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About the Journal

The Journal Of Contemporary Urban Affairs is dedicated to focuses on socio-economic consequences of contemporary urbanization. In this regard, studies on conflict and divided territories, emerging cities, infra habitation, slums, affordable houses, gated communities, revitalization and rapid urbanization which are the main socio-economic challenges in the contemporary urban spaces considered for publication in this journal. Recently, the editorial board of the journal have been added "Pandemic and its socio-economic consequences on cities" as additional scope to be considered for publication. Contributions are welcome from across the full range of social science disciplines and are expected to advance empirical and theoretical knowledge on contemporary urban affairs - by considering the main scopes of the journal - both from positive and normative perspectives. Highest priority is given to research reports that are specifically written for a multidisciplinary audience.

Journal of Contemporary Urban Affairs distinguishes itself by providing an international and interdisciplinary platform for the exchange of ideas and information among Architectures, urban planners, policy makers and urbanists from all disciplines to focus on seven main concern of this journal which are Housing studies, Emerging cities, urban ecology, Infra Habitation, Revitalization strategies, conflict, divided territories and overall contemporary urban issues about mentioned concerns. Submissions of empirical, comparative, theoretical research, critical review and manifestoes for the future of cities from different scholarly disciplines and methodological perspectives are encouraged.

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EDITORIAL

The Journal Of Contemporary Urban Affairs is dedicated to focuses on socio-economic consequences of contemporary urbanization. In this regard, studies on conflict and divided territories, emerging cities, infra habitation, slums, affordable houses, gated communities, revitalization and rapid urbanization which are the main socio-economic challenges in the contemporary urban spaces considered for publication in this journal. Recently, the editorial board of the journal have been added "Pandemic and its socio-economic consequences on cities" as additional scope to be considered for publication. Contributions are welcome from across the full range of social science disciplines and are expected to advance empirical and theoretical knowledge on contemporary urban affairs - by considering the main scopes of the journal - both from positive and normative perspectives. Highest priority is given to research reports that are specifically written for a multidisciplinary audience.

Editorial Board strives to provide a possibility for the scientists of different fields to publish the results of their research, technical and theoretical studies. *Journal of Contemporary Urban Affairs* is multidisciplinary in approach and will publish a great range of papers: reports of qualitative case studies, quantitative experiments and surveys, mixed method studies, action researches, meta-analyses, discussions of conceptual and methodological issues.

A broad outline of the journal's scope includes peer-reviewed original research articles, case and technical reports, reviews, short communications and notes to the editor. All scholars, practitioners, professionals, researchers and policy makers with a common interest to study in the field of architecture and urban design from different disciplines, such as Art, Architecture, Landscape, Urban Planning and Urban Design are welcome to share their research findings. The journal only publishes research of the highest quality and impact. All articles are published in English and undergo a peer-review process.

Educational Technology

Journal of Contemporary Urban Affairs has an international editorial board of eminent experts in their field from Turkey, USA, UK, Germany, India, Canada, New Zealand, Cyprus, Egypt, Malesia, Lebanon, Switzerland and Pakistan. We are confident that JCUA will attract a great number of editors, eminent scientists in the field. The selection will be based on the activities of the editors and their desire to contribute to the development of the journal. *Journal of Contemporary Urban Affairs* provides a platform for academics and scientists professionals to refer and discuss recent progress in the fields of their interests. Authors are encouraged to contribute articles which are not published or not under review in any other journal. Each submitted manuscript is evaluated based on the originality of its contribution to the field of scholarly publishing, the soundness of its theory and methodology, the coherence of its analysis and its availability to readers (grammar and style). Normal turn-around time for the evaluation of manuscripts is one to two months from the date of receipt.

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Manuscripts must be submitted online. Electronic submission reduces the editorial processing and reviewing time. As part of the submission process, authors are required to check off their submission compliance with all of the following items, and submissions may be returned to authors who do not adhere to the following guidelines:

-The submission has not been previously published or presented to another journal for consideration (or an explanation has been provided in Comments to the Editor).

-The submission file is in OpenOffice, Microsoft Word, RTF, or WordPerfect document file format.

-Where available, URLs for the references have been provided.

-Where available, DOI Number for the references have been provided.

The text is single-spaced; uses a 12-point font; employs italics, rather than underlining (except with URL addresses); and all illustrations, figures, and tables are placed within the text at the appropriate points, rather than at the end. The text adheres to the stylistic and bibliographic requirements outlined in the Author Guidelines. If submitting to a peer-reviewed section of the journal, the instructions in *Ensuring a Blind Review* have been followed.

A manuscript goes through the peer review process. Authors submit manuscripts to Editorial office via the online system. The acknowledgement letter should be sent to the author to confirm the receipt of the manuscript. The Chief Editor first reviews manuscripts. Chief Editor is assisted by Section Editors (could also be Co- or Associated Editors). The Editor assigns a Section Editor to see the manuscript through the complete review process and return it with a recommendation or decision. The manuscript is checked to see if it meets the scope of the Journal and its formal requirements. If it is incorrect or unsuitable, the author should be informed and the manuscript filed (or returned if requested) – direct rejection. Manuscripts that are not suitable for publication in the Journal are rejected. A Rejection letter is sent to the author stating the reason for rejection. If the manuscript conforms to the aims and scope of the Journal, and formally abides by the Instructions to Authors it is sent out for review. Depending on the type of paper, it could be accepted immediately for publication (invited Editorial, Book review etc) by the Chief Editor. Check that the manuscript has been written and styled in accordance with the Journal style; that it carries an abstract (if applicable), keywords, correct reference system etc. and check that the correct blinding system has been used. If anything is missing, the Editor in Chief of associate editor will ask from the authors to complete it before the manuscript is sent out for review. The manuscript is sent out for review. The reviewer reads and evaluates the manuscript and eventually sends a review report to the Chief Editor. The time for review can be set to 2-6 weeks depending on the discipline (more time is usually given to papers in the humanities and social sciences). Make sure to provide the reviewer with clear instructions for the work, e.g., outlined in the form of a Review report or a number of questions to be considered. Based on the reviewers' comments the Chief Editor makes a decision to:

-Accept the manuscript without further revision

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-Reject

An acceptance letter is sent to the author and the final manuscript is forwarded to production. Sometimes, the authors are requested to revise in accordance with reviewers' comments and submit the updated version or their manuscript to the Chief Editor. The time for review can be set to 2-6 weeks depending on the discipline and type of additional data, information or argument required. The authors are requested to make substantial revisions to their manuscripts and resubmit for a new evaluation. A rejection letter is sent to the author and the manuscript is archived. Reviewers might be informed about the decision. After review a manuscript goes to the Copy Editor who will correct the manuscript concerning the correct referencing system, confirmation with the journal style and layout. When Copy Editor finishes his/her work they send manuscripts to the Layout editor. Layout Editor is responsible for structuring the original manuscript, including figures and tables, into an article, activating necessary links and preparing the manuscript in the various formats, in our case PDF and HTML format. When Layout Editor finishes his/her job they send manuscripts to Proof Editor. Proof Editor confirms that the manuscript has gone through all the stages and can be published.

This issue on educational has 9 articles. The editors seek to publish articles considering socio-economic consequences of contemporary urbanization in the specific field of: Housing Studies, Emerging Cities, Urban Ecology, Infra Habitation, Revitalization Strategies, Conflict, Divided Territories; they are looking forward to substantial improvement of educational processes and outcomes.

With kind regards,

Dr. Hourakhsh A. Nia
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The Identification of The City on The Legibility and Wayfinding Concepts: A Case of Trabzon

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ABSTRACT

The concept of wayfinding includes understanding the space and finding direction within the space. But as cities and architectural spaces grow and become more complex, visitors and locals of the sapce can find it difficult to find direction. For these reasons, for visitors who speak different languages, along with these elements, there is a need for well-designed information and direction-finding graphics and landmarks that have a universal quality.

The aim of the study is to explain the concepts of wayfinding and way-finding, defined as "direction-finding" in the literature and to create awareness. Furthermore, to analyze the concept of wayfinding and the direction designs that aim to transform the cities that have become complex into more understandable spaces, through the city of Trabzon and to examine the problems of the city in this context and to make suggestions.

In this study, Trabzon will be evaluated with the concepts of legibility and directability and the direction and information designs over the focal point, regions, edges, nodes, roads with which Kevin Lynch have defined the imageable, readable city. A survey was conducted to investigate the spatial information elements and legibility of Trabzon city. Furthermore, to create awareness for other cities with similar problems.

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1. INTRODUCTION

1.1. Identification of The City, Legibility and Direction Finding

When the growth and resemblance of the cities to each other by becoming ordinary started to be a problem, the first studies on direction finding and legibility of the city were brought forward by Kevin Lynch in 1960s. In his book City Image, Lynch analyses direction finding in the city by associating it with the legibility of the city and urban images; he states that a city is perceived and encoded to our minds with "roads, monuments, regions, borders and signs".

According to Lynch (1960); "*Structuring and defining the environment is a very important skill for all living creatures.*

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To do this, a variety of clues are used: smell, sound, touch, gravity, and even magnetic fields and stimulants, as well as visual sensations such as colour, shape, motion, and light are utilized. For urbanites who live in modern cities getting completely lost is not a common situation. The presence of others and special tools such as maps, street numbers, plates, bus numbers help us to find the way. The strategic ring of direction-finding process is the environmental image, an image where the individual generalizes the outside world in his/her mind. This image is the product of both immediate senses and past experiences, used to interpret acquired information and to direct movement."

Bentley defines the legibility as the ability to read and understand the environment for options. Readable environments make it easy for people to find their way. If people find out about the environment and what is going on there, they utilize the preferences and advantages of the environment. The meaning of readable environments is that people can obtain clear and accurate images from it. Planners can control only physical planning, permanent images change only by user factor (Bentley, 1985; Yavuz, 2009).

According to Kaplan & Kaplan (1982); legibility is an environmental feature that allows the person to explore his surroundings without getting lost (Yavuz, 2009). According to Evans; legibility is to enable people to understand the plan of a place and the activities it involves (Carmona et al. 2003; Yavuz, 2009).

Sternberg explains legibility in terms of being easily understandable, comprehensible and safe for either residents or foreigners by creating effective differences in the meaningful parts of the whole and between these parts in urban planning (Sternberg, 2000; Yavuz, 2009).

Direction finding is that individuals can find their way to their targets without delaying or experiencing undue worry. On the basis of the concept, there is the concept of "spatial orientation" which means that the individual places himself / herself into the mental representations of the environment [Sönmez & Önder, 2015, cited from Peponis et al., (1990)]. One of the most effective concepts in showing up and progressing of direction finding and related studies is the concept of legibility. Direction finding is considered as a feature of readable environments; the environments that provide the necessary environmental information for the direction-finding behaviour and which enable this knowledge to be grasped and understood are expressed as the readable environment. This is possible with the fictionalization of the environment with defined and distinct elements; by means of comprehending the defined elements, it becomes easier to move to the target and direction finding in that environment [Sönmez & Önder, 2015, cited from Passini (1984 & 1996)]. We perceive the place and our location with the questions of "Where am I, where am I going, and how should I reach it". Legibility and direction finding are two concepts associated with each other.

Lynch, in his book "Urban Image", describes a legible city as textures which are created with definable elements and which can be comprehended visually. At the same time, by establishing relations with the urban images; he defined a readable city as a whole texture of which the regions, borders and roads can be easily identified.

Lynch, in the continuity of the definitions of legibility, mentions the importance of the individual's ability to find his/her direction properly and to move easily. According to Kevin Lynch, five main elements for the mental image of a city and, accordingly, for the legibility and direction finding in the city can be defined as follows:

Roads: These can be streets, pedestrian roads, public transport areas, canals and railways. These elements are dominant in the image of many people. People observe the city on the move and perceive other environmental elements on these roads and relate to the whole.

Edges: They function as a boundary between two regions. Coasts, railways, development zone borders and walls are examples of edge elements. The edges may be walls that allows passing at some of its points and that connect two regions, and the connecting points connecting two regions. The edge elements that hold the generalized areas together, such as in the cities of which the main lines are determined with water or walls; are important elements that many people use to find directions.

Regions: Regions are perceived as two-dimensional areas; they form medium or large-scale parts of the city. The observer feels as entering into these areas psychologically. These can be recognized by some of their common determinant characters.

Nodal / Focal Points: Nodal points are strategic points; they are intense focal points when traveling from one point to another. In particular, intersections, squares as meeting points can form nodal points.

Signal elements: They create the point reference source. They are often easily defined physical formations that are not entered; like a building, a sign plate, a shop, or a mountain. They may be within the city or at a certain distance. In this way, they symbolize a fixed direction for any practical use; like the city's towers, golden domes or high hills.

The elements Lynch defines create the spatial information for direction finding and legibility. Legibility is designed with spatial guidance tools that are integrated into the perception and definition process of cities.

Spatial direction tools; with the elements Kevin Lynch has defined, can be listed as follows:

- Legibility of circulating arteries
- Focal points
- Definable areas, squares
- Accessories, materials, colors, textures, lighting
- Creating spaces with identity.

These items can be used as an effective design tool in direction. But as cities, architectural spaces grow and become more complex, visitors and locals can find it difficult to find direction. For these reasons, along with these elements, there is a need for well-designed information and direction graphics and landmarks of a universal nature for those who speak different languages.

1.2. Information and Direction Design

As cities, architectural spaces grow and become more complex, visitors and locals started to have difficulty in finding directions; a need for information boards, direction signs and landmarks has arisen. There is a need for well-designed information and direction graphics and landmarks of a universal nature for those who speak different languages. Information design and direction design, as a sub-branch of graphic design, is a field of expertise which is based on interdisciplinary cooperation covering many disciplines such as architectural design, interior design, urban design, landscape design, industrial design, communication, ergonomics, psychology and computer technologies. Information and direction designs, a sub-branch of graphic design that makes information readable and accessible for all, have been important components of urban design and spatial design by creating spatial image and corporate identity (Figure 1).

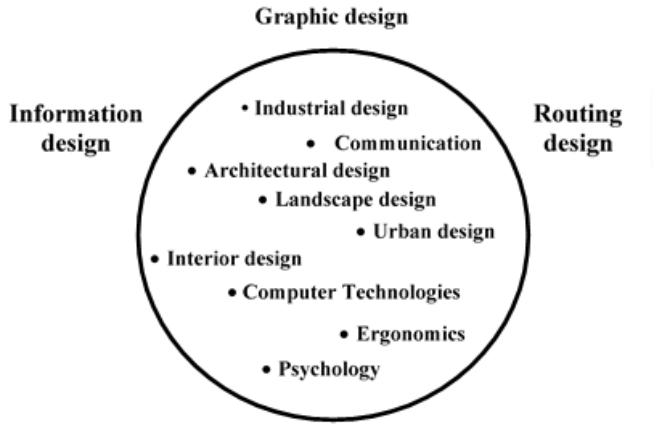


Figure 1. Interdisciplinary cooperation in information and direction design.

1.2.1. Information Design

Information design is a design field that organizes and presents the information needed by its user in a fast and understandable way. Making life easier, making the time used efficiently and preventing confusion are among its primary tasks. In this field, which we can explain as the design of information, the primary objective is to convey the information in the simplest, clearest and most understandable way to others. It is necessary for the user who is in constant information bombardment to perceive the environment more clearly (İlisulu, 2017).

Information design, which is one of the most basic areas of graphic design, works on how to transfer information better to the user. Graphic language, especially in metropolitans, is preferred in terms of being universal. It is the language that can be accessed and understood by everyone from the illiterate masses to the tourists who do not know the local language of the city; the language that the visual communication and graphic design would recommend. Especially considering the urban life with fast tempo, the fast transfer of this information also becomes important. Simple but very well-designed directions, signs that can be understood by everyone, directional systems that can be associated with each other and that can be followed, consistent composition, colour and typography are the elements that should be designed (Taşçıoğlu & Aydın, 2015).

Highways, city entrance signs, airports, terminals, campuses, Olympic facilities, shopping centres, cultural centres, hospitals, exhibition and fairgrounds are the places where information and direction designs are used to find direction. In big and crowded cities, symbols and pictograms used in the international arena, information and direction graphics are the tools that regulate social relations and provide communication. The pictogram or pictograph is a symbol representing a furnishing, an object, a place, a function, a concept by way of illustration (Figure 2).

In the context of environmental graphic design, pictograms are used in direction and marking sequences, especially in large and complex spaces. Pictograms are used to direct and inform people in many public spaces such as airports, train stations, bus stations, shopping centres, business centres, museums, hotels, hospitals etc. Therefore, it is very important that the pictograms can be easily understood by different human masses (Dur, 2011).

Figure 2. Symbolic expression with pictogram (URL-1,2017).

1.2.2. Direction Design

Direction design is an information design field that aims to enable users to find their destination in open or closed areas. The direction design consists of visual designs intended to guide the user in a certain direction. The marking design is a visual sign indicating the point of arrival to the user. These marks are the markers that specify a name and a function of that place. For example, street markings guide pedestrians, while guiding them, also make it easy for them to read the environment. Being able to see an important building far away helps pedestrians know where they are and whether they go in the right direction. A marked street will be much easier to perceive, read and familiar (Kolody, 2002; Yavuz, 2009). Marks such as door writings, floor numbers, building names etc. are within the scope of the marking design. "The direction and marking design guides the pedestrian or vehicle traffic in main entrances, road junctions, arrival and exit points, by combining graphic elements such as typography, symbols and arrows (Gibson, 2009: 50, cited by: Taşçıoğlu & Aydın, 2015).

The principles of a successful direction design can be listed as follows(Ataoğlu, 2017):

- It should support user and visitor experience, make finding directions easier.
- It should be guiding and explanatory for those visiting for the first time.
- It should help at decision points.
- It should create a sense of space.
- It should create an open and consistent information system.
- The route for reaching the point of destination and leaving the space and its guidance should also be designed.
- The message should be open and clear, should be understood easily.
- It should give direction to the target and be supportive at each stage.
- There should not be information and marking confusion.
- It should support creating corporate identity, brand value and image.

It should add aesthetic value to the space with its colour, form, typeface and graphic designs.

For information-direction design

Pictogram, typography, infographic, maps, schema and graphs, I am here maps, direction arrows, landmarks, entry signs are used.

2. FIELD SURVEY

In this study, the city of Trabzon will be evaluated with the concepts of legibility and directability and the direction and information designs over the focal point, regions, edges, nodes, roads with which Kevin Lynch have defined the imageable, readable city. In particular, it aims to determine the perceptions and direction attitudes of university students for Trabzon city and the city square. A survey was conducted to investigate the spatial information elements and legibility of the city of Trabzon.

In this framework, the aim of the study to analyse the concept of legibility and direction designs that intend to transform the cities into more understandable spaces through the city of Trabzon, the square and its surroundings and to examine the problems of the city in this framework and to make suggestions. Furthermore, to create awareness for other cities with similar problems.

2.1. Study Area

Trabzon is a port city founded in the 7th century B.C. as one of the Ionian colonies of the Miletus city state on the Aegean coast of Anatolia (Aksoy, 1997). Trabzon has a colourful identity and geographical location with the fact that it has the largest port of the Eastern Black Sea, its geographical and topographical position, hosting many different cultures such as Persians, Romans, Byzantines, Genoese and Ottomans, and the reflection of this dynamic diversity in the space (Figure 3-4).

Figure 3. Trabzon City Square and its surroundings (URL-2,2019).

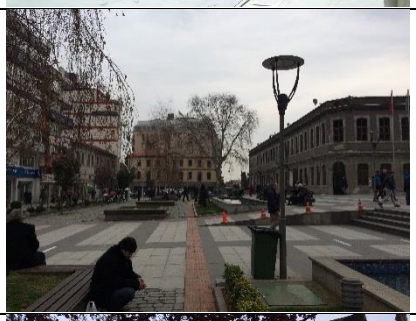
KTU campus (Yavuz, 2019)			Zağnos Valley (Yavuz, 2019)
Park Square Atatürk statue (Yavuz, 2019)			Square Park TS Emblem (Ataoğlu, 2019)
Square, Old Town Hall (Yavuz, 2019)			Hagia Sophia Museum(Yavuz, 2019)
Atapark (Yavuz, 2019)			Atatürk Statue (Ataoğlu, 2019)

Figure 4. Images of the study field (Yavuz, 2019; Ataoğlu, 2019).

2.2. Participants

Universities are in interaction with the city where they were founded in addition to their basic functions such as education and training. This expectation supports the revival of the city and it goes beyond the its immediate environment, contributes to and supports the development of its region (Demirbaş et al., 2017). At the city central of Trabzon, which is a university city, students coming from different provinces of Turkey for education purposes live with the residents. A total of 116 university students from the departments of Landscape Architecture, Architecture and Interior Architecture participated in this study to determine the university students' perception of Trabzon city and city square and their direction attitudes. The questionnaire form contained questions about the determination of demographic data and the determination of the places forming an image in the minds of the users in the square and its immediate surroundings. In the questionnaire, there were 10 questions in total. The questionnaire was conducted with students randomly selected from different classes from each of the three departments. The questionnaire was completed in approximately 5 minutes with each participant. The study was conducted in April 2019. 75% of the participants were female and 40% were between 16 and 20 years old. 28% of the total sample was represented as Trabzon residents. Although the majority of the students were not from Trabzon, it was found that they mastered on important components about Trabzon during their stay (Table 1).

Table 1. Percentage (%) distribution of demographic characteristics of participants.

		Percentage(%)
Gender	Male	75
	Female	25
Age	16 -20	40
	21-25	52
	26-30	8
Department	Landscape Architecture	48
	Architecture	35
	Interior Architecture	17
Class	1st grade	26
	2nd grade	34
	3rd grade	24
	4th grade	16
Neighborhood	Kalkınma	40
	Konaklar	25
	Bostancı	8
	Others	27
Where are you from?	Trabzon	28
	Others	72
How long have you been living in Trabzon?	1 year	21
	2 year	23
	3 year	17
	4 year	13
	More than 5 years	26
Where are you staying?	Home	52
	Dormitory	48

Within the scope of the study, the surveyed individuals were asked to make evaluations about direction finding and direction for the city they live in and the city centre and its immediate surroundings. 29% of the participants stated that they could not easily find the structures or institutions in the city square and its immediate surrounding, 20% stated that they had problems in finding direction, 69% stated that they have lost the way for their destination and experienced delays. In addition, they stated that there were serious deficiencies in the number and quality of directional signs (Table 2).

