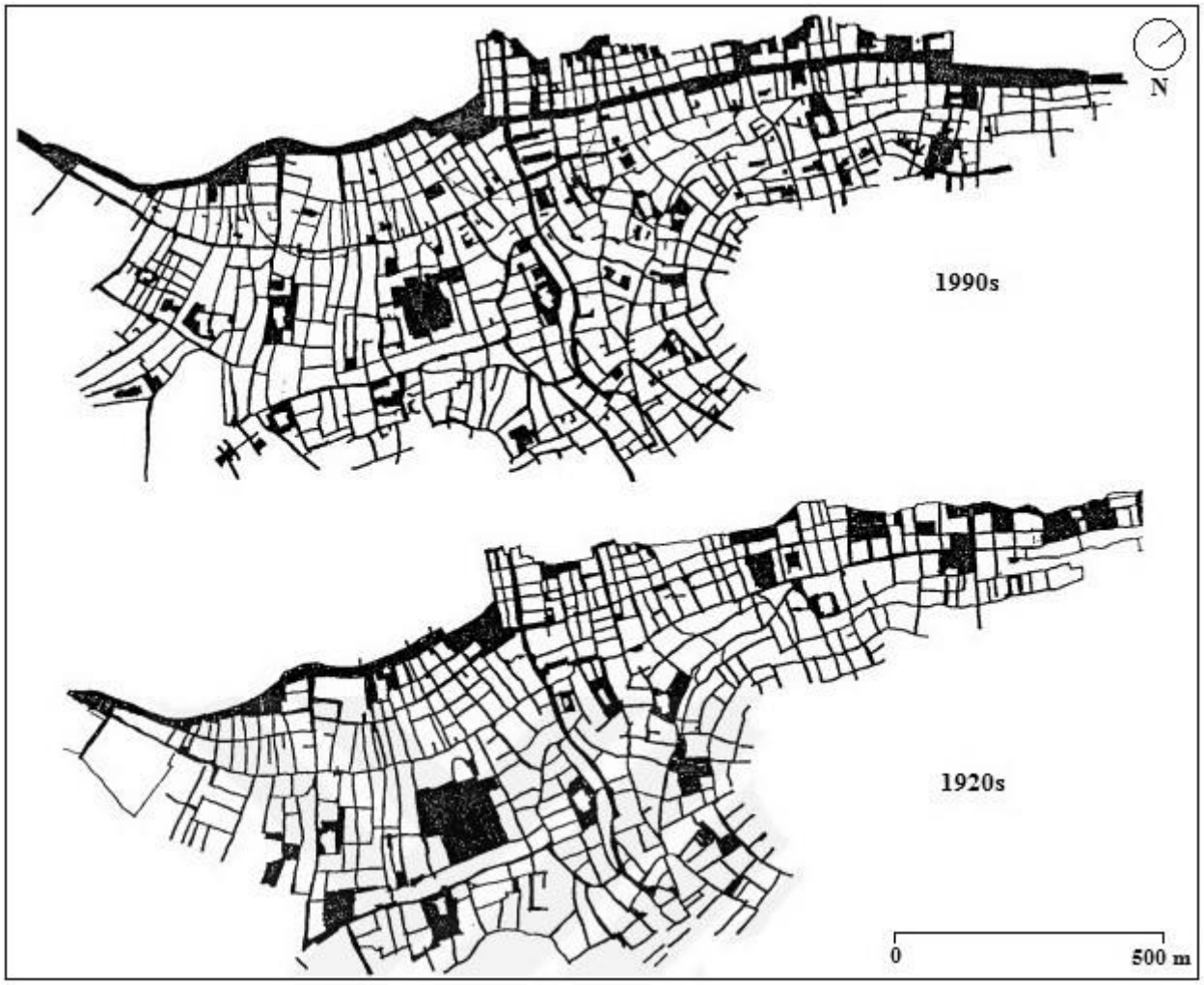

Figure 2. Urban morphology of Ayvalık (Kıyak, 1997, p. 69).

Redating the Grid

Literature Review: Current Arguments and Related Testimonies

The argument about a massive land reclamation from the sea through debris that appeared after the devastation of 1821, which then led to a grid planned urban morphology around the 1850s along the coast, was first and in fact only put forward by Psarros (2004; 2007; 2017) as a rather brief and factual statement simply after the testimonies of Apostolakis (1914) and Karamplias (1949), accompanied by a series of schematic plans about the historical urban development of Ayvalık. No further primary source from the rich 19th century Ayvalık literature mentions such a redevelopment at all. This crucial, though telegraphic argument textually appears more or less the same in all the related studies of the scholar in question without any further supplements, and is as follows:

> "By 1850, most residents had returned and houses and churches had already been rebuilt or repaired. In Ayvalık, the coastline has been shifted 100 to 200 m to the west, from the ruins of the disaster that were thrown into the sea." (Psarros, 2004, p. 15; 2007, p. 501-502; 2017, p. 44, 120)

Among the two sources that Psarros (2004; 2007; 2017) cited for the aforesaid breakthrough argument, a short testimony by Apostolakis (1914) appears as the oldest one by date, which is as follows:

> "Natural alluviums and technical fillings were made along the coast, so the shoreline is deeper and outside today, where houses, warehouses and factories were built." (Apostolakis, 1914, p. 64)

The second and final source quoted for the same reason is a much later statement by Karamplias (1949) about the topographical development of Ayvalık, which is as follows:

> "Around the middle of the city a torrent crosses, which takes the flowing waters from the highest slopes of the Saint Anthony and Prophet Elias hills and proceeds to the sea. This torrent, commonly called river, is exactly the one that with its alluvium, the lower part of the city towards the sea was formed in ancient times, probably more than 200 meters long." (Karamplias, 1949, p. 45)

As a final and perhaps the most striking demonstration of the argument in question visually, when considered the series of schematic plans about the historical urban development of Ayvalık, the whole coastal grid was considered as a mid-19th century land infill, therefore was torn off from the rest of Ayvalık and was interpreted as a new urban development (Psarros, 2004, p. 19; 2007, p. 508; 2017, p. 112-113) (Figure 3).

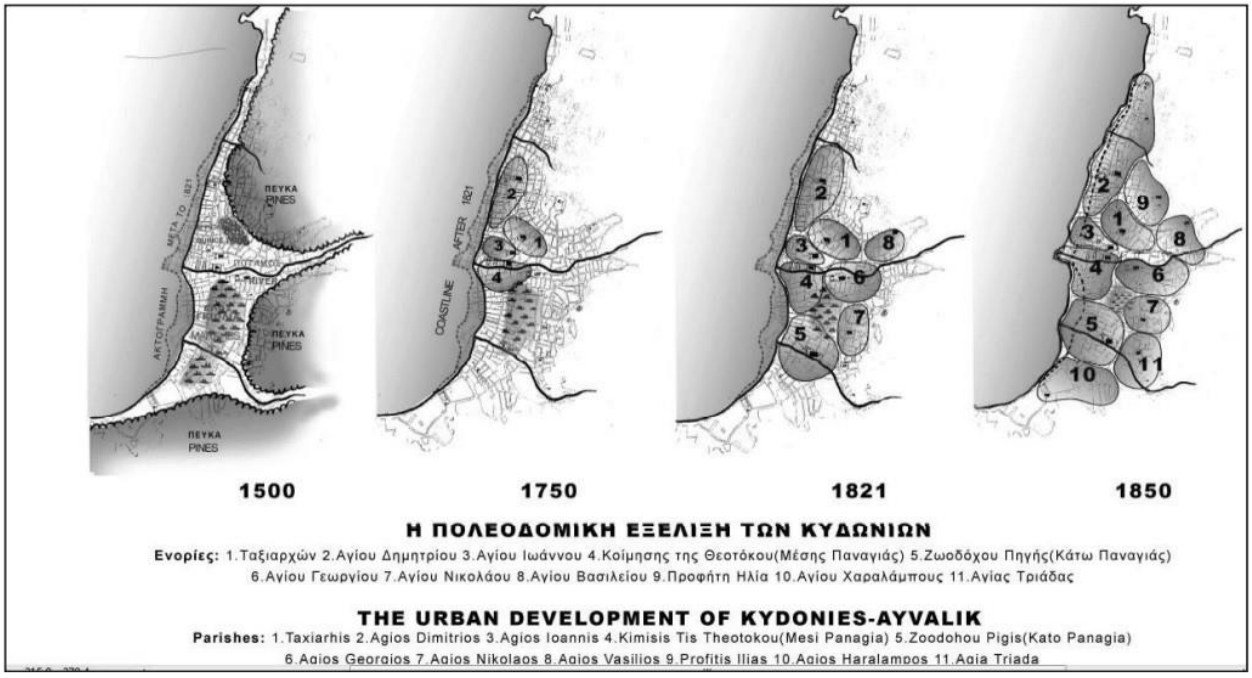

Figure 3. Supposed historical urban development of Ayvalık (Psarros, 2004, p. 19)

Later scholars, who intended to refer to the historical urban development of Ayvalık without exception appreciated and in part also polished up the argument despite its brevity as well as lack of primary sources about an unarguably major urban transformation. For instance, while Uztuğ (2006, p. 5, 7), Terzi (2007, p. 25, 27, 33-36), Çakıcı-Alp & Aykaç (2017, p. 425), Kabukçu (2018, p. 72, 120) and Özaydın et al. (2018, p. 11) textually as well as visually considered the argument of Psarros (2004; 2007; 2017) about the coastal urban morphology of Ayvalık, Özel (2011, p. 19-22, 27), keeping onside the general literature about the history of urban planning, carried it one step further and interpreted the grid morphology of Ayvalık as a usual urban application like in all settlements planned from scratch through modern planning practices. However, a so far unpublished cadastral plan of Ayvalık dated 1823, and presented below, nullifies all the previous arguments in the literature.

An Unstudied Primary Source: The 1823 Cadastral Plan of Ayvalık by Francesco Casciai

The plan, measuring approximately 25 cm x 195 cm with an excessive longitudinal format with four sheets in total, was found in the Ottoman State Archives (BOA) under the section "hatt-ı hümâyun" (HAT) and with the registry code 01219-47728 (Figure 4). It has a linear scale of 200 m in the lower center, divided into quarters that the first one additionally has units. The plan shows the whole coastline of Ayvalık and to some extent also the road network and city blocks, as inner parts remain largely incomplete for some unknown reason. The work is actually a cadastral plan that indicates plots instead of buildings. Few of them are marked with Arabic numerals to demonstrate land use but many of them appear unmarked, which is another curious deficiency of this work. Usual plots are scarcely marked with the numbers 2 and 3. A main artery in the center is marked, perhaps symbolically, with the number 4. Bold cut out dots indicate reclaimed lands along the coast that some of them are additionally marked with the number 5 (Figure 5).

The plan has a four-line makeshift legend in Ottoman Turkish towards the left-hand side, probably added later to the incomplete plan together with the aforementioned numerals that it refers to, which is as follows:

> "2 ikinci hanedir | 3 üçüncü numro arsadır | 4 dördüncü numro tarikdir | 5 beşinci numro kazıklanmış mehdden mahaldir"
> (2 the second one is residence | 3 the third number is plot | 4 the fourth number is road | 5 the fifth number is piled cradle site)

A two-line note in Italian, followed by a signature of the planner, can be seen on the right-hand side of the linear scale, which is as follows:

> "Fatto in 'Aivali il mese 'di Maggio 1823 | Francesco Casciaj Ing. Toscano | [signature]"
> (Done in Ayvalık, the month of May 1823 | Francesco Casciai, Tuscan Engineer | [signature])

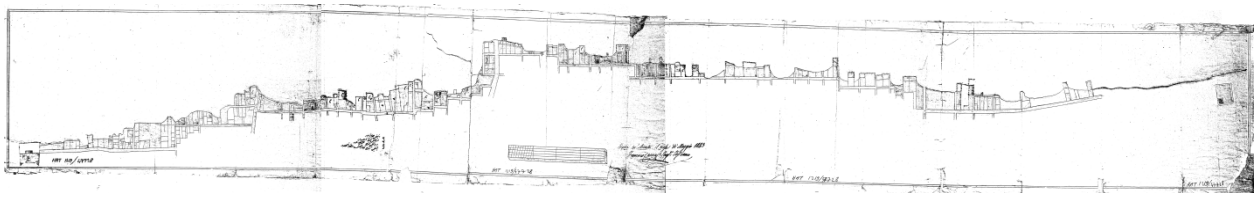

Figure 4. Cadastral plan of Ayvalık dated May 1823 (BOA, HAT, 01219-47728, H. 29.12.1243)

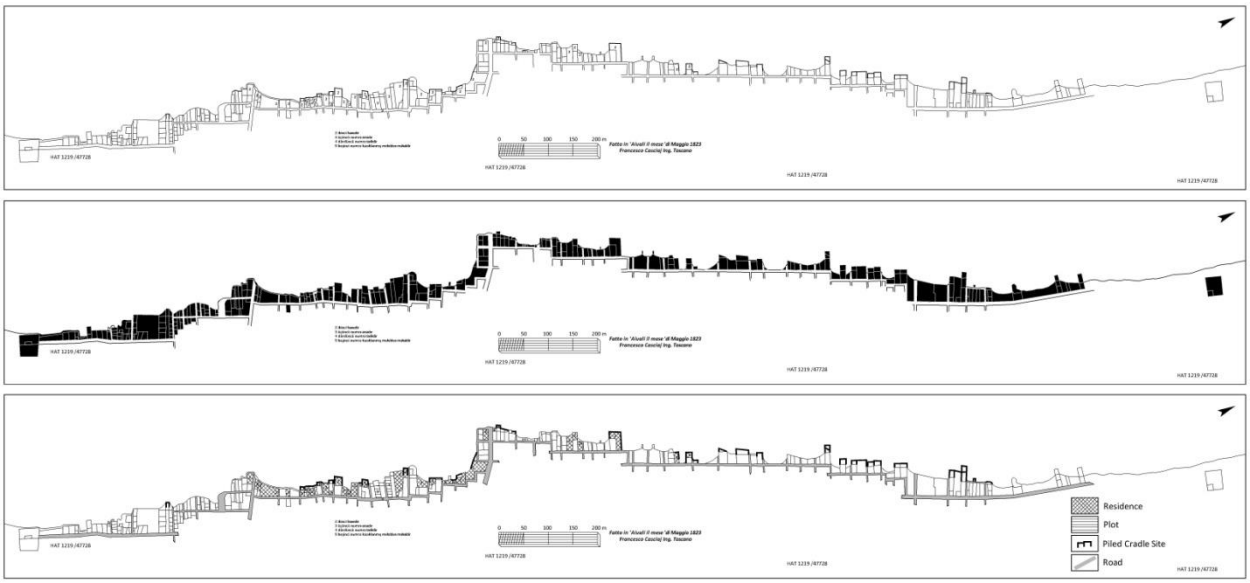

Figure 5. Cadastral plan of Ayvalık dated May 1823 redrawn; urban morphology; and land use (Sağlam)

Engineer Francesco Casciai was apparently a citizen of the Grand Duchy of Tuscany with the capital city of Florence, as the plan predates the Italian Reunification (1848–1871). His ancestors were probably from Cascia, Perugia. It is possible to come up with his name in several Florentine registries about juridical issues from 1824 and 1844-1845 but specific information was not found (Cantini & Nenci, 1830, p. 364; Palamidessi, 1845, p. 2). The presence of Francesco Casciai in the Ottoman Empire and his cadastral work on Ayvalık certainly need further elaboration.

The plan actually shows the state of Ayvalık by May 1823, in a time when it was completely abandoned and devastated since June 1821 due to the dramatic events related to the Greek Revolution, and when all the properties were confiscated by the state. Moreover, the archival subsection of the plan as "hatt-ı hümâyun" indicates that it was appertaining directly to the Ottoman sultan himself, namely Sultan Mahmud II (r. 1808–1839). As previously mentioned, a restoration policy was introduced in November 1823 by him, which allowed the emigrated residents of Ayvalık not only to return but also to get their confiscated properties back, while the returns officially commenced only in October 1824 (Genç, 2007, p. 295-302). In this case, it can be argued that the plan was prepared as an urban inventory, and with this preliminary preparation it was presumably aimed to better organize the restoration process with the returning inhabitants and the plots they were about to reclaim upon arrival starting from late 1824. The archival registry date of the plan as H. 29.12.1243 (12.07.1828) despite its earlier preparation further supports this argument.

The main arteries on the plan precisely follow modern Barbaros [1], Fecir [2], Gülbahar [3], Talatpaşa [4], Eski PTT [5], Gümrük-2 [6], Atatürk [7-8], and Cumhuriyet [9] streets from the south to the north, respectively (Figure 6). According to the plan, as of 1823, there were already some reclaimed lands from the sea through piling, which formed few, singular and rather small plots along the coast. The plan also shows that the existing grid layout of Ayvalık with a surface area of roughly 12 ha, excluding Republican extensions, certainly predates 1821 to a large extent. Thus, it perchance appeared during earlier urban expansion phases in the 17th-18th centuries.

It also appears that the surface area of reclaimed lands between 1821-1923 is around 3,7 ha in total, which is considerably less than the unfounded former supposition that continued to be quoted by later scholars. Moreover, even though the hypothesis of Karamplias (1949) about the topographical evolution of Ayvalık in antiquity remains totally irrelevant to an urban morphology discussion in the context of the 19th century, it was pointlessly cited by Psarros (2004; 2007; 2017). In this case, the testimony of Apostolakis (1914) that lacks any technical details seemingly defined those comparatively less reclamations of 3,7 ha, as houses, warehouses and factories were indeed built on them. Yet, any direct relation of those works to the debris that appeared in 1821 remains dubious, since the southern portion of the small cape of Ayvalık is still missing on two photos dated 1893, where the iconic Kanelo café is located today. The photos are further important to provide slightly later examples to “piled cradle sites” shown on the cadastral plan dated 1823 (Figure 7). Moreover, two Ottoman archival documents dated 20.08.1899 and 12.11.1899 indicate permission for the places that the people of Ayvalık wanted to reclaim from the sea, including required maps and deeds (BOA, DH.MKT., 2235-118, H. 12.04.1317; 2269-52, H. 08.07.1317). Thus, it can also be argued that Apostolakis (1914) actually defined much later as well as multifaceted reclamations than the 1821-1850 period. In the end, in terms of the most significant effects to the historical urban fabric of Ayvalık, several protrusions appeared along the northern half from the central cape and the flat cove in the southern half was largely filled, until the early 20th century.

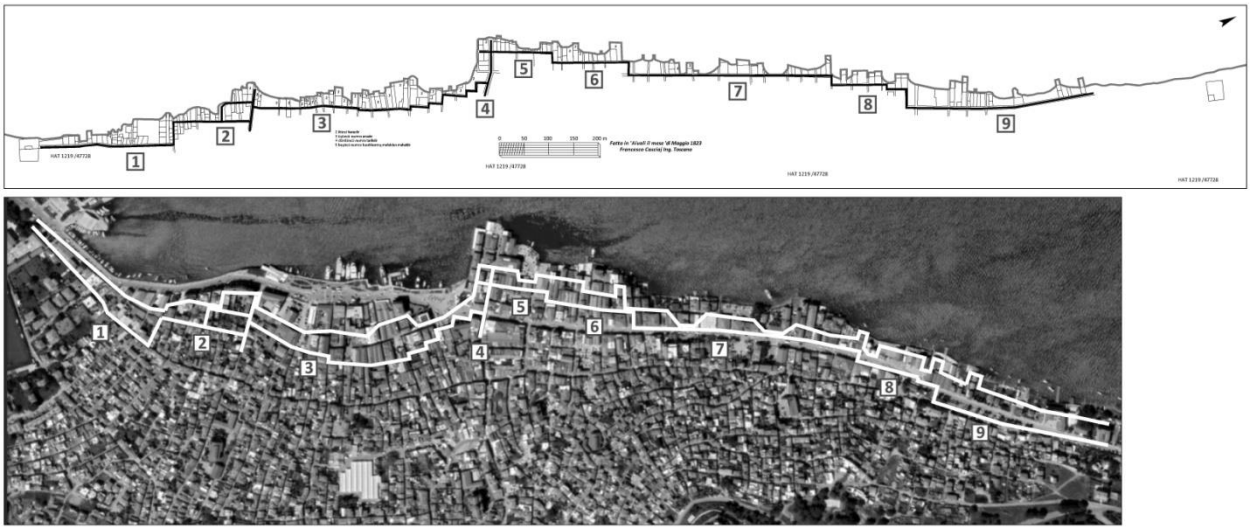

Figure 6. Comparison of the cadastral plan dated May 1823 with the current layout of Ayvalık (Sağlam)

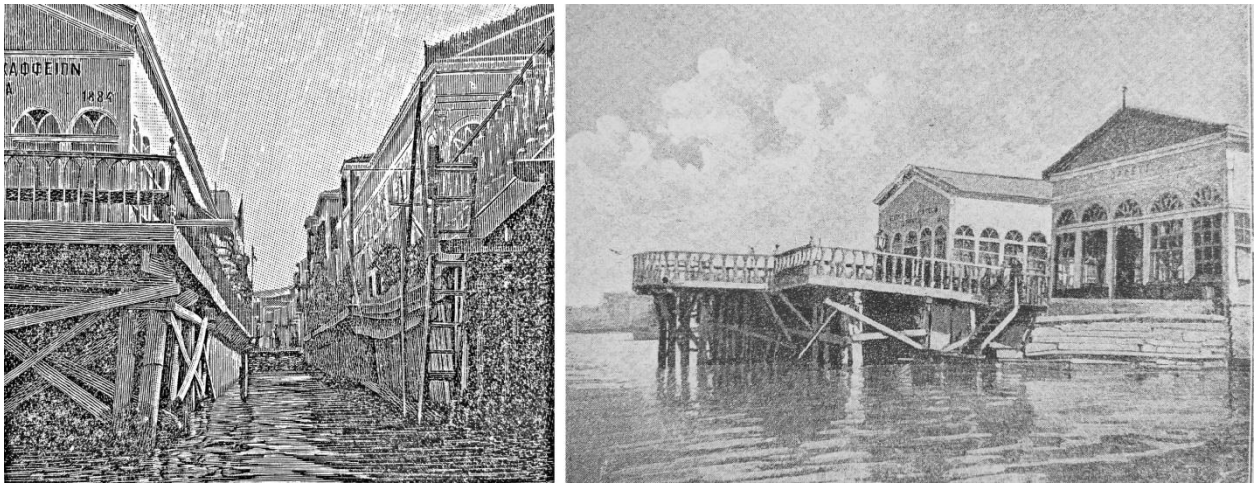

Figure 7. Cafés and the small river on the central cape of Ayvalık, as of 1893 (Kaptan et al., 2019, pp. 95-97)

A City Too Small: A Historical Population Density Experiment after Demographical Statistics

It is possible to find further information in primary sources about the historical urban development, topography, and demographical statistics of Ayvalık to provide an indirect verification for the approximate area of the pre-1821 city through a population density experiment, which also corresponds to evident contents of the cadastral plan dated 1823. An Ottoman Imperial Divan registry dated 17-27 July 1701 notes a request of the Greek residents of two neighbourhoods of Ayvalık from the sultan to repair the partially ruined ancient church (kadîmî kilise) there, reportedly remained from the time of the conquest (fetih zamanından) (BOA, A.DVNSMHM.d., 111-2169, H. 10-20.02.1113). In the Codex of Jerusalem (Κώδικα 'Ιεροσολύμων), no. 509, fol. 49b, there is a donation list dated 10 September 1653 that mentions 33 beneficent households from Ayvalık with 172 family members in total, therefore indicates an average household size of 5,2 by the mid-17th century (Patrinelis, 1993, p. 15-17). As a comparison, the population was 27.968 in 5719 houses by 1906 (HVS, 1906, p. 550), therefore the average household size eventually decreased to 4,9. In 1668, M. des Mouceaux described Ayvalık as: "large village, built partly on the mountain, partly on the shore" (Bruijn, 1725, p. 455). An Ottoman jizya tax registry of Ayvalık dated 14 September 1691 mentions a grand total of 531 non-Muslim, namely Greek households in 4 neighborhoods that 461 of them were suitable for taxation, which were classified as 127 rich (âlâ), 206 average (evsat) and 128 poor (ednâ), according to prosperity (BOA, MAD.d., 297, H. 20.12.1102). Thus, when multiplied by the approximate contemporary household size, the population appears as 2761 people at that time. The letter of Jesuit Priest Tarillon dated 4 March 1714 indicates roughly 600 houses in Ayvalık (Querbeuf, 1819, p. 34), which equals to around 3120 people and seems coherent with the aforesaid, slightly earlier number.

Ayvalık historical city centre has a built area of approximately 82 ha in total, which reached its greatest extent before the 1920s, when the population was around 30.000 citizens (Simos, 1920, p. 48-49). Therefore, the average gross population density was roughly 366 persons/ha in Ayvalık in general. Contemporary witnesses provide varying data for the pre-1821 demographics but it is possible to rationally and reasonably narrow them down. Nikolaos Papadoupoulos' encyclopaedic work dated 1817 mentions the population of Ayvalık as 20.000 residents (Papadopupoulos, 1817, p. 394-395). The assumption of Ambroise Firmin-Didot was "at least 15.000" people as of 1816-1817 (Firmin-Didot, 1826, p. 377). Likewise, by 1817, François Pouqueville briefly talked about nearly 25.000 inhabitants there (Pouqueville, 1821, p. 136). In 1818, William Jowett guessed the population about 25.000. A year later, Charles Williamson roughly estimated 15.000-20.000 citizens in Ayvalık. Pliny Fisk and Levi Parsons provided the population as 20.000 inhabitants in 1820 and showed the local bishop, consul, and professors of the college as references (Clogg, 1972, p. 643, 659, 667). However, around 1820, Claude Denis Raffenel stated that Ayvalık, extending partly on the plain and partly on small hills, had nearly 3000 houses and 32.000 citizens, plus 7000-8000 foreigners (Raffenel, 1822, p. 198). Even 3000 houses could accommodate almost 15.000 people, therefore Raffenel's (1822) demographical statistics were obviously exaggerative and unreliable, especially when compared with previous contemporary accounts. Ottoman official sources, namely another "hatt-ı hümâyun" document dated June 1821 concerning the Greek Revolution indicates 25.000 Ayvalık inhabitants (Arıkan, 1988, p. 586, 592). Thus, the pre-1821 population can be estimated between 20.000-25.000, which roughly corresponds to an area of 55-68 ha. Stone houses of 2-3 stories and with terraces, how Raffenel (1822, p. 198) described the common dwelling character in Ayvalık, also coincides with much later decades, as testified by extant monuments there, so the general appearance of neighborhood units can be considered most likely the same for an experimental population density comparison concerning different periods of the 19th century.

The so far established layout in the literature for Ayvalık by 1821 includes 8 quarters, and covering an area of around 44 ha in total (Figure 3), it could accommodate more or less 16.104 residents, though both numbers remain significantly insufficient when considered even the minimum size estimated above. Nevertheless, the presence of 8 parishes was testified by Charles Williamson in 1819 (Clogg, 1972, p. 659), and the foundation of Prophet Elias (1835), Saint Charalambos (1840) and Holy Trinity (1846) as the latest parishes were provided by another contemporary source, whereas the development of Saint Basil (1810), the final pre-1821 neighborhood, was presumably still in progress by 1821 (Stavraki, 1861, p. 41). As the urban development of Ayvalık by 1850 onwards in the land side is rather evident, the formerly excluded coastal lands must be largely present (approx. 8,3 ha, 3038 people) by 1821 to better approximate the hypothetical size of the city at that time.

Meanwhile, Mouceaux (1668) and Raffenel (1820) as two witnesses mentioned that a certain part of the city already stretched out along the coast; to some extent confirming the former presence of the so-called reclaimed lands. Before 1821, there were 36 oil mills and 24 soap factories in Ayvalık (Walsh, 1836, p. 396). Annual olive oil production was 200.000 leğens that each leğen weighed 6¼ okkas (1 okka ≈ 1,28 kg), therefore 1600 tons in total (Papadoupoulos, 1817, p. 395). Ayvalık was a considerable settlement even before 1821, with an urban morphology by the shoreline, in fact fronting its oldest neighborhoods like Taxiarches, Saint Demetrius, Saint John and Kato Panagia; and this coastal region with a regular urban layout seemingly included those significant industrial facilities with piled jetties for maritime transportation.

The Early 17th Century Grid Plan of Kuşadası: An Unparalleled Example?

Kuşadası, being a coastal town of Aydın Province in the west of Turkey, has a historical city center with a striking grid urban layout. Joseph Pitton de Tournefort was the first researcher to compare the square-planned urban morphology of Kuşadası with European cities, in fact with a purely impressionistic assessment (Tournefort, 1718, p. 207). Then, Müller-Wiener (1961; 1975) argued that in the second half of the 13th century, a Genoese colony called Scalanova was founded there, as the testimonies of Ludolf von Sudheim and Francesco Balducci Pegolotti dated around 1340 were cited as evidence. Moreover, the grid planned urban morphology of Kuşadası was interpreted as another indicator of its foundation as an Italian colony with a "rational plan" that is uncommon for the Ottoman cities, which have rather irregular forms (Müller-Wiener, 1961, p. 77-79; 1975, p. 414-419).

On the other hand, Kiel (2004) questioned that the grid layout of Kuşadası cannot be a sufficient indicator alone for a Genoese colonial presence, as there are grid plans also in Navarino (Pylos) and Banja Luka, which were founded by the Ottomans in the 16th century. In addition, there is absolutely no settlement named Kuşadası in the cadastral registers dated 1545 and 1575 to which the Kuşadası region was subject. According to two Ottoman archival documents from 1619 and 1622, Öküz Mehmed Pasha founded Kuşadası and built a castle, city walls, fundamental public buildings and commercial establishments between 1614-1616. Kuşadası became the new administrative center of the region and replaced Ayasuluk (Selçuk) in 1676, which declined and lost its commercial character. The Europeans called Kuşadası literally "New Pier" (Scala Nova) as it became the new regional harbor. Thus, Kuşadası is an Ottoman settlement founded in the early 1600s, which Vincent de Stochove also confirms by 1631 (Kiel, 2004: 403-415).

In fact, testimonies about the Late Medieval Ayasuluk were erroneously attributed to Kuşadası and blended with some superficial urban hypotheses to attribute an obscure Genoese colony there. A settlement called "Scalanova" is not found in Late Medieval written or cartographic primary sources. Moreover, all portolans dating to the Late Middle Ages, when the Genoese were present in West Anatolia, reveal that the locality of present Kuşadası was an uninhabited coastal region and was not a harbor for seafarers. Hence, the grid urban layout of Kuşadası is an early 17th century Ottoman application, which is just another example like Ayvalık for the usage of grid plans in Ottoman territories, particularly in West Anatolia, even before modern planning practices (Sağlam, 2022).

Turkish Urban Planning Practices in the 19th Century: An Underlying Literature and Discussing the Ayvalık Case

The rationale of modern city planning practices in the Ottoman Empire was based on various practical reasons. Their first application emerged quite simultaneously with Europe around the beginning of the 19th century, which can be broadly defined as the changed direction of the modernization experienced by the empire, spontaneous developments in solving the problems, and their effects on built areas. For instance, the elimination of classical institutions and traditional urban environment was inevitable, which could not keep up with transformations for modernization, therefore had gradually become obstacles. Prevention of fires, integration into the global capitalist system, and the local government structure implemented with the Tanzimat became necessary too, together with infrastructure and services to construct the urban environment required by them. These were the main internal dynamics of the urban transformation that emerged at that time (Akbulut, 1992, p. 22-23).

Researches about the Ottoman and Republican modernization processes generally ignore rural parts. The modernization that started with the Tanzimat period changed urban space mainly in three ways with the state intervention: Local zoning and planning studies in the existing urban fabric, which were often carried out after fires; opening new areas around the city; and the modernization of urban space through planning studies covering either the whole city or a large part of it (Akbulut, 1992, p. 35).

Fires as major catastrophes also offered opportunities, because depending on the size and location of the fire area, various applications were made like opening new roads or the spatial arrangement of an entire fire area and its surroundings (Çelik, 1986, p. 53). Among these fires and subsequent arrangements, the Aksaray Fire of 1856 is particularly important. It devastated 650 houses and then a plan of the fire area was prepared for the first time, which partially included properties (Ergin, 1938, p. 40). Afterwards, again for the first time, an attempt was made for a new spatial arrangement in line with modern urban planning principles of that period. An application called the grid plan, with streets intersecting each other at right angles, was carried out by the Italian cartographer Luigi Storari. It was a remarkable innovation but was not the first grid plan in the Ottoman Empire. For instance, Antoine Ignace Melling made a local zoning plan application in the Selimiye District of Üsküdar around 1801-1802 in accordance with the grid plan principles (Akbulut, 1992, p. 38). Grid plans have then become the main method to transform former, irregular settlement patterns after almost every major catastrophe.

Meanwhile, with the establishment of the "Altıncı Daire-i Belediye" in 1857 as a municipal organization responsible for Beyoğlu and Galata regions, ownership of property had become one of the defining features of the new form of urban administration through an autonomous local structure. In order to be elected to the Municipal Council of Beyoğlu, it was mandatory to own properties of a certain value and to be an old resident of Istanbul (Çelik, 1986, p. 45; Ortaylı, 1985, p. 33). There was a practical reason behind the necessity of owning real estate. It was foreseen that financing services was difficult with scarce state resources, so they would be partially covered by the wealthy local bourgeoisie, whose property rights were secured and it was authorized to design its own living space (Akbulut, 1992, p. 31). Until 1877, the "Altıncı Daire-i Belediye" carried out several practices that would later set examples for other municipalities and made great contributions to the creation of modern urban environments, such as the first cadastral maps in the Ottoman Empire. Thus, property rights and property tax values of the bourgeoisie were recorded. The importance of cadastral maps increased with the new land code of 1858 (Arazi Kanunnamesi) regarding immovable property, while the right to own property and the immunity of domicile were eventually secured by the new constitution of 1876 called Kânûn-ı Esâsî (Yamaç, 2014, p. 56, 60).

Between 1858-1860, the engineer of the Beyoğlu Municipal Council Gaitan d'Ostoya prepared the cadastral map of Galata, Pera and Pangaltı districts with modern cartography methods. Cadastral maps of Beyoğlu during the reign of Abdülaziz (r. 1830–1876) were compiled as an atlas and then published (Dağdelen, 2005). It is still an important documentation for urban history research for Galata and Beyoğlu. Each building is indicated with its parcel size, usage and ownership. Those versatile maps are important in terms of land and building use as well as cadastral information. Similar maps were continued to be produced also during the reign of Abdülhamid II (r. 1876–1909) (Koçak et al., 2013).

As previously mentioned, the argument of Psarros (2004; 2007; 2017) concerning a massive land reclamation that caused an urban development with a grid layout around the mid-19th century in Ayvalık actually quoted some insufficient accounts, namely Apostolakis (1914) and Karamplias (1949), and such a work is not stated by any primary source. Nevertheless, as if a fundamental factual phase in the urban morphology history of Ayvalık, later scholars, when referring to its historical development, quoted and partially improved the major reclamation hypothesis despite its fundamental deficiencies, especially the conceptual obscurity about such a major incident that allegedly happened there, though was finely visualized through eye-catching plans (Figure 3). This so-called redevelopment curiously did not raise any skepticism and eventually remained as it is.

Considering the general literature about the history of modern urban planning, and also the overall weakness of the sources consulted by Psarros (2004; 2007; 2017), even though the scholar did not explicitly provide the reason nor provided any further background for the striking plans after the reclamation argument, the motive was presumably a simple stylistic conditioning; the grid plan itself could only be a result of modern urbanism practices, which mainly preferred grid plans that quite often appeared after major catastrophes. At first glance, the case of Ayvalık theoretically fit to all three prerequisites, namely an extant grid form, a 19th century historical context, and a major catastrophe. As the general urban planning literature does not stand against such a redevelopment, the constructive approach of Özel (2011, p. 19-22, 27), a following scholar, further supports this explanation concerning the case of Ayvalık. However, like Kuşadası, it has a grid layout older than the 19th century but later developments, including reclamations, indeed followed and extended the older morphology. Meanwhile, the majority of documented building inscriptions in Ayvalık certainly point a period later than the 1840s–1850s, though it was already a considerable village between the late 17th–early 19th centuries, therefore epigraphic evidence alone is an insufficient indicator for the longue durée urban development and morphological continuity.

Nevertheless, the general literature about Turkish urban planning practices, as summarized with its main lines, is also helpful to elaborate the scientific value of the cadastral plan of Ayvalık by Francesco Casciai dated 1823. As this plan shows properties rather than buildings, and since the supposedly first cadastral maps in Turkey appeared around the mid-19th century, it is a much earlier cadastral work and is also important in terms of the history of urban planning in Turkey. Moreover, considering the new land code of 1858 and the constitution of 1876, the plan further points to a city with the conception of immovable property long before, already in 1823, when the state did not legalize private properties yet.

Conclusion

The grid urban morphology along the plain coastline of Ayvalık was previously interpreted as a novel mid-19th century development on reclaimed lands through the debris that appeared after the destruction in 1821. However, being a significantly earlier cadastral work in the context of Turkish urban planning history, a hitherto unstudied plan dated 1823 displays that the present grid in question substantially predates 1821 and perchance appeared in the course of previous centuries, as there was already a significant settlement with respect to archival sources. Also, historical demographics and a retrospective population density experiment support this hypothesis, while the formerly supposed pre-1821 layout was considerably insufficient for the

estimated population. Grid plans were in use throughout the Ottoman Empire before modern urban planning practices, at least since the 16th-17th centuries. Interdisciplinary approaches and authentic primary sources constitute essential tools for urban history studies instead of morphological generalization after basic literature, and also questionable secondary narratives.

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Conflict of Interests

The author declares no conflict of interest.