Table 2. Percentage (%) distribution of the participants' data related to direction finding and direction.

Questions	Yes %	No %
S3.Can you easily find existing structures / institutions?	71	29
S4.Can you find your way easily?	80	20
S5.Have you ever lost your way?	31	69
S7.Is it enough the number of direction signs?	20	80
S8.Is the quality of the signboard that where you are and where you want to go sufficient?	22	78

It was intended to evaluate whether Trabzon city centre and its immediate surroundings were readable places; what their perceivable elements were; what the reference points related to the city centre were; and the presence of elements, structures or places defining the city of Trabzon. In this context, the answers of the participants showed us that the people formed images that were highly visually perceivable in the study area. 54,3% answered the question "The place you indicate as address in the city square and its immediate surrounding when you want to meet a friend" as the Square Park. 8,8% of the participants stated that they preferred the cafes in the immediate area, 6,9% preferred Forum AVM as the meeting place. According to the answers, the most preferred values were "Nodal point" with 55,2% and "*landmark*" with 31% amongst the five elements defining the city. These results show that the nodal points and landmark locations as the meeting point are more preferred, easily remembered and easily accessible places (Table 3).

Table 3. Percentage (%) distribution of the participants' meeting point preferences.

S1. Town square and nearby
When you want to meet a friend, where do you meet?

Items	Number of people percentage%	Paths	District	Edges	Nodes	Landmark
Meydan Park	54,3				✓	
Cafes	8,8					✓
Forum Mall	6,9					✓
Atatürk Statue	6,9					✓
Uzun Street	6,0	✓				
Trabzonspor Emblem	4,3					✓
KTU (University)	3,4		✓			
Konaklar District	2,6		✓			
Point Stationery	1,7					✓
Dormitory	1,7					✓
Arzum Market	,9		✓			
Beşirli District	,9		✓			
Lc Waikiki (Clothing Store)	,9					✓
Tanjant Taxi Stops	,9				✓	
Total	100,00	6,0	7,8	0	55,2	31,2

36,2% of the participants answered the question "The first place / object that comes to your mind in the city square and its immediate surroundings" as Atatürk statue, 15,5% as Trabzonspor emblem, 9,5% as Uzun Street and 6% as cafes and restaurants. According to the answers, the most preferred were "*landmark*" values with 77,7%, and "*Regions*" with 17,4% amongst five elements defining the city. These results show that the places and regions that have a landmark feature are preferred more in the city square, and that they are places that can easily form an image in memory and be remembered (Table 4).

Table 4. Percentage (%) distribution of place / object preferences of the participants that first comes to mind on the city square and its close vicinity

S2. Town square and nearby What is the first place / object to think						
Items	Number of people	Paths	District	Edges	Nodes	Landmark
percentage%						
Atatürk Statue	36,2					✓
Trabzonspor Emblem	15,5					✓
Uzun Street	9,5	✓				
Cafes-Restaurants	6,0					✓
Forum Mall	5,2					✓
Faculty of Architecture	3,4					✓
Tanjant taxi stops	2,6				✓	
KTU (University)	2,6		✓			
Atatürk Pavillion	2,6					✓
Atapark	1,8		✓			✓
My home	1,7					✓
Sümela Monastery	1,7					✓
Square- Sitting Furnitures	1,7					✓
Boztepe	1,7		✓			
Point Stationery	,9					✓
Arzum Market	,9					✓
Old Town Hall	,9					✓
Coast	,9			✓		
Airport	,9		✓			
Keloğlan Statue	,9					✓
Cephanelik Restaurant	,9					✓
Zağnos Valley	,9		✓			
Kanuni Home	,9					✓
Total	100,00	9,5	17.4	0,9	2,6	77,7

37,1% of the participants answered the question "Where would your reference point be when you describe an address in the city square and its immediate surrounding to someone?" as the square park, 14,7% as Uzun Street, 8,6% as Atatürk statue and 6,9% as KTÜ (Karadeniz Technical University). According to the answers, the most preferred values were "*Nodal point*" with 39,7% and "*landmark*" with 29,3% amongst the five elements defining the city. These results show that the nodal points and places with a landmark feature are mostly preferred related to reference point preferences, that they are important for direction in urban spaces as they are places that form an image in the memory and can be easily remembered (Table 5).

Table 5. Percentage (%) distribution for participants' preference of reference point when describing an address in the city square and its immediate surroundings.

S6. Town square and nearby Where is your reference point when describing an address?						
Items	Number of people	Paths	District	Edges	Nodes	Landmark
percentage%						
Square	37,1				✓	
Uzun Street	14,7	✓				
Atatürk Statue	8,6					✓
KTU (University)	6,9		✓			
Cafes-Restaurants	6,1					✓
Sea	5,2			✓		
Arzum Market	3,4					✓
Old Town Hall	2,6					✓
Taxi Stops	2,6				✓	
Meydan Mosque	1,7					✓
Kalkınma District	1,7		✓			
Trabzonspor Emblem	1,7					✓
Coast	1,7			✓		
Atm	1,7					✓
Ziraat Bank	1,7					✓
Koton (Clothing store)	,9					✓
Forum Mall	,9					✓
Maraş Street	,9	✓				
Total	100,00	15,6	8,6	6,9	39,7	29,3

25% of the participants answered the question "What is the place/structure you mostly use in the city square and its immediate surroundings?" as Square park, 21,6% as Uzun Street, 13,8% as KTÜ (Karadeniz Technical University), 9,5% as cafes and restaurants. According to the answers, the most preferred were "*landmark*" values with 40,8% and "*Regions*" with 34,6% amongst the five elements defining the city. These results showed that places with a landmark value and regions were mostly preferred with regards to the most used place/structure in the city square (Table 6).

Table 6. Percentage (%) distribution of the mostly used place/structure preference of the participants in the city square and its immediate surroundings.

S9. Town square and nearby Your favourite place / structure						
Items	Number of people	Paths	District	Edges	Nodes	Landmark
percentage%						
Meydan Park	25,0		✓			
Uzun Street	21,6	✓				
Faculty of Architecture	13,8					✓
Cafes- Restaurants	9,5					✓
Forum Mall	8,6					✓
KTU campus	7,8		✓			
Dormitory	2,6					✓
Stationery	1,8					✓
Taxi Stops	1,7				✓	
My Home	,9					✓
Ganita	,9		✓			

Sanat Street	,9	✓				
Kalkınma District	,9		✓			
Gym	,9					✓
Koton (Clothing store)	,9					✓
Theater	,9					✓
Ayasofya Museum	,9					✓
Maraş Street	,9	✓				
Total	100,00	23,4	34,6	0,0	1,7	40,8

Participants were asked to rank the place / structure / elements that define Trabzon in order of importance. In the rank of the 1st choices, the Square Park with 24,1%, Uzungöl with 10,3% and Sümela Monastery were prominent. Amongst the second choices of the participants that define Trabzon, Uzungöl with 12,9%, the Square Park with 11,2%, Sümela Monastery with 10,3% were emphasized. In the 3rd choice of the participants, the Square Park with 18,1%, KTÜ (Karadeniz Technical University) with 10,3% and Sümela Monastery with 9,5% were prominent. These results showed that the Square Park was an important nodal point, and that Sümela Monastery, Uzungöl, KTÜ, Boztepe and Uzun Street were the most important places/structures/elements that define the city.

Table 7. The percentage (%) distribution of place / structure / item preferences that define Trabzon in order of importance of the participants.

S10.Describe the Trabzon places / structure / elements (3 words in order of importance)

1st choice	Number of people percentage%	2nd choice	Number of people percentage%	3rd choice	Number of people percentage%
Meydan Park	24,1	Uzungöl	12,9	Meydan Park	18,1
Uzungöl	10,3	Meydan Park	11,2	KTU (University)	10,3
Sümela Monastery	10,3	Sümela Monastery	10,3	Sümela Monastery	9,5
Uzun Street	8,6	Boztepe	10,3	Boztepe	9,5
KTU (University)	7,8	KTU (University)	9,5	Ayasofya Museum	7,8
Ayasofya Museum	6,0	Forum Mall	8,6	Uzungöl	6,9
Atatürk Pavillion	6,0	Atatürk Pavillion	6,0	Forum Mall	5,2
Trabzonspor	6,0	Uzun Street	5,2	Uzun Street	3,4
Boztepe	4,3	Ganita	3,4	Trabzonspor	3,4
Ganita	3,4	Ayasofya Museum	2,6	Beşirli Coatal district	2,6
Beşirli Coatal district	1,7	Beşirli Coatal District	2,6	Valleys	2,6
ForumMall	1,7	Stadium	1,7	Ganita	1,7
Stadium	,9	Kalkınma District	1,7	Atatürk Pavillion	1,7
Kalkınma District	,9	Valleys	1,7	Kalkınma District	1,7
Ortahisar District	,9	Sürmene, Çamburnu	1,7	Moloz	1,7
Valley	,9	Moloz	,9	Bread	1,7
Akçaabat	,9	Trabzonspor	,9	Nature	1,7
Sea	,9	Laz	,9	Urban Museum	1,7
Eyof Park	,9	Pide(A type of Bread)	,9	Konaklar District	,9
Sürmene, Çamburnu	,9	Stadium	,9	Çömlekçi District	,9
Of	,9	Fiddle	,9	Ortamahalle District	,9
Cephanelik Restaurant	,9	Nature	,9	Maraş Street	,9
Hamamizade	,9	Sea	,9	Plateaus	,9
		Cemil Usta Restaurant	,9	Botanik Park	,9
		Atatürk Statue	,9	High Buildings	,9
		Kostaki Residence	,9	Altındere	,9
		Kunduracılar Street	,9	Sea	,9
				Cemil Usta Restaurant	,9

Whether there was a difference in answers given to the questions in the questionnaire according to departments was evaluated with Crosstab. Amongst the questionnaire questions, it was observed that the differences of the departments of the students were effective only on the questions of S1, S2, S7, S8 and S9. Amongst the answers, the quantity (and strength) of the effect of the departmental differences were analysed with 'Cramer's V' test. The Cramer V values range from 0 to 1, the values between 0-30 (or 0-40) indicate the presence of a weak relationship, values between 31-60 (or 41-70) indicate a moderate relationship, and values between 61-

100 (or 71-100) indicate a strong relationship (Özbay, 2008). S1 Cramer V value was 50, S2 Cramer V value was 57, S3 Cramer V value was 50 and the effect of Landscape Architecture, Architecture and Interior Architecture departments on the answers to these questions was moderate. S7 Cramer V value was 23, S8 Cramer V value was 25, and these showed that the effect on the answers to these questions was low according to the departments (Table 8).

Table 8. The effect of departmental differences on the questions Chi-Square and Cramer V values.

		Value	df	Asymptotic Significance (2-sided)	Kramer V
S1	Pearson Chi-Square	59,704	38	,014	,507
S2	Pearson Chi-Square	74,193	46	,005	,566
S7	Pearson Chi-Square	6,246	2	,044	,232
S8	Pearson Chi-Square	7,676a	2	0,022	,257
S9	Pearson Chi-Square	57,856[a]	36	,012	,499

3. RESULTS AND SUGGESTIONS

Legibility is an important issue in our developing cities with rapid urbanization and population growth. In this study, which addressed this problem, a total of 116 university students from the departments of Landscape Architecture, Architecture and Interior Architecture participated to determine the university students' perception of Trabzon city and city square and their direction attitudes.

Within the scope of the study, the surveyed individuals were asked to make evaluations about direction finding and direction for the city they live in and the city centre and its immediate surroundings.

It was evaluated whether Trabzon city centre and its immediate surroundings were readable places; what their perceivable elements were; what the reference points related to the city centre were; and the presence of elements, structures or places defining the city of Trabzon.

In this context, the answers of the participants showed us that the people formed images that were highly visually perceivable in the study area.

These results show that the nodal points and places with a landmark feature are mostly preferred related to reference point preferences, that they are important for direction in urban spaces as they are places that form an image in the memory and can be easily remembered.

The majority of the participants, as Lynch stated, it was shown that a city would be perceived and encoded to our minds with "roads, monuments, regions, borders and signs". When the elements of Kevin Lynch were analysed for the city of Trabzon in the light of the surveys, it can be explained as follows:

- Roads: Uzun Street, where the urban transportation is provided and which was pedestrianised, Maraş Street and the Tanjant Road where the vehicle passage is provided were prominent as the dominant elements.
- Edges: For Trabzon, which is a sea city, the coast, seaside and historic city walls constitute important points of reference as border elements.
- Regions: The city square and the coastal region in its surrounding and Karadeniz Technical University campus, which is the residential area of Trabzon, which is a university city, the shopping centre region near its surroundings attract attention as the regions. Uzungöl, which is far from the city, makes its presence felt with its different character.
- Nodal / Focal Points: The squares, which are urban open spaces surrounded by buildings, where various activities take place, are important triangulation points that give character and identity to cities. In the city centre of Trabzon, Atatürk Square Park has created a city image as a nodal and a reference point.
- Signal elements: There are many natural and artificial elements marked as a landmark and attract attention in the deep-rooted history of Trabzon, which is a coastal and port city. The most prominent of these were Sumela Monastery, Ganita, Boztepe, Hagia Sophia, the statue of Atatürk in the Meydan Park and the TS emblem.

In the field study, urban images, legibility, spatial information gained through past experiences and the importance of direction and information boards were noteworthy.

In addition, they stated that there were serious deficiencies in the number and quality of directional signs (Figure 5).

Figure 5. Directional signs of study field, Trabzon city (Ataoğlu, 2019).

Direction / information designs that encode a city into our minds with "roads, monuments, regions, borders and signs" should be more carefully evaluated. Direction and information designs, which are multidisciplinary fields that direct and inform the user in the growing and complexifying urban space and interior space, serve as a sub-branch of graphic design in expressing the character and identity of the space. City directors should be aware of this discipline and follow developments in order to adapt to the rhythm of the rapidly changing world.

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Conflict of interests
The Authors declare no conflict of interest.

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Understanding Aesthetic Experiences of Architectural Students in Vertical and Horizontal Campuses: A Comprehensive Approach

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ABSTRACT

The typological features of university campus areas are shaped according to their locations in the city. Campuses in city centers carry great potentials for students' cultural, intellectual and artistic activities, especially for those from faculty of architecture and design, with close relations to the city. In big metropolitan cities, it is hard to reserve land for campuses therefore they emerge as vertical settlements. On the other hand, campuses built on the periphery mainly feature horizontal planning characteristics due to availability of land. The aim of this paper is to develop an approach for measuring architecture students' aesthetic experience of vertical and horizontal campuses in relation to sense of place theory. Recently, emerging technologies in cognitive science, such as brain imaging techniques, activity maps, sensory maps, cognitive mapping and photo-projective method etc., have enabled advanced measurement of aesthetic experience. In this exploratory research, using 'photo-projective method', students will be asked to interpret and draw 'cognitive maps' of the places that they are happy to be (defined place) or to see (landscape) on the campus. Based on students' impressions and experiences, it will be possible to compare aesthetic experience on vertical and horizontal campus. Thus, a comprehensive approach for improving campus design according to users' aesthetic experiences and sense of place rather than building technology, law, development and finance driven obligations will be introduced.

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1. Introduction

To become a part of global educational and research networks, Turkey has been investing huge sums on its educational and urban infrastructures. Cities with higher education institutions have been receiving thousands of native students as well as international students from all over the world, due to their advantageous location and appropriate cost than most countries. By 2018, population of students in higher education institutions of Turkey has exceeded 7.5

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million according to statistics (Table 1). Several new campuses have been built on available plots. However, in dense cities, where land is scarce and rates are expensive, universities and their growing facilities have been packed into vertical buildings. According to their locations within the city, campus types are grouped as urban, suburban and rural. Similarly, Erçevik and Önal (2011) define three categories for universities in Istanbul as town university, in-town campus, and out-of-town campus. In their approach, town universities are scattered in various parts of the city whereas in-town campuses are formed as a result of urban transformation or re-functioning process of extensive areas.

Table 1. Number of Higher Education Institutions, 2017 – 2018 (https://istatistik.yok.gov.tr/)

	STATE UNIVERSITIES	FOUNDATION UNIVERSITIES	FOUNDATION VOCATIONAL TRAINING SCHOOLS	TOTAL
UNIVERSITY	112	69	5	186

According to Sargent (2016), vertical campus is the natural outcome of both new city development and urban regeneration. It is a new typology in the overgrown and denser city. In the form of progressive high-rise towers, it incorporates a variety of settings and amenities that support working, living and recreation. The demand for vertical campus has imposed new spatial attributes such as the need for 'vertical connectivity', 'convenient services for working', 'amenities for personal needs', 'multi-use conversion to changing functions' and 'connection to nature via green areas and elements'. Table 2 shows comparison of past and contemporary campus buildings and includes a categorization for spatial attributes of campus.

University campuses, which are located in city centres, have to fit in vertical structures due to pressure from the real estate sector (Groesbeck, et.al, 2012). When campuses are designed in vertical forms, they carry advantage of their positions in dense urban centres with easy access to public transportation. On the other hand, vertical campuses are found to be incompetent for creating balance between outer and inner spaces and providing living environments as in classic horizontal campuses. In order to overcome disconnection of vertical buildings in campus life, aesthetic studies based on environmental psychology, user experience, cognitive and behavioural sciences can contribute significantly to design of vertical campuses.

In addition to their high standard academic programs, universities are expected to provide high quality physical environments which ensure students' physical as well as social and psychological well-being. Therefore, physical environment of the campus should be integrated into an organic habitat or '*village*' which reflects and instils a tactile sense of place (Sturner, 1972). Basing on these facts, this paper deliberates aesthetic experience of campus in relation to the '*theory of sense of place*' (Figure 1). Sense of place components can be defined as activity, meaning and physical setting (Carmona et al., 2003). Tuan (1977) defined '*sense of place*', as attachment and meanings to a setting held by an individual or a group. For studying the variation of sense of place between different types of places, descriptive place meanings and evaluative place attachment measures are considered as important tools (Masterson et. al., 2017).

'*Place meanings*' are evaluated by descriptive statements, and they are about what places are like, and their images (Manzo, 2005; Brehm et al., 2013). On campus, they are either defined by adjectives, descriptive/ symbolic/ interpretive comments or character definitions of places.

Table 2. Comparison of Spatial Attributes between Past and Contemporary Campus Typologies (This table is adapted from Sargent, 2016).

Building Attributes	*Campuses of the Past*	*Campuses Going Forward*
Occupancy / Zoning	• Corporate office	• Mixed use
Layering	• Limited to lobby atrium	• Visibility from entry, multiple levels
Stairwells	• Closed stairwells	• Interconnecting stairs
Grid	• Varied grid	• Regular planning grid
Core	• Centre core, opening to common space	• Offset core, minimal openings to usable space
Connections	• Horizontal, individual floors	• Vertical and horizontal, connecting atriums
Tenancy	• Space often wrapped core and had preferred zones	• Divisible with equal quality of space
Partitioning and elements	• Fixed and firm	• Flexible, demountable
Outdoor space	• Scaled buildings, limited to no access to	• Access to exterior, plazas, balconies

'*Place attachment*' on the other hand, is a positive emotional bond, between groups or individuals and their environment (Altman and Low, 1992). Students create personal bonds to campus through socializing (Chow and Healey, 2008). Through this stronger attachment they are believed to ensure higher levels of academic motivation (Bergin and Bergin, 2009; Osterman, 2000). Place attachment is comprised of *place dependence* and *place identity*. '*Place dependence*' is about connections that can be defined as instrumental between place and citizens (Stokols and Shumaker, 1981). Tidball and Stedman (2013) defined place dependence as the ability of a setting which can satisfy the important needs of people. In a survey by Jorgensen and Stedman (2001), place dependence is expressed with phrases such as, '*This is the best place to do the things I enjoy*'. In scope of recent works on sense of place, this research will be surveying Sargent (2016)'s spatial criteria of '*connectivity*', '*convenient services for working*', '*amenities for personal needs*', '*multi-use conversion to changing functions*' and '*connection to nature via green areas and elements*' on vertical and horizontal campuses.

There are some different definitions about place identity. For example, Proshansky (1978) defined '*place identity*' as the dimensions of self that define the individual's personal identity. Jorgensen and Stedman's (2001) survey includes an expression such as '*This place reflects the kind of person I am*'. Previous research exploring undergraduate students' *place bonding* levels to campus, has discovered that in different grades, at home or abroad, students showed relatively different extent of place bonding to campus.

The extent of place identity was a comparatively weaker asset for place attachment, especially when limited years of study on campus was considered. Hence, it took more to incorporate the place as part of one's self (Northcote, 2008; Qingjiu and Maliki, 2013). Figure 1, shows the model of this study, based on theory of sense of place and employed for evaluating students' aesthetic experience on campus.

Vertical and horizontal campus typologies effect students' adaptation to urban life. For example, particularly for students from faculty of architecture and design, access to the city is critical for educational facilities and professional development. Due to these circumstances, newly established and developing universities have fitted in vertical campuses in central areas of the city. Briefly, vertical campus has become an alternative solution for integrating with the city, while horizontal campus, as the classical campus, has a greater potential for giving a sense of campus place.

This paper focuses on architecture students' perception and use of campus space. It aims to find the difference between vertical and horizontal campuses via descriptive statements about positive aesthetic experience, in scope of cognitive approach. As methodology, photo projective method (PPM) and cognitive mapping method in environmental psychology are employed. The aim of using both is to obtain comparative data about aesthetic evaluations and sense of place that architecture students have established within vertical and horizontal campuses.