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CHAPTER 10. Sun Shelters for Urban Beaches

Carlos Mourão Pereira, Teresa Valsassina Heitor and Ann Heylighen

Introduction

Urban beaches are threshold areas between natural and built environments, with a complex scale, where the relationship with architecture is often forgotten. Currently, they are facing risks related to public health, social justice and climate change. Therefore, in this chapter we explore knowledge about resilience to these three contemporary risks, focusing on the architectural scale of the sun shelter, which provides shade to beach users during times of excessive solar radiation. We argue that the sun shelter is an important space in the scope of resilience, i.e. the capability of spatial adaptation to uncertainties of change (Eken 2019). Contact with water environments may contribute to better mental and physical health. Specifically, it reduces anxiety, depression and stress. Urban waterfronts induce physical activity, mainly walking, contributing to less obesity (Völker et al. 2016). Moreover, water environments, like the beach, presented resilience during the covid-19 pandemic. Often, in contrast with other outdoor spaces, on beach stay areas the preventive use of mask is not required, as it is enough to maintain social distancing between bathers. Urban beaches, due to their easy access, are often crowded spaces with tourists, suburban and local users. However, beyond the mentioned advantages, the urban

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beach is not a safe environment during midday hours in periods of excessive ultraviolet radiation, resulting in sun burning of users and consequent cases of skin cancer. Guy et al. (2015) analysed a consistent amount of data related to skin cancer, one of the most common of oncological diseases, demonstrating its increasing risk with consequences on substantial expenses within the healthcare system.

In periods of excessive ultraviolet radiation, it is not sufficient to stay within the shade of a beach awning, neither with the use of sunscreens, to prevent the avoidance of skin exposure during the six midday hours. Køster et al. (2011) found evidence that tourists trust sunscreens too much and that its use needs to be re-evaluated and that a sunny place is a risk factor for sunburn. In fact, in order to prevent sunburning, beaches with safe shade areas are rare. For suburban families without private transportation, it is extremely difficult to stay on the beach in the early morning or a late afternoon, without the risk of using public transports during the hotter hours. Due to climate change, global warming and in particular the more frequent likelihood of heat waves, there is the risk of heatstroke, mainly in hot and less ventilated spaces, as a bus without an efficient climatization. Heat waves induce heatstroke and consequent mortality (Conti et al. 2005, Misset et al. 2006, Bouchama et al. 2007). In urban city spaces, due to the heat island effect, the risk related to heatstroke is higher in hot and humid areas (Conti et al. 2005). This is relevant because the most crowded urban beaches are located in coastal cities, characterized by hot and humid environments.

Therefore, it is pertinent to explore knowledge about spatial attributes that induce bathers to stay within the safety of the shade during risk periods, whilst complementing the sensory stimulation of a sunny beach. The loggia, an outdoor covered space, with open or partially closed sides, may provide light protection like an indoor environment. Moreover, its shade and building components may provide temperature regulation and wind protection, increasing comfort on waterfronts. Usually, the public loggia has the function to provide a transition at building entrances. However, there are cases with a specific function, as the Loggia dei Lanzi, in Florence, that is an open-air sculpture gallery (Figures 1). A loggia may have the specific function of providing a sun shelter on beaches, presenting several different uses in order to attract diverse groups of people. Therefore, in this study we explore beach user's motivations to find spatial attributes for loggia buildings. Specifically, extensions provide spaces to stay and circulate on beaches, giving shade and keeping multisensory components such as views, sounds and smells from the waterfront.

Figure 1. Loggia dei Lanzi, Florence, Italy, 1880-95 (Left picture authorship: Fratelli Alinari); idem, 1890-99 (Right picture, published by Photoglob Zürich)

According to its uses and location density, the beach can be classified in three types, namely urban, urbanized, and natural (Ariza et al. 2010). In the scope of this study, we define the urban beach as the one located inside or adjacent to an urban area, easily accessible by walking and public transport. Urban public space is often defined as an open and accessible area of social inclusion that can be used by diverse people (Van Melik & Spierings 2020). The beach is a space of threshold between land and open water, a boundary of culture and nature, a place of conflicting interests. It can offer a sensual experience and a feeling of regeneration but also segregation (Richter & Kluwick 2016). The proximity to urban beaches increases its residential value and people with economic difficulties rarely live near waterfronts, facing the limitations of not staying in the shade during the six midday hours in times of excessive ultra-violet radiation. Often, on public beaches it is possible to use a portable umbrella or awning, however this does not give a shade similar to an indoor environment. Furthermore, at urban beaches there rarely exists spaces that provide safe sun protection, being those shaded spaces consumption environments, such as cafeterias or restaurants. In this context, we could argue that the provision of sun shelters in urban beaches may contributes beyond preventive health, to increase the spatial justice for suburban users. Spatial justice had an exponential growth within literature of the 1990s, through the study of

public environments (Van Melik & Spierings 2020). However, the public space of the beach remains largely unexplored in literature.

Therefore, based on the qualitative research method of face-to-face interviews, conducted on two beaches in the Lisbon region, with people of different ages, we explored motivations to use sun shelters, aiming to contribute to lower risks surrounding public health, social justice and climate change.

Context

Interest in the appropriation and building of waterfronts was already present in antiquity. In the sixth century the byzantine emperor Justinian the Great established a building code defining parameters to protect coastal views (Lencek & Bosker 2009). The modern connotation of the word beach, as a space of leisure and holidays was achieved in the nineteenth century (Payne 2016). During the 18th and 19th centuries the medical interest was centred around the sea water and the ozone, although sun exposure was a coastal component to be avoided. Bathers used the beach in the early morning or late afternoon. Until the early 20th century, clothing and architecture were designed to provide shade, people used hats and umbrellas, and the loggia spaces protected outdoor walkways and seating areas (Figures 2). By contrast, in the 1920s the sun exposure began to be the main medical interest and beach spaces were used mainly during peak sun hours (Lencek & Bosker 2009). Since the 1960s populational masses began to use air travel to access beach resorts (Williams & Micallef 2009). The World Health Organization (2002) points to the fact that since the early 1970s an increasing incidence of skin cancer has been observed, due to the wrong perception by society that a tanned skin is desirable and healthy. Moreover, it is argued that substantial expenses are attributed to skin cancer and cataract treatments with consequences on national economies. Sunscreens induce a false sense of safety and users tend to extend the time of sun exposure. Another limitation is its correct application, considering skin absorption and contact with the water.

Figure 2. North Beach Santa Monica, Los Angeles, USA, 1905; *i*dem,1898. (Pictures published by University of Southern California. Libraries and California Historical Society**).**

In the last years of the 20th century, with the internet, it became possible to use a laptop on the beach, transforming this space into a non-seasonal one, resulting in the beach becoming a place apart from the fixed work space (Lencek & Bosker 2009).

It is not possible to directly perceive excessive ultraviolet radiation and beaches out of season often do not have staff sensitised to this risk, resulting in more cases of sunburn. The darker skin pigmentation of inhabitants of low-latitudes gives more protection to excessive ultraviolet radiation, being relevant that currently with migration or tourism the skin is no longer adequate to the environment where people are situated (Lucas et al. 2006). Although there is uncertainty about the future of the ultraviolet conditions, there is the fact that climate change, with global warming, aerosols, clouds and ozone mutations, is temporarily increasing the intensity of this radiation in different parts of the globe (Seckmeyer et al. 2008). The first decade of the 21st century is evident in the consequences of climate change with heat waves and rising sea levels, and the need for adaptation and mitigation, in order to safeguard public health, biodiversity and the economy (Jol et al. 2008). In literature safety is pointed as a relevant attribute to beach quality in the perception of its users (Roca & Villares 2008, Ariza et al. 2010). Shade is also an identified attribute (Cervantes et al. 2008). Williams and Micallef (2009) state that a safe beach needs to have preventive health efforts against excessive ultraviolet radiation exposure, in the form of signage and educational campaigns. Pereira et al. (2003) explored user's perception and identified the infrastructures as a relevant attribute on beach quality. Moreover, Roca and Villares (2008)

stated the importance of early planning, considering the users diversity to minimize conflicting interests related with social uses on urban beaches, where overcrowding occurs during peak hours, due to its easy access.

Methodology

This study is based on qualitative research methods and explores health promotion and safety focusing the use of loggia spaces. The combination between safety and qualitative research was studied by Flin (2019), pointing to the potential to investigate beyond quantitative approaches. Specifically, this points to what safety scientists need to understand regarding people's behaviour, their cognitive, emotional, physiological, and social components. We carried out interviews to explore the user's experiences and perceptions in two case studies of bathing facilities located in the Lisbon metropolitan area, namely the Tamariz and Moitas beaches at Cascais (Figures 3 & 4).

According to Sarvimäki (2017), a well conducted case study can be the highly valuable. In fact, case study research from the 1980s, with detailed descriptions on social life, still inspires today's investigations. However, there is the limitation of the lack of relations to other spaces out of the confined studied area (Van Melik & Spierings 2020). Moreover, it is important to consider that each beach has its own specific characteristics, and this diversity of attributes needs to be considered during the research process (Mead 2017).

Figure 3. Tamariz beach, Cascais, Portugal (Picture credits: 2016 Google)

Figure 4. Moitas beach, Cascais, Portugal (Picture credits: 2016 Google).

The in-situ interviews have the advantage of enabling a deeper understanding of the everyday life of people, compared with a remote one where the participant may forget important spatial attributes. Furthermore, it has the advantage of providing relationality between time and space (Van Melik & Spierings 2020). Therefore, we used the technique of face-to-face interview during mid-day hours in periods of excessive ultraviolet radiation, in order to achieve a realistic approach to the experience and perception inherent to the motivations of using a sun shelter. The 85 participants sample integrated people diversity, regarding age and cultural backgrounds. Specifically, it integrated participants from 10 to 86 years old and 14 countries (Angola, Brazil, Canada, France, Germany, Ireland, Italy, Netherlands, Norway, Portugal, Russia, Spain, Sweden and the United Kingdom). Therefore, to achieve deep qualitative data, as far as possible, an unstructured format was used, personalised to each interviewee concerning vocabulary and language. In the beginning of each conversation, we informed the interviewees about the intensity of the ultraviolet radiation to which they were being subjected to, by using the beach during a high-risk time of day, sensitizing them to follow the recommendations of the national health agency. This initiated an introduction to the topic of our study and an input to achieve reflection about possible motivations of using loggia sun shelters at the beach. Regarding data analysis, we used the qualitative technique of coding, selecting text from the interviews, aiming to achieve generalisable statements and an understanding of the phenomena in study (Flick 2009).

Results

Interviews to the users of the bathing facilities revealed eight motivations for using the shade of a loggia, with the function of sun shelter, during the high-risk midday hours (11am – 5pm). Specifically, the identified motivations were related with recreational, rest, cultural, sportive, nutrition, health and well-being, pedestrian circulation, and labour spaces (Figure 5).

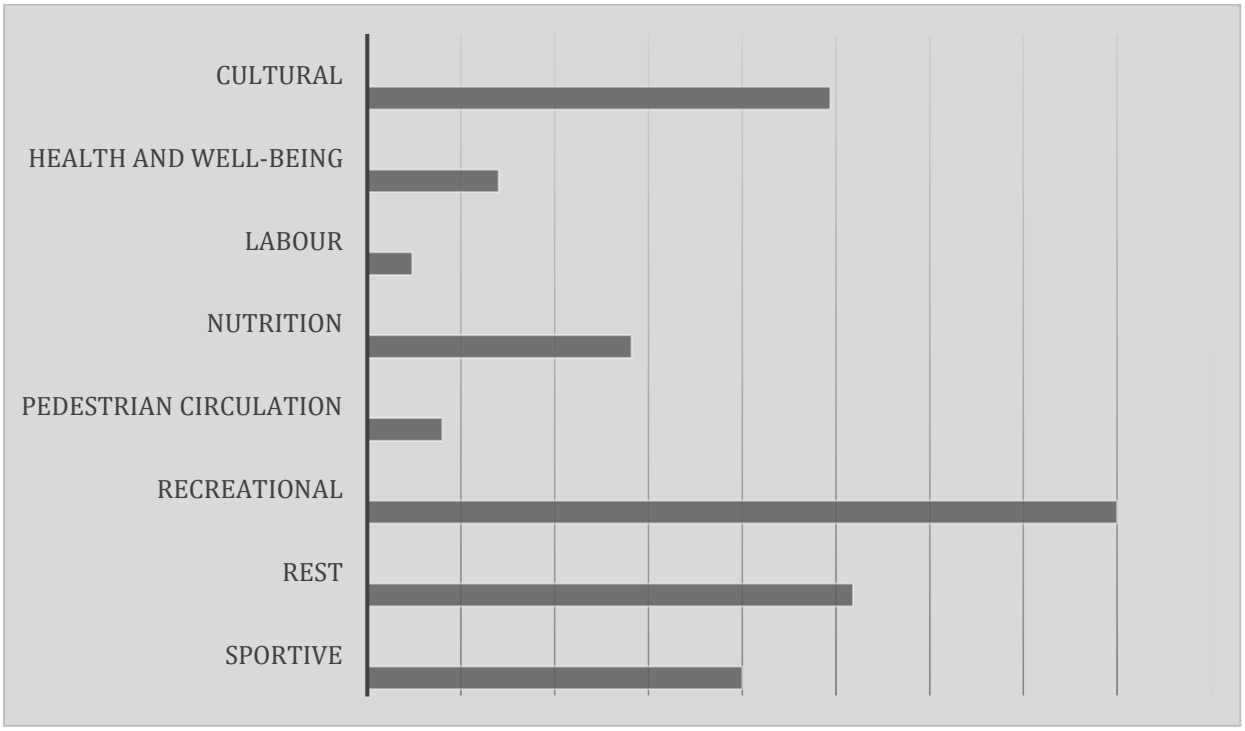

Figure 5. Frequency of motivations identified from the 85 interviews.

The motivational component of a sun shelter, that interviewees identified most frequently, is recreation. As an advantage of the sun shelter, a bather (B73) pointed at "Those dances that they usually do here at the beach, (...) it's another thing to do in the shade (...) nobody deserves to do it in the heat. (...)". An interviewee (B56) with children presented the idea of an inter-generational space with "games that allow them to be entertained (...) we have to keep an eye on them (...) we were there supervising but we could also be there playing with them". Also, it was mentioned that this space should be accessible for sitting. Another bather (B38) stated the importance of the sun shelter as a space "for children to be on the internet (...) for the older people to play cards (...) and that they were no longer (...) in the sun". An interviewee (B66) identified the motivation of a musical interactive space referring to the idea that "children like music (...) live or through speakers, where you could hear the sound of the sea, but also as a background hearing the sound that the speakers transmit". A bather (B45) with children identified a specific spatial component for a motivating sun shelter, arguing that "if there are games for children (...) inflatable toys (...), they will be there". One of the interviewees (B63) identified a thermic disadvantage of a

bathing facility without sun shelter, stating "(...) now, at the beaches (...) they put a playground, but there is are no shade at all (...) and then, with the scorching sun, the sand will be very hot (...)".

Moreover, a bather (B73) identified an advantage related to a shaded shelter mentioning the specific condition of being "pregnant and with a very young child, always standing behind him to put on his hat, or these things". Also, she stated the presence of "slides" as an encouragement to be in the shade. Several interviewees stated the importance of recreational bathing activities in the sun shelter to motivate its use. An interviewee (B52) characterized the sun shelter as an environment "(...) for children (...) just a place where they could play a little bit. In addition, if this roof could cover some (...) water (...) I guess it would be a very (...) popular place where the family, the children could stay (...) from 11 until 5pm - it would be helpful". Another bather (B11), mentioned the presence of water as motivation to use the sun shelter, stating the space of the loggia, with "a covered swimming pool (...) can be opened or closed". Furthermore, another interviewee (B58) stated the importance of the sun shelter as an alternative to open water environments, mentioning the use of "(...) bathing (...) satisfying the same expectation but in a more protected way. (...) conceiving swimming-pools (...) where children have fun but protected from the sun. (...) slides, animation, music, dance (...)". A bather (B64) identified the motivation of a shaded saltwater environment, referring to the idea of a roofed space with water, "coming from the sea". By contrast, an 11-year-old interviewee (B40) mentioned that he would like a heated swimming pool with fresh water.

More than a quarter of the interviewees identified rest as a motivational component of a sun shelter. A bather (B73) referred to her own specific condition and need mentioning "(...) the pregnant just want to rest (...) as well as possible, far away from the sun". Moreover, some bathers referred to the motivation to use the sun shelter for a short sleep. One of them (B3) required a space "(...) for babies to nap". Another interviewee (B72) argued "a nap (after lunch) (...) is something healthy". Furthermore, a bather (B24) presented the idea of a polyvalent space with loungers to rest and sleep mentioning "a place to nap (...) listen to music, read a book". Another interviewee (B37) stated the importance of the rest space, of a sun shelter, to allow "the same beach atmosphere". A bather (B46) presented the furniture potential to provide motivation through the usability of the sun shelter, arguing that "many old people (...) have difficulty lying down on a towel in the sand.

They also could have, when they want to rest, some loungers or comfortable chairs". An interviewee (B67) presented an idea to provide privacy in rest spaces of sun shelters specifying "(...) white curtains (...) so it could be fresher inside that space. (...)". Furthermore, a bather (B47) presented the motivation of a multisensory space to rest, mentioning "a nice view and people could stay longer. (...) sited or (...) some hammocks to lay down (...) just the natural sound of the sea environment". A professional interviewee (P6) argued a space with "(...) a more relaxed atmosphere (...) if it was free, I think people would enter a lot more". Also, a bather (B5) stated the importance of a rest space "(...) where you can sit in the shade without having to buy any drinks (...) on the beaches there are not many places where you can withdraw to the shade (...) in these hours to take a break".

An almost equal number of interviewees identified culture as a motivational component of a sun shelter. One interviewee (B13) mentioned that "it would be nice if we could get a space (...) that guarantees us that radiation wouldn't come in (...). That space could have internet access (...). They could even foment reading, have a little library (...)". Another bather (B20) mentioned an advantage related to the visual perception when using the laptop, stating that in a space with shade "we see the screen better". An interviewee (B39) referred to the use of "watching television (...) the News, I like to know how the country is doing". Another bather (B33) shows interests in a sun shelter with cooking classes. An interviewee (B23) mentioned "I do spearfishing" and that he would "stop, see and hear and enter" in a space that presents the mentioned thematic. A bather (B36) mentioned a library space combined with tourism information; "books that explain nearby places". Another interviewee (B43) identified spatial components inherent to a motivating "area with shade (...) with some good lounge chairs and a book". Furthermore, another bather (B28), presented the importance of views from the loggia space: "a space of reading, a space to observe the landscape". A professional interviewee (P3) presented cognitive activities possible to motivate the use of a sun shelter: "drawing (...) cognitive games, painting, sculpture (...)".