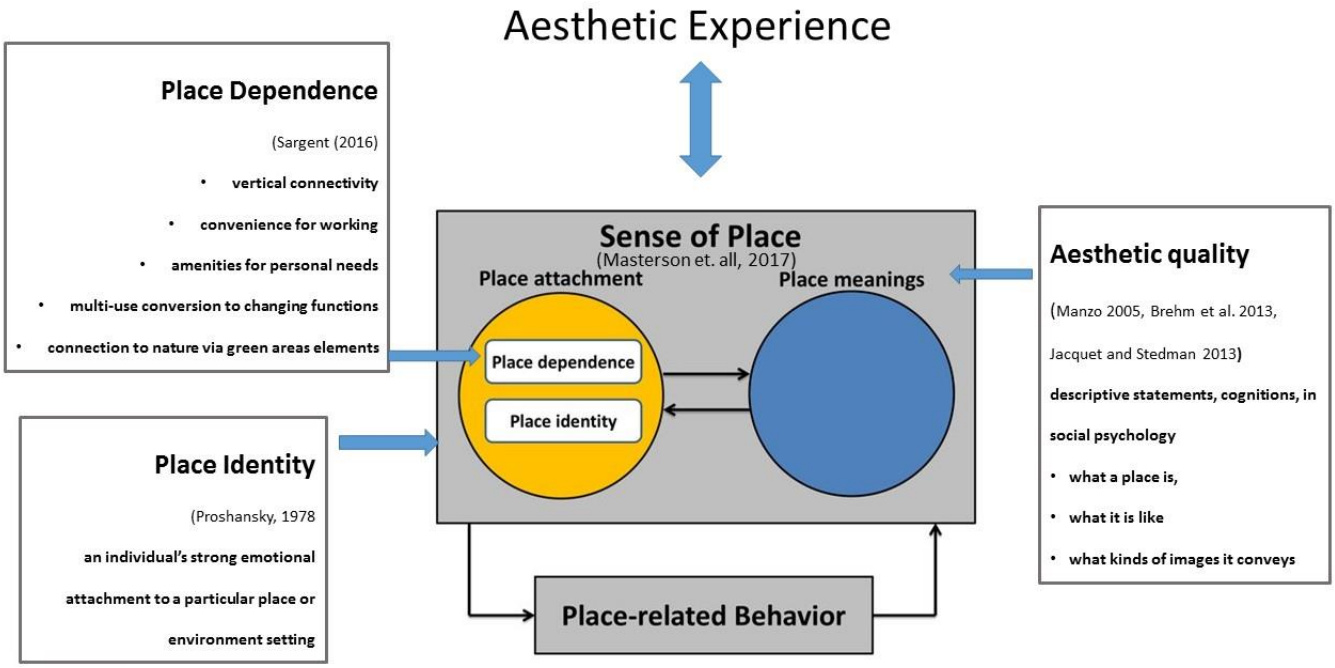

Figure 1. Aesthetic Experience of Campus (Developed by the authors)

2. Methodology

In environmental psychology research, objective measurement of aesthetic appreciation may implement multiple methodologies (Berlyne, 1974). Pringle and Guaralda's (2018) research on visual fields creating happiness in urban spaces, were carried out via analysis of data on photo sharing platforms such as Instagram. It involved use of urban photographs, which people took according to their preferences, as data. The common feature of such methods, including *participatory photo mapping, photo projective method, auto photography* and *photo survey research method* etc,. is their inclusion of photo-based analysis and evaluations via photographs and expressions without much intervention in user experience (Collier, 1967; Yamashita, 2002; Moore, et.al., 2008; van Riel and Salama, 2019; Garrod, 2008; Dennis, et.al, 2009;).

In former studies, for establishing spatial relations on photographs, participants were given a map of the environment and asked to show the locations where photos were taken. In this research, students are required to form their own cognitive maps of campuses for which they are supposed to have emotional, sensory and spatial ties, that might feel like a second home. Thus, the diversity of spatial attributes reflected to mental images in cognitive memory of students and how far they can relate their photos to their cognitive maps will be depicted. Employing both experimental aesthetic methods, PPM and cognitive mapping, will enable comparison of vertical and horizontal campuses according to students' aesthetic and physical experiences.

2.1 Photo Projective Method

Photo projective method (PPM) is used for aesthetic and behavioural evaluation in urban areas. It is a reflective method based on taking photographs and interpreting these photographs in urban areas (Bostancı, 2019). For urban aesthetics studies and research, urban photographs are the most common information materials. Using methods such as, adjective pairs and semantic differential etc, qualitative adjectives are derived from photographs (Kaplan, 1972; Bradley and Lang, 1994). PPM is used in various social science researches including anthropology, psychology and health, aesthetics and urban landscape studies etc. (Collier, 1967; Yamashita, 2002; Sugimoto, 2014; Wójcik and Tobiasz-Lis, 2013).

2.2 Cognitive Mapping

'Cognitive mapping technique' can be defined as the mind schemes developed by Tolman (1948), for analysing the ways in which individuals relate to their environments and to the society. Indeed, it is a way to understand how individuals gain pattern recognition. Such an approach owns features that can easily be adapted to urban issues such as; finding directions and memory association etc. Cognitive mapping was also included among methodologies used by Lynch (1960) in grouping urban image elements as paths, edges, landmarks, nodes and districts. These concepts showed how human mind formed the spatial relationships in cognitive maps of the places lived for long durations or visited for the first time. Cognitive maps of cities have more a dynamic structure than cartographic maps due to individuals' mobility and personal experience (Lloyd and Heivly, 1987). In the context of sense of place, cognitive maps can be considered as indicators to understand the importance given to a specific area by people who are constantly crossing it.

3. Case Study

Two different campuses, carrying vertical and horizontal planning characteristics, were selected from Istanbul and its surrounding district. A total of 40 architecture students, of whom 20 studying on horizontal campus and 20 on vertical campus, was required to document the visual characteristics of their campuses using PPM. Upon photos of 5 favoured and 5 unfavourable spaces, they were asked to make brief interpretations including qualitative adjectives.

For example, a student in vertical campus commented on a class photo among his favourable places using following terms '*The studio views are nice, especially during sunsets. The studios are positive in terms of socialization, group work, and overall division and layout. Easy to communicate with others and learn things during design days for example. The lighting is also good.*' In these categories, *positive adjectives* include '*nice view*', '*positive*' and '*suitable for socialization*' and '*good lighting*' etc. A week after this exercise, students were asked to draw the cognitive maps of their campuses and to mark the positions of the photographs they took. Generally, while taking pictures in a specific area with PPM, users are asked to mark the shooting areas on maps. In this study, instead of giving available maps, it was necessary to ask for cognitive maps. These mental maps helped to understand the extent to which students could keep campus spaces in their minds, and the extent to which mental maps could reflect the selection of favourable and unfavourable places. Hence, in such behaviour-based experimental studies, it is possible to obtain new findings that is not possible to envision.

Although a total of 40 students, were selected for the study, some did not participate in and some

could not contribute enough to the process. Finally, data could be obtained from 16 vertical and 15 horizontal campus students. Total 31 participants, with varying levels of ability to photograph and schematize maps, contributed to the study. An important issue here is that students from two different campuses provided data only for their own campus. Both campuses were established after 2000s. Thus, they own features proper to be expressed as new campuses with different campus typologies. Both campuses have several renovated parts and additions to their original designs. Information about the implementation of the field study was given on both campuses simultaneously on February 11, 2019. Students were given a week time to collect data. Cognitive map applications were conducted on 18 February 2019 during 1 hour of a course period. Participants were students, who were instructed by the researchers. In both cases, students were previously informed about the applications for half an hour. The participation of students was optional related to the fact that experimental studies based on volunteerism would create better results.

When demographic data of students was analysed, 31 participants were found to be last year students in faculty of architecture. 81% of them were in the 20-22 age range and 19% were over 22 years old. In both groups, students residing in Istanbul formed the majority.

On the vertical campus, 70% of 16 students participating in the study were female and 31% were male. 55% of participating students in vertical campus lived in Istanbul with their families. 25% came from various districts in the Marmara region, 19% from various regions of Turkey and 1% from abroad. 55% of these students were staying in their homes while 45% in dormitories or in rental homes with friends.

Among 15 horizontal campus students, 56% were female and 44% were male. 40% of these students came from Istanbul and 27% came from Marmara region. 33% were from the province where the campus was located. 25% of the students were living in the horizontal campus, 25% in surrounding dormitories, 50% in the campus dormitory. As previous research demonstrated (Northcote, 2008; Qingjiu and Maliki, 2013), staying in the campus dormitory was indeed an important factor for higher spatial place attachment levels to the campus.

3.1 Findings for Vertical Campus

The vertical campus in case study, was a corporate twin tower building re-functioned with an educational structure in 2010. It was located on the European side of Istanbul. It had an advantageous position due to its close location to Bosphorus and bridges with several public transportation options. The towers are 9 and 10 floors above ground with 4 additional basement floors. At entrance floor there is a café, a restaurant, a print centre and a wood atelier. At mezzanine floor a library and toilets are available. Typical upper floors from 2nd to 9th floor include design studios, office space for academicians, meeting rooms, storage rooms and toilets. Basement floors host a conference room, more management offices and parking lots. Corridors on all floors are furnished with seating, display and storage facilities.

In case study, 20 last year students from faculty of architecture were selected. 16 students provided data. Table 3, includes 3 selected photos from their most favourable and unfavourable spaces on the vertical campus. Generally, in PPM methodology according to changing themes, the ratio and simple statistics of spatial attributes are calculated. However, in this study, only descriptive expressions were used since number of samples was low and the research was an explanatory study. Among 16 students, 11 took 10 photos and 5 took 6 photographs. Thus, total number of photographs taken and interpreted on vertical campus was 140.

Table 3. Example photos taken by students from vertical campus using PPM approach.

In Table 3, first favourable images were café theme photos, representing general ambiance, seating with friends, interior details and food displays, at rate of 69%. One of the café photos was verbally described by a student as *'The hanging of various graffiti and paintings on the walls makes it a fun place'*. The second most favourable area was the entrance lobby with a rate of 62%. This area became as an area of interest for students, since their projects were exhibited there. The third most favourable place differed among students. Some chose photos of the studios, library and café in the outdoor area while others preferred the landscape, twin skyscraper view and interior resting spaces along corridors.

In this diversity, the landscape photo overlooking to the urban environment and the sea in Table 3 revealed the weak relation between students of vertical campus and the city. Only 2 out of 16 students submitted photos of Bosphorus. However, more sample groups could affect this result. In Table 3, elevators were photographed among the most unfavourable elements by 16 students. They used various negative expressions such as *'The elevators are not very useful at times. There is always at least one elevator that does not work, and that creates even more student traffic'*. Ranged in the second place with 75% among unfavourable areas was the fire staircase, where students used to smoke. Its importance laid on the fact that it had graffiti on its overall walls displaying the image of a rule-free student zone. Students made contradictory comments about this area: *'Despite being used very densely, it is lightless and enclosed. Graffiti makes the area even more stifling', 'The smell of paint is disturbing'* or *'I love it for its street ambiance'*. Probably smokers were those who made positive expressions. Nevertheless, they photographed this smoking area among unfavourable probably due to their expectance of better standards. In the third place of most unfavourable areas, were also stairs, lifts and model storage rooms. Key expressions extracted from such comments on photos can be found in Table 4.

Table 4. Evaluative categories and key expressions from scene descriptions of vertical campus.

Vertical Campus	
Positive Key Expression	**Negative Key Expression**
good, good shape, good layout, good lightning, good view, good idea, sense of place, belonging, more open, more options, less enclosed, well designed, well decorated, well organized, well lit, nice, nice view, nice idea, social, enjoyable, cosy, comfortable, comfortable for sitting, suitable, suitable for campus life, suitable for sleeping, new, fast, high, high quality, aesthetic, intimate, pleasant, similar to non-school places, out positive, large spacious, makes me happy, warm, warming, warm atmosphere, successful, appealing to the eye, visible, monumental, decorative, positive, very different, bright, proper fit, indirect, feels like outside school, calm, favourite, not crowded, multi-functional, big, reflects campus ambience, common space, ideal, comforting, silent, wide, spacious, so so, great, clean, useful, street ambience, same design language, appropriate ceiling height, spacious, supporter, conflicting, monumental, with mission, increased visuality, intensive green, light coloured, most functional, required, most preferred	narrow, enclosed, not good looking, not very warm, dull, dark, isolated, tiring, uncomfortable, un-designed, monotonous, not useful, time consuming, high traffic, expensive, crowded, limited, discomfort, hot, small, very small, too small, unsafe, messy, empty, unoccupied, unobtrusive, oblivious, boring, ignored, under construction, insufficient, low, anti-aesthetics, not wide enough, wrong location, incorrect positioning, unorganized, careless, left over, ugly, bad ventilated, mis-positioned, no adequate lightning, worst area, waste of space, no good advantages, no link, very dusty, unhealthy, very bad smelly, annoying view, useless, view blocked, suffocating, unlit and closed, untidy, very disturbing, so flat, not enough seating, distracting, no air circulation, only single function, the most outrageous, terrible, ironic, bad smell, no design, no order, no colour, blocking view, eliminating importance, hearth breaking, inadequate, unacceptable, correctable, changeable, not sustainable, varying, similar to hospital, not clean, not functional, chaotic, not enlightened, too much noise, not opening

Students' positive and negative interpretations via several adjectives, given in Table 4, have created an important data set. In urban and architectural design studies, design measurement criteria define the starting point for studies related to urban aesthetics. The acquisition of such information has created a need for extensive and deep-literature research (Nia and Altun, 2016). Key expressions obtained could be used as descriptive socio-psychological criteria for various design studies. Among vertical campus students with 75% rate, the most common expressions for positive feedback were '*good*', '*good view*', '*good idea*'. The second most commonly used phrase was '*comfortable*' with 62%. Between negative expressions, with 50% '*crowded*' (this expression is seen next to the pictures about the elevator) was the foremost and with 37% '*insufficient*' as the secondary.

Based on students' comments, campus spaces were categorized according to spatial attributes of vertical campus. Spaces of '*vertical connectivity*' were the elevators and stairs, spaces of '*functions connection to nature via green areas and elements*' were the studios, outdoor area, café, restaurant and outdoor area, spaces of '*convenient satellite services for working*' were the entrance lobby, café, corridors, spaces of '*amenities for personal needs*' were the studios, labs, tracing room, storage room, café, restaurant, parking lot and spaces of '*multi-use conversion to changing*' were the studios, entrance lobby, corridors, staircases, fire staircase (Table 5).

Table 5. Categories and key expressions of subjects for photography on vertical campus.

Vertical Campus	
Category	**Key Expression**
cafe	Restaurant, couch area, coffee shop area, common space
studios	design ateliers
labs	computer classes
wood atelier	laser cutting
storage room	
entrance lobby	exhibition area, empty space, natural lighting, glass roof,
corridors	edges of studios, empty spaces next to the studios, tracing room
staircases	circulation area
elevators	traffic
fire staircase	smoking area, under construction
outdoor area	outside sitting area, entrance stairs, common space, backyard
outdoor smoking area	hidden sitting area, lifesaver for winter times, hot area for smoking
parking lot	

Figure 2, shows cognitive maps of students from vertical campus. Among total 16 cognitive maps, 3 different techniques were unconsciously used by students. On 43% of cognitive maps, each photo was marked with several positions, instead of a unique position, since they were comprised of a number of partial sketches. In 30%, a related relational diagram was drawn indicating areas where each photograph was taken. 25% showed a combination of these two techniques. 88% of the students correctly positioned their photographs. However, it was obvious from the cognitive maps that they could not express the vertical campus in a holistic way.

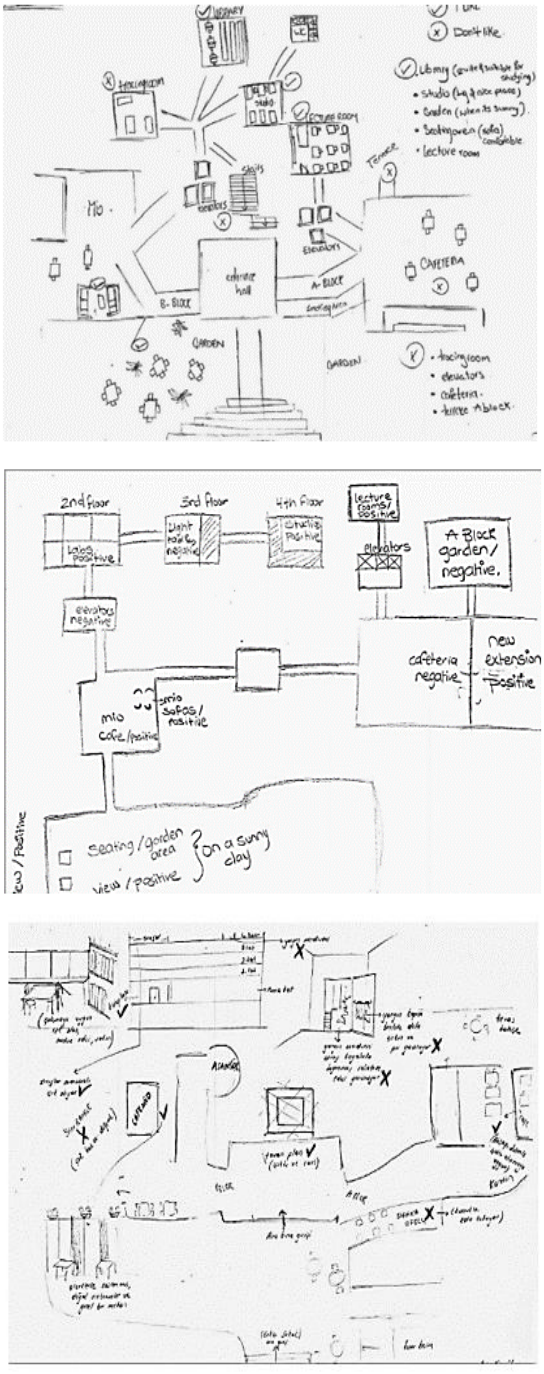

Figure 2. Cognitive map samples of students from their vertical campus experiences:
Relational schema (a,b) , Descriptive schema (c)

3.2 Findings for Horizontal Campus

The horizontal campus is a state university located in the Marmara Region, close to Istanbul. It was founded after 2000s and construction activities have been ongoing. Within campus boundaries, available are several faculties in different buildings, open / closed sports areas and green social areas. There is a ring service on the campus. An urban neighbourhood is within walking distance. The campus has a sea view. It owns classical horizontal campus features.

In the study, 20 last year students from the faculty of architecture were selected. 15 of them provided convenient data. Table 6 shows 3 selected photos from students' most favourable and unfavourable spaces on the horizontal campus. Table 6 contains the most favourable and unfavourable photos taken by students. Among 15 students, 9 took 10 photos and 6 took 6 photographs. Thus, number of photographs taken and interpreted on horizontal campus was 126.

Table 6. Example photos taken by students from horizontal campus using PPM approach.

1st favourable	2nd favourable	3rd favourable
		
1st unfavourable	**2nd unfavourable**	**3rd unfavourable**
		

In Table 6, first favourable images are café themed photographs by 60% of students. One of the café photos was defined by a student as '*An original space with paintings from the films, artistic lamp, bare concrete image, bare chimney pipes and simple, comfortable seatings'*. Green areas and pine woodland were chosen as the second most favourable areas with 53%. This field was described by a student as '*A place where we sit in our free time with friends and have a nice time'*. The pathway with trees, which had a partial view of the sea, was defined as the third most favourite area with %50. One comment was; '*On a sunny day, the sky and the tree branches are integrated into a beautiful path of pedestrian path. It is possible to see the sea view*'. The third most admired photo included the sea view. Based on this information, it was clear that students' attention was drawn to various details and comfort factors in the café area, where they spent most of their free time. The next two admirable areas were green space. The pine woodland and pathway

with trees caught attention since they were the places where students could integrate with nature on the horizontal campus.

In Table 6, corridors and undefined interior spaces between classrooms appeared as the most unfavourable by 73%. A student wrote: *'The skylights that cannot be entered in the floor gardens. Unspecified and meaningless corridors. Interior walls painted with bad colour. Gloomy ambiance'*. The second most unfavourable areas were the open ground with asphalt between the car park and the road. Photos similar to those were found to be 46%. One comment was: *'Very wide and empty space. There are no suitable add-ons for socialization and it creates a feeling of insecurity at night when it stands isolated'*. In the third rate of most unfavourable photographs, were left over spaces between the buildings and the landscape, similar to secondary photographs. Such images were 60%. One of the students defined it as '*A non-green bump, bare earth appearance does not create a feeling of spacious environment. No sense of vitality*'. Based on this information, it was conceived that students sought for architectural details that would create a warmer atmosphere in undefined areas such as the corridors on vertical campus. Urban spaces and undefined areas were also regarded as unsafe areas. Key expressions extracted from such comments on photos can be found in Table 7.

Table 7. Evaluative categories and key expressions from scene descriptions of horizontal campus

Horizontal Campus	
Positive Key Expression	**Negative Key Expression**
good time, natural, nature and panorama, relaxing, artistic, brutalist look, industrial look, bare concrete image, simple, comfortable, unique, spacious, peaceful, qualitative, qualitative time, nice time, accessible, panorama, sea view, harmony, aesthetic, clean air, shadow, comfortable, pedestrian, colourful, greenery, green, free, relaxing, social, essential, silent, student friendly, tree-lined, easy on the eye, different, good lighting, variety of the food and drinks, seasons beauties, feeling good, lovely, stress reducing, lovely, open	ugly, uncomfortable, like a hospital, un-functional, un-aesthetic, no panorama, dangerous, too wide, empty, no functions, unsecure, un-green, un-lively, un-spacious, no green, un-harmonious skyline, no shadow, no tree, slippery, un-thought, unable to sit, bad, useless, problematic working system, neglected, bad image, monotonous, incompatible, bulky, disturbing, old and worn, idle, unspecified, meaningless, bad view, tiring, gloomy ambiance, no-suitable, boring

Table 7 includes students' positive and negative descriptive attributes for horizontal campus. *Comfortable, nature, greenery, lovely* and *good* are among the most positive adjectives. At the same time, it can be assumed that original expressions such as *brutalist look, seasonal beauties and bare concrete image* etc. reflect their feelings as well as their thoughts. Among negative adjectives, *uncomfortable, bad view, unsecure* etc. are expressions of the majority. Especially on horizontal and large campuses, where dormitory buildings and secondary education facilities are available, security and feeling of safety become important issues for planning, design and management of campus space. Categories from these expressions are grouped in Table 8.

Table 8. Categories and key expressions of subjects for photography on horizontal campus.

Horizontal Campus	
Category	**Key Expression**
Café	social, brutalist look, qualitative time, good lighting, comfortable, variety of the food and drinks
Pedestrian path	accessible, panorama, harmony, sea view, tree-lined
Café in the pine area	clean air, shadow, comfortable, green
Library	silent, peaceful, student friendly
Green area	colourful, greenery, nature, stress reducing, good time
Unoccupied lot	dangerous, too wide, empty, bad view
Corridor between classes	bad, useless, unspecified, meaningless, gloomy
Entrance turnstiles	problematic working system, disturbing
Sitting group for the ring points	un-thought, unable to sit

From Table 8, it is seen that other than café, library and corridors between classes, students' most favourable and unfavourable areas are outdoor spaces. Students, who spend time outside and find these exterior areas healthy and green, emphasize the importance of creating organic habitats in campus life. The buildings are partially visible in the photographs. It reveals the fact that students' connections with these structures are weak however they do not find it negative. Horizontal campus life is oriented to exterior space. Unaesthetic seating groups in the waiting area of ring service, entrance turnstiles and isolated areas constitute the negative spatial features.

Even the findings obtained with a small number of samples could provide important clues about the design of campus space and its landscape. The results reveal the need of innovative design solutions for assuring horizontal connectivity in expanding campus areas. The fact that green spaces are considered among the most favourable features by students, shows the importance of landscape planning. Creation of social spaces and activity areas for elimination of urban gaps and development of creative solutions to those empty and undefined areas should be the major design issues for a happy and lively horizontal campus.

As described previously in the case study, students were asked to draw individual cognitive maps marking locations of their photos. The maps helped in evaluating their spatial awareness and partially understanding how they used the campus

space one week after taking those photographs. 3 samples were selected out of 16 cognitive maps (Figure 3).

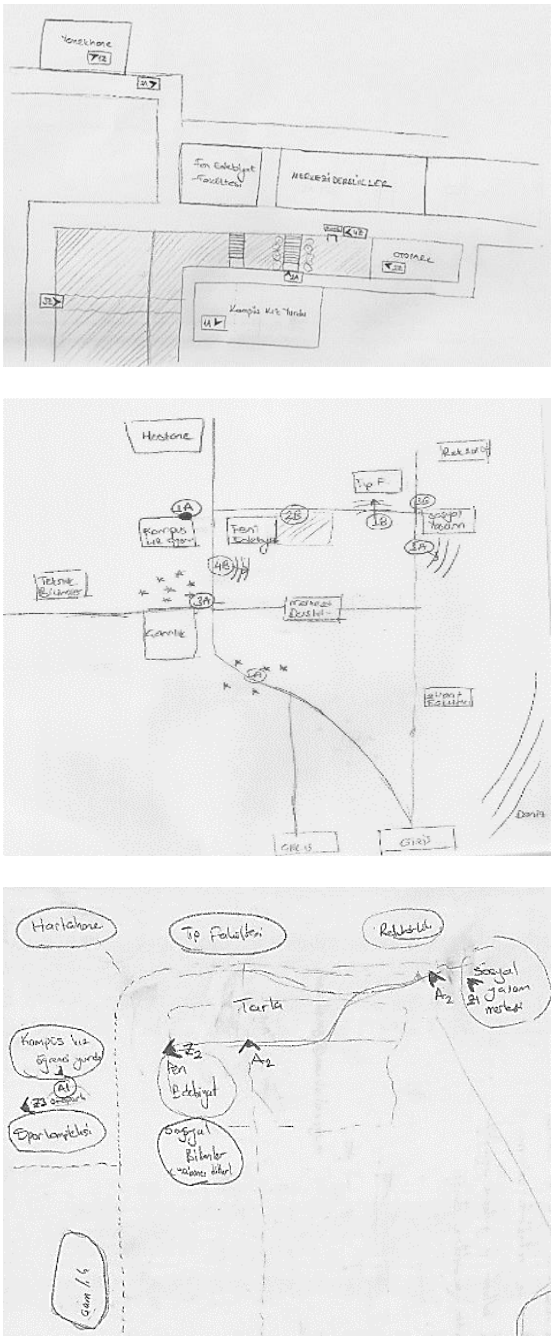

Figure 3. Cognitive map samples of the students from their horizontal campus experiences: *Drawing of near scale (a), Detailed connection drawings (b), Descriptive scheme (c)*

The cognitive maps in Figure 3 differ in expression techniques. In the first, surrounding environment is limited with near scale drawings by 30% of students. They might have preferred this drawing technique because they interact more with their close environment. The second one using detailed connection drawings, is a more efficient approach in establishing connections within the campus. 50% of students making detailed connection drawings means that they mostly conceive campus space as a result of spatial relations. The third category employing the descriptive scheme drawings, which selects the path of narration, is found to be drawn by 30% of students. In their cognitive maps, horizontal campus students were able to place the subjects correctly at 93%, slightly more accurate than vertical campus students.

3.3 Comparison of Findings for Vertical and Horizontal Campuses

The research of vertical and horizontal campuses was carried out in parallel sessions by two different researchers working on those campuses. A total of 31 samples from target 40 participants were obtained. Overall 266 photos were returned for PPM. While most participants were able to use three to four sentence comments in photo interpretation, those who made single sentence definitions were also included in the research. To facilitate the comparison, the findings are grouped into two: findings from PPM and findings from cognitive mapping.

Findings from PPM

PPM is a productive technique for acquisition of a large amount of data even with a small number of participants as well as for correct classification and interpretation of this data. Comparison of Table 3 and Table 6 reveals the most favourable images to be the cafés in both campuses and café photos taken from the interiors. In comparison of second favourable spaces, it is seen that the photos were taken from outdoor space on horizontal campus and interior space on vertical campus. The interiors on vertical campus offer more opportunities for activity and students are more likely to spend time indoors as studios located are on the upper floors. The third favourable photos of horizontal and vertical campuses feature a striking common detail. Both include landscape photographs with sea as the major element. Although verticality was seen as an important aesthetic advantage by the researchers at the beginning of the study, the expected interest was not detected. An interpretation of this could be students' priority of functional requirements and socialization opportunities before visual aesthetics of the campus. Thus, about discussions on aesthetics and function, it could be asserted that the latter comes first in the evaluation of living spaces, such as home, where most of the time is spent.

Unfavourable areas are found to be empty corridors and undefined exterior spaces on horizontal campus. Again, three photos of unfavourable spaces on vertical campus are lifts, their waiting halls and model storage rooms. Both groups of participants are unpleasant with the unfunctional spaces that have not been specifically designed for their needs. Therefore, it

can be asserted that design solutions are required for empty and undefined areas in both interior and exterior spaces on campus.

When key expressions in Table 4 and Table 7 are examined, the first remarkable outcome is the bigger number of positive and negative adjectives used by vertical campus students. Due to comparison of two different groups, this finding could be interpreted with the motivation and personal characteristics of students as well as the context of the study. In terms of positive key expressions, the most expressed on vertical campus were *good* and *comfortable*, while on horizontal campus were *comfortable, nature, greenery, lovely* and *good*. Positive expressions for nature were distinctive good features of horizontal campus. For comparison of spatial components between vertical and horizontal campus typologies, Table 9 was constituted, by referring to Table 5 and Table 8. From Table 9, it is evident that on the vertical campus interior features are accentuated by students whereas on horizontal campus the emphasis is on outdoor features.

Table 9: Comparison of Spatial Components between Vertical and Horizontal Campus.

Comparison of Spatial Components between Vertical and Horizontal Campus: Photographic finding	
Vertical Campus Indoor	**Horizontal Campus Indoor**
Cafe	Cafe
Studios	Library
Labs	Corridor between classes
Wood atelier	
Storage room	
Entrance lobby	
Corridors	
Staircases	
Elevators	
Fire staircase	
Vertical Campus Outdoor	**Horizontal Campus Outdoor**
Outdoor area	Pedestrian path
Outdoor smoking area	Cafe in the pine area
Parking lot	Green area
	Unoccupied lot
	Entrance turnstiles
	Sitting group for the ring points

Findings from Cognitive Mapping

Cognitive mapping in this study was used as a subsidiary method for establishing the relationships between photos and spatial relationships. The main purpose was to depict whether students were able to comprehend the spatial relationships correctly. According to maps drawn, vertical campus students accurately marked photos with 88% rate and horizontal campus students with 93%. However, when selected cognitive maps in Figure 2 and Figure 3 were compared, it was seen that drawing cognitive maps of vertical campus was more complex. It was relatively easier for students on horizontal campus to imagine and draw the gym, the faculty buildings, the tree-lined walkway and the social life centre. Despite several years spent in the campus, it came out to be difficult for students on vertical campus to make connections between floors since they mostly used elevators. It was hard for them to guess what functions took place on the floors, that they did not use. For this reason, cognitive map drawings of vertical campus students were mostly shaped as partial sketches of different floors. It is important to underline that this is a valid technique and an acceptable approach. Besides, on horizontal campus, there were students who only drew and interpreted the areas around the faculty on their cognitive maps. Overall cognitive maps of horizontal campus showed that students had access to more spaces than vertical campus students, whose campus life was limited to studios, cafe and restaurants and elevators. On vertical campus, few spaces such as, the entrance lobby hosting student projects exhibitions, was a favourable space with its aesthetic glass roof receiving natural lighting. It gave students a sense of dependence and identity together with aesthetic quality.

4. Recommendations for Further Studies

This study obtained data by photographic techniques and provided important findings on the dissimilarity of aesthetic experiences on vertical and horizontal campuses. According to total 31 students' photos and key expressions depicting the sense of place on the campus, place attachment (mainly generated by place dependence) was found to be the most important factor for positive aesthetic experience.

In future, comparative studies could be conducted on the same campuses with different sample groups: students from faculty of architecture and different faculties, male and female students, students from local and different countries etc. The pilot study was limited with the borders of selected campus areas. In future studies, it is possible to conduct research related to campus and city interaction. Within the immediate vicinity of the campus, students might be asked to take photos of their favourable and unfavourable areas. Social media platforms, where students share personal feedback through photo sharing and texting, could be employed for accessing

such spatial data. Thus, participatory workshops could be handled to create engaging campuses.

5. Conclusion

The originality of this study lays on use of two different methodologies based on environmental psychology and aesthetic experience for interpreting horizontal and vertical characteristics of campus typologies. Use of cognitive maps to measure aesthetic experience came out as an effective methodology since those drawn for horizontal and vertical campuses differentiated significantly. Although students correctly marked the positions on their maps of horizontal campus (93%) and vertical campus (88%), the perception of horizontal and vertical campus spaces were found to be distinct. Students on the horizontal campus could associate space relations with similar drawings and proper connections. Students on the vertical campus had difficulty in drawing cognitive maps, especially in connection points. On their cognitive maps, vertical campus was represented by disjoint sketches of spaces and its spatial relations were indicated with elevator and floor numbers. This finding proved higher levels of spatial interaction for students on the horizontal campus due to easier formation of internal and external connections.

In vertical campus, the difficulty of creating cognitive maps might be explained as an interruption in aesthetic experience. Due to the plan layout which is organized in several layers, students on the vertical campus never percept the space with its entire volume. Students only focus on spaces they use more hence miss most spatial features. When photographs are analysed, it is seen that students do not pay much attention to the city views, even on the vertical campus. In their photos of unfavourable spaces, they emphasize the empty spaces around vertical circulation elements and express their disgust with waiting for the lifts. As an interior design solution for vertical campuses, options of adding visual attractors such as; temporary and permanent photographs, paintings, images, texts, textures and colours should be considered. These attractors might help students to have a sense of aesthetics and comfort as if the campus was their habitat. Alternative activities could be designed indoors, such as activity and body performance workshops. Although it might seem difficult to create an organic habitat on vertical campuses, it may be possible to overcome this challenge with creative solutions.

Students described café and similar recreation areas as their most favourite in both campus buildings. The panoramic views of Bosphorus on vertical campus and the views of sea and nature on horizontal campus, were recalled only by few students as an aesthetic experience. In café areas, students usually took pictures of seating elements. A small number photographed the view toward outdoor areas. It revealed that students' attractions were mainly focused on the areas of comfort where they spent good time with friends. This shows that design elements that make students feel '*as if at home*' might strengthen place identity. Most importantly, other than aesthetic quality, place attachment criteria should be considered in priority for campus design at micro and macro scales.

In case study, while horizontal campus photographs revealed a balance of indoor and outdoor use, on the vertical campus outdoors photos were limited. Key expressions revealed that students felt safer on the vertical campus. Therefore, in the design process, use of alternative fencing elements such as vertical greenery systems could improve security. Although the case study was carried out in February, which was a cold season for being outdoors, photographs including exteriors and nature were still remarkable. Landscape was only photographed by horizontal campus students. Inclusion of green balconies and greenery could increase interaction with nature on vertical campus.

Limitation for this study was the acquisition of data from students only about their own universities. Students recorded their own aesthetic experiences on campuses hence the practice was consistent with itself. However, comparative interpretation of information obtained from two different student groups might be criticized. Use of simple random sampling method could also be criticized. Although a total of 40 were adequate for such experimental and behavioural studies, more universities and applications would be needed to test the methodology. Therefore, it is important to highlight that it was a pilot study.

Despite all limitations, results have shown that sense of place is important for a lively and happy campus life. Vertical campuses are a current design problem in overpopulating cities. This study has proved that using alternative measurement techniques for further analysis of spatial attributes could help improving aesthetic experience or sense of place on campus. Based on cognitive maps, photos and expressions of students, campus design could be improved to create alternative habitats for students.

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Conflict of interests

The Authors declare no conflict of interest.

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The Spatial Transformation of the River Waterfront through The Three Historical Periods: A Case Study of Belgrade

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ABSTRACT

Urban renewal of the coastal area has regained importance in recent years. The main problem with the city's coastal area is often the insufficient utilization of its potential. The paper analyzes the process of urbanization and treatment of the waterfront through the three historical periods: 1. traditional city, 2. during Modernism and 3. contemporary urbanism. Belgrade is chosen as a case study because it is located on the banks of the two rivers the Sava and the Danube, and throughout history, rivers had a significant role in the urban development of the city. A polygon for the methodology of urban morphological research for this paper was the contrast between the Old Belgrade and traditional city core and the New Belgrade created on the principle of the modern movement in architecture. The paper aims to research the relationship between the city and the river waterfront by the method of compare spatial-temporal transformations and to reveal the positive and negative elements of each period of urbanization. The result of the analysis indicates a changed treatment of the river waterfront through the time - from the fortified city isolated from the river to the gradual descent of the city center near the coast.

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1. Introduction

One of the most significant areas in cities all over the world is the waterfront area. The position of cities on the banks of rivers has always played an important role in their development.

Belgrade as the capital of Serbia has an exceptional geographical location at the confluence of two international rivers - the Danube and the Sava. Rivers are an integral part of Belgrade`s urban tissue with about 150 km of length of river banks. During the long history, the rivers Sava and Danube play a specific role in the life and development of Belgrade where various cultural influences meet.

Many development potentials are recognized in the entire Danube basin and it is very important for the establishment of economic, functional and cultural networks with Germany, Austria, Slovakia, Hungary, Serbia, Croatia, Romania, Bulgaria, Moldova and Ukraine (Radosavljević, 2008).

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The Belgrade fortress build by rivers is the oldest part of the city at which archeological layers from pre-history to today are noticeable. Belgrade has been often destroyed and rebuilt through these historic periods: Celts (3rd century B.C.), Romans (during the first centuries A.D) and Slavs (from the 7th century A.D.). Later it was settled by Hungarians, Serbs, Turks, and Austrians. The city did not descend on its rivers because there was fear of protecting the city from numerous armies that attacked from the river or natural disasters such as floods.

During the industrial period of the 19th century, the coastal areas were intensively used for the production and exchange of goods. The economic prosperity of cities was based on their ability to utilize coastal resources, but it also led to the degradation and pollution of these urban spaces. From the sixties of the XX century, where the process of regeneration started in Britain, the possibility of waterfront renewal and the idea of creating a new identity of cities by coastal area becomes a significant topic among the planners (Marshall, 2001).

Belgrade used its coastal area for centuries for defense purposes, so that only in the 20th century began to descend on the coast and conquer the left bank of the Sava by building New Belgrade. The ambivalent attitude of Belgrade towards its rivers is a logical consequence of these events through time. However, through the decades-long urban development of the city, many potentials of the waterfront area have remained unused. The shores of the Danube and Sava represent a significant part of an attractive, but inadequately used urban space. In the last few years, there have been plans for several potential huge sites in the coastal zone (Marina Dorćol, Port of Belgrade, Belgrade Waterfront Project) for their transformation with ambitious reconstruction proposals to future purposes.

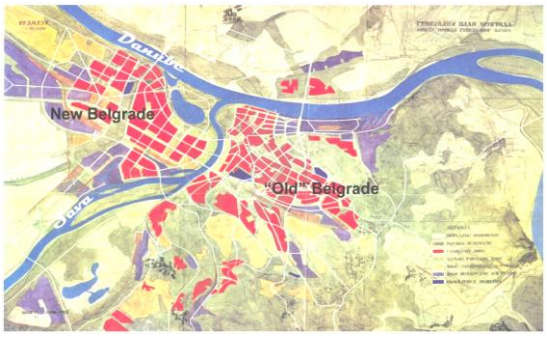

Figure 1.Belgrade: the city at the confluence of the rivers Danube and Sava
(According to Master Plan of Belgrade of 1950)

2. The river waterfront in the traditional historic city

The first observed period was the time of the country's reconstruction after the Second World War. The characteristics of this period are:

- accelerated development,
- modest economic potentials,
- a country devastated by the war (the housing stock, infrastructure, public and industrial facilities were destroyed),
- development of residential settlements and administrative buildings on a swampy land on the left bank of the Sava River.

The rivers played a decisive role in establishing international traffic connections and the inclusive economic development of Belgrade in the 19th century and its transformation from an oriental settlement into a modern European city. After 1830 Belgrade was rapidly developing as a commercial and trading center (Bajić and Basarić, 2014). The coastal area around Kalemegdan fortress played an extremely important role in the period of liberation from the Turkish influence and the creation of the new Serbian Belgrade. The position at the confluence of the river enabled the city's commercial prosperity since the transport of goods was carried out to the greatest extent by river flows, and especially benefited from the intensive development of the industry which was the main carrier of modernization and urban development, especially in the period until the First World War (Bajić and Basarić, 2014).

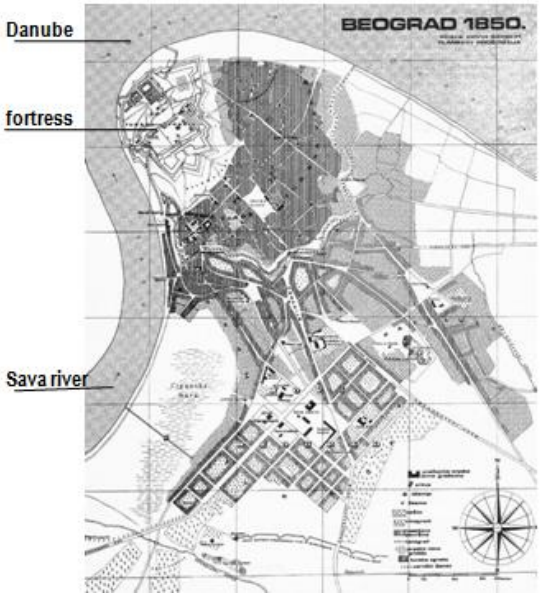

Figure 2. Old Belgrade: the traditional historic city
(Plan of Belgrade of 1850)

Figure 3. Old Belgrade by the river Sava(Photo of Belgrade 1920, according to: `Politika` newspaper 13.2.2013.)

Construction of the railway along the right bank of the Sava and Danube was a key factor in industrialization, but also represents the separation of river banks from the city core, which to this day has remained one of the biggest urban challenges and unresolved problems (Vuksanović-Macura, 2015). At the time of its formation, the industrial zone in the coastal area was located on the periphery of the settlement, but by its development and expansion, a significant part of this zone, as well as the Sava and the Danube riverbank, was at central city locations. Soon after the construction of a railway, the rapid development of this part of the city began. The railway station, the river port, and tram traffic have influenced the development of a long-standing market place in the coastal area, where the entire Belgrade trade. As a consequence, this part of the city became very attractive. Before the war in 1914, important public buildings were built in this area (Belgrade Cooperative, Hotel Bristol) became symbols of the accelerated development of the coastal area and its commercial, traffic and cultural significance (Bajić and Basarić, 2014).

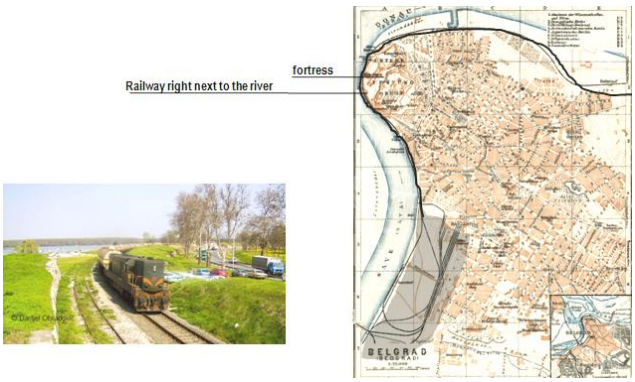

Figure 4. The railway next to river separating the Old Belgrade from its waterfront
(Plan of Belgrade of 1929, author marked the railway https://www.discusmedia.com/maps/serbian_town_plans/4561/).

At the end of the nineteenth century, the construction of the first industrial enterprises started with the urbanization and the right bank of the Danube. Before, this was an empty terrain along the river. Since the beginning of the 20th century, the industry has become one of the most important holders of economic and urban development in Belgrade. The new factories in this industrial zone had formed along the river after the opening of the Beton Hall, Danube harbor and main Port of Belgrade (Mihajlov, 2011).

The 1923 Belgrade Master Plan's preparation and implementation process, a significant moment in Belgrade's political and urban history when, after the First World War, the city lost its centuries-long border position, becoming the capital of a newly established extended country, the Kingdom SHS, later the Kingdom of Yugoslavia. The goal of government and city authorities was to create a representative national capital and overcome the city's existential and functional problems. The 1923 Master Plan introduced very innovative and modern approaches to solving the city's problems and improving residential areas, traffic, and greenery. Although urban planning of Belgrade in this and the following period, had initiatives to move the rail traffic from the Sava river coast, none of them was realized (Vukotić Lazar and Roter-Blagojević, 2017).

It can be concluded for this period that the river coast became the main market place, the center of the gathering, that transport (railway) was a priority in the city`s strategy of development, and that important public buildings with commercial or touristic purpose were built in this area.

3. The river waterfront during Modernism

The Second observed period is marked by:

- strengthening of the economic and political power of the State,
- technology improvement,
- massive industrial development,
- improvement of the standard of living and freedom of movement across the world,
- and international influences in architecture.