One fifth of the interviewees identified sports as a motivational component of a sun shelter. A professional interviewee (P9) pointed out the importance of the proximity between the beach and the sun shelter, referring to "any sportive activity that was in the shade, but at the same time near the beach." A bather (B46) mentioned volleyball and a few other motivating activities to do inside a sun shelter, "classes (...) with music (...) Zumba (...). Nowadays, for older people there's also those dance classes specifically for different age groups". Another interviewee (B59) identified the motivation of a shelter space with "exercise machines (...) because we (...) know we are benefitting our health". A bather (B27) mentioned the sporting activity of playing football in the shade, moreover he presented a spatial idea for a motivating sun shelter "you can bring the pool inside the canopy (...)". Furthermore, another interviewee (B36) specified "step, dance (...) aqua gym, a group activity."

Only seven interviewees identified nutrition as a motivational component of a sun shelter. An interviewee (B67) presented the attraction of the sun shelter as a space for "drinks (...) doesn't have to be alcoholic (...), for example, fruit juices". Furthermore, one of the interviewees (B21) mentioned a space with drinking fountains to provide free water for the users. Moreover, a bather (B10) identified the motivation of a shaded picnic area in

the sun shelter, specifying "(…) some tables which allow people to be sited with the family. A kind of living space. (…) we could eat, stay there for an hour or two and then, it wouldn't be so hot, and we could enjoy the beach".

Also, six interviewees identified health and well-being as a motivational component of a sun shelter. An interviewee (B42) presented the idea of the sun shelter to provide a "massage area, spa. (…)". Moreover, another bather (B47) mentioned the potential of a space with "baths (…) a shower to refresh. (…)". Some interviewees stated that the presence of the sun shelter may provide a sensitizing spatial component. One of them (P2) argued "shaded spaces (…) could have a role in making people aware of the risks they are taking". Furthermore, a bather (B44) expressed his perception mentioning "whatever the shelter is, makes it clear for people this is a health issue (…) cancer multiplies… it is very persuasive".

Even less interviewees identified pedestrian circulation as a motivational component of a sun shelter. One interviewee (B72) stated, "the most prudent is to encourage walking through shade areas". Mentioning an urban space with shaded circulation that he experienced "streets which are open (…) awnings passing from side to side". Furthermore, another interviewee (B14) mentioned the space of "a square completely covered".

Very few interviewees identified labour as a motivational component of a sun shelter. One bather (B42) identifies the potential of a space with "some electronic system that allows one to read the news (…) profiting from time doing nothing by even being able to work. (…) with the internet (…) the person is connected to everything." One of the interviewees (B12) mentioned that if she wasn't at the beach she would be "giving assistance to the people (…) do some volunteer work". When questioned, she stated that the use of a sun shelter could correspond "exactly" to a space of volunteer work promotion.

Only five of the 85 interviewees didn't present any motivation to use a sun shelter, specifically two professional users (P1 and P7) and three bathers (B4, B15 and B55).

Discussion

As well as in our research, several studies explored user's perception toward the aim of improving beach quality (Cervantes et al. 2008; Roca & Villares 2008; Ariza et al. 2010). Cervantes et al. (2008) explored the identification of attributes within the topic of an ideal recreational urban beach. Ariza et al. (2010) proposed an evaluation frame based on functional analysis to assess the overall quality of beaches in the Mediterranean area. Roca and Villares (2008) suggested that user's preferences and perceptions are induced by the bather's profile and the characteristics of the beach. Völker et al. (2016) stated the importance of providing walking, playing and sitting areas with waterside views to promote restorative experiences and physical exercise. Yoona and Uysal (2005) identified family togetherness, fun, relaxation and safety as important factors within a tourist's motivation, safety being a crucial one. In contrast to the aforementioned studies, the findings achieved with the interviews are specific to the beach user's motivation to use loggia spaces as a sun shelter. This research matter is new in literature, the findings being an exploratory contribution to the identification of the user's needs.

To be able to combine the diverse motivations identified, some compartmentalization is required within the spacing of the sun shelters. For example, a rest area needs to have some walls to provide acoustic shadow, reducing noise from recreational spaces. Therefore, instead of just a single sun shelter it is also possible to adapt a beach with several loggia spaces specific to each motivation identified. This may result in less requirement for large structures, providing the advantage of facilitating easier re-use or rehabilitating existing buildings connected to beaches, contributing toward a more ecological approach in the adaptation to climate change.

Mead (2017) argued that the beach needs to react and respond to the effects of rising sea levels, a human induced, or natural phenomena, that is occurring and will continue to for centuries. Therefore, carefully dimensioned loggia spaces may provide resilient empty areas to adjust the consequent rising of seaside promenades, contributing toward coastal adaptation to climate change.

Eken (2019) states that scale of architecture has the potential to provide internal regeneration of the macroscale of the urban system. In this scope, we argue that the scale of the sun shelter may contribute to urban resilience, specifically protecting beach users against skin cancer and heatstroke and thus lowering expenses in health care.

Concerning spatial justice, is it important to provide free access to the sun shelter, to be inclusive, as far as possible, to all of its users. However, to build and maintain these spaces may be infeasible on some beaches. For these instances, one possibility is to develop a hybrid model, combining free access during the six mid-day hours of the bathing season, with a paid entrance during the remaining time and period. Sun shelters have the function of health promotion, preventing risks related to excessive sun exposure. Therefore, we state the need of designing these spaces with the strongest scientific evidence to mitigate risks related with their own use.

Conclusion

Approaching resilience to contemporary risks related with public health, social justice and climate change, this study explored the identification of motivations for bathers to use a sun shelter during periods of excessive solar radiation, in complement to the beach experience. Loggia spaces with free access, that are integrated within

urban beaches, could be popular sun shelters for suburban families without private transportation and the tourists.

The increasing temporary periods of excessive ultra-violet radiation and heat waves require the adaptation of urban beaches to climate change, sun shelters being an important contribution in providing social, ecological and economic resilience of cities, especially ones with sea or river bathing facilities.

Based on a qualitative research method of face-to-face interview, carried out during the aforementioned risk periods, was possible to assess motivations related with the topics of recreational, rest, cultural, sportive, nutrition, health and well-being, pedestrian circulation and labour spaces.

The aim of this research was to explore motivations and uses for sun shelters integrated within beach environments. The findings, achieved through in situ interviews, only integrated the perception of fully-sighted participants. In order to enlarge the diversity of spatial perceptions, specifically regarding the sensory modalities beyond sight, we are currently studying the spatial perception of blind interviewees which are pertinent to explore inclusive sensory qualities.

Moreover, these findings have limitations regarding the representativeness of the interviewees sample. We selected two popular beaches for two specific groups: suburban residents without private transportation and tourists. Both groups are vulnerable to the risks related to excessive sun exposure. To increase the inclusiveness of the findings, future research is needed to determine the motivations of users on beaches with other characteristics.

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Conflict of Interests

The Authors declare no conflict of interest.

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CHAPTER 11. Evolution of Buddhist Architecture in Andhradesa: South-Eastern Coastal Region of India

Preethi Belmann, Shantharam Patil and Chekuri Krishna Jyothi

Introduction

This chapter attempts to understand the ideas and practices that have been transmitted, leading to the evolution of Buddhist architecture through the built heritage in the south eastern coastal region of India (between 400 BCE-700 AD) which contributed to the development of the trade route. During the Satavahana Dynasty, Buddhist architecture flourished between the Krishna and Godavari valleys in Andhradesa (Andhra Pradesh). The objective is to document and analyze the various forms of Buddhist monuments built and how they transformed by defining the features of built aspect, typology, and building material representing the specific Buddhist culture and time in the region over the period. Marking these Buddhist sites as essential landmarks of Buddhist architecture for the uniqueness and antiquity the structures portray, their development, and restoration would improve the scope and avenue of proper utilization and boost tourism. The state of Andhra played a crucial role in the spreading of Buddhism and spawning the Mahayana sect in Buddhism and later on various other sects of Buddhism. These sects had their establishments consisting of stupas, Chaityas, and viharas built by the donations of the followers. The economic part of Buddha's teachings, particularly the impact of Buddha's education

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on society during his time and later, is significant. Buddha believed in the advantage of collective ownership of property. Seabound trade was mostly responsible for the flourishing state of Buddhism in Andhra Desa. Most monasteries were located near the river valley basin or flat hilltops running along the east coast of Andhra Desa (shown in Fig 1). These areas are observed to have rich and fertile lands, equipped with river connections for transport and communication. The recovery of many Buddhist sites serves the evidence to state that Buddhism spread from South East Coastal area to Burma, Sri Lanka, and other Southeast Asian Regions. Andhra played an important role in the spread of Buddhism and the development of various sectors. The principles of Buddhism attracted many people as it spread out of the Ganges valley into North India, then towards the North-western Deccan, and from there towards Southeast Coastal area (Patnaik & Kumar, 2019).

Buddhism in Andhradesa is believed to be from pre-Ashokan times. However, it spread across Ashoka's reign when Andhra Pradesh was a part of his domain (3rd century B.C.). It witnessed all three phases of Buddhism, namely Theravada, Mahayana, and Vajrayana. It was Andhradesa that Vajrayana, the last phase of Buddhism, originated. Of the eighteen sects of Indian Buddhism, nine had their base in Andhradesa; the rock-cut caves, brick, stone-built stupas, chaitya, viharas, and salamanders represent the Buddhist architecture in Andhradesa. The paper would help understand the ideas and practices transmitted over time, influencing the development of Buddhist architecture.

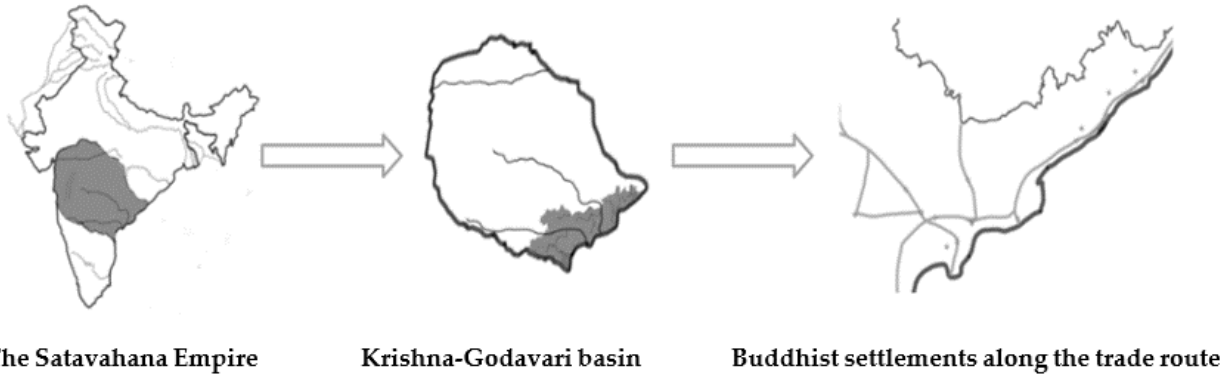


Figure 1. Locating the Buddhist sites under the Satavahana period (Developed by Author)

Several relic caskets have been recovered from stupas, chaityas, votive stupas, and viharas of Andhradesa (Ray & H.P., 1989). Schools of Buddhism with their subsects flourished in Andhradesa from the 1st century B.C. and temples were built to meet their religious requirements. The study aims to identify the ideas and practices that have been transmitted onto the Buddhist complexes and how they have influenced the evolution of Buddhist architecture. The study will look into evolution in terms of materials, architectural planning and features, and the building style and identify its meaning concerning Buddhism. The extent of the study is within the eastern coastal region of Andhradesa, specifically along the trade route. While the objectives are as follows: (a) To study and understand the existing Buddhist heritage sites in terms of timeline, culture, area, and type of architecture. (b) To identify and define the possible influences that lead to the evolution of Buddhist architecture. (c) To map the timeline of these Buddhist settlements based on their typology. (d) To establish a better understanding of the history of other spaces concerning Buddhism during the same time frame. (e) To analyze comparative evolution based on built aspects, architectural features, components, and building material.

Material and Methods

The research methodology supplied qualitative data that enabled this study to examine the monuments from different angles. Archival resources and a diverse range of literature helped in determining the research gap (Geng, 2021). The approach to understanding the literature with possible ways and methods collected, compared, and synthesized is represented in the flowchart below.

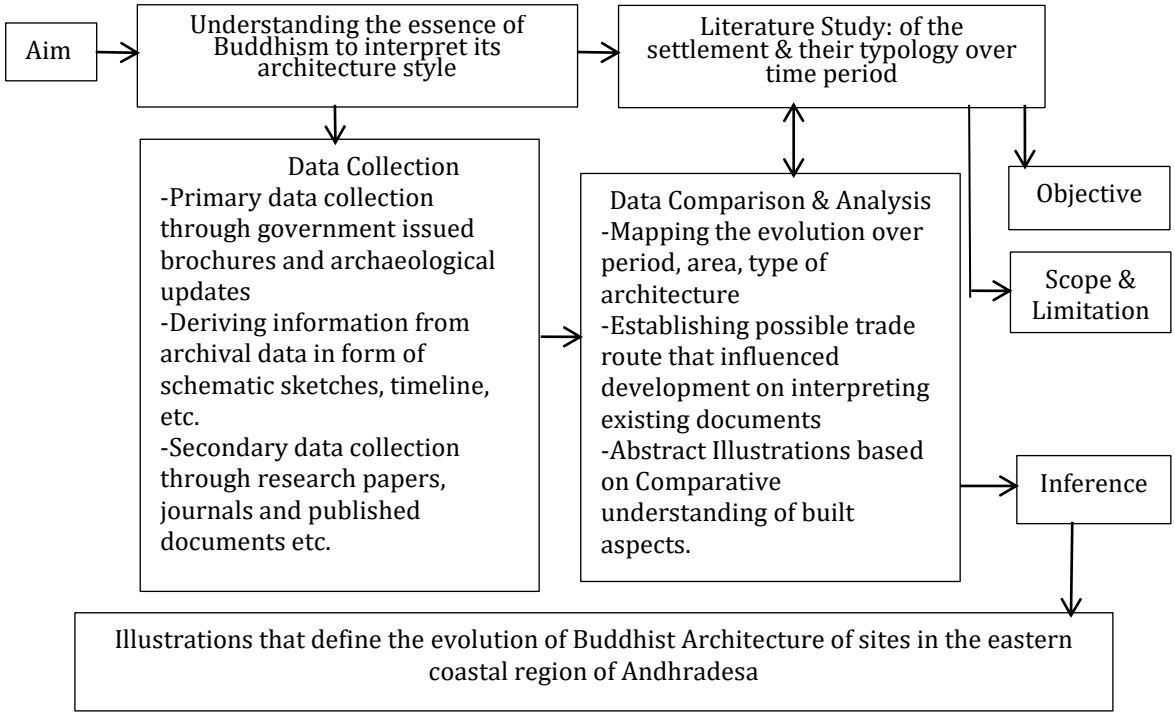


Figure 2. Research Structure (Developed by Author)

Buddhist Architecture and its principles

The origins of Buddhism can be traced back to the 6th century B.C. Gautam Buddha's teachings gave rise to a new school of thought. During the 3rd-2nd century B.C., when Buddhism expanded from the Ganges valley through North India, then into the North-Western Deccan, and from there, through the South East Coast area and finally to Karnataka, Buddhism attracted a significant number of followers. During 600 B.C.E., the usage of iron near the Krishna and Godavari valleys ushered in a significant transformation in the people's material lives (Ray & H.P., 1989).

The economic aspects of Buddha's teachings are crucial, notably the economic influence of Buddha's instruction in the society of his day and subsequently (Begum, 2013). Buddha was the first of the ancient sages to recognize the benefits of common property ownership. The sculptures represent economic and social circumstances. It is also referenced in Buddhist writings, which attribute the construction of holy shrines to trading groups and merchants. The patronage of skilled artisans and labor was aided by the abundance of food and wealth gained through trade.

Buddhism's early architecture includes three types of structures: monasteries (viharas), relic worship places(stupas), and shrines/prayer halls(chaitya/chaityagriha), subsequently referred to as temples. Adoration and safekeeping of Gautam Buddha's remains was the original purpose of a stupa. Stupas were eventually incorporated into chaityagriha in line with developments in religious practices.

Buddhist settlements and their timeline

Andhradesa had close relations with Buddhism from the 4th century B.C to the 6th century A.D. It soared to a great height in this land. The presence of Buddhism in Andhra coincides with the urbanization of Andhradesa during the period of Satvahana to the later Satvahana reign. The influence of Buddhism in Andhra is subtle but profound routed as it has made unforgettable contributions and influence in terms of spirituality, opinion, and sentiment. The presence of Buddhism emerged along the trade route contributing to the Urbanism of the place (Subramanian, 1989) (Figure 3). However, Buddhism was divided and subdivided into several schools. The significant schools that came to dominate the religious culture of Andhra were:

- Theravada flourished in the Telugu community and continued to be there alongside Mahayana Buddhism in the 1st century A.D. During this period, the veneration objects were stupas, Dharma chakra, Bodhi tree, Vajrasana, and Buddha padas.

- Madhyamika school of philosophy and Hridyasutra, Vajrachedika, and prajnaparamita sutra were authored on the banks of the Krishna River, now called Nagarjunakonda, which later influenced several schools of Buddhism and philosophical systems.
- Vajrayana flourished in places like Dhanyakataka, Guntupalli, Sankaram, Ramathirtham, Salihundam. One of the nerve centers of Buddhist activity during the Ikshvaku period.

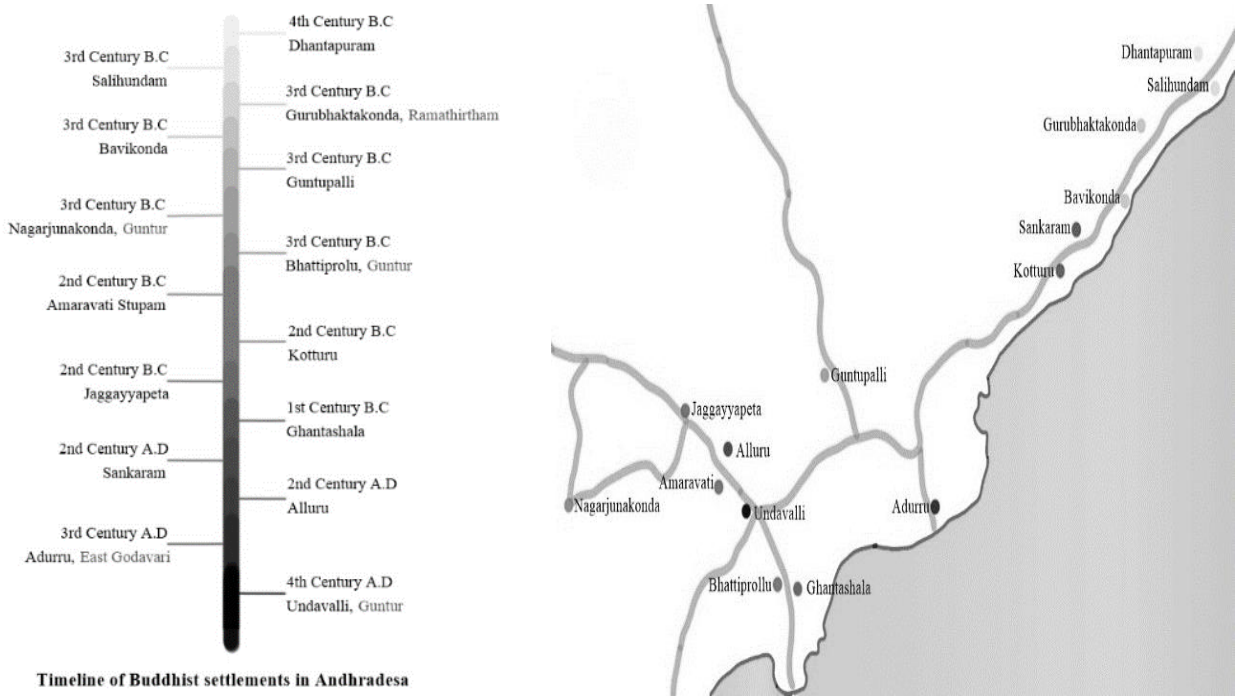


Figure 3. The remains of Buddhist settlements along the possible trade route (Developed by Author)

Results

Possible influences that led to the evolution of Buddhist Architecture

With its central location along the routes, Andhradesa served as a maritime power that promoted Buddhis Throughout the country. The road to Kalinga connected it with the northern part of India, whereas the road to Dravida connected the south. The famous Buddhist sites are found along these routes either by the water bodies or on the hills. It was along these paths that the Buddhist monks traveled and brought with them different ideas and cultures (Amar, 2009). This can be justified as paintings closely resembling Amravati are found in Ajanta caves (concentrated in Caves 9 and 10). A large number of Buddhist monuments like monasteries, stupas, viharas, chaityas, and temples were found where an assembly of monks and nuns take place. They followed and adopted various beliefs of the time that influenced the architecture of these monuments. Later the pattern of these viharas and chaityas formed the base of south Indian temple architecture. The means of travel varied as it was famous for the most important ports. Through the waters, the culture influenced Sri Lanka, Burma, Malaysia, and Indo-China. Andhra shared close links with Sri Lanka. There are records like Dantavasma and Attakathas that testify to the influence of Andhra culture on Ceylon Buddhism in terms of art, architecture, and sculptures.

Migration and Buddhist transmission due to the trade network

Back in those days, there were great overland and maritime trade routes that linked different nations and have undergone profound changes. Buddhism proliferated along the routes (as shown in Figure 4) to Northeast India and beyond, along the eastern and western silk path, towards Afghanistan, and across Central Asia eastward to Pacific-to Korea, China, and Japan. Through the sea routes, it reached out to Cambodia and Borobudur in Indonesia's Java. Several Buddhist structures and sites of hundreds of pagodas were found in Burma, Pagan, and Sri Lanka. Found across through archaeological excavations, great architectural monuments, sculpted decorations, inscriptions, and sacred relics seem to commemorate Buddha's life and thought in all nations (Bhattacharya, 2018). The demand to adapt to local traditions influenced Buddha's ideas in various ways, mainly evident from the evolution of architectural monuments and religious practices as it reached citizens

of different cultures. It has been noted by the pilgrims that Buddha's teachings seemed to be subjected to comparatively less alteration while crossing through sea routes.

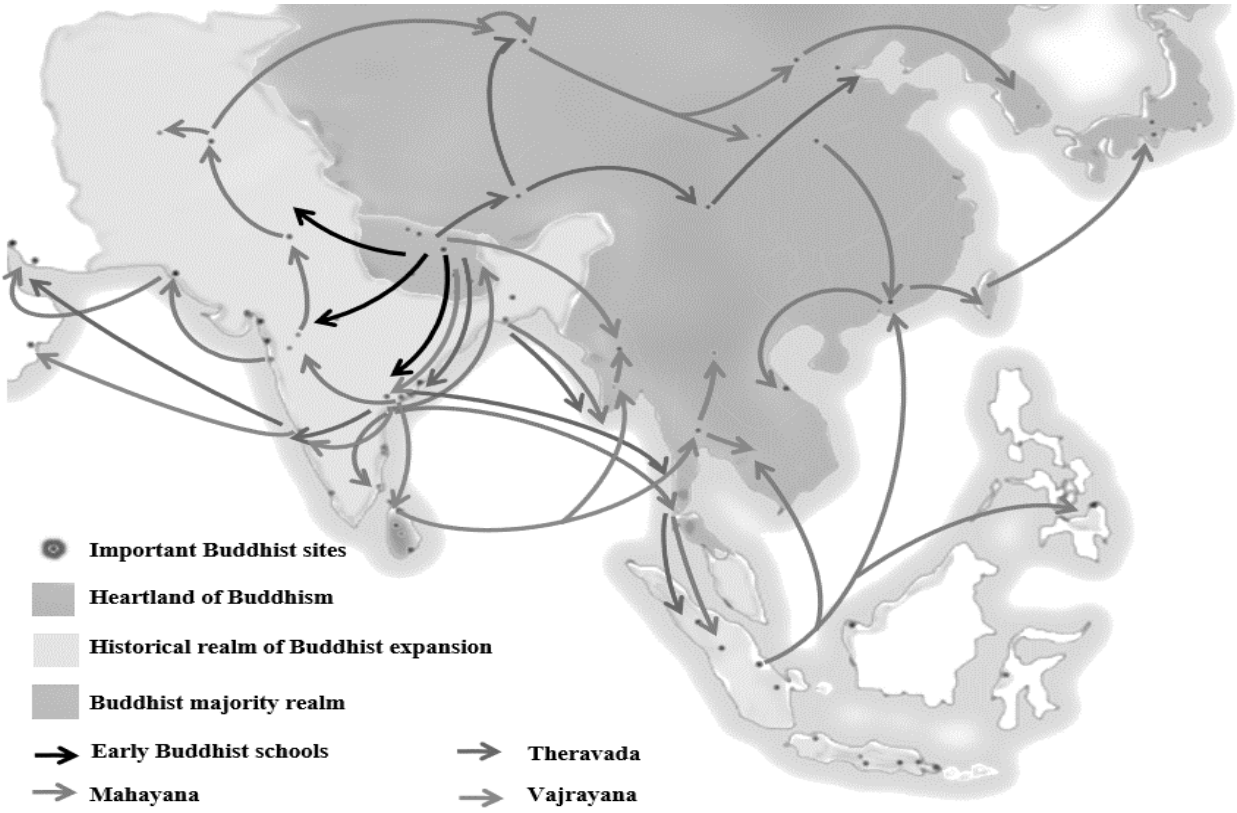


Figure 4. Buddhist expansion starting 5th century B.C. (Developed by Author)

Buddhism during the Satvahana period

A large number of Buddhist remains found in the eastern part of Deccan consisted of a large number of Buddhist centers with several stupas, chaityas, and viharas, some of which date back to the Satavahana period. The Buddhist remains at Ramathirtham, Guntupalli, Gudivada, Sankaram, Alluru, Ghantasala, Nagarjunakonda and Amaravati belong to this group. The remains of these Buddhist monuments themselves and the inscriptions found here provide a lot of data concerning the place of Buddhism in the society in this region and the monastic life during the Satavahana period. The inscriptions hold the name of rulers that belong to the Satavahana period as well, as the architectural evidence, style, and techniques also give us a few clues as they resemble the building patterns of the Satavahana period.

Typology of Buddhist settlements

The remains of Buddhist settlements that consist of monasteries, temples, stupas, viharas, chaityas, etc., in this region, give us an understanding of how Buddhism flourished in the coastal area of Andhradesa along with the trade route. The attempt is to study and understand these built structures of Buddhist settlements mostly on archaeological sources and define their evolution.

The schools of Buddhism with their subsects flourished in Andhradesa, and their temples were built to suit the religious needs and requirements. Particularly the stupa, which is an extraordinary beauty monument developed from the local spiritual practices. The sense of the signs showing the evolution of such architectural components is partly dependent on the material used and the medium of construction due to some of the visible variations between the ancestral stupas in India and those found in the 3rd century B.C. in Andhradesa, the change in the medium to stone, brick, and stucco is observed. The change in medium to build stupas produced potential speech as clear indications of stupa forms evolving over time. Stupas were the most common subject of Buddhist rituals. Stupas represented the mound on which the monks buried the relics of Buddha and his disciples and their cremated remains. Stupas formed the center of large pilgrimage centers visited by the Buddhist laity as well as Buddhist monastic complexes. There were mainly two types of Buddhist settlements divided based on their activity.

- Sankhara (community settlement, mainly for teaching and religious purpose)
- Bhaudhara (settlements that provide a resting place for tourists, consisting of the kitchen, and dining facilities).

Discussion

Material Study

The evolution of Buddhist Architecture in the region was greatly influenced due to advancements in technology and usage of materials (Begum, 2013) ; here, we investigate considerable development and usage pattern concerning built spaces.

Rock cut Monuments

The earliest rock cut caves were discovered infertile tracts; one of the first caves of Andhradesa is situated in Guntupalli, dated to the 3rd century B.C.E, where the rock cut a chaitya arch on the façade to create a chaitya window. Each cell has a doorway, and a few are provided with windows. A small horse-shoe gable topped on the doorway and windows. The chaitya consists of a rock cut stupa located inside a small circular chamber with a domed roof, surmounted by carved stone ribs that seem to have evolved from a wooden structure that gives an umbrella frame with long rafters running downwards from a central point. This treatment shows that an earlier practice in the wood was transferred to the stone, which turned out to be more permanent. The arch is carved as such that light falls directly on the stupa inside. Other rock cut cells formed out of natural caves are provided with arched windows, doorways, rock cut beds. Monks back then preferred rock cut caves, stupas, viharas, cells, and chaityas as a suitable rock; trained sculptors and architects were available. It is quite compact, with minimum circulation space around the stupa.

In Sankaram (2nd century A.D.), chaityas of rectangular plan with rock cut stupas were discovered. It consisted of a rock stupa raised on a square platform with a vaulted roof supported by pillared columns and a screen wall at the entrance to allow light inside the cell. The ceiling and walls were decked with sculptures. The front façade has a sculpted Buddha in a meditative posture in an arched niche. The evolution of rock cut monuments was mainly influenced due to advancements in technology, and the representation seemed to have shifted towards more realistic and functional monuments (Figure 5).

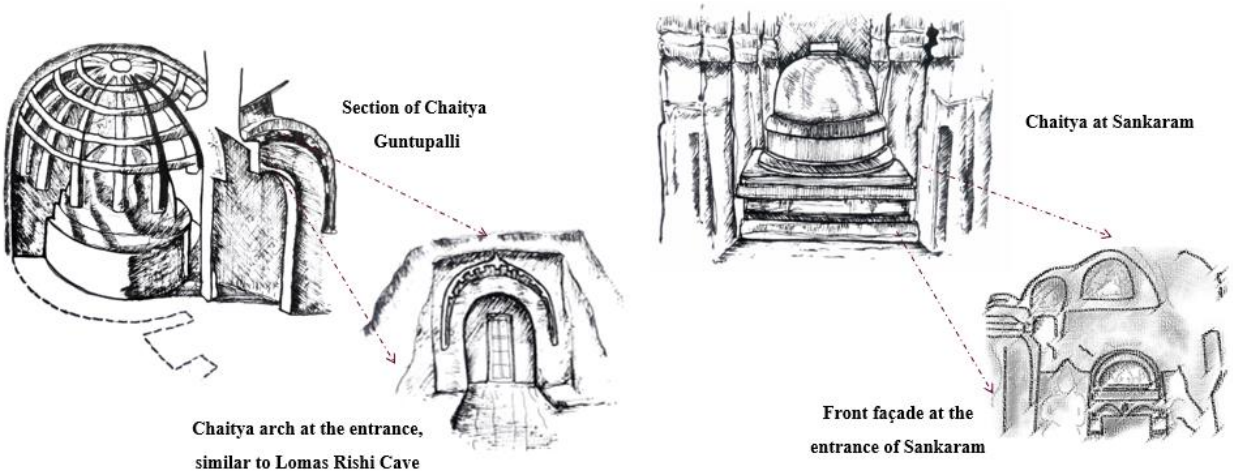


Figure 5. Advancements in rock-cut architecture over time (Developed by Author)

Stone Monuments

Stone monuments came into the picture during Ashoka's reign; the stone was mainly used for surrounding enclosures as a railing or structural support such as stupas, mandapa, vihara, and stone pathways, majorly used for flooring, dome portion of stupas, beams, railing drums, balustrades, etc.

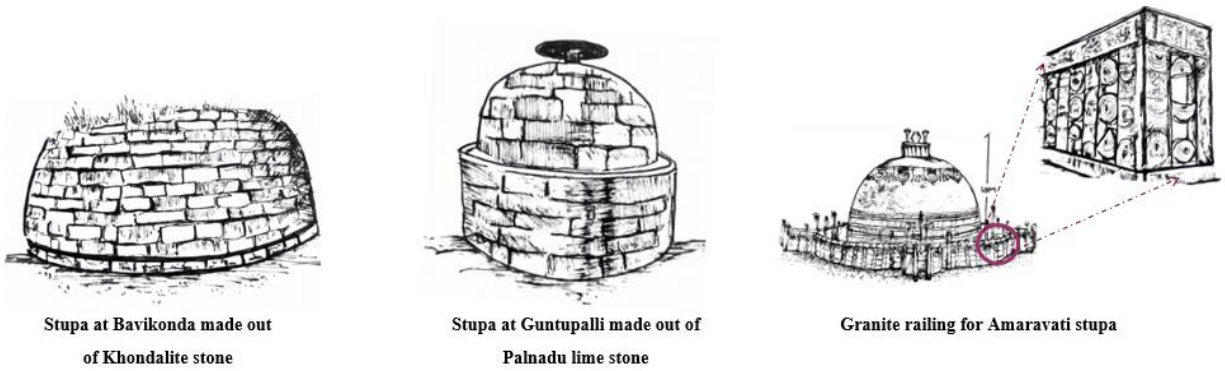


Figure 6. Evolution of stone as a material (Developed by Author)

The stupas at Thotlakonda and Bavikonda were made out of Khondalite stone that was locally available, whereas the stupas of Guntupalli, Salihundam, and Nagarjunakonda were made out of limestone. Buddhists preferred limestone for the construction of stupas because it was easy to cut, polish, carve, and chisel the drums and dome portion. The Ayaka platforms, dome, and drum were made of limestone, while railings were erected in granite. The floors of pradikshinapatha of stupas, viharas, chaityagriha, and temples were dressed in stone. The technique used for laying the floor inside the refectory of Thotlakonda was that the first leveled and partitioned with brick and rubble and then rammed, following which lime concrete was poured to keep it intact. The details of the railings of the Amravathi stupa were then achieved in both granite and limestone. They were carved and polished in octagonal shape using the grinding techniques by the sculptors. They were erected as lenticular sockets fitted with crossbars and crowned with massive coping stones, recalling the techniques used in wooden examples. These railings are a resemblance to typical Mauryan polish. There seems a constant shift (Figure 6) in the approach of stone monuments as, with time, they discovered how efficient the use of locally available stone and with improvement in craftmanship, the form of the built structure was majorly influenced.

Brick Monuments

The transformation of technology from rock-cut to brick was major during 1st century B.C and continued till the 13th century as bricks could be made and used in plains as well as hills. Molded and chamfered bricks of wedge-shaped set-in mud mortar were prepared according to the required size and shape. During the initial stage of brick technology, the masons provided a massive wall made of burnt bricks. The floor of Chaityas and Votive stupas was paved with rubble and plastered with lime. Mud mortar was later replaced by lime as it offered leakage protection and enhanced the longevity of the structure. The apsidal stupas found in Guntupalli and Nagarjunakonda were made on raised platforms. With the development of brick technology, the outer walls were encased with stone slabs. Solid or wheel-shaped stupas mostly found in the coastal region were built of bricks paved in the header and stretcher method. The walls of viharas constructed on the hilltop in different tires were supported by brick buttresses to withstand rainwater erosion. The bricks were laid lengthwise in course on both sides of each layer and were filled with small nodules of stone, mud, and brick boats. The brick sizes seem to differ as they become more compact and cuboidal in shape. The change in brick monuments was impacted due to the various binding materials they could find and the variation in the shape and size, giving them the flexibility to experiment with the form and scale of the built structure.

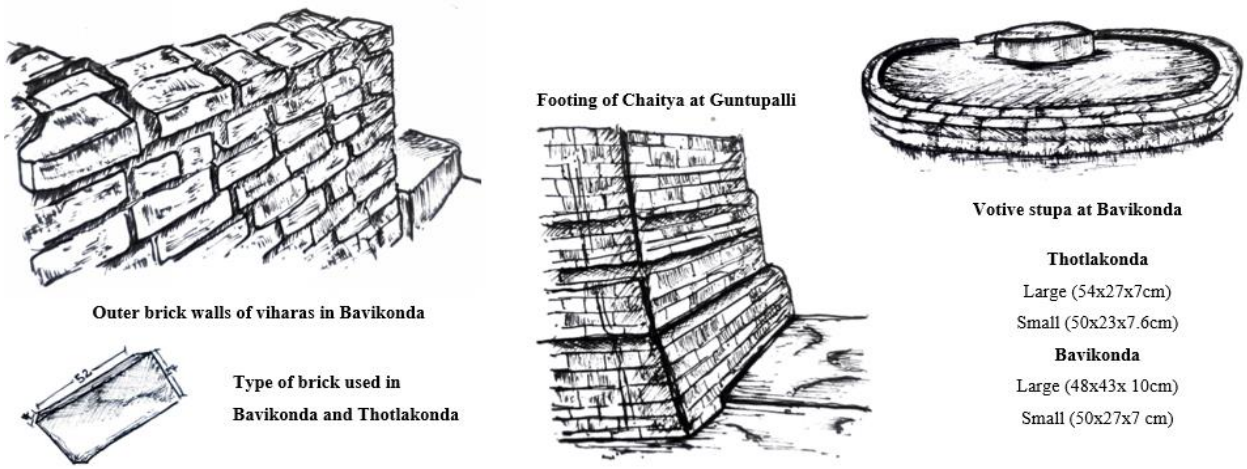


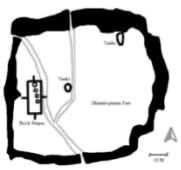
Figure 7. Different patterns in which brick evolved as a material (Developed by Author)

Comparative Study

Influenced by the shift in materials and other factors (Sree Padma & Barber, 2008), we trace and analyze the evolution pattern and its impact on built structures over the period through a comparative study given below.

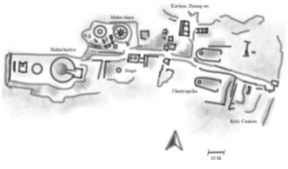
Table 1. Comparative study on the evolution of Buddhist-built spaces (Developed by Author)

PLAN



Dhnatapuram (4th century B.C.)

Four brick built stupas and some buried votive stupas in the north west side of the fortified campus



Salihundam (3rd century B.C.)