In the period between the two world wars, after the Sava ceased to be a border river, it was considerate the possibility of the development of Belgrade on its left bank of the Sava river. In the years after the Second World War, on the left bank of the Sava River, the construction of New Belgrade was started as a new urban center. By the way of its development, New Belgrade represents a separate part of Belgrade, a "city in the city". Conceived and built in an empty

territory, according to Blagojević (2007), as a "city-symbol of the new state and ideology", New Belgrade was also a city-polygon, where principles of modernism and the ideas of the functional city inspired by of Le Corbusier were achieved. New Belgrade represents a relatively pure and rare example of consistent construction in the spirit of functionalism and Modernism reflecting a clear approach formulated in the Athens Charter (Blagojević, 2007).

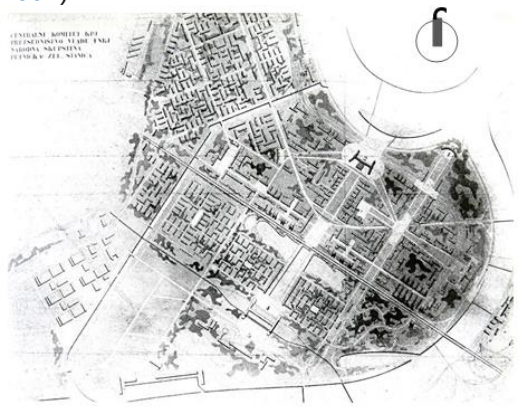

Figure 5. A conceptual plan of Nikola Dobrović for New Belgrade on the left bank of the Sava river 1948 (http://contemporarycity.org/2014/04/belgrade/)

The architect Nikola Dobrović, who was appointed as the director of the established Urban Planning Institute of Serbia, took the task of solving the problems of urban development of Belgrade, where he considered that the key to solving all urban problems of the city lied in traffic. Blagojević (2007) pointed out that Dobrović treated greenery as a modernist idea of the Garden City, so it was realized in New Belgrade as a green zone of park-garden space near the river similar to modern landscape urbanism as Monclus (2018) suggests.

Figure 6. Museum of Modern Art in New Belgrade`s greenery (http://www.slikavest.rs/nove-linije-povodom-otvaranja-muzeja-savremene-umetnosti/)

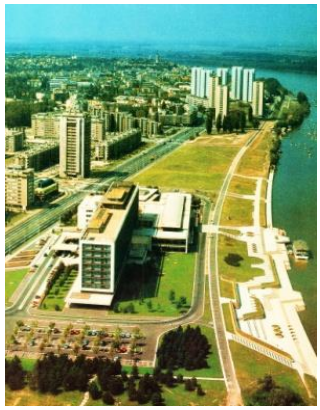

Figure 7. The river coast arrangement next to Hotel "Jugoslavija"(photo was given by the author BranislavJovin)

Although the fact that in the period of industrialization, the areas beside the river became places of impure, working zones, economic and industrial facilities all over the world, in Serbia, exceptionally during the time of socialism, some important objects were located in exclusive locations in the coastal area. This thesis is confirmed by examples: the Palace of Federation- SIV 1961, the Central Committee building– CK 1965 (now Ušće), the hotel Yugoslavia 1969 and the Museum of Contemporary Arts 1965 and only built in the old town waterfront "25 May" Sports and Recreation Center 1971. Also, many objects were solved through an architectural competition and were planned at locations in the coastal area, such as the Museum of the Revolution, the Military Museum and the Belgrade Opera House. These decisions had the urban symmetry and architectural monumental impression more typical for the Heroic period than for the International style and Modern architecture, so it can be characterized as the specificity of Serbia and as a precursor to the time when the focus is again turning toward the rivers (PetrovićBalubdzić, 2017).

A new stage in the development of New Belgrade marked the 1950 year where the idea of New Belgrade as a governing city was abandoned (Blagojević, 2007). Instead, the program priority in the coming period becomes housing for the working class, so a large number of open residential blocks were built with freestanding buildings in a lot of greenery. On the large public green surfaces of the coastal belt of New Belgrade, continuous paths have been formed for recreation, primarily walking and cycling.

The mass construction at a new part of the city noticeably neglected the reconstruction of the old city core, resulting in its devastation. At the same time, the Sava river coast served for the consent of ships and the unloading of goods, and heavy road traffic was directed through the

street around the Kalemegdan fortress. The revitalization of river banks, the relocation of the railway station and the use of tourism potentials have not been achieved during this period.
It can be concluded for this period that the river coast becomes park-garden space for recreation, but where important public buildings with cultural and administrative purposes were built.

4. The river waterfront in the contemporary urbanism

The third observed period has these characteristics:

- Considerable development mainly through interpolations both in Belgrade urban tissue and in New Belgrade,
- Due to the global economic crisis over the past years, this development stopped. The most important projects for which international competitions have been announced and quality results obtained have also stopped,
- Great interventions in urbanism – huge scale projects near rivers.

Coastal spaces play an important role in processes marked as decomposition of the urban matrix. The regeneration and activation of the area of the Sava and Danube coasts is an important aspect of recent initiatives of Belgrade's urban development, which are being carried out through various planned proposals and studies, architectural and urban competitions, as well as the ambitious ideas of private investors. Today the coastal area is treating as a space of special interest for the development of the city, where various activities and facilities are envisaged. The specific strategic goal is the orientation of Belgrade towards the rivers.
Projects of the transformation of the Belgrade coast into a potentially high-level urban area were made in the period after 2000 for several important locations. In 2001, an architectural and urban design contest was announced for the program solution of a complex of the marina "Dorćol". The competition solutions enabled the main purpose of the marina to be maintained with the necessary accompanying facilities, as well as the revitalization and conversion of valuable objects of industrial heritage in the area. It should transform this devastated area on the Danube coast into an exclusive mixed-use zone with residential, commercial, sports and cultural facilities within the marine complex of the total area of 76,000m2. The Master Plan for the Belgrade Port, created in 2009 by Daniel Libeskind Studio in cooperation with Gehl Architects, envisions a complete urban reconstruction of the existing port complex. The project covers an area of 96 ha. A network of public spaces, the formation of a new city park, the introduction of mixed content and greater density of construction are strategic elements of the plan. The site is generally upgraded to a new level because of flooding, with low-level routes and platforms providing access for low water levels. In many places, the stairs will lead to the river, allowing direct contact with the water surface, which is generally the lack of all existing Belgrade river banks.

Figure 7. Revitalization of Port Belgrade /Daniel Libeskind& Jan Gehl (http://www.lukabeograd.com/en/city-on-wather/master-plan/strategy.html)

There was an international competition in 2011 for the architectural and urban solution of "Beton Hala" where Sou Fujimoto and their vision of building as "floating cloud" become an answer to the accurate problems of the coast. Another urban regeneration project in the coastal area was the master plan "Beko" in 2012 of Zaha Hadid architects, planned to build right in the oldest part of the town, near Kalemegdan fortress, a complex of residential, business, commercial and hotel spaces.

Figure 8. Revitalization of Port "BetonHala"/ Sou Fujimoto (https://www.archdaily.com/286381/beton-hala-waterfront-center-sou-fujimoto-architects)

Figure 9. Urban regeneration of "Beko"/ Zaha Hadid Architects (http://www.zaha-hadid.com/architecture/beko-masterplan/)

The most ambitious in the scope of the planned construction, that is now building, is the project of transformation of the Sava coast "Belgrade on the Water, Belgrade Waterfront" from 2014. On the surface of about 177ha, it has over one million square meters of living space, about 750,000m2 of commercial and commercial space and more than 62,000m2 of public facilities. As one of the conditions for the realization of the project, the relocation of the railway node and the bus station is envisaged. Until now, four residential towers have been finished and the shopping center next to the river is under construction.

Figure 10. Transformation of the Sava waterfront "Belgrade on the Water"(https://www.belgradewaterfront.com/en/)

One of the lasts projects going on in Belgrade is the construction of cable cars that would connect the Old and New Belgrade, going over the river Sava, and pedestrian bridge connecting Kalemegdan fortress with a low level of the coastal area. It is projected for solving the part problem of public transport in Belgrade, as the metro does not exist.

Different authors criticize urban megaprojects as an instrument of urban planning and development, with specific reference to the Belgrade Waterfront Project that induced a change of the institutional framework (introduction of specific legal and policy instruments) (see Grubbauer and Čamprag, 2018; Lalović et al.,2015; Zeković et al., 2018), which led to: slow development and economic effects, low transparency, social inequalities, marginal social mobilization and weak networks between the key actors, public funds overuse, impact on law-making, displacement impacts, high public financial risk, deep urban transformations, environmental impacts, medium-technological modernization, etc. This way, the quality of solutions of large-scale urban projects directly depends on the socio-economic and political context, and hence varieties of private interest that each stakeholder defines without considering the public interest.

Figure 11. Cable car Project and pedestrian bridge for connecting Belgrade with the rivers (http://beogondola.com/)

It can be concluded for this period that the river coast became connected with the center of the city where the railway and heavy transport were moved, so it consists of megaprojects of buildings with different usage such as residential, commercial, touristic, sports and recreational, mostly as private property.

5. The method: the comparison of urban morphology of the three observed periods

Comparing the three ways of treatment of rivers coast through the time from the19th century till now, it can be concluded that the Belgrade position on the banks of the Danube and the Sava River has greatly influenced the establishment of traffic connections, economic and cultural development of the city. Through different periods, the usage and role of the river coast have been changed.

Table 1. Main characteristics for the three observed periods with different treatment of river waterfront

	Positive	Negative
Period Of The Traditional Historic City	• from the defensive role of the river coast to the main market place, the center of the gathering	• industrialization brought the factories, warehouses, and landfills, shipyards, industry and transport facilities occupied a wider part of the coastal area
	• transport as a priority in the city`s strategy of development	• railway going through the city historic core, next to the river, separated it from the city
	• important public buildings with commercial or touristic purpose were built in this area	• without adequate greenery
Period Of Modernism	• green zone of park-garden space near the river	• difficult maintenance of large public spaces of greenery making the devastated surrounding
	• A place for recreation, primarily walking and cycling	• lack of other activities for the attraction of people to stay longer near the river
	• important public buildings with cultural and administrative purpose were built in this area	• the appearance of illegal rafts and various floating objects
Period Of the Contemporary Urbanism	• residential buildings next to the river with a great view	• the high density of population
	• the used advantage for the most attractive part of the city, railway and heavy transport is moved from the city center	• the lack of large enough real public spaces along the river (shopping mall is just for public use, but not ownership)
	• a lot of different activities such as commercial, touristic, sports and recreational	• huge occupancy of the plot, almost without public greenery
	• people are close to the river as there is an accessible narrow path for walkers but also and bicycles next to the coastline with stairs and terraces	• lack of cultural spaces and buildings
	• it is connected with the rest of the city	• residential segregation as it could afford the only rich level of society

The inadequate use of land resulted in the inability to connect the city with its rivers and harmed the quality of the environment. The unsolvable problem of the railway and the transit traffic for many years has made the coastal part of Belgrade a deserted transit zone in the city center itself. The connection of the inhabitants of the city to the river, which reached the peak of the development of the trading zone and the construction of representative elite facilities in the first observed period, was interrupted by the construction of a railway at the beginning of the 20th century. After that, the coast lost its significance and became a transit zone. This leads to a gradual degradation of its urban and ecological qualities. Cutting the flow of people and greenery between the two axes - the Sava and railway - be a key problem of these two zones.

One of the problems with the treatment of river waterfront during modernism, except for the lack of the different content and objects, is that was built a rigid hydro-technical concrete fort system along the whole coastline. It can be part of the reason why Belgrade never completely descended on its rivers. Such systems have been overcome, both functionally and esthetically and since it shows over years that they are insufficient and that their upgrading is necessary. The system with water canal incorporated into the urban tissue of the city which can be useful control during floods, that suggested Libeskind and Gehl in their proposal for Port Belgrade, is more contemporary. However, the future development of the New Belgrade riverside and re-functionalization of the broadly planned greenery, which was planned during modernism, could be now considered from another perspective according to Blagojević, that "its

failure and unfinishedness now become its main resource" (Blagojević, 2007).
The water line has a great influence on the design of the city structure. In the case of Belgrade, two more factors have been identified, which have been determined by the urban landscape: dynamic topography, on the one hand, and a huge amount of water, which is not typical for most cities along the river. These features once have played an important role in defensive function, but today they are again a feature that contributes to a unique urban identity.

6. Conclusion and results

The creating of the new architecture, such as public buildings or squares near rivers, can contribute to the completely new identity of the entire surrounding area, which shows a great impact that they can do. After overcoming the industrial zones, contemporary cities are increasingly competing in the plans for the future of the coast. These areas become competitive with the center of the city, influencing the developing of representative architecture as well as open public spaces.
The analysis of the development of the coastal area of Belgrade over time reveals the dynamic and rapid changes that are caused by economic, demographic, political and doctrinal changes that are recorded in its tissue through urban and architectural solutions, plans and new ideas. It can be concluded from the used methods in this research such as spatial analyses through the use of urban morphology and temporal analyses through the use of the historically defined urban process from different aspects (economic, political, social, environmental...), that every period has a positive and negative consequences of any urban decision. Even though period of Modernism was very criticized at the beginning, now, after some time distance, the results of this study shows that it has great potential, that it was flexible urbanization with sense of width (for space, air, greenery, view, sunshine, traffic, parking, etc) which gives opportunity for next generations to intervene in urban tissue or to keep grown greenery. Some of the main problems that contemporary old part of city waterfront have today, the Modernism, as it is shown on the example of Belgrade, still function well. On the other, contemporary urbanism doesn't have one great vision of the whole city perspectives but more mega projects in different parts of the city, so it gets the impression of disconnection. These results allow us to better understand the process of renewal and could help a lot for the future development of the waterfront area.

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Conflict of interests

The Author declares no conflict of interest.

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Revitalization and Adaptive Re-use in Cappadocia: A Taxonomy of Creative Design Solutions for Uçhisar Boutique Hotels

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ABSTRACT

The "architecture without architect" in Cappadocia has always been fairy due to its volcanic stone formations and transforming silhouettes. In 1973, French architect Jack Avizou highlighted the essence of cave houses as vernacular building types and their potentials for local tourism beyond conventional notions of architectural heritage. Upon completing restoration of cave houses in Uçhisar and transforming them to boutique hotels, he was nominated for Aga Khan Award for Architecture in 2010. On the other hand, Aga Khan Award winner Turkish architect Turgut Cansever, had also been advising for Argos Hotel project in Uçhisar since 1996. He gave importance to the concept of "protection" and preserved vernacular identity and characteristics despite the demands of tourism sector. This paper aims to explore Avizou and Cansever's design solutions in Uçhisar's local context. Building / interior design elements and spatial relations in interiors will be analyzed with cluster analysis and ranked according to levels of novelty. Hence, achievement of creativity through transformation, combination and variation of original designs, will be displayed. Understanding Avizou's and Cansever's visions on revitalization and adaptive re-use is substantial since, their creativity shall be a source of inspiration for future sustainable tourism and building practices in local and global context.

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1. Introduction

For economic growth, especially during times of financial crises, tourism is regarded as an accelerator. The UN World Tourism Organization (UNWTO) research demonstrated that interest in the environment, culture and heritage is a primary motivation for more than 50% of travel, and is consistently growing as a market sector (Brooks, 2011). According to the Council of Europe (Faro Convention, 2005), cultural heritage is valuable in itself and for the 'contribution it can make to other policies'. Many countries have invested large sums in the restoration of various historical sites with the aim of maintaining jobs in the tourism sector and using cultural heritage as a tool to stimulate cultural and economic development in a period of economic recession (Inkei, 2011). Hence, construction industry and small and medium-size businesses are being preserved besides historic monuments and sites. Beyond economy, cultural tourism has significant socio-cultural and environmental impacts on host society.

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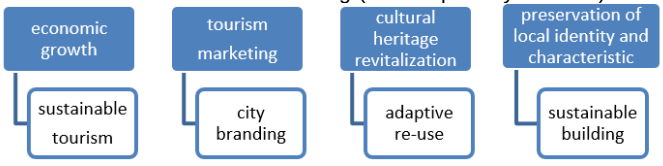
During World Summit on Sustainable Development (WSSD – Johannesburg, 2002), it was stated that: "*The contribution that tourism can make to poverty alleviation, to conservation of the natural and cultural heritage, and to overall sustainable development can be substantial. This is especially so in developing countries, where natural resources and landscapes are still relatively untouched and where few other activities have a sustainable development potential, from an economic or environmental perspective. Furthermore, tourism has proved to be in many countries a much more sustainable development option that intensive agriculture, forestry, extractive mining or other primary activities*".

Thus, cities themselves have already become products within the economy of consumption. The identity of cities or areas have been redesigned, presented and consumed steadily. In global competition and mobility of tourism, field branding strategies are applied for increasing the cities' recognition, recalling their identities and main characteristics and developing new strategies for their consumption (Zhang and Zhao, 2009). Efficient city branding depends on the identification of main characteristics of the city including its identity, historical, cultural activities, demographic characteristics, economy, perception of the city and experiences of people etc.

Hence, cultural heritage with its overall physical, diverse and intangible components require new strategies of preservation, renovation and adaption. For preserving cultural heritage, The Council of Europe (1985) suggested use of protected goods in the light of modern living needs; adaptation of old buildings for new purposes (when possible); and harmonization of the needs for protection with the needs of modern economic, social and cultural activities. As shown in Table 1, revitalization and adaptive re-use of heritage buildings and sites are rooted in a number of disciplines including economy, sustainable tourism, tourism marketing, city branding, preservation and sustainable building. The aim of this paper is to inspect sustainable design strategies applied in revitalization of Cappadocia as a tourism center. Case study will focus on adaptive re-use of cave houses as boutique hotels.

Table 1. Theories of Revitalization and Adaptive Re-use in Sustainable Tourism and Building (Developed by Authors)



1.1 Revitalization and Adaptive Re-use of Heritage Buildings and Sites

In tourism, consumers' motivations and behaviours are increasingly characterized by a more selective choice of destination, a greater attention to the tourism experience and its quality, a greater sensitivity to the environment, vernacular culture and local people at the destinations. Hence, cultural tourism and its sustainability is possible through preservation of vernacular identity and characteristics. Applying determined place / urban identity in all areas of design (in a collective manner), is an advertising and marketing technique for place branding (Usal, 2012). Therefore, contemporary strategies and practices have been shaped around revitalization and adaptive use of heritage buildings and sites.

Vernacular architecture is a great source for architects, urban planners, and relevant service providers who are expected to develop sensitive scenarios to physical, economic, social and environmental needs. In vernacular architecture, physical characteristics of the region including the climate, tectonics and landscape blends with cultural and social values. Vernacular architecture, as a result of hundreds of years of experience, is efficient in meeting the needs of local environmental conditions and quality of life. Vernacular buildings require less energy for their construction, operation and maintenance thus, they are sensitive to the nature and their environments.

In Turkey, several architects in their projects have successfully integrated vernacular design principles that determine the sustainable identity of vernacular architecture. The architect Turgut Cansever, who later advised for Argos Boutique Hotel in Cappadocia, was awarded three times with international Aga Khan Award for his contributions to vernacular architecture along with urban and rural development policies. Cansever's projects Ahmet Ertegun House (1980), Turkish History Foundation Building (1980) and Demir Holiday Village (1992) were all found to be valuable for their sensitive approaches to economic and environmental problems. This paper includes samples from Cansever's design approach to Cappadocia as well as French architect Avizou, who was the first figure to emphasize the significance of vernacular architecture and highlight its potentials for tourism in the region.

2. Vernacular Architecture in Cappadocia

Cappadocia; was shaped 60 million years ago with lava and ashes of Erciyes, Hasandağı and Güllüdağ mountains and erosion of these soft layers rain by the wind and rain during millions of years. Throughout history, many civilizations including Assyrian trade colonies, Hittites, Persians, Romans, Anatolian Seljuks, Karamanoğulları and Ottomans have settled on this land. Traditional Cappadocia settlements were independent of strict design rules. Cave settlements were formed in centuries as a result of natural and human forces by abrasion and friction. Caves provided various functions such as sheltering, worship, defence, burial place, storage and transition tunnels. Easy digging of shelters facilitated expansions and connections with new corridors and stairs on need. People developed their defence mechanisms skilfully upon discovering the suitability of caves for hiding and defending. Therefore, cave houses scattered on the sloping terrain, have become the characteristic pattern of Cappadocian architecture. They featured rational and creative solutions, which were shaped around principles of sustainability.

The streets in Cappadocia conformed to topographical features. They were usually scaled according to dimensions which allowed animals (carrying human load) could pass. These organic streets were limited either by wood / stone cantilevered building masses, high garden or courtyard walls, depending on regional characteristics. Cappadocian settlements; could be classified in three categories including underground carved settlement, slope carved settlement and rock carved settlement. Stea and Turan (1993) termed them as carved-out spaces (lithospace) and built-out spaces (terrapace) during their investigation on placemaking and developed a model for housing patterns in Cappadocia (Table 2).

Table 2. Housing Patterns in Cappadocia (adaptation from text by Stea and Turan, 1993)

Cappadocia Housing	
Carved-out housing	*Built-out housing*
• Negative space • Subtractive • Away from the surface • Provides a strong defense mechanism with its depth and camouflage	• Positive space • Additive • Close to the surface • Indicates social status/ respectability of its owner in community(in terms of size and decorative elements)

Stone was the main building material of Cappadocia region, due to its volcanic land. It was soft and easily processed when it came out of the quarry, but after contact with air it became hard and very durable for building. Local people, who used to live in rock-carved spaces at first, started applying fine stone work to architectural structures. The most glorious built-up Cappadocia houses began to emerge in 19th century with post-Tanzimat influences. Houses began growing in size and decorations appeared on facades. Ornamented mouldings, cantilevers and doors / windows converted to sculptures, appeared as authentic works of this late period. The stone called "kepez" also contained different color shades. Its porous structure provided serious insulation against heat. Its abundance, easy processing and thermal insulation has made stone workmanship a traditional construction technique in Cappadocia. In its history, a guild of 700 masters practicing in the region was noted (URL 1). Natural stone (volcanic tuff) offered unlimited possibilities, especially in terms of architecture: from small to enourmous scaled caves with a variety of curves, roughness and textures in walls. Everything was designed according to user's lifestyle and daily actions. Types of housing varied from "carved", "semi-carved-semi-masonry" and "masonry" (Binan, 1994). Main components of carved space were living spaces, kitchens, cellars, warehouses, tandoor houses, places of worship, barns and stables etc. In addition, water wells and ventilation chimneys were indispensable in the underground world. All of the rooms opened to a "hayat" surrounded by high courtyard walls.