Houses a light apsidal and circular chaityagrihas, pillared mandapas, viharas, and image of the Buddha, votive stone stupa and platforms, spooked stupa, terracotta receptacles.

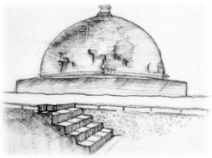
Bavikonda (3rd century B.C.)

Consists of a Mahachaitya, embedded with relic caskets, large vihara complex, a number of votive stupas, a stone pillared congregation hall, rectangular halls, a refectory.

Guntupalli (2nd century B.C.)

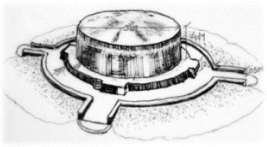
Consist of a rock-cut circular, it chaitya, four rock-cut monasteries, a ruined brick chaitya, remnants of a large pillared hall, a 111 stone built stupa and a large group of brick built stupa on the ridge

MAHASTUPA



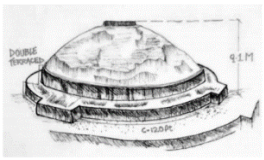
Thotlakonda (3rd century B.C.)

Main stupa measures 7m in dia made out of bricks built on a raised platform that served as a circumambulatory path.



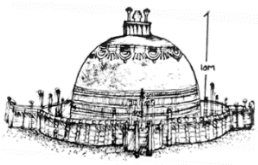
Bavikonda (3rd century B.C.)

It has four entrance ways (2×4.30 m) on the four cardinal points and provided with a lower pradakshnapatha (3 m), a circular drum with ayaka platforms, with an upper pradakshnapatha (1.50 m).



Chandavaram (2nd century B.C.)

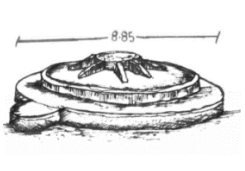
The main stupa is one of the largest stupas, built on a double terraced, elevated platform with a unique dome decorated with limestone panels



Amaravati (2nd century B.C.)

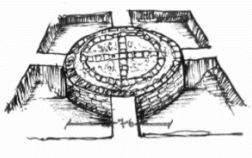
The dome was made of pale green limestone, painted with bright colours the lower part of it haa stone reliefs, harmika is placed on top as it contains ashes of Buddha

STUPA



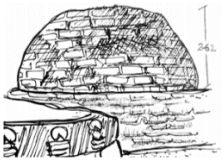
Salihundam (3rd century B.C.)

It's a wheel pattern plan with with eight spokes radiating from is 8.8 m in dia. The outer edges and inner spokes of the stupa were made of big size bricks..



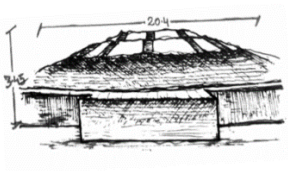
Nagarjunakonda (3rd century B.C.)

Made of brick has a wheel shaped base with dyaka platform in four cardnial directions



Guntupalli (2nd century B.C.)

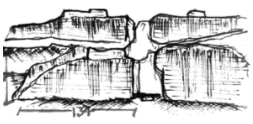
The stone stupa is erected on a circular base the dome measures 2.62 m in height and 4.88 m in dia



Alluru (2nd century B.C.)

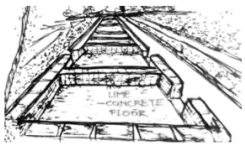
The stupa represents a large wheel, tyres and spokes on a circular solid hub. Its drum has 4 ayaka vedikas similar to that of Amaravati.

VIHARA



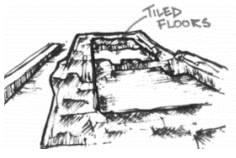
Salihundam (3rd century B.C.)

Named after the sutra the Salipataka mahavihara at Salihundam consists of five vihara, made up of sunbaked bricks. They are arranged along the paved pathway from the foot of the hill to the top



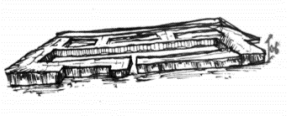
Bavikonda (3rd century B.C.)

Consists of a large vihara complex stating that the monkish community living in viharas were huge in numbers , Made up of terracotta blocks and bricks.



Nagarjunakonda (3rd century B.C.)

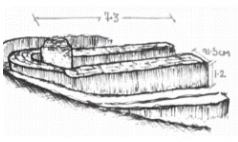
Each vihara contains one or two chaityagrihas, which indicates that the ksetra flourished after chaityagriha. Each of the first two viharas contains a chaityagriha and a few votive stupas.



Alluru (2nd century B.C.)

Made of brickwork is a combination of architectural features of the Mahayana, Theravada and vajrayana phase ,which indicates that it was active for a very long time.

CHAITYA

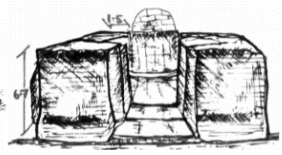


Salihundam (3rd century B.C)

Made of stucco images the aspidal end has a huge basement constructed with brick and lime mortar.

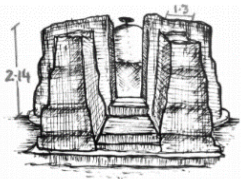
Bavikonda (3rd century B.C)

The circular chaitya with an aspidal stupa were embeded with caskets while its exterior walls are similar to tier structure, made out brink and stone



Nagarjunakonda (3rd century B.C)

Uddesika Chaitya has tiled floor with a thick outter wall made out of brick and a cylindrical aspidal stupa that has a white ring at the base.



Guntupalli (2nd century B.C)

Consists of outer wall of 2.14 m hieght and 80 cm wide. Its external diameter is 11m, with a stupa at its centre surrounded by a circumambulatory path.

Key Understanding

- The sites have taken up to be located near a water body or a hilltop, along the assumed trade route. To fulfill basic needs, water cisterns were carved out of stone or made of brick on-site to store water.
- Stupas of Salihundam have bases in a swastika; a similar pattern is seen in Nagarjunakonda and Bhattiprolu stupa, where pearls are found arranged to form a swastika. Hence, it can be said that Buddhism attempted a synthesis of different practices and social unity and cohesion, which is seen through the evolution of architectural features.
- The constant shift in materials and medium of construction kept improving, which created the potential to express directly on the built form. A significant reason that influenced the shape of the built structure.
- The settlements were mainly made up of local material available (Khondalite, or black granite). Brick of different dimensions was made on-site and used for construction. Most of these sites seem to have gone under phase-wise construction.
- The study can be further analyzed by comparing more settlements in and around the vicinity. Taking into consideration the variation in material and other categories widens the scope of analysis.

Case of the settlements around

Thotlakonda and Bavikonda are Buddhist complexes located on a hill overlooking the sea near Bheemunipatnam. The strategic location of these monasteries is said to have played an important role in spreading Buddhism to other parts of South Asia. Buddhist monks used it for both residential and academic complexes. These complexes are surrounded by small sites that consist of small memorial cairns, most likely erected for devout laity and dead monks. These memorials show a strong religious interaction between the local population and the monks in the monastery. They mainly include reservoirs, walls, water cisterns, terraces, and a small non-monastic village. The settlement pattern indicates that the monastery was not isolated (Figure 8); instead, it was enmeshed within a landscape of relations, both religious and economic, sort of connecting monks to the laity in the local area.

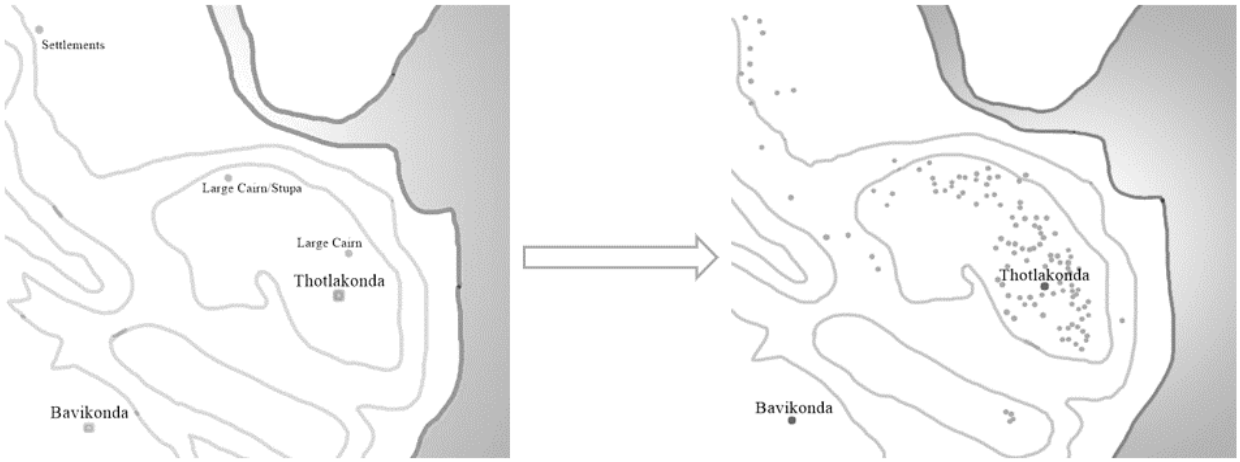


Figure 8. Sites along the ancient trade route commanded profitable maritime trade (L.Fogelin, 2012).

Thotlakonda

The architectural style and landscape of Thotlakonda reveal elements like the social role and social tensions of the monastery. The placement of the monastery was such that it was spatially and visually segregated from the non-monastic settlements. It mainly consisted of the monastery and a large mortuary landscape. Access to the heart of the monastery, the cloister, passed through the ritual space, defining the transition from secular to sacred ground. The inwardly focused cloister to the concealment of the refectory indicates the isolation of the monastery. Surrounding the site, numerous cisterns and large reservoirs are found. Thotlakonda is divided into three general areas as wall, railing, and routes of access. The first is a sheltered courtyard, which contains a large pillared hall. To the east lies the refectory, several small buildings and storerooms can be found. To the north of the shelter are the large central stupa, several smaller votive stupas, a maha chaitya, and several cisterns.

Bavikonda

Located 3 km away on a hill from Thotlakonda, the site stretches over a wide area and consists of several stupas. The land is adorned with shrines, temples, halls, galleries, refractories, and platforms, there are 26 buildings in the complex in total, and the architectural styles indicate that the complex has been built over three separate phases. Bavikonda differs from Thotlakonda in terms of size, layout, and elaboration of the main stupa. The maha stupa stands out prominently in the northern part of the site. It has a diameter of 32 meters, built of bricks and mud mortar. The present height of the stupa measures 4 meters. Four Ayaka platforms are located around the stupa, with stairs leading between the lower and upper pradikshinapatha. Encircling the lower path is a simple brick railing with four gates. At the foot of these two sites, the local settlements on the floodplain were named Buddhala, which suggests the impact of these Buddhist settlements on the lives of the masses back then.

Comparative understanding of the settlement pattern

Located at a distance of 6km from each other, Thotlakonda and Bavikonda have primary similarities such as spatial arrangement, division of the ritual area, cloister, and refectory, but they differ in terms of layout, size, and elaboration of the main stupa. The differences (shown in Figure 9 and Figure 10) are assumed to be influenced firstly by phase-wise construction funded by the merchants, sea voyagers, travelers, etc., that bought with them different ideas and cultures secondly due to the demand to adapt to local traditions and practices of the place.

Table 2. Comparative understanding of settlement patterns (Developed by Author)

Thotlakonda	Bavikonda

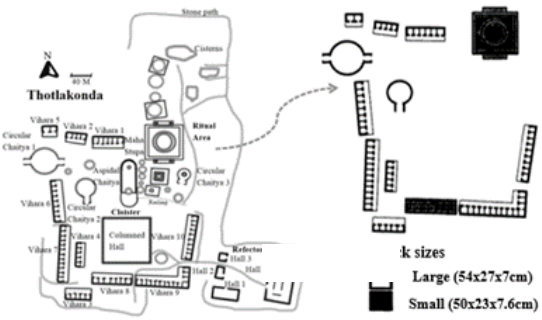
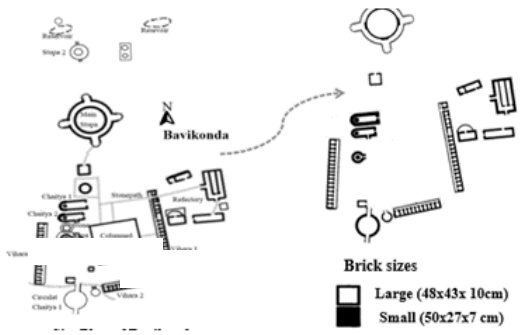

	

Figure 9. [11]	**Figure 10.** [11]
The Central stupa is of diameter 16.5m with lower and upper circumambulatory paths; the height of the stupa is 4m with four simple Ayaka platforms located around. Stairs leading between the upper and lower pradikshinapatha and brick railing encircling the lower path.	The stupa is comparatively a large structure with a diameter of 32m; it has a clear segregated circumambulatory path. In Bavikonda, no post holes for pillars were found. Some stucco lotuses near Ayaka platforms were discovered.

Conclusion

To conclude, the coastal region of Andhradesa grew as a focal point, especially under the expansion of Satvahana when the coastline became a trade hub, which significantly contributed to the growth of religion, art, and architecture. It is also evident that the circuit of Buddhist monastic sites was responsible for Urbanism as they drew a large mass by encouraging trade. Through the comparative understanding of these Buddhist sites, it can be summarized that the built aspects have varied over time periods in terms of shape, form, and dimension to fulfill the user requirement. The variation noted in terms of physical form and arrangement pattern was majorly influenced by the shift in material and construction technique. In the evolution of architectural elements, there seems to be an attempt at a fusion of diverse traditions to incorporate social harmony and solidarity. The changes were mostly driven by the development of religious practices throughout this time period. These sites can be marked as essential landmarks in the history of Buddhist architecture for the uniqueness and antiquity the structures portray. These Buddhist monuments are rare landmarks that serve as major referring and concentric points, that have highly impacted the urban layout. The specifics of our ancestors' lives and the relationships

between various global civilizations are revealed by the tangible and intangible forms of heritage, maintained in materials form and their spiritual beliefs. Hence before making decisions on conservation, it is crucial to understand the key aspects of these historical structures. The development and restoration of these Buddhist sites would improve the scope and avenue of proper utilization and boost tourism. Despite Buddhism's significant influence in the area, urban expansion and change through the years have resulted in the invasion of other cultures and customs, diminishing the significance of the built environment. The research places a strong emphasis on the historical and cultural importance of established settlements, and it may be used to further examine each one in detail to move to propose the best techniques. In the view of the rapidly changing environment and its effects on these buildings, the study should assist highlight the value of these sites and built structures and the need to protect them as soon as possible. Future research lines can be based on individual cases and the best preservation methods for each site can be worked on respectively.

Acknowledgments

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Conflict of Interests

The author declares no conflict of interest.

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CHAPTER 12. Evaluating Heritage Site from the Perspective of Visitor's Satisfaction: Insight from Puthia, Bangladesh

Afrina Akter, Ferdous Farhana Huq, Mst. Umma Roman, MD. Wahidur Rahman

Introduction

Heritage is a good condenser of past and present culture and transfers information to the future (Medici et al., 2019). Heritages encompass the spectrum of landscapes, structures, objects, traditions, or any other natural or man-made items that are silent evidence of its splendid past (Huq et al., 2017; S. Tonkin, 2006; Meli et al., 2007, STANTEC, 2013). Cultural heritage is special and unique because it enables us to understand history, identity, and people and incorporate aesthetic, historical, social, evidential, and scientific values. Heritage is thoroughly related to tourism as tourists are emotionally involved with a heritage destination (Yao, 2013). Many prefer visiting a heritage site for its uniqueness and history (Shackley 1998). Tourism activities are becoming popular and emerging rapidly in Bangladesh (Roy, S.C. & Roy, M., 2015). Bangladesh, located in the eastern matrix of Bengal, possesses a tangible and intangible heritage from the early historical period to the colonial era (Rahman et al., 2008). Among numerous tourist spots of Bangladesh, few are famous for their archeological values. Meanwhile, Puthia though having significant heritage resources, has not yet become a popular tourist attraction like others as it lacks proper maintenance, preservation, and tourist facilities (Alam, 2013). Besides, there

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is no complete documentation of this site's heritages to provide people with comprehensive information about this site. There is no development plan for this site in the Rajshahi master plan (Alam, 2013.). Due to a lack of specialized conservation planning, this site is deteriorating gradually. The local people are primarily responsible for abolishing heritages because they don't know how to value them (Rahman, 2019). Even the heritage resources of Puthia are getting encroached on by the local people (Mojumdar and Prince, 2017). If these continue, this distinctive heritage site's beauty will be faded away, and the potential of developing tourism in this place will be lost. Therefore, it is high time to conserve this area by considering the tourism context to become functional, active, and valuable to its local people.

This study's primary goal has emerged from the existing research gap as a handful of studies have attempted to explore the heritages of Puthia, and very few studies to date have been done on quantifying the Visitor's experience of any heritage site of this country as well as a subcontinent. Therefore, this research focus on exploring the heritage resources of Puthia and developing a technique to measure the Visitors' satisfaction with any heritage site or recreational site by taking Puthia as a case. The study also aims to present the means of making this a better place for tourists by integrating the local community and tourist recommendations. The contribution of the research is manifold. Firstly, it locates every heritage structure this place has. These heritage resource findings are a strong base for the researchers for their heritage studies and help local policymakers better understand the spatial distribution and historical significance of this place's structures, eventually assisting local policymakers. Secondly, in this study, existing tourists' satisfaction regarding this place's establishments, instigated, and the methodology developed for measuring the Visitor's satisfaction level can be utilized to calculate the Visitor's satisfaction of any other heritage or recreational site.

Furthermore, based on the satisfaction and expectation levels, recommendations regarding the development of facilities have been proposed to augment the tourist's satisfaction level. Findings from this study will help the legislators and urban planners to understand the Visitors' satisfaction indicators that require immediate and long-term attention and enable them to work efficiently to develop the site as a tourist-friendly place. Besides, the technique used to measure the Visitor's satisfaction level in this study is unique, and researchers and academicians can apply this method to measure the tourist's satisfaction level in different heritage sites.

Heritage Tourism

Imon (2013) has argued that heritage tourism is a form of cultural tourism, whereas cultural tourism is defined as the movement of people motivated by the cultural intents such as cultural events, arts, festivals, monuments, and pilgrimage (UNWTO 2005:1). Heritage tourism has evolved into an essential tool to present the national identities to visitors, and Bangladesh has several historically crucial places that are successful in attracting tourists (BhuiyanandDarda, 2019; Islam, 2019). Heritage places have an intrinsic ability to draw tourist attractions because of their unique historical features that affect tourists' imaginations (Gunn, 1979:71 & 1988: 53). Shackley(1998) states that people visit heritage sites to enjoy their uniqueness, unique characteristics, and history. Huh (2002) identified four dimensions in a historical place that attract more tourists than other sites. These are general tour attractions, heritage attractions, maintenance factors, and cultural attractions, which are vital in affecting the visitors' overall satisfaction (Huh, 2002). Ensuring tourist satisfaction is highly important as their positive feedback helps develop tourist attraction in the heritage site. However, poorly managed tourists can cause damage to the heritage site. Imon et al. (2008) have identified four factors influencing how tourists behave in a heritage site. These are psychological, social, cultural, personal, and situational factors. Controlling the maximum number of tourists and applying the 'heritage guide' tool can help attain sustainable heritage tourism by ensuring proper heritage management (Liu and Shu, 2020; Imon et al., 2007).