Cappadocia houses, had not been of interest for many years and were faced with collapse and disappearance. However, with revival of tourism after 1970's, Cappadocia region started to gain importance. New functions such as hotels, pensions, restaurants, discotheques, cafes and shops etc. were given to renovated historical buildings and put into service for tourism. In 1982, The Ministry of Culture launched a rescue operation. In 1985, preservation of heritage rock was finally recognized as "World Heritage" by UNESCO (Figure 1). The vaults carved into the lava stones in these primitive settlements started to take place on touristic media and marketing mediums all over the world.

Figure 1. Göreme National Park and the Rock Sites of Cappadocia (URL 2).

3. Revitalization and Adaptive Re-use of Vernacular Houses for Tourism in Uçhisar

The best example of settlements, carved into rocks, is Uçhisar Castle and its surroundings. Uçhisar, is the highest rock in the region. The horizon to be seen 90 km to the east, leads to the assumption that it was one of the attractive points preferred for asylum by the first Christians, who fled from the Romans. Turks moved to Anatolia in the 11th century and preferred to settle in the old settlements. They also utilized Uçhisar as a protection and defence center in Seljukid, Beyliks and Ottoman Periods (Cimşit, 2007).

As a neglected historical site, Uçhisar was identified as disaster area in the 1960s and was abandoned with support of the state. On leaving, many of the villagers removed stones from their original houses and used them to build their new houses. Hence, the village was ruined by the end of the 70s. On the other hand, Club-Med Hotel (1968-2005) opened and attracted international interest, mainly of French. Within time, Uçhisar has become a favourable destination for Belgium, Italian, American and Japanese tourists as well Turks from all over the country due to its suitable weather conditions between May and October. Development of similar infrastructures and services in Uçhisar has been boosting the tourism and related sectors in recent years (Figure 2).

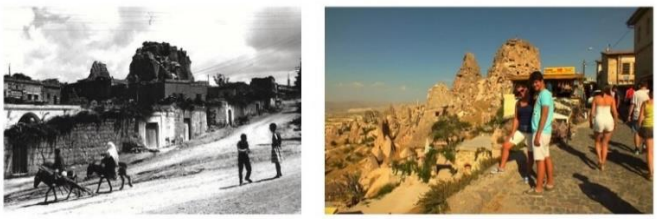


Figure 2. Revitalization of Uçhisar (URL 3).

Uçhisar is a defensive hill settlement. However, its stone and rock formation is problematic due to its softness, loose porosity and dune layers in between etc. Hence, structures in Uçhisar were built smaller compared to other regions with big cave monasteries. In addition to caves; additional rooms with flat roofs were built. They were built out of cut stone on rock carvings. These rooms, owing temperature and humidity regulations, had climatic advantages over caves (Figure 3).

Due to poverty in Uçhisar, ground floor walls were built with more modest materials such as rubble / rough stones. Cut stone was only used at upper elevations. In Uçhisar houses; rooms were arranged around a common living area (inner courtyard). Decorations were sparse. Upper floor ceilings were covered with poplar structures called 'hezen'. The wood was scarce in ornamentation since the area was lacking trees. Wood was only used for doors in courtyards and interiors.

Figure 3. Vernacular Architecture in Uçhisar (URL 4).

3.1 Les Maisons de Cappadoce

The adaptation of cave houses for contemporary use was initially introduced to Uçhisar by French architect Jack Avizou. Overwhelmed by the book called 'Architecture without Architects' (Rudofsky, 1964) and his touristic visits to Cappadocia, Avizou settled in Uçhisar in 1993. He set up a firm operating in architecture and tourism sectors. He bought 17 cave houses abandoned by villagers and converted them into boutique hotels with total 31 rooms. Avizou explained his efforts: *'Politicians were always discussing about especially on the frescoes of the old chapels. I introduced the concept of heritage and restoration in this region' (URL 5).* According to Avizou's vision; bakery ovens, wine cellars, stairs carved into rocks, terraces and inner gardens started to appear in the middle of the isolated and striking Cappadocia landscape. He was inspired by vernacular art for decoration and used it in a simple style for authentic comfort. He designed interiors with pottery, rugs and carpets. He redesigned the local Turkish primitive human settlements according to French taste and later marketed them via his tourism company (Figure 4). The project was nominated for Aga Khan Award for Architecture in 2010 for its impetus throughout the region, due to renovation of vernacular structures and revival of traditional crafts.

Figure 4. Restoration of Vernacular Housing by Avizou- for Les Maisons de Cappadoce (URL 6).

3.2. Argos in Cappadocia

Argos in Cappadocia, is a restoration project of an old neighbourhood, which earlier was removed away stone by stone and became an excavation area in 1970's. The founding partner of the Argos in Cappadocia hotel, Gökşin Ilıcalı, discovered Uçhisar in 1996 and decided to make a tourism investment through restoration. He hired Aga Khan awarded Turkish architect, Turgut Cansever for his master knowledge and former practices on vernacular architecture. During restoration, Cansever put emphasis was laid on vernacularity, respect for history and importance of the place. The stone houses, which had been removed, were traced and spaces in between were designated according to the needs of the new function (Figure 5). The new layout, with original traces, was called as "içinden köy geçen otel / the village with a reception desk" by Architect Özbay, the current coordinator of the project (URL 7).

Figure 5. Restoration of Vernacular Housing Consulted by Cansever for Argos (URL 8).

Keeping the new behind the original, respect for traditional textures and priority of local crafts, were effective strategies in the success of final product. The project took a long time due to several stages. Masters of traditional crafts were seeked to train new craftsmen. The initial tourism company owning Argos was purchased in 2014 by a big Hotel Investments Group. With ongoing restoration work, Argos in Cappadocia has received several global and national awards (Table 3).

Table 3. Global and National Awards of Argos (Developed by Authors based on info at URL 9).

- Excellence (Trip Advisor, 2010)
- World's Newest and Best 45 Hotels (Travel+Leisure , 2010)
- "The most environmentally friendly projects in the world" (Conde Nast, 2010)
- "The Most romantic hotels in the world" (Conde Nast, 2011)
- 'Silver Magellan' at "The Most Luxury Hotel and Resort in the World" (Travel Weekly, 2011) "Boutique and Private Meeting Facilities" (1st Congress, Meeting and Event Awards - ACE of M.I.C.E, 2012)
- "Turkey's Best Boutique Hotel Investment" (Turkey's Most Successful Tourism Investment Survey, 2013)
- "Top 100 Hotels in the World " (Fodor's, 2014)
- "Best Hotels in the World" Categories (Travellers Choice, 2015)
- '5 Stars' at 'Best Hotel' and 'Sustainable Hotel' Categories (International Hotel Awards, 2015)
- 'Global First' at "The Most Beautiful Historic Luxury Hotel' Category (World Luxury Hotel Awards, 2016).

4. Methodology and Case Study

This paper focuses on utilization of vernacular building / interior design elements for adaptive re-use of cavehouses as boutique hotels. Case studies will include two awarded projects: Les Maisons de Cappadoce and Argos in Cappadocia (Table 4). First of all, images of selected elements will be classified with cluster analysis. Indeed, the concept of classification is noted as the building block for most of the cognitive capabilities human possess (Gagne, 1985). With classification, one can understand interrelationships of similar things together, based on a set of criteria or characteristics. Classification by architectural elements (Purini, 1968), allows categorization of large databases of building elements into semantic categories such as; certain historic periods, styles, cultural influences and functions

After classification of building / interior design elements, their original and new uses will be compared according to levels of novelty. The model used in the study is 'taxonomy of creative design' by Nilsson (2011), which offers a progression from imitation to original creation (Figure 6). It helps to organize creative works into an inclusive, unifying landscape that serves as an analytical tool for evaluating creative work, and also as a methodical approach for developing creative skills. Today, Avizou's and Cansever's visions on adaptive re-use of cave houses are still inspiring current boutique hotel design projects. Therefore, this research intends to display the novelty of their design solutions and display their contributions to sustainable development of local economy, tourism and building sectors.

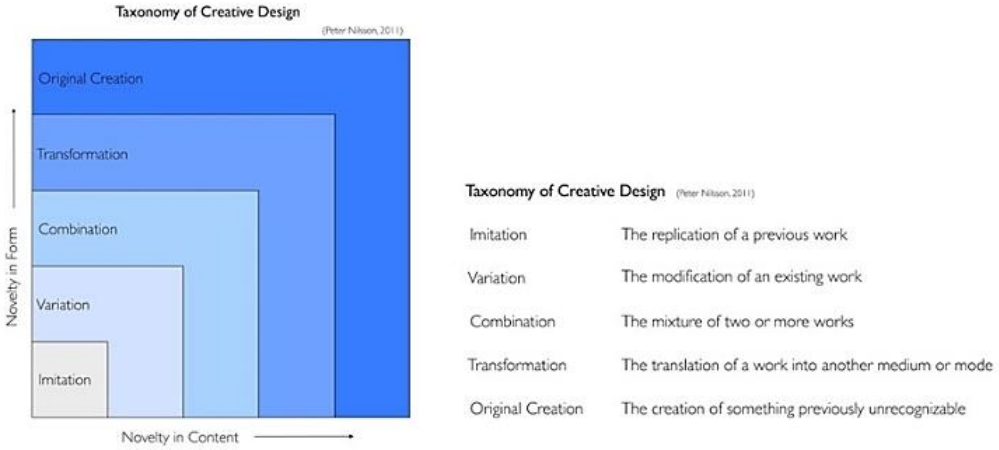


Figure 6. Taxonomy of Creative Design (URL 10).

4.1 Findings

The common point for both projects is their respect and emphasis for preserving the rich heritage of vernacular culture. In Cappadocia, adaptive re-use of vernacular housing as boutique hotels has brought many economic benefits and improved quality of life for residents. Table 4, displays adaptive re-use scenarios of Les Maisons de Cappadoce and Argos in timeline.

Table 4. Adaptive Re-use Scenarios (Developed by Authors based on info at URL 11).

Property Name	Original Use	New Use	The benefit
Les Maisons de Cappadoce (1994-2010)	Cave house Stables	Boutique Hotel	Initialization of the concept of heritage and restoration in Cappadocia
Argos Stage 1 (1996-2002) Mansion 'ManastırKonak'	Monastery church from 4th-5th century Caravanserai or oil mill	Bezirhane	Cultural and social events, (concerts, exhibitions and theater performances, festive receptions, media conferences, lectures, symposia, fashion shows etc.
Argos Stage 2 (2001-2006) Mansion 'Tüneli Konak'	Roman water tunnel with 5.5 km length	Public circulation tunnel and suite room	The first suite room with a pool inside
Argos Stage 3 (2005-2009) Mansion 'Vasil Konak'	Residential	Boutique Hotel	Open to public Provides street-courtyard-panorama connections
Argos Stage 4 (2007-2009) Mansion 'Gemil Konak'	Residential	Boutique Hotel	Suite rooms with common facilities: restaurant, kitchen, bar, lounge / lobby.
Argos Stage 5 (2010-2011) Mansion 'White Konak'	Residential	Boutique Hotel	Suite rooms
Argos Stage 6 (2012-2013) Mansion 'Tıraz Konak'	Residential	Boutique Hotel	Suite rooms
Argos Stage 7 (2014-16) Mansion 'Kavak Konak'	Residential	Boutique Hotel	Suite room with "şırahane" (traditional kitchen) and "peynir odası" (cold storage)
Argos Stage 8 (2015-2017) Personnel Building	Residential	Personnel Building	A large cafeteria and kitchen in basement, and dressing and relaxation rooms on upper floors for hotel staff
Argos Stage 9 (2015-2017) Museum Saloon	Caravanserai or oil mill Staples	Multi-use hall Boutique Hotel	Exhibition of historic mill beds and mule circulation
Ladies' house (2015-2015)	Two heritage school buildings from Republican Period	A restaurant and shop for jewelry and food products	Handmade by Uçhisar ladies.

Following tables 5, 6, 7, 8 and 9 are *taxonomies of adaptive re-use design guidelines according to levels of novelty* in *'Fitting to Topography, Spatial Layout, Vernacular Construction Technics and Material, Interior Furnishing and Ethnographic Elements'*.

Table 5. Taxonomy of Design Guideline 'Fitting to Topography' according to Levels of Novelty. (Les Maisons de Cappadoce; URL 12, Argos in Cappadocia; URL 13)

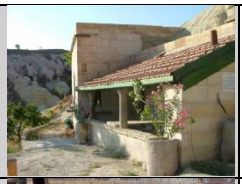
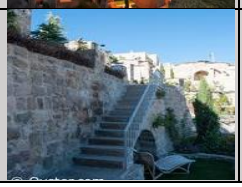
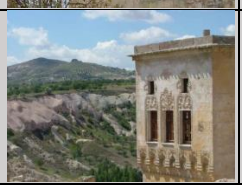
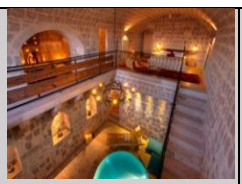
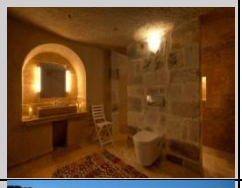
Original Architectural / Interior Design		Transformation/ Combination/ Variation		Imitation
Les Maisons de Cappadoce by Avizou				
Fitting to topography	Building types			
	Vertical circulation elements (staircases, ramps, etc.)			
Argos in Cappadocia consulted by Cansever				
Fitting to topography	Building types			
	Vertical circulation elements (staircases, ramps, etc.)			

Table 5, displays designers' levels of novelty in designing *'Fitting to Topography'* criteria.

- Avizou's project Les Maison Cappadoce, is located on the outskirts of Uçhisar. Due to its location, exterior space use is focused on small gardens and balconies. On the other hand, Argos in Cappadocia, consulted by Cansever, is located on steep hills. Hence, terrace use is varying according to different functions: cafes, restaurants, cultivation activities.
- In both projects, emphasis was laid on use of local materials and building techniques. For local people, new job opportunities were created in the building sector. Employment of local stone masons and carpenters, enabled preservation of local craft skills in the region. Many skillful architects, interior designers, engineers and construction man were employed on construction sites. Therefore, both projects have made remarkable contributions to sustainable economic growth. Additionally, young architects and interns were accepted to practice in Argos restoration works. Besides support for architectural education, new and original knowledge was introduced to architectural history and theory through findings on heritage sites.
- The stairs in inner courtyards are out of local materials. Facade openings and entrances under stairs provide relationship between middle courtyards and surrounding living spaces. The original function of courtyards for circulation has been preserved.

Table 6. Taxonomy of Design Guideline 'Spatial Layout' according to Levels of Novelty.
(Les Maisons de Cappadoce; URL 12, Argos in Cappadocia; URL 13)

Original Architectural / Interior Design		Transformation/ Combination/ Variation		Imitation
Les Maison Cappadocia by Avizou				
Spatial Layout	Organization of interior spaces			
				
	Inner Courtyard			
	Terrace with panorama			
	Water element			
	Shading Element			
	Facade ornamentation			
Argos in Cappadocia consulted by Cansever				
Spatial Layout	Organization of interior spaces			
				
	Inner Courtyard			

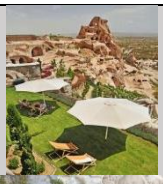
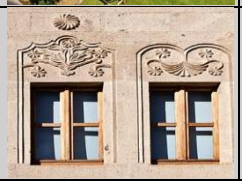
	Terrace with Panorama			
				
	Water Element			
	Shading Element			
	Facade Element			

Table 6, displays designers' levels of novelty in designing '*Spatial Layout'* criteria.

- In both projects, according to adaptive re-use for boutique hotels; spatial organizations were modified. In Les Maison Cappadoce, Avizou preserved the spatial integrity of houses with inner platforms and flow of volumes in between rooms. When new divisions were required, he proposed furniture islands or groupings. However in Argos, in line with luxury suite room concept, houses were divided into smaller parts. Original volumetric transitions were lost in most room designs.
- In traditional Cappadocia houses, inner courtyards were paved with stones. Originally, they were the service places, where food was prepared and cooked, routines such as laundry was done in daytime and where people cooled themselves down during hot summer nights. In both adaptive re-use projects, inner courtyards are covered with greenery for recreation and cafe restaurant facilities in line with tourists' interests.
- In Argos, most stone covered terraces have been transformed to green terraces for panorama viewing. They are furnished with seating groups directed towards panorama. In Les Maisons de Cappadoce, terraces are mostly left as stone pavement. In both projects, decorative water elements and small size stone pools with ornamental carvings, are placed in terraces and inner courtyards.
- In terraces of Argos, the tradition of viniculture has been revitalized as a part of gourmet tourism. Arranged in platforms, several terraces have been planted with fruit trees and organic vegetables. Serving local wines in its cafes and restaurants, Argos in Cappadocia, was chosen to be one of the best wine resorts in the world. This helped revival of cultivation culture and economy of these fertile lands. Currently, local wine producers export their high quality wines to local and global markets. Several wine tasting and selling shops, which create new job opportunities for local people, have been opened.
- In both projects, during restoration practices, original stone relief motifs were preserved on building facades.

Table 7. Taxonomy of Design Guideline 'Vernacular Construction Technics and Materials' according to Levels of Novelty. (Les Maisons de Cappadoce; URL 12, Argos in Cappadocia; URL 13)

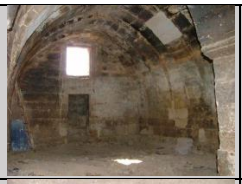
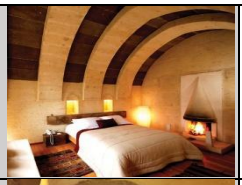
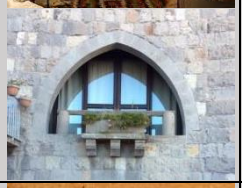
Original Architectural / Interior Design		Transformation/ Combination/ Variation		Imitation
Les Maisons de Cappadoce by Avizou				
Vernacular Construction Technics and Materials	Wall types & coverings			
	Facade openings (Doorways & windows)			
	Ceiling structures			
Argos in Cappadocia consulted by Cansever				
Vernacular Construction Technics and Materials	Wall Types & Coverings			
	Openings (Doorways & Windows)	 	 	
	Ceiling structures			

Table 7, displays levels of novelty in '*Vernacular Construction Technics and Materials*' criteria.

- In both projects, original stone arches and wooden-beamed ceilings in rooms have been preserved. Additionally, rooms have been supported with ribbed vaults on locations where the rock is humid and non-durable.
- In bathrooms, travertine is preferred instead of tiles or ceramics. Argos in Cappadocia has some indoor pools (in few suites), which did not exist in vernacular architecture. These pools cause moisture and odor inside the rooms due to inadequate ventilation

Table 8. Taxonomy of Design Guideline 'Interior Furnishing' according to Levels of Novelty. (Les Maisons de Cappadoce; URL 12, Argos in Cappadocia; URL 13)

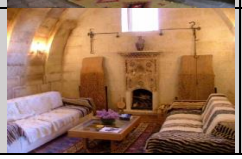
Original Architectural / Interior Design		Transformation/ Combination/ Variation		Imitation
Les Maison Cappadocia by Avizou				
Interior furnishing	Level difference			
	Niches for display			
	Wood furniture			
	Stone furniture			
	Seating inside			
	Fire place			
Argos in Cappadocia consulted by Cansever				
Interior Furnishing	Level difference			
	Niches for display			
	Wood furniture			
	Seating inside			
				
	Fire place			

Table 8, displays designers' levels of novelty in designing '*Interior Furnishing'* criteria.

- In both adaptive re-use projects, room interiors are furnished in a simple style. Modern furnishing is combined in harmony with local furniture, made out of cedar.
- Niches in interiors are used according to their original functions as display and storage areas.
- Fireplaces, which in the past were used for heating interiors, have been preserved in their original forms. Due to provision of modern central heating systems, most fireplaces have simply become decorative elements. Only few can still be used upon request of hotel guests.

Table 9. Taxonomy of Design Guideline 'Ethnographia' according to Levels of Novelty.
(Les Maisons de Cappadoce; URL 12, Argos in Cappadocia; URL 13)

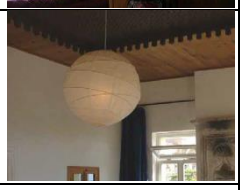
Original Architectural / Interior Design		Transformation/ Combination/ Variation		Imitation
Les Maison Cappadocia by Avizou				
Ethnographia	Carpet			
	Antique houseware &daily items			
	Lighting			
Argos in Cappadocia consulted by Cansever				
Ethnographia	Carpet			
	Antique houseware & daily items			
	Lighting			

Table 9, displays designers' level of novelty in 'Ethnographia' critera.

- In Les Maison Cappadoce, Avizou maintained use of ceramic pots in daily functions. In Argos, original ceramic pots are being exhibited in wall niches as if in a museum.
- Traditional weaving rugs, which were used to cover stone floors in the past, are being exhibited on the walls, over beds and sofas as decorative elements.
- Interiors are lighted mostly by wall mounted chandelier or hidden lighting fixtures. In general, interiors are dimmed to preserve the cave ambiance.

5. Conclusion

The two adaptive re-use projects introduced in this paper, display creative design solutions while preserving the vernacular identity and characteristics. Classification of spatial elements and relations, helped further analysis of both projects according to levels of novelty that range from original and imitation. Within this taxonomy, the two architects' design solutions mostly revealed transformation, combination and variation of vernacular design guidelines such as: 'fitting to topography, spatial layout, vernacular construction technics and material, interior furnishing and ethnographic elements'. The respect for originality has dominated both projects. They displayed few imitated design solutions, which may have been added later by other decision makers than the master architects themselves.

It is also important to highlight the coherency of sustainable building solutions between implementation phases and after-use scenarios of both projects. Use of local material and craftsmanship, training of stone masons, carpenters and other construction workers, engagement of young architects and intern students in the building and restoration process have provided many job opportunities in poor village of Uçhisar. The economic development, which initiated with construction work, has been further sustained through the business model of boutique hotels. Vernacular lifestyle has also been marketed according to the requirements of tourism sector. Alternative experience-based activities have been proposed such as; tasting wine in platform terraces, eating and drinking in cafes and restaurants of Argos, walking tours in between fairy chimneys under moonlight, meeting opportunities in the restorated oil mill 'Bezirhane', entertaining in music, well-being and gourmet themed festival Cappadox, and shopping handmade local products. With increasing number of such creative design solutions, which have all been inspired by vernacular architecture, revitalization and adaptive re-use in Cappadocia have generated a sustainable business model embracing local economy, tourism and building sectors.

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Conflict of interests

The Authors declare no conflict of interest.

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The Role of Changing Housing Policies in Housing Affordability and Accessibility in Developing Countries: The Case of Kenya

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ABSTRACT

Rapid urbanization has led to the influx of people into urban areas as people seek better life opportunities. This migration has however largely not been planned, resulting in population explosions in the cities. Relying on existing research on the topic and government reports, this study finds that many middle and low-income families in Kenya have ended up living in informal settlements in urban areas due to housing unaffordability. The study further determines that the problem of housing is more pronounced in developing countries. Studies related to this issue establish that the housing crisis cannot only be attributed to rural-urban migration but also other factors like failed housing policies, poor housing financial systems, too much interference in the running of housing by the government and complex land tenure systems among others. This research, therefore, identifies the critical housing crisis issues, housing policy gaps in Kenya and proposes policy actions and the potential role of governments in a housing market to address affordability challenges. The study establishes the role of government and other institutions in the housing sector and proposes the land and housing reforms which can add knowledge to future research in similar areas.

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1. Introduction

Nowhere is the housing crisis so much manifested than in the urban areas of the developing countries. The greater part of the population in urban areas of the developing countries lives in informal settlements. In South Africa, more than 1.1 million households are estimated to be living in informal settlements of nine major cities (Del Mistro & A. Hensher, 2009). The condition is similar in the developing countries in Southeast Europe. In Albania, about a quarter of the population lives in the informal settlements occupying about 40% of built-up areas of the cities. The condition is similar in Macedonia where an estimated 11% of the population live in informal settlements (Tsenkova, 2012). Millions living in these settlements don't have access to affordable and decent housing, water, sanitation, electricity, security among services essential to human wellbeing. These settlements are overcrowded thus exposing them to diseases.

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Mumbai, India is an example of cities urbanizing too fast yet the condition of living continues to deteriorate. According to McFarlane (2008), the majority of the population living in Mumbai lacks the basic security of tenure, poor houses expose them dangerously to monsoon rains, are frequently subjected to demolitions and evictions, lack adequate access to clean water and sanitation facilities thus making them vulnerable to diseases.

According to Khalifa (2015), informal settlement problem is a direct result of governments' inability to provide affordable and adequate shelter to the urban poor and should, therefore, be viewed as an attempt by the poor to seek a solution to their problems under existing difficult conditions. This problem is multifaceted and would require input from across sectors to address. To address the problem, a demand-driven approach should be taken by ensuring the participation of all stakeholders. Many scholars have since concluded that a multi-disciplinary approach in the planning process, decision making as well as implementation is critical in achieving a well thought and designed city (Lüthi, McConville, & Kvarnström, 2010). All actors including the public and private developers are key to seeking answers to these problems. Previous studies have shown how government interventions to control public housing through rent control policies have failed due to lack of participation. To solve the housing problem, the Colombian government adopted a free housing system targeting the poor (Gilbert, 2014). In some cases, policies formulated by authorities were impracticable as they were adopted from some places that do not have similar housing conditions. Also, laws adopted have proved very expensive to the investors due to the tiresome and complex approval process thus scaring them away.

Similar situations to all these processes related to housing matters have been realized in the cities of Kenya. In Kenya, the housing problems can mainly be attributed to rapid urbanization. Kenya has experienced a very high population growth rate since its independence with official figures estimating the population as 2.5 million in 1925. The population increased steadily from 2.5 million to 5.4 million in 1948 when the first official census was conducted in Kenya as a colony. In 1969, the population of Kenya was found to be 10.9 million while the 2009 census found the population as 38.6 million (Mutuku, 2013). This population is projected to reach 53.4 million by 2020 and 67.8 million by 2030 (Mutuku, 2013). Since 1969, a population census in Kenya is conducted every ten years. The rapid population growth leads to rapid urbanization with Kenya's urban population increased from 285, 000 (5.2% of total country population) in 1948 to 12.5 million (32.4%) in 2009 (GOK, 2012). Rural to urban migration is the major cause of this massive population growth in urban areas. When the first population census was done in Kenya, there were 17 urban centres with a total population of 285,000. Since then, the number of urban centres has increased rapidly reaching 139 in 1989 and 230 in 2009. Meanwhile, the proportion of the urban population to that of the country population also increased from 5.3% in 1948 to 18.1% in 1989 and 31.3% in 2009. Such rapid urbanization has led to increased demand of housing while the supply has stagnated. Many low-income earning families have therefore not been able to access housing thus settling in the slums.

2. Critical Global Housing Crisis Issues

Housing and construction sectors are the driving engines of an economy as they employ millions of people. These sectors also do use inputs from many other sectors and, any problem in the housing sector is likely to affect the overall performance of an economy. The sector, however, experiences key problems that need to be addressed.

2.1. Squatting and Invasion of Land

Due to rural-urban migration, groups of people have occupied and developed pieces of land in the urban areas without entering into any agreement with the owner. According to Wakely (2014), this massive invasion may happen on a large sway of land by a group having common leadership and being controlled by political groupings responsible for managerial and technical processes of settlement. These vacant lands being invaded may be located at the peri-urban, within the inner city on major infrastructure land reserves like railways, designed open spaces or even places that have been deliberately been left undeveloped due to unstable geology thus exposing occupants to some dangers.

Most of the invaders are the urban poor who can't afford the expensive houses in the leafy suburbs around the city or the transportation cost between areas of residence and the city. As such they settle too close to the city where they can walk to work. This, in turn, leads to the development of illegal housing structures within the city.

The informal land markets in the peri-urban areas are also cheap, unserviced and accessible to the poor. Therefore, these lands are subjected to unapproved land use activities and informal settlements by those not able to access the formal yet expensive urban land and housing markets (Lombard, 2016). Lack of administrative clarity, land tenure regulations and uncontrolled actors in

these areas have often led to land conflicts in these areas.

2.2. Globalization and Rapid Urbanization

Globalization has significantly contributed to the urbanization of cities. It relies on human capital moving from beyond the countries and local market borders into the global and international markets leading to international investments (Malik & Wahid, 2014). Globalization leads to urbanization as people move into urban centres due to new opportunities created by urban areas. Whereas the urbanization process has many positive outcomes including development of information technology, media innovations, development of new architectural designs and expansion of transport infrastructure, it has also led to negative conditions in the cities due to the development of slums and informal settlements, squatters and generally deplorable living conditions.

Rapid urbanization has led to not only a steady rise in demand for land for development but also an increase in housing demand which is too high to be met by the existing housing supply levels. The effect of rising land prices to levels that are unaffordable by the low and middle-income earning groups of citizens. The situation has further been aggravated by land speculation and tenure systems in the city which are complex and expensive to process. This, in turn, has contributed to housing problems in the cities as the overall cost of land acquisition and construction of houses has been very expensive.

2.3. Illegal Sub-Divisions and Development of Lands

Illegal subdivision of vacant lands for settlement especially at the peri-urban is a common occurrence in the developing countries. The lands originally meant for agriculture and other uses are being converted into small plots residential zone without approval by the authorities. This practice is very common as lands that have been rendered available in this manner are usually affordable to the low-income groups. However, they are considered illegal as they violate the original master plans that do the land-use zoning and that have designated those places for different use. The buildings are erected as well as the sub-divisions taking place in those places do not conform to the set planning standards and regulations and the transfer of ownership from the owner to the buyer does not always follow the required processes.

The overall impact of this is the reduction in agricultural productivity as agricultural lands are being converted into residential areas. Also, the communities are living under constant threats of eviction and demolition of their structures as they are deemed illegal.

2.4. The Politics in Housing

One of the main setbacks to efforts of solving the housing crises in the third world countries is political involvement in housing policy formulations and executions. Housing policies are formulated with political impacts in mind. According to Gilbert (2014), the decision by Colombia president to introduce free housing policy was not only influenced by a desire to help the poor but also to secure his re-election for the presidency. Such populist policies are always not implementable in the long-term. Owners of lands and other properties in the cities have vested political interests and will, therefore, oppose any idea aimed at reforming the housing sector as this threatens their source of income. They, therefore, offer the public cheaper houses for renting but with compromised standards of services like water and buildings stability. According to Clarke and Ginsburg (1975), key players in housing sectors like building materials industries were actively participating in politics and even succeeded in persuading the authorities to make policies that do favour them like rezoning of building lands.

Such political interference in policy formulations and implementations have had an adverse effect on the supply of affordable and quality housing. Many informal settlements in the cities have experienced tragedies of buildings collapsing due to planning standards and approvals not being adhered to. Some of these buildings are linked to individuals who are politically connected in the country and therefore able to bypass the set laws. Political interference on land market issues is not limited to politicians and business investors only, the government through a corporate governance system can also implement a policy of dominance aimed at securing the support of major players of the land sector like industrial workers. In Mexico for instance, the government that existed before the 2000 democratic election encouraged a corporate governance system aimed at ensuring political and social control in both rural and urban areas(Assies, 2008). Such control if extended to land matters may lead to access to the land by the political elites at the expense of other citizens. In Kenya, for instance, upon the attainment of independence, the regime in the 1960s and 1970s encouraged the formation of private land buying companies to be able to purchase lands from the white settlers. These lands were then to be divided into individual shareholders (Boone, 2012).

3. Housing Crisis in Kenya

The population of Kenya increased steadily from 2.5 million in 1925 when the first census was conducted, rising to 5.4 million in 1948. In 1969, the population was estimated to be 10.9 million while the latest census put it at 38.6 million (Mutuku, 2013). It is projected to reach 53.4 million by 2020 and 67.8 million by 2030 (Mutuku, 2013). The growing demand for housing made the government formulate the national housing policy in 1966/1967 to address the housing problems both in rural and urban areas (ROK, 2004). During that period, the housing demand was 7,600 and 380,000 new units in urban and rural areas respectively. The housing deficit has expanded at a high rate recently due to population increase. According to a report of Habitat for Habitat-for-Humanity (2018), the housing deficit in Kenya was 2 million in 2012 and the number has been growing at a rate of over 200,000 units a year. This has led to the growth of informal settlements in Kenya as 60% of the population stays in the informal settlement. Consequently, many families live in overcrowded and poorly ventilated houses exposing them to risks of diseases like cholera, respiratory diseases, malaria among others. According to Dennis (2017), less than 50,000 housing units are produced every year falling below the annual demand thus an upward push against affordability. *Article 43 (1b)* of the constitution of Kenya (GOK, 2010) provides for the right "to accessible and adequate housing, and to reasonable standards of sanitation" to Kenyans. Besides, the devolved units (County governments) have a role to play in the provision of housing as outlined in the Fourth Schedule of Constitution (GOK, 2010). Despite all attempts made by the government to address the accessibility and affordability of housing in Kenya, many people still do not have access to modest housing.

3.1. Rapid Urbanization and Housing Crisis in Kenya

At the time of the first population census in Kenya, there were only 17 urban centres with a total population of 285,000. This represented 5.3% of the total Kenya population. The number rapidly increased reaching 139 in 1989 and 230 in 2009. Meanwhile, the proportion of the urban population to that of the country population also increased from 5.3% in 1948 to 18.1% in 1989 and 31.3% in 2009. The urbanization process and trends are summarized in table1 below:

Table 1. The Trend of Urbanization in Kenya (1948-2009)

Year	Total population	Number of urban Centres	Urban Population	Percentage of Urban Population to total Population	Intercensal Growth Rate (%)
1948	5,407,599	17	285,000	5.3	
1962	8,636,263	34	747,561	8.7	6.3
1969	10,956,501	47	1,076,908	9.8	7.1
1979	15,327,061	91	2,315,696	15.1	7.7
1989	21,448,774	139	3,878,697	18.1	5.2
1999	28,159,922	180	5,429,790	19.3	3.4
2009	3,8412,088	230	12,023,570	31.3	8.3

Source: (GOK, 2012)

The influx of urban population led to increased housing prices thus making it unaffordable to the low- and middle-income earners. According to Njaramba (2017), the housing prices more than tripled between 2000 and 2014 as shown in the figure below. The rapid growth after 2005 could be attributed the expansion of the middle-income population in the urban areas (Vuluku & Gachanja, 2014). It is this influx in price that Vuluku and Gachanja (2014) identify as the major cause of housing unaffordability that has led to many settling in informal settlements. The result has been spread of slums and other social ills related to it including insecurity and poor standards of living.

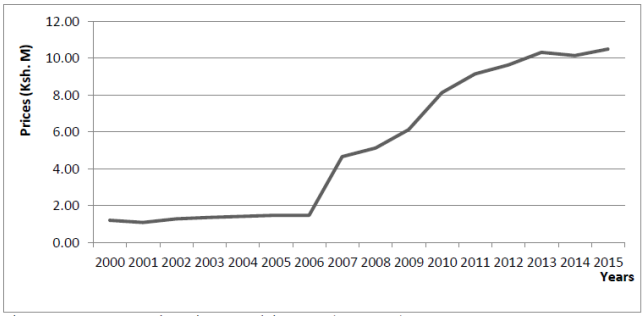

Figure 1. Average Housing Prices Growth in Kenya (2000-2015) (Njaramba, 2017).

The trend is even more in the major cities due to rural-urban migration. Major cities like Nairobi have slums mushrooming due to increased population and have some of the biggest slums in Africa like

Kibera. The slums are therefore very congested. According to UNHP (2003), slum areas have 250 units per hectare density compared to 25 units and 15 units per hectare in middle and high-income areas respectively. (UN-Habitat, 2015) also attributes the slum growth to rapid urbanization that is 4.5% annually and with 56% of the urban population living in slums. The urbanization trend in Nairobi is summarized in figure 2 below:

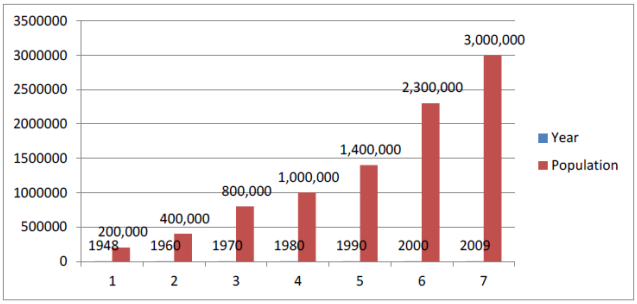

Figure 2. The urbanization trend in Nairobi (Akelola, 2016)

3.2. Housing Affordability and Financial Mortgages

According to Bujang, Zarin, and Jumadi (2010), housing affordability is the ability of a person to pay for housing. However, Gan and Hill (2009) give it a broader view encompassing the ability to purchase (household can borrow enough funds to purchase a house and repay affordability (the burden imposed on a household of repaying the mortgage). In Kenya, the levels of income and the mortgage interest rates are factors that are directly contributing to the housing crisis. In 2012, an average of 18% interest rate was charged on mortgages while in 2013 it was 16.89% in average (CBK, 2013). The high-interest rates discourage households from borrowing thus affecting homeownership as 30% of households in Kenya depend on a financial mortgage to acquire homes (GOK, 2012). With the high-interest rates in Kenya, it would take a Kenyan on minimum wage salary (US dollar 162) the equivalent of about 9-year salary to completely service the loan for the cheapest house (Kieti, 2015). Besides, access to mortgage has been limited to the high-income earners who have collaterals for the mortgage and due to high interests, it accrues. The poor who can only secure low mortgage have therefore been discriminated against (Akelola, 2016). In 2007, the World Bank found only 3% of the African population has an income that can afford a mortgage (World-Bank, 2007).

3.3. Forced Evictions and Slums Demolitions.

The presence of slums in a city represents the level of the housing crisis as residents with low income are unable to afford decent houses. Various governments have tried to solve the housing problems in the cities by forcefully evicting the slum dwellers without offering an alternative affordable settlement. These evictions have mostly been carried out to upgrade the slums, urban renewal, redevelopment and to create spaces for roads, railways expansion, and construction. The policy was applied in Nairobi in 1938 when the colonial government sought to eliminate illegal settlements occupied by Africans. This policy led to the demolition of Pangani African settlement in 1938 (Mitullah, 1993).

The first National Housing Policy, Sessional Paper No. 5 of 1966/67 advocated for slum clearance as a housing strategy (ROK, 2004). According to Wafula (2004), evictions were common in the 1970s and 1980s as a response to slums development. The evictions were characterized by centralized decision making by the central government, lack of citizens participation and weak local urban governance and administration. In her research, Wafula (2004) found that negotiations with the slum dwellers were very rare and alternative resettlement sites were not offered to them. In most instances, those evicted from the slums were not offered any compensation. Whereas slum demolitions and evictions have been carried out to rid the cities of slums and prevent further proliferation, in Kenya, such evictions have resulted in more slums (Everett, 2001). Evictions have also be conducted to acquire land for the public good, provision of affordable housing, urban redevelopment and resettlement programmes and speculation purposes (Otiso, 2002).

3.4. Rental Housing

Sound rents policy can stimulate rapid investment in the housing sector. The government of Kenya, therefore, does not determine the rent levels but leaves it to the market forces of demand and supply (ROK, 2004). The government, however restricts rental increment on the rental houses meant for the poor.

The locations of rental residential housings are a big determinant in the supply of housing in Kenya, especially in major cities. Developers tend to target high-income areas that ensure lucrative returns. Upper middle, middle-income and low-income earners have therefore continued to suffer housing supply deficit while the high income enjoys a surplus. According to Akelola (2016), while the high-income earners enjoy a 60% supply of housing in Kenya, the upper-middle, middle and low-income earners suffer a 15%, 92%, and 98% housing deficits respectively.

Rental housing in Kenya also remains unaffordable due to high cost of inputs like lands, finance, and building materials. Lands in the urban areas are too expensive and lack security of tenure while the

housing finance systems remain inaccessible to the middle and low-income earners.

4. Possible Remedies to the Housing Crises

Addressing the critical housing issues in Kenya identified would require financial and general housing policy reforms discussed in this section.

4.1. Housing Financial Systems Reform

Enhancing the accessibility of the housing finance by the middle and low-income earning groups could prove to be the gateway to housing crisis solution in Nairobi. The ability to purchase a new home or even construct a new one is mainly dependent on one's ability to access the housing mortgage at an affordable interest rate. Access to credit facilities increases expenditure in the housing sector leading to an increased supply of housing. For instance, according to GOK (2017), the housing expenditure from Kshs 5.9 billion in 2014/15 to Kshs 6.0 billion in 2015/16, representing 82.2 percent utilization. This increase was attributed to an increased credit to the real-estate sectors. Currently, the commercial institutions do not offer long-term loan repayment option and charge very high-interest rates. These conditions are only suitable for the high-income earners. Besides, the middle- and low-income earners do not have the collaterals need by the financial institutions as a guarantee for loan services. The government should therefore as a matter of urgency formulate regulations to ensure that financial discrimination against the low and middle-income earners is eliminated. As Swagel (2012) points out, private sectors should supply housing capitals while the government have a role of providing secondary guarantees to ensure that mortgage-backed securities conform. In Morocco, to increase access to the financial systems by the slum dwellers, the government established FOGARIM fund which provided a security guarantee to those who borrowed from financial institutions (Bogaert, 2011).

4.2. Slum Upgrading Programmes

According to UNFPA (2007), the single and largest influence on the development in the 21st Century is the growth and development of new cities. With an increasing number of the urban population relative to that of rural areas, the world is rapidly urbanizing at a rate not experienced before. The number of people in urban areas is expected to reach 4.9 billion by 2030 while the rural inhabitants' number is projected to reduce. The urbanization rate is even higher in developing countries than the developed ones. The now developed countries had twice the number of people in urban areas than the less developed ones at the beginning of the 20th century (150 million to 70 million). The numbers have how however changed with less developed countries now having twice as much population living in urban areas than the developed countries (UNFPA, 2007).

Rural-urban migration has led to population surge in the cities with many poor families forced to live in informal settlements. The living conditions in slum areas are often deplorably characterized by poor infrastructures, exploded sewerage systems, drainage systems, and low-quality housing structures. Governments in the developing countries should implement the slums upgrading Programmes aimed at improving the dilapidated infrastructures and linking these settlements to the wider city by providing better transport networks. Kenya, grappling with a high rate of urbanization, therefore, has some of the biggest informal settlements in the world. In order to address the housing problems, the Kenya government has partnered with UN-Habitat in 'The Kenyan Slum Upgrading Programme' since 2000. The project was aimed at redeveloping the slums into orderly flats with 50 m^2 two-bedroom houses which are privately owned (Huchzermeyer, 2008). Similar approaches if adopted can help improve the living standards in the informal settlements.

4.3. Regularization of Land Tenure Security

Having land tenure security cushions informal settlement dwellers against threats of evictions and harassment by authorities or private developers. In Kibera, Nairobi, the slum dwellers are just but squatters without tenure security and therefore face threats of eviction without relocation or resettlement. A case example is the eviction of Kibera residents to create a way for the construction of Ngong road- Kibera-Kungu Karumba -Langata link road. Lack of land tenure security by Kibera residents meant that any compensation by the government to the victims of eviction would be a goodwill gesture but not a right to them. Fear of demolition contributes to the development of slums as the owners of slum structure refrain from erecting permanent and decent houses. This also discourages them from providing basic services like roads, drainage, sanitation thus contributing to poor conditions of the slum. As a step towards eliminating the slums, the government should consider the regularization of tenure in the informal settlement. The government should first recognize the slum dwellers as legitimate plot owners and start the process of identifying and documenting legitimate slum-dwellers and registering their rights to lands and structures they own in slums. To give a sense of security, they should be given title deeds as proof of ownership and strict adherence to planning laws and regulations for building standards be complied with. This would improve the quality of structures and infrastructure in the

informal settlements thus saving the government from the expensive initiative of slum upgrading.

4.4. Formulation of Clear Policies and Regulatory Frameworks

Too many regulations in the housing sector could also be an impediment to the growth of the sector. Some of the regulations are never applied as they were adopted from some "best practices" but are not compatible with the local needs. The absence of implementation institutions or duplication of responsibilities leads to difficulties in implementation. These rules regulate the property ownership, tenure systems, plot sizes control, building standards among others. A clear study of these regulations should be commenced and ones found to be inappropriately increasing the cost of housing, encouraging corruption and delaying implementation of important projects ought to be repealed. Some of these laws may also discourage investments in the housing sectors. In Sweden for instance, Söderholm and Wihlborg (2016) argue that the ability of government to implement social housing programs by using legislation that gave out grants and credits to contractors in the mid-1940s helped to address the housing shortage problem. Sector-wide reforms should also be implemented by the government. This is because the housing sector is very much linked to the other sectors of the economy and failure in other sectors is likely to have an impact on the housing sector. Solving the housing problem must be part of a strategy to address the social and economic challenges in the community. These reforms should target all sectors including land, finance, building materials, and other service sectors. Gilbert (2000) argues against government interventions like rent control as they may lead to a reduction of supply for the rental housing which is counterproductive.