Visitor's Satisfaction with Heritage sites

Many studies have been conducted on understanding visitors' satisfaction with a tourist site. Armario (1996); Ramchurjee (2013) have presented a clear relationship between tourists' motivation, activities performed at the destination, and tourist satisfaction. Gaki et al. (2016) have identified a vital co-relation among tourism satisfaction, loyalty, and the tourism product components, i.e., accommodation, service, tourist attraction, etc. Several studies have identified the factors such as hospitability of locals, attractiveness, treatment received by tourists, lodging, nearby attractions, availability of information, entrance fees, and safety issues as critical determining factors of tourists' satisfaction in the rural-based heritage sites (Asmelash. 2020). Marino (2017) argues that tourist satisfaction depends on functional benefits, hedonic benefits, and cognitive perception received from the venue. Few research has mentioned that indicators such as information brochures, hospitability, service quality, maintenance, accessibility, sanitation, food quality, alleged environmental quality, perceived value, and shopping facilities are necessary factors in determining satisfaction level (Ali et al. 2019; Aliman et al. 2016; Adinegara et al. 2017; Sukiman et al., 2013). Determining the satisfaction level based on

these indicators is as crucial as comparing the current status of performance of the indicators with the expectations of the visitors (Kirom et al., 2018; Wang, 2016; Bagri and Kala, 2015; Sukiman et al., 2013, Chon and Olsen 1991). Several research has identified tourist loyalty (Willingness to revisit, willingness to pay more for the services, and encourage others to visit the site) as a very relevant factor in studying tourist satisfaction levels, and tourist loyalty depends on the satisfaction level of the visitors (Asmelash, 2020; Ali et al. 2019; Gaki et al. 2016). In the context of Bangladesh, factors related to Food, Environment, Destination attraction accommodation, transportation, Cost, Security systems, Recreational Amenities, information facility, and staff quality are identified as having a straight impact on the satisfaction level of the visitors (Sardar et al. 2020; Hossain 2020; Hassan 2012; Roy et al. 2016; BhuiyanandDarda 2019). Most of the research conducted in Bangladesh is limited to identifying the aspects impacting the tourist's satisfaction level. A comprehensive study to calculate the tourist's satisfaction level based on these indicators and recommend measures to enhance satisfaction has not yet been carried out. Hence, this research emphasizes this research gap and proposes a method to calculate the Visitor's satisfaction with a heritage site by considering the relevant indicators.

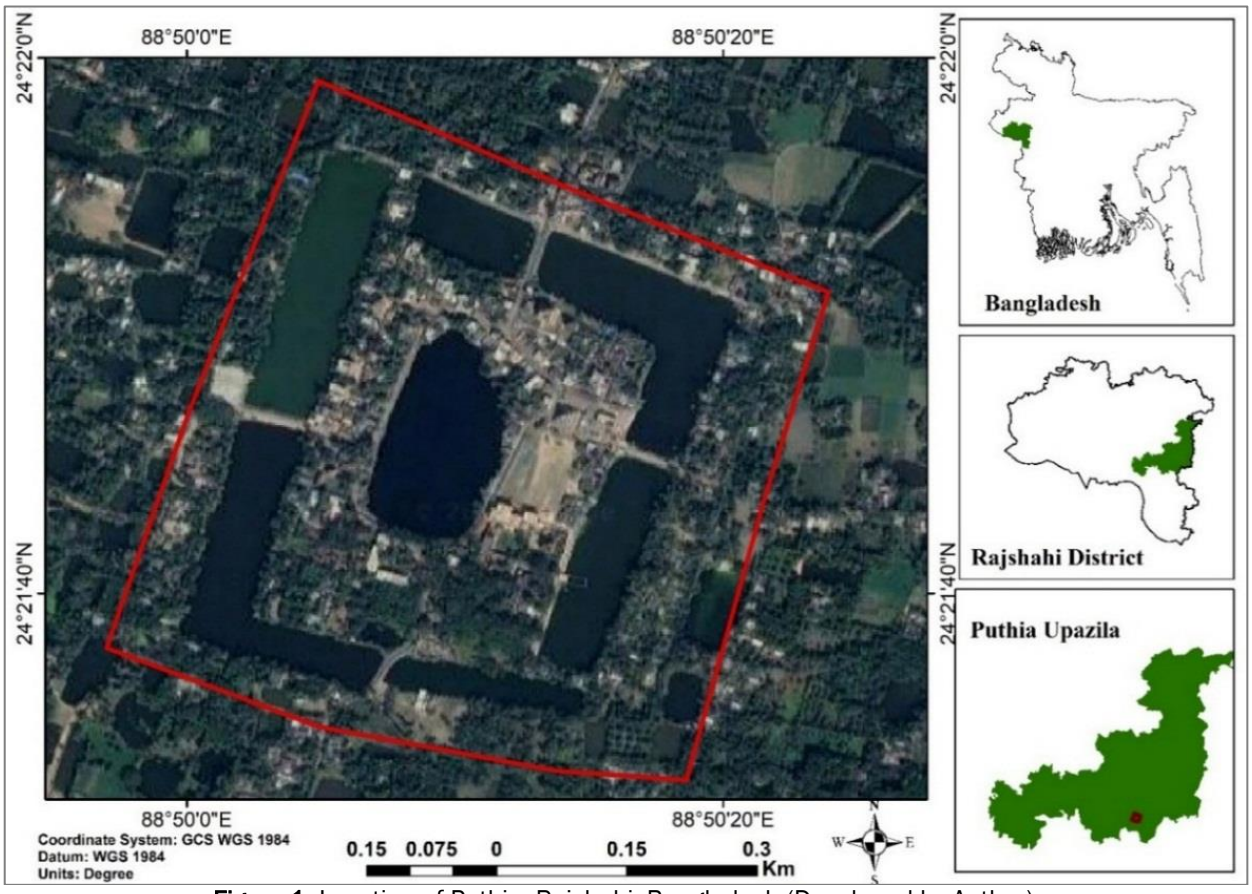


Figure 1. Location of Puthia, Rajshahi, Bangladesh (Developed by Author)

Material and Methods

Study Area

Puthia heritage site of Rajshahi, Bangladesh, is selected as the research area due to several reasons (Figure 1). At first, it is one of Bangladesh's richest heritage sites, with distinctive architectural design and irreplaceable character (Chandan, 2015, Mojumdar and Prince, 2017). There are numerous temples and buildings, and these structures were constructed when Subadars ruled Bengal under the Mughal emperor' from the Mughal period to the colonial period (Chandan, 2015, Mojumdar and Prince, 2017). Secondly, it is about 32 km from Rajshahi city, and the main palace is located about 500-meter south of the Natore-Rajshahi highway. The palace and the temple complex are still in good shape, making the place more attractive to visitors (Akter et al., 2021). Thirdly, although this palace is full of heritage resources and is a gorgeous place, there is significant research and information about all the heritage resources of Puthia (Alam, 2013).

Data Collection and Analysis

A satellite image of the site was collected and georeferenced in GIS software to prepare the base map of the area where the heritage resources of Puthia are identified. After preparing the base map, a field observation survey was conducted to determine the site's heritage using indicators of age, design, materials, and type of structure (Huq et al., 2017, Huq et al., 2019, Huq, 2020, Hua 2010). A participatory mapping technique was used to conduct a focus group discussion involving the caretakers of Puthia palace and local people to prepare a site map. Finally, the information collected from the observation survey and focus group discussion was triangulated and merged with the layout map (in ArcGIS software) to prepare the site's final heritage resource map (Figure 1). Expert opinions and Local people's opinions were gathered to introduce the local history, description, and past and present use of these heritage resources. A structured questionnaire survey technique was applied to calculate the Visitors'satisfaction level of the site (Huq et al., 2019, Islam et al., 2019). Literature was reviewed to develop the relevant attributes to find the Visitor's satisfaction, perception, and experience in that site. There were 23 attributes identified to measure the expectations and satisfaction levels. A five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used to treasure the substantial aspects (Table 1). It is one of the simplest and most widely used scales (Rubin, 2005). Two hundred thirty sample sizes were selected using thumb rules (no. of variable x 10) (Roscoe, 1975). Data were collected from May 06 to May 12, 2019, and from June 14 to June 29, 2019.

A regression analysis technique was used to analyze the collected data. A simple linear regression equation: Y= a +bXwas developed to show the correlations between tourists' satisfaction and other attributes (Lind, 2016). The correlation among the variables is shown by the value of R square and the significance P-value. The important Performance Analysis (IPA) method is applied to measure the relationship between user perception and expectation (Martilla 1977). The Customer Satisfaction Index (CSI) is adopted to determine the satisfaction index that has been achieved concerning the service delivered (Table 2) (Adris et al. l, 2014). Depending on the Likert Scale used in the study, CSI values can be categorized into seven interpretations or five interpretations. Depending on the five-point Likert model used in this study, this study interprets the CSI values as; very satisfied (0.81 -1.00), satisfied (0.66-0.80), quite satisfied (0.51 -0.65), less satisfied (0.35-0.50), and not satisfied (0.00-0.34) (Supranto 2001; Lubis et al. 2007; Rachmawati et al. 2013; Helia et al. 2018; Gunawan and Iqbal 2018).

Table 1. Likert Scale used in the data collection process (Developed by Lubis et al. 2007; Rachmawati et al. 2013)

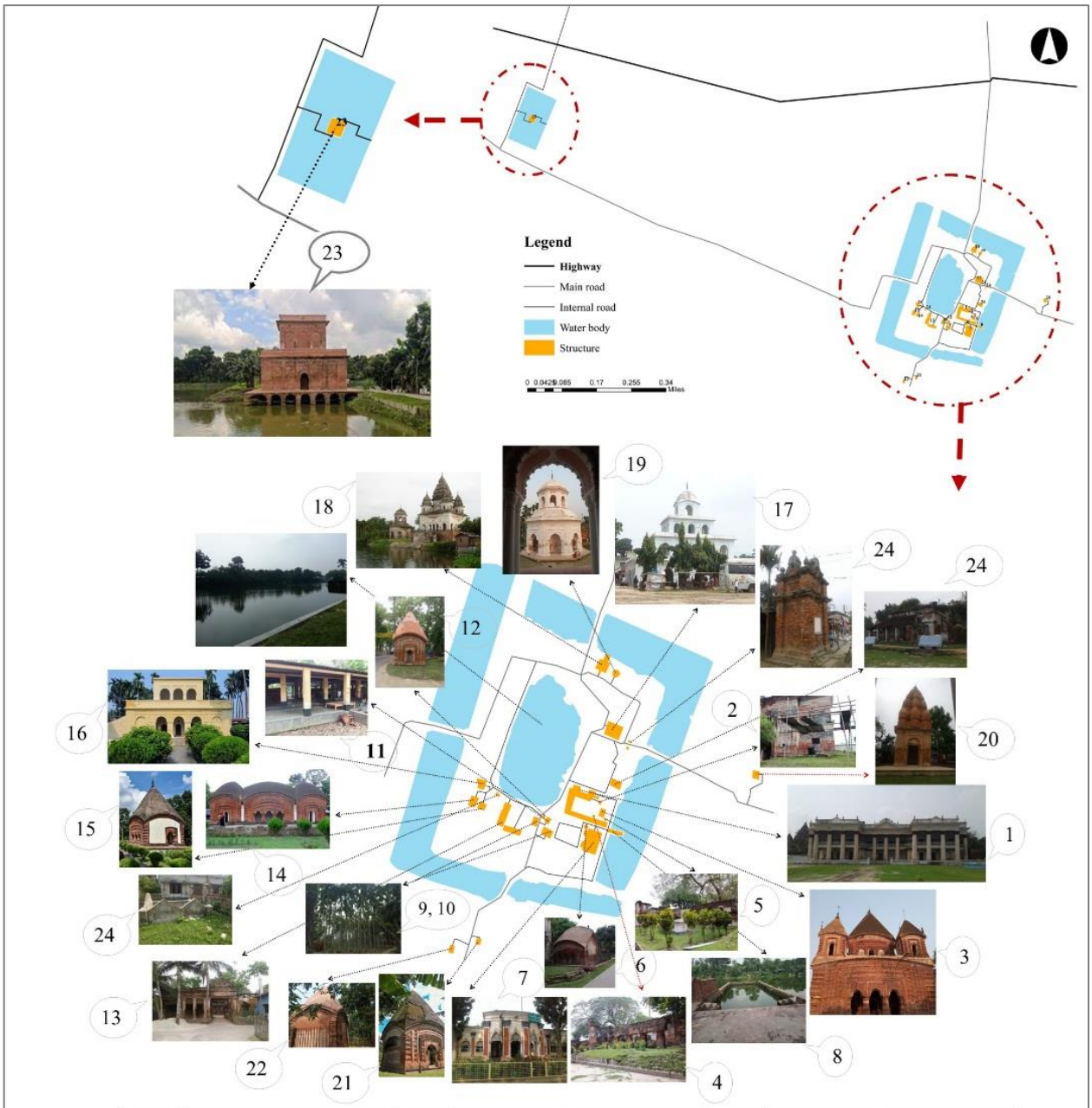
Scale	Performance	Importance
1	Very Not Satisfied	Very Not Important
2	Not Satisfied	Not Important
3	Neutral	Neutral
4	Satisfied	Important
5	Very satisfied	Very Important

Table 2. CSI Value Criteria (Developed by Supranto 2001; Lubis et al. 2007; Rachmawati et al. 2013; Helia et al. 2018; Gunawan and Iqbal 2018)

CSI Value	CSI Criteria
81%-100%	Very Satisfied
66%-80%	Satisfied
51%-65%	Moderately Satisfied
35%-50%	Less Satisfied
0%-34%	Not satisfied

Mapping of Puthia Heritage Resources

This study identifies 23 heritages in Puthia. The locations of these heritages are plotted into GIS to produce a map to present the heritage resources of this area (Figure 2). Among these 23 heritages, 14 heritages are enlisted by the Department of Archaeology Bangladesh. Gobinda Temple, Jagadhatri temple, Doul Temple, and Boro Shiva temple were enlisted as heritage in Bangladesh Gazette on October 09, 1975. Puthia palace, Krishnapur temple, Jagannath temple, ChotoAhnik Temple, Gopal Temple, ChotoGobinda Temple, BoroAhnik temple, Khitishchandrer Moth, KestaKhepar Moth, and Hawakhana were enlisted as heritage in Bangladesh Gazette in October 01, 1987 (Department of Archaeology, 2021). This study identifies 09 more heritages in this site apart from these 14 enlisted heritages, which are neither enlisted nor protected, under the risk of deterioration. The following map shows the enlisted and not-enlisted heritage resources of Puthia.



Symbol	Name	Symbol	Name	Symbol	Name
1	Puthia palace	9	Sare-Tin-Ani	17	Doul temple
2	Durga temple	10	Sare-Tin-Ani	18	Boro Shiva temple
3	Gobinda temple	11	Sarbasajahara mayer temple	19	Jagannath temple
4	Jagadhatri temple	12	Choto Shiva temple	20	Kesta Khepar Moth
5	Laxmi temple	13	Char-Ani residence	21	Khitish Chandrer Moth
6	Choto Ahnik temple	14	Boro Ahnik temple	22	Krishnapur temple
7	Hemanatakumari residence	15	Choto Gabinda temple	23	Hawakhana
8	Ranir ghat	16	Gopal temple	24	Others (Graveyard, Gate, Theater)

Figure 2. Layout map of Puthia heritage resources (Developed by Author)

Visitors' Expectation and Satisfaction Index Measurement

Characteristics of Visitors and Their Visit

From the statistical values, it is said that most visitors (almost 36.8 %) in age 21-30 years old visit the Puthia heritage site more. Among all other visitors on the site, 29.4% are 21-30 years, 21.3% are 15-20 years old, and

above 40 years old visitors are 12.5%. As Puthia heritage site is not so far from Rajshahi city and is an educational region, the maximum visitors are students. Among all the visitors, 33.5 % are students from different levels, 24.7 % are Service holders, 21.3% visitors are businessmen, 14.3% are housewives, and 6.2% are from other occupations such as farmer, labor, and unemployment. The maximum number of respondents visit the site with their family, friends, group, or individually. The sample respondents are also divided in gender, showing that males pay more visits (67.3% of total respondents) to the Puthia site than females (32.7%). Some respondents visit Puthia on holiday with their family members, especially their children. Most tourists (57.7%, more than half) visit the Puthia heritage site for recreational purposes. 10.4% of people visit the heritage site Puthia for educational purposes, and 14.6% of people visit the site the emotion to learn the tradition and old history. Besides, 17.3% of people visit Puthia heritage sites for multi-purpose reasons such as business or other works. Most visitors, almost 67.6 % of total respondents, visit the heritage site Puthia once in life. 24.3% of visitors visit the heritage site once a year, and only 8.1 % of visitors visit the site once a month. Generally, students visit the site once a year with their friends on different occasions, such as the festival 'Eid' and during holiday seasons. Some local people call the heritage site once in a month with their families and children (Figure 3).

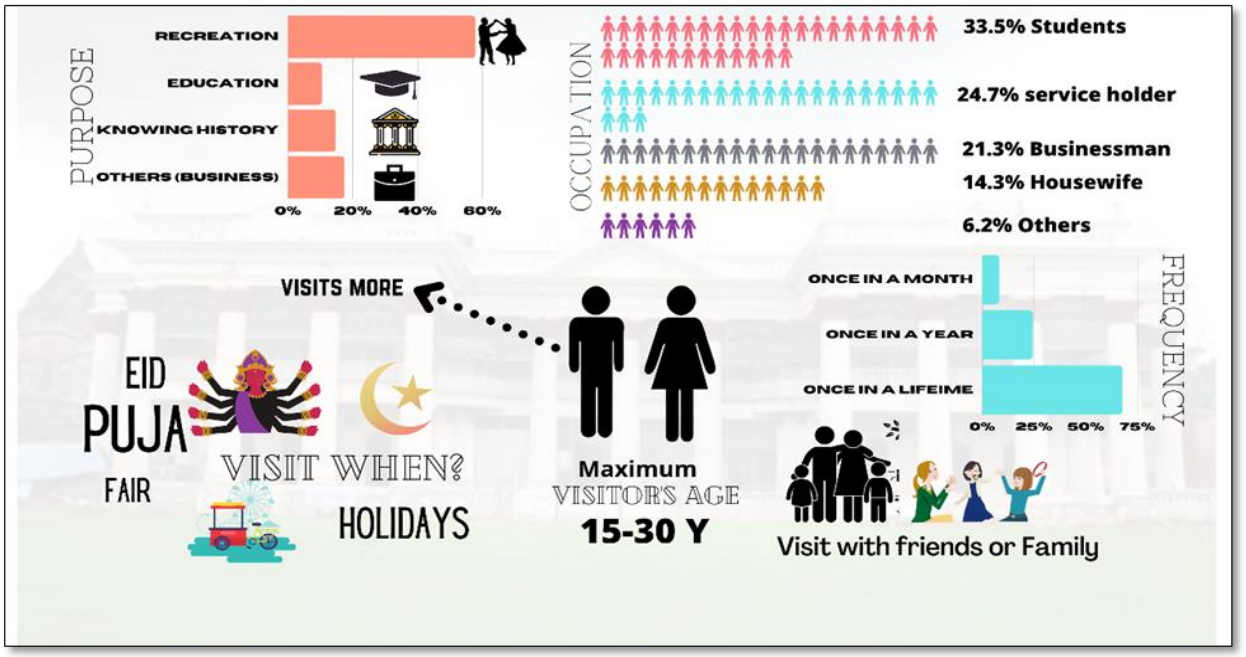


Figure 3. Infographic of the visit characteristics in Puthia(Developed by Author)

Visitor's Perception Regarding Existing Facilities

Visitors' perceptions of existing facilities' performance are measured from 1 to 5. The highest mean score of the attribute 'necessity of layout map' of heritage resources among all the attributes is 4.79, and the standard deviation of this statement is the lowest at 0.312, which means all the respondent who visits the site agree with this statement and also feel the necessity of a layout map of the heritage site. The mean value of the attribute "Natural scenery of the site is attractive" is found to be 4.14, and the standard deviation of this dimension is 0.797which agrees that this site's natural scenery is attractive, and visitors are satisfied with this attribute. Some attributes have high mean value, such as accessibility of the site, frequent visit, and provoking friends to visit the site. The mean score of the hygienic sanitation system, availability of bins for waste dumping, and information about the site's heritage resources arerespectively 1.64,1.68, and 1.94. (Table 4). These three attributes' performances are inferior compared to the other attributes, and performances for the attributes must be increased to augment the site's satisfaction level and attract more visitors to the heritage site Puthia. Some statistical value describes data acceptancy and validity. It is expressed that the total data is 230. At 95% confidence level acceptance, the standard deviation range is -2 between +2, Where $-2 < 0.98 < 2$, which means data is acceptable at 95% confidence level, and data seem to fit the empirical rule well (Lind, 2016). The skewness of -0.058, which is nearly 0, means the dataset is valid and normal in distribution. The data are relatively symmetrical, as per the rule of thumb, if the skewness is between -0.5 and 0.5. (Wheeler, 2008).

Table 3. Mean score for visitors' perception at Puthia heritage site (Developed by Author)

Dimensions	Mean	Std. Deviation
The heritage site is felt safe and secured	3.27	0.856
The site has available food facilities	2.12	0.77
There is a hygienic sanitation system on site	1.64	0.65
There is sufficient parking place	3.23	0.981
Information about heritage sources is available	1.94	0.715
There is sufficient sitting place on the site	3.07	0.798
Quality of sitting place is well	2.48	0.704
The site is illuminated by lighting facilities	2.65	0.648
The site is easily accessible	3.96	0.829
There is sufficiently enough bin for waste dumping	1.68	0.598
The natural scenery of the site is attractive	4.14	0.797
The site is free from noise, nuisance, and pollution	3.66	0.787
There is a need to have guides to obtain a relevant explanation	2.64	0.464
There is a need to have a layout map for proper direction	4.79	0.312

Correlation and Regression Study of the Variables

The table presents the correlation of the dependent variable tourist satisfaction with other independent variables. All the significant levels are zero, which is less than 0.05, which means the correlation of all variables is acceptable. From the table, all these variables are positively and significantly correlated with the tourist's satisfaction level. Natural attraction, information, accessibility, and parking strongly correlate with tourists' satisfaction. Natural attractions contribute 70.5% on a tourists' satisfaction. Easy accessibility and information on heritage resources contribute 63.9% and 63.8% to the visitors' satisfaction level at the Puthia heritage site (Table 5). Table 4 indicates the layout map as a prime concern of Visitor satisfaction, but as it has no real existence so a correlation with satisfaction could not be found.

Table 4. Correlation between satisfaction and other variables (Developed by Authors)

	Variable	Pearson correlation	Significance
Dependent Variable	Satisfaction	1	
Independent Variables	Security system	0.547	0
	Food facility	0.605	0
	Sanitation	0.5	0
	Parking	0.616	0
	Information	0.639	0
	Sitting place	0.404	0
	Sitting place quality	0.341	0
	Lighting	0.231	0
	Accessibility	0.638	0
	Waste dumping	0.304	0
	Natural attraction	0.705	0
	Environmental clarity	0.56	0
	Guide	0.263	0

According to the contribution of these independent variables to satisfaction level, the forward or stepwise regression model is used to find the satisfaction equation. The stepwise method chooses to explain the highest percentage of the still unexplained variation by determining the independent variable first that has the strongest correlation with the dependent variable. This procedure is iterated until the regression equation incorporates all independent variables with significant regression coefficients (Lind, 2012).

This model has nine independent variables, R square = 0.835, meaning satisfaction will be changed by 83.5% with the change of these independent variables. Significance P= 0.003, which is less than 0.005. Durbin Watson's value is 1.809 with the range of 0 to 4 and 1.809 < 2, which means there is positive autocorrelation or serial autocorrelation in residual and regression analysis. The rule of thumb says test statistic value between 1.5 to 2.5 is considered relatively normal (Glen 2016). From ANOVA, the significance value is 0.000, less than 0.005, which means this model is significant (Lind, 2012). The linear regression equation of the satisfaction is:

$Y = b + a_1*X_1 + a_2*X_2 + a_3*X_3 + a_4*X_4 + a_5*X_5 + a_6* X_6 + a_7*X_7 + a_8*X_8 + a_9*X_9$(Lind, 2016).

Y = Satisfaction level	X_3 = Environment clarity	X_6 = Food facility
X_1 = Natural attraction	X_4 = Easy Accessibility	X_7 = Sanitation
X_2 = Information	X_5 =Security system	X_8 = Parking
b = Constant	a_1, a_2, a_3, a_4...= Coefficient of independents variables	

Considering the coefficient value from regression analysis, the satisfaction equation will be:

Y = -1.628 + 0.301*X1 + 0.264*X2 + 0.194*X3 + 0.23*X4 + 0.179*X5 + 0.141* X6 + 0.184*X7 + 0.126*X8 + 0.11*X9

From the regression equation, the constant of the satisfaction equation is -1.628, meaning satisfaction will be negative without these independent variables.

Visitors Satisfaction Index

This study uses Important Performance Analysis (IPA) and Customer Satisfaction Index (CSI) techniques to determine Visitor satisfaction according to existing facilities' performance. Factors in Quadrant 1 (low performance, high expectation) are measured important by the tourists of Puthia, but these factors do not fulfil their expectations. The visitors' expectation regarding these indicators' performance is high, whereas the present performance is very low. So, the indicators in this quadrant should be given priority to perform according to the tourists' expectations. Indicators located in quadrant 2 (high performance, high expectation) perform satisfactorily, and tourists also consider these factors important. These factors' existing performance must be maintained because the indicator has attracted tourists' attention to this place.

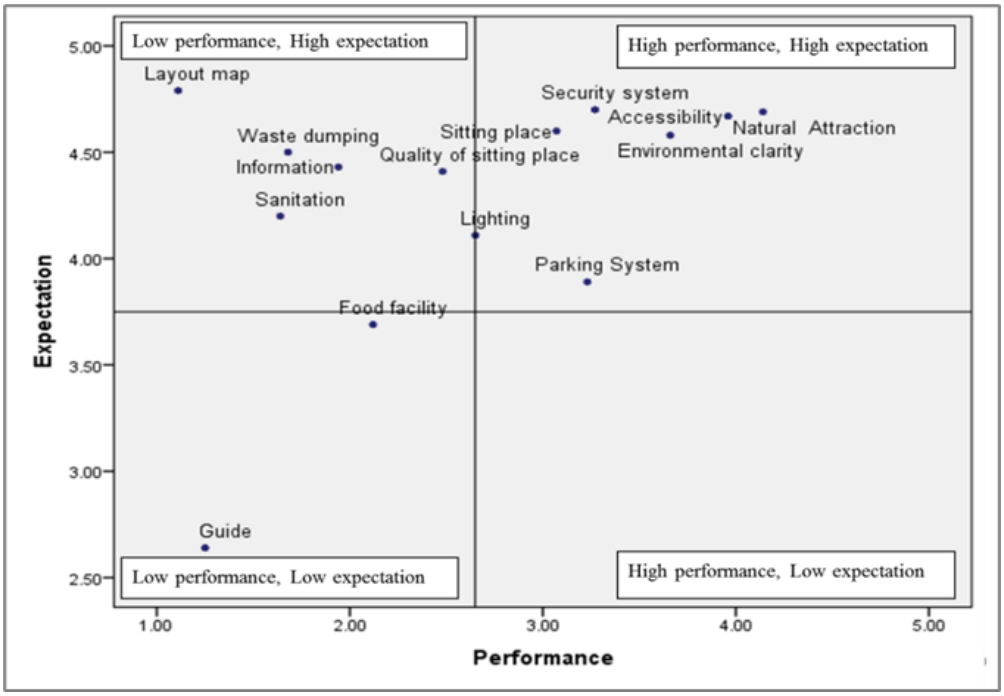


Figure 4. Cartesian diagram of performance and expectation variables (Developed by Author)

The data collected from the field on the performance and expectations of the factors have been analyzed according to the algorithm used in measuring the customer satisfaction index (CSI) to develop the site's visitor satisfaction index (VSI).

Table 5. Matrix of CSI Method for visitors of Puthiaresource (Developed by Author)

Indicators	**Performance (MSS)** MSS= $\frac{\Sigma X}{n}$ Where n= no of the respondent and X= Real performance value attribute	**Expectation (MIS)** MIS =$\frac{\Sigma Y}{n}$ Where n= no of respondent Y = Expectation value attributes	**Weighted factor (WF)** WF = $\frac{\text{MIS}}{Average\ value\ of\ MIS}$	**Weighted score (WS)** WS= WF* Avg MSS	**CSI** CSI= $\frac{\text{WS}}{Hs}$ Hs=Highest score (5)
Security system	3.27	4.7	1.10	2.85	0.57
Food facility	2.12	3.69	0.86	2.24	0.45
Sanitation facilities	1.64	4.2	0.98	2.55	0.51
Parking facilities	3.23	3.89	0.91	2.36	0.47
Information facilities	1.94	4.43	1.04	2.69	0.54
Sitting place	3.07	4.6	1.08	2.79	0.56
Sitting place quality	2.48	4.41	1.03	2.67	0.53
Lighting facilities	2.65	4	0.94	2.43	0.49
Accessibility	3.96	4.67	1.09	2.83	0.57
Waste dumping	1.68	4.5	1.05	2.73	0.55
Natural attraction	4.14	4.69	1.10	2.84	0.57
Environmental clarity	3.66	4.58	1.07	2.78	0.56
Guide	1.25	2.64	0.62	1.60	0.32
Layout map	1.11	4.79	1.12	2.91	0.58
Average	2.59	4.27		**CSI**	**0.52**

The above analysis shows the satisfaction level for each parameter. The average CSI score is termed VSI, which is found to be 0.52, which falls between 0.51 and 0.66 on the CSI scale, indicating that visitors are moderately satisfied with both the overall performance and expectation of the current facilities offered in the Puthia heritage resources.

Proposal to Enhance the Visitor's Satisfaction of The Site

The site's important performance analysis shows that attributes layout map, waste dumping, sitting quality, information availability, sanitation, lighting, and food facility are found to perform weakly, and visitors have high expectations of these factors. Therefore, concentration must be given to improving these factors' performance, eventually improving visitors' satisfaction. This study proposes improving the overall Visitor satisfaction of the site by proposing those facilities that are low in performance but high in expectations found in the important performance analysis. All the expected facilities are integrated into the layout map and introducing such a layout map in the Puthia area can ease the service facilities of tourists (Figure 5).

Symbol	Name	Symbol	Name	Symbol	Name
1	Puthia palace	9	Sare-Tin-Ani	17	Doul temple
2	Durga temple	10	Sare-Tin-Ani	18	Boro Shiva temple
3	Gobinda temple	11	Sarbasajahara mayer temple	19	Jagannath temple
4	Jagadhatri temple	12	Choto Shiva temple	20	Kesta Khepar Moth
5	Laxmi temple	13	Char-Ani residence	21	Khitish Chandrer Moth
6	Choto Ahnik temple	14	Boro Ahnik temple	22	Krishnapur temple
7	Hemanatakumari residence	15	Choto Gabinda temple	23	Hawakhana
8	Ranir ghat	16	Gopal temple	24	Others (Graveyard, Gate, Theater)

Figure 5. Provision of necessary facilities in the layout map (Developed by Author)

Conclusion

Puthia is called "Temple Village" because of having the highest concentration of historically significant Hindu structures. Every year this site is visited by a large number of tourists. Although Puthia has a great historical significance with solid tourism potential, this site received minimal attention regarding proper heritage conservation or tourist management. This study has attempted to identify this site's heritage resources and evaluate the visitors' satisfaction levels. Findings from the correlation study show that 13 factors directly correlate with the satisfaction level of the visitors. The regression model identifies nine factors that significantly correlate with the satisfaction level of the visitors. R square value suggests that the visitors' satisfaction level will be changed by 83.5% with the change of these nine independent variables. Visitor satisfaction analysis based on CSI methods demonstrates that the site visitors are 'moderately satisfied' with overall performance and expectations of different aspects of the Puthia heritage site. Important performance analysis (IPA) identifies six (06) factors that are performing very poorly, and visitors have high expectations regarding their performance. Therefore, this research proposes a few measures to improve these six factors, which eventually

will help to enhance the overall visitors' satisfaction level in the future. The outcome of this research will help researchers and academicians to conduct their future research on Puthia heritages. The method formulated to measure the visitor satisfaction index (VSI) can be used to study any heritage site's satisfaction level or recreational place. This study will also help policymakers to prepare a practical heritage and tourism management plan.

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Conflict of Interests

The author declares no conflict of interest.

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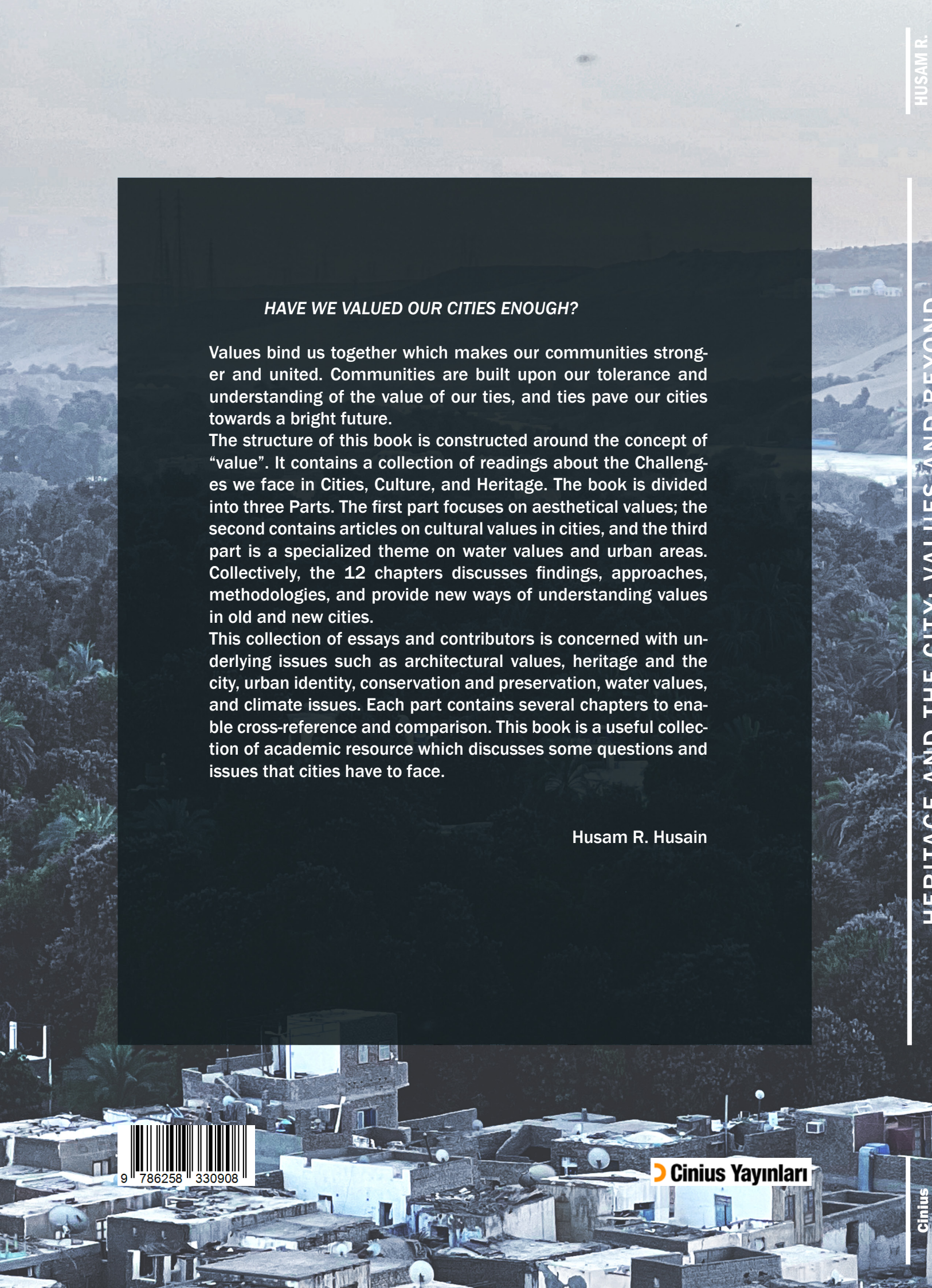

HAVE WE VALUED OUR CITIES ENOUGH?

Values bind us together which makes our communities stronger and united. Communities are built upon our tolerance and understanding of the value of our ties, and ties pave our cities towards a bright future.

The structure of this book is constructed around the concept of "value". It contains a collection of readings about the Challenges we face in Cities, Culture, and Heritage. The book is divided into three Parts. The first part focuses on aesthetical values; the second contains articles on cultural values in cities, and the third part is a specialized theme on water values and urban areas. Collectively, the 12 chapters discusses findings, approaches, methodologies, and provide new ways of understanding values in old and new cities.

This collection of essays and contributors is concerned with underlying issues such as architectural values, heritage and the city, urban identity, conservation and preservation, water values, and climate issues. Each part contains several chapters to enable cross-reference and comparison. This book is a useful collection of academic resource which discusses some questions and issues that cities have to face.

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Cinius Yayınları

HUSAM R.

HERITAGE AND THE CITY: VALUES AND BEYOND

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