Reforms should target the role of government in housing sectors. Excessive control of the housing sector may affect the supply of affordable houses to the public. Man (2011) established that before the economic and housing reforms of 1978, the socialist housing policies interventions in China lead to low investment in housing sectors. This led to an acute shortage in urban housing supply and substandard quality of housing. The restoration of private property rights in China due to housing sector reforms and commercialization encouraged homeownership. Many rental houses were sold to employees thus reducing cost and increasing access to affordable houses. Further reforms in the housing sector by the Chinese government reduced government interventions in policy formulations and management of housing. The government, therefore, stopped playing roles in housing production instead became responsible for housing low-income earners (Zhou & Ronald, 2017). The housing sector like others should be allowed to regulate itself under the market forces with less restriction on ownership by authorities.

4.5. Encouraging Public Rental Housing

Much government intent to control rent in the urban areas has proven futile. It has led to a decline of investments in private renting thus affecting the supply of housing to urban poor and middle-working class who can't afford private houses. There have been few interventions by governments to supply rental housing to the citizens. In China, the government tried to eliminate social inequality in society by promoting a centralized and direct distribution of housing to the public at a lower rent. This approach to housing crisis solution, however, failed as the government could not meet demand. The cost of such distribution soon became unbearable to the government (Zhang, 2002). The government later introduced neoliberal reforms by involving various actors like property developers, banks and lenders who partnered with local government in providing housing to the public (Wang, Shao, Murie, & Cheng, 2012).

Developing countries governments should encourage rental housing by providing tax reliefs for rental incomes earned by landlords, offering good credit facilities to landlords, providing better services in low-income areas including roads, water and electricity and being a fair arbiter between landlords and tenants. Besides, tax policy also affects homeownership to a great extent. While popular discussion about tax treatment to homeowners mainly focuses on the deduction of tax on mortgage interest and property tax payments, most academic discussions emphasize exclusion of the imputed rental incomes on homes and houses owned as a tax benefit. This would encourage house ownership thus helping in alleviating the housing problems especially in t urban settings (Poterba & Sinai, 2008).

4.6. Cost Subsidy for Building Materials

Building materials play a critical role in the housing sector as they determine the quantity and quality of housing. Access to these materials is important in ensuring that the supply of housing meets the demand. The cost of building materials can be a threat to housing ownership as high cost tends to discourage aspiring home-owners. In Nigeria, many housing projects initiated could not be completed on time due to the sudden increase in the cost of building materials(Akanni, Oke, & Omotilewa, 2014). High costs have a multiplier effect on the construction industry leading to the expansion of informal settlements in the cities.

Many families in developing countries do not own homes and houses due to the high cost associated with the construction of homes. According to Gilbert (2000), the overly high cost could be attributed to overdependence on imports for the building materials and monopoly in the local markets. Many developing countries tend to import building materials even when traditional materials are readily available locally. Governments should encourage local production of the building materials to reduce the cost associated with importations thus lowering the production cost. The costs for local consumers will reduce leading to increased purchases and more houses being constructed.

Besides, market liberalization should be encouraged to help increase local competition in the market. Policies must be put in place to regulate the local monopoly which often leads to higher prices of goods to consumers. If these measures are implemented coupled with new innovations, the demand-supply of houses will increase therefore alleviating the housing problems in developing countries.

5. Conclusion

The solution to housing problems in developing countries requires efforts involving actors from across sectors. Besides, drawing lessons from countries that have had similar crises could help to address the problem. Sweden was able to solve its housing problems by involving all actors like members of the public, cooperatives, private developers and government. Having clear policies for the housing sector is a critical part of housing problem solutions. Poor policy guidelines, lack of implementation institutions, duplication of policies and adoption of incompatible policies from other jurisdictions are among the causes of housing crises. Policies should not scare away investors by raising the costs of construction to high levels and delaying approval processes for projects. Reforming the housing finance system is important to make the mortgage and credits accessible and available to families with low and medium income. Currently, the existing housing finance laws in most developing countries discriminate against the poor as they attract very high interest and the repayment period is too short. The poor are therefore not able to build or purchase homes. This has forced many to settle in informal settlements with deplorable. This research also points to the critical roles of governments in the housing sectors. Governments provide grants, incentives, flexible regulations and have a direct role by building affordable housings. Rather than complete liberalization of the housing sector, this research emphasizes the important role of both government and private actors in addressing housing problems.

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Conflict of interests

The Authors declare no conflict of interest.

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The Impact of MCK+ Prangkuti Luhur towards the Improvement of Community Life Quality in Bustaman Village

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ABSTRACT

At the global level, many efforts to fulfill the availability and access to sanitation have always been the main focus of human development goals and framework at every level of government. In the city level (Semarang), access to sanitation has already started since 2005 when the city government launched a community-based sanitation program in Bustaman Village. There are four locations become pilot project Bustaman village, Plombokan village, Bandarharjo district and Kebonharjo district, and till now only Bustaman village are still running and successful.

Based on management in sanitation, this study aims to know the impact of community based sanitation and how community in self-reliance manage MCK+. The method used is a qualitative approach. The analysis conducted is an analysis of knowledge on the impact and how the community manage the sanitation facilities. Research findings showed that the impact of MCK+ are the improved public awareness for healthy and clean living, conscious effort to manage MCK+, making wastes into renewable energy becoming biogas. The existence of an institution named Prangkuti Luhur, which overshadowed the existence of MCK+, continuously form strong social ties, besides cohesion, due to the similarity of fortune. It also strengthened the framework of communal MCK+ institutions in Bustaman Village.

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1. Introduction

The *Sanimas* program has been implemented since 2003 to 2008 wherein that period there were 323 points / *Sanimas* project locations distributed in 124 cities/regencies, 24 provinces in Indonesia. According to the data collected, of the 323 points/project locations that have been implemented, there were several points of *Sanimas* development implemented in the densely populated, slum, poor and sanitation prone areas of Semarang City. In the early development of the *Sanimas* program in Semarang City (2005), it was carried out in Bustaman Village (RT 04-05 RW 03), Purwodinatan Village, Central Semarang Sub-district with the construction of MCK+ which was projected to serve approximately 124 families or 307 people.

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As with the progress of *Sanimas* program in Semarang City, only *Sanimas* in Bustaman Village which was successfully implemented. This success could be seen in the increasing level of public health, the increasing environmental quality around the location of program development, and of course the improved community welfare. Thus, the MCK+ of *Prangkuti Luhur* becomes one of the pilot projects in Indonesia that has succeeded in developing community-based sanitation and one of the environmentally-conscious examples for other communities.

Village or *kampong* is a large part of urban areas in Indonesian big cities such as Semarang. It is understood as an urban burden on the urban modernization process. It shows a negative 'stereotype', meaning that it does not have the ability to drive changes in urban modernization. It shows a negative impact on the changing process of urban modernization. It represents a chaos and slum condition as a residential environment in urban areas. The Village has its complexity of problems as a part of the urban modernization process. Settlements with poor sanitation will affect the environmental sustainability of these settlements. Considering the serious condition of improper settlement sanitation, various efforts are carried out to improve environmental quality. One option to deal with the problem is through the Community-Based Sanitation program or what is popularly known as *Sanimas*. *Sanimas* is a program specially focused on the management of wastewater in areas prone to sanitation, buildings and densely populated populations, and poor population with a purpose to improve the quality of settlements (Clarrino, 2014). A clean and healthy residential environment is one of the basic human needs. National sanitation services and public awareness to improve the quality of environmental sanitation are still low. Especially in densely populated areas, which are slum and poor in urban and rural areas, are not supported by good sanitation facilities. Population access towards infrastructure and facilities of residential wastewater management is closely related to aspects of health, environment, education, and social culture. If the understanding of cleanliness and population access towards facilities and infrastructure of residential wastewater is getting better, the cases of waterborne diseases will be less likely to spread (Saraswati. R, et al, 2015)
(http://proceedings.upgris.ac.id /index.php/sens /sens /paper /viewFile /811/763).

In general, the coverage of sanitation services in Semarang City is only around 49% or as many as 680.814 people from the total population of 1.389.416 people (BPS, 2010). In fact, population access towards wastewater infrastructure and facilities is closely related to health, environment, education and socio-culture aspects. Sanitation in Semarang City get a second-worst rank in Central Java. From a total of 177 villages, 36 percent of them or about 60 villages are poorly sanitized. Most of the poorly sanitated villages are located in the areas prone to flood and rob. It also mostly found in slum areas such as North Semarang, East Semarang, and Tugu Sub-districts. From 177 *kelurahan*, 36 percent of them or around 60 are poorly sanitized villages (Radar Semarang, 11-08-2010).

2. Methodology

This research was conducted using a deductive rationalistic approach. Descriptively researchers tried to explore issues in details, like experience inhabitant using community-based sanitation in natural context by adopting a qualitative approach. In particular, the author visited Bustaman Village several times. No formal preparation was made at that time since the visit was not conducted for research purposes. Only when arrived at Bustaman Village, the author started observing with more professional observation, participating in several activities, and venturing to talk about how people feel about community-based sanitation and what the impact of community-based sanitation to the inhabitant lives and health. Visiting Bustaman Village gave an opportunity to gain clarity from inhabitant to the author's preconditions and to design the methodology. Intensively with limited contemporary systems or various limited systems by using several data collection procedures (Sarwono, 2006). The data collection was conducted by using observational, behavioral mapping and direct interviews with the snowball method. The analysis was taken descriptively based on the results of interviews and observations that have been made. The methods used comprised of a survey, observation, focus group discussion (FGD) and case study, to get reliable as well as in-depth information.

3. Literature Review

3.1. *SANIMAS* Concept and Program

According to Ministry of Settlement and Regional Infrastructure, (2003), SANIMAS are solution for providing sanitation facilities with a participatory paradigm. Sanimas Focuses on handling household waste water, especially human feces. Through SANIMAS program, the community

chosen the appropriate settlement waste water infrastructure and facilities, participates actively arrange action plans, form groups and carry out physical development including manage operations and maintenance activities, even if necessary develop it. The SANIMAS program play an imporetant role in providing sanitation facilities handling residential waste water for low-income people in slums and squatter area, and sanitation prone area with sustainable responsive approach.

In the SANIMAS program, there are three options offered to communities for sanitation system improvement: (i) Communal or shared septic tanks, normally applied for a group of four to five households. In this option, households have to build their toilets and connect it to the shared septic tank, (ii) Enhanced communal septic tanks quality, completed with bathing, washing, and toilet block facilities (also known as MCK + facilities) including a communal sewage treatment facility which processes sewage into usable biogas, (iii) Simplified sewer system with a communal sewage treatment facility. For the treatment facilities, there are three choices of technology used: (i) Anaerobic Baffled Reactor (ABR): (ii) Anaerobic Filter: (iii) Aerobic Reactor: A chamber equipped with oxygen supply. All these three facilities are equipped with a biodigester, which can produce methane (CH4) usable as alternative energy for household activities such as cooking, lighting, water heating, and so on. These facilities are known as MCK + and can serve 50–150 households (WSP, 2013)

3.2. Empowerment

Community participation in the national development is one of the main prerequisites for successful development in Indonesia. However, many efforts to bring participatory development into reality are still challenged by various obstacles, including those caused by a lack of understanding regarding the meaning of the concept of participation. Sutrisno (1995) concluded that community participation in development is not a people mobilization in the development. Community participation in development is a collaboration between people and the government in planning, implementing, and financing development.

Ife (2005) stated that a community-based approach is a natural result of an agreement towards decentralization and participatory democracy. Participatory democracy is required to create a powerful structure at a certain level that encourages the community to participate effectively in decision-making that can influence their life. A community needs to feel a sense of belonging and agreeing so that finally the expected form of participation can succeed.

Arnstein (1969) argued that community participation is a matter of how people can engage in social change that allows them to get a share of the benefits of the influential groups.

Based on the correlation and mutual substitution of *community development* and community *empowerment* notions, a few key essences can be summarized to empower the community. "Community empowerment is a deliberate effort to facilitate local communities in planning, deciding, and managing the local resources owned through collective action and networking so that ultimately they have an economic, ecological, and social capability and independence" (Karmilah. M, et all 2014).

4. Findings and Disscussion

4.1. Sosio Economic Conditions

The socio-economic condition of the Purwodinatan district shown that large of people are labor worker and *srabutan*[1] worker, entrepreneurship, informal worker (goat cuisine) and civil servant (80%), retired (2%), home worker (15%) and unemployee (3%).

Bustaman Village, population 366 people or 114 families with a total population of 189 men and 177 women in two RW[2] (RW 04 and RW 05). The average number of people per family in Bustaman Village is 3-4 people/household with the number of households that occupy each housing unit an average of 2-4 households/house. The density of Bustaman village reaches 610 people/ha and is classified as a very high density settlement. Bustaman village is still dominated by productive age residents, ie between 15-60 years old, around 65% of the total population. Most of the residents of Bustaman Village (56.8%) have an income of Rp. 500,000, - Rp. 1,500,000, - per month. The income of Bustaman Village inhabitant is lower than the regional minimum payment/UMR (Upah Minimum Regional) of Semarang city, which is Rp. 1,909.000. Bustaman famous as goat village, because, 50% of people in Bustaman not only become a goat trader, but also the derivative work from like goat slaughter, goat skinning, made a goat soup (Gule Bustaman), and satay that made from goat.

There is a daily form of economic activity related to goats and is used as a superior culinary in Busataman village. Related to these activities in

[1] *Srabutan worker is, someone that make a living with many kind of job that depend on situation, and their skill*

[2] *Non-governmental bodies that consist of inhabitant and families that live together in one neighborhood*

the village are very diverse, some become bosses, butchers/goats cutters, scrapers, cleaning goats' heads, *gule* spice makers, satay and *tengkleng*. This economic activity has been carried out since the Dutch era. Although not all residents process goat ingredients produced into cooking, the diversity of activities related to goats are diverse.

Figure 1. Activity of Bustaman People.
1. Goat Processing, 2. Goat Cage in the village, 3. interaction of inhabitant, 4. House wife staller
Source: Researcher documentation (2017)

4.2. Profile of *Prangkuti Luhur*

In order to promote the community self-reliance in managing and educating the public, KSM was formed which would later plan the MCK+until its operation. For this reason, a community organization named KSM *Prangkuti Luhur* was formed. *Prangkuti Luhur* is a sanitation institution built in 2005 since the development of the MCK+in Bustaman Village. Members of *Prangkuti Luhur* are all residents in RT 05 and RT 04 or approximately 366 people (114 families). The organization of *Prangkuti Luhur* currently consists of a chair person, treasurer, secretary, and several divisions. (see diagram below).

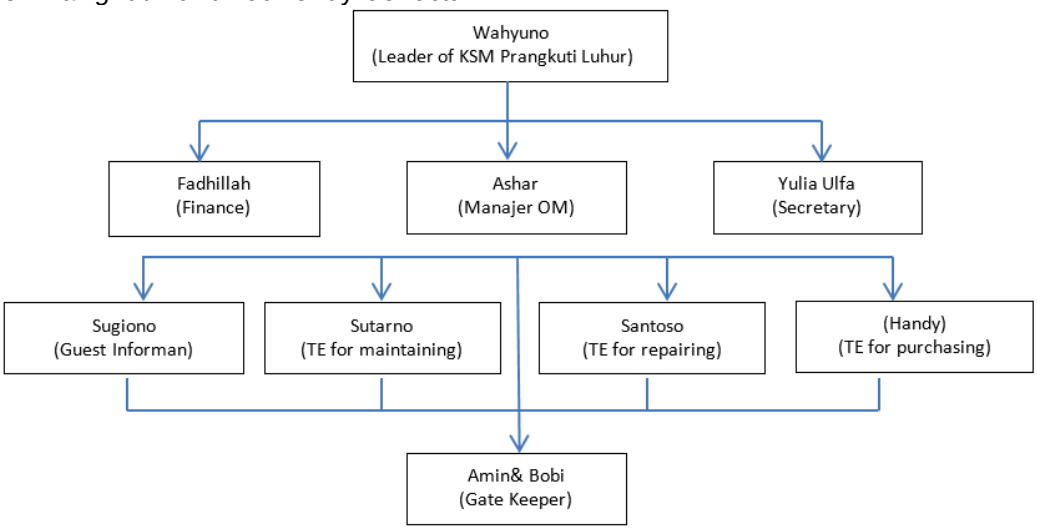

Figure 2. KSM Prangkuti Luhur Organozation Structure Source: research informant 2017

Prangkuti Luhur was created in order to educate the community regarding healthy and clean living behavior. *Prangkuti Luhur* must independently empower the community related to sanitation issues. At its early establishment, this KSM was supported by the Semarang City government and other parties (BORDA). The partnership built between the community through KSM *Prangkuti Luhur*, Government and NGOs is an equal relationship. With the progress in terms of management, there was an offer from BORDA to further develop the MCK+, i.e. create a new division to manage waste into biogas, so that the MCK+ becomes MCK+, due to the additional function. The following is an illustration of the position of KSM *Prangkuti Luhur* in encouraging community independence to manage MCK+.

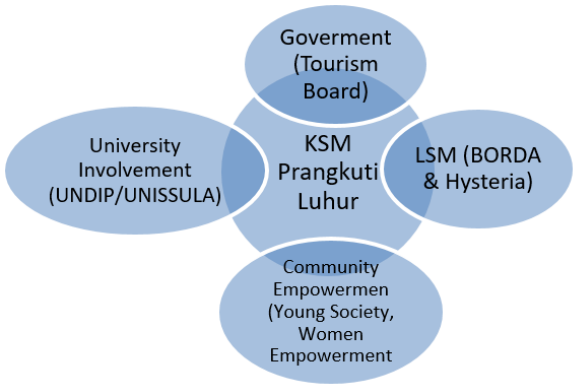

Figure 3. The Networking of Bustaman Village

The study suggests that the participation level was very low during its early phase of inception. However, along with KSM maturity, they can conduct an accurate analysis of water and sanitation conditions to know the communal needs. This analysis was conducted to prepare action and implementation through community empowerment

KSM capability to prepare plans, implement, monitor, and evaluate the prepared programs based on their needs is a representation of KSM Prangkuti Luhur which is independent and progressive. The entire processes started from planning to controlling phases prove that Bustaman people are aware and understand the importance of community participation in every stage of planning. It can be seen in Figure 3.

4.2. Networking in the *Sanimas* of Bustaman Village.

In this *Sanimas* program, three actors play a role and carry out their duties together with the same goals and authority, they are the local government collaborated with the Semarang City Planning and Housing Agency, Community Self-Supporting Groups, and organizations focused on environmental sanitation, namely LSM BORDA from Germany. The professional relationships formed through this networking will facilitate the taking of joint actions.

The community surely has an important role.In the planning process, the community / KSM conducts a sanitation mapping to collect data and describe sanitation conditions in Bustaman Village. In the implementation to management phases, community / KSM participation is given in the form of energy, especially in the development process of physical sanitation and infrastructure as well as mutual cooperation regularly. While participation in the form of material is shown at the stage of development, maintenance, and management through contributions, both contributions for the operation and maintenance of facilities.

In this *Sanimas* program, the government acts as the main controller for the sustainability of the program. The government has a role in the preparation phase, such as determining the location, forming KSM, determining parties who will cooperate, and coordinate all program requirements, as well as contribute part of the required of budget and cost plan (RAB). However, even though the authority was delegated to the community, the government still has to monitor and evaluate the sustainability of the *Sanimas* program in Bustaman Village.

On the non-government side, BORDA as an NGO that has the same concern and interests also plays a role in the sustainability of the *Sanimas* program in Bustaman Village. In addition to providing funds, BORDA also renders ideas on the concept of sanitation construction to be offered to the government and the community. BORDA gives training to KSM who will execute the *Sanimas* program. BORDA's role is similar to the government's role, which is to monitor the sustainability of the program, also besides, to provide an understanding of good management and maintenance of communal WWTP systems to the community.

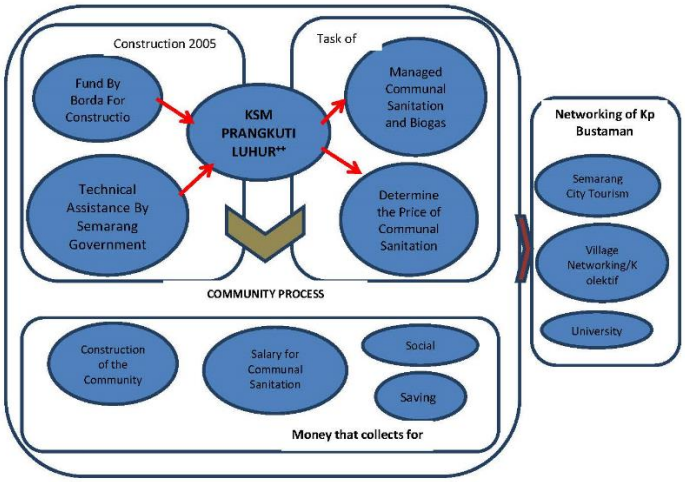

Figure 4. Community Process and Partnership Network Model. Source: Researcher Analyzed, 2017.

Mobilization of local resources is the main fundraising strategy for the KSM Prangkuti Luhur. The main sources of resource KSM Prangkuti Luhur are membership fee, and indirect support of partner NGOs. The facilitators try to motivate the members of the KSM Prangkuti Luhur to raise funds which may help to meet their crisis in times of need or situations like installation of latrine, water reservoir and so on. It has been reported that the membership fee is increasing gradually and become regular.

4.3. Impacts KSM *Prangkuti Luhur* on the Community

One of the impacts resulted regarding the existence of Prangkuti Luhur for the community is community becomes more aware to live healthy and clean. This can be seen from the use of MCK+by 124 families in Bustaman Village, not only Bustaman Village that use the MCK+ but also other Village near Bustaman like Bustaman Village Gedong, Begog, Village Pekojan, and Village Pekojan Tengah, see the map below (Figure 5)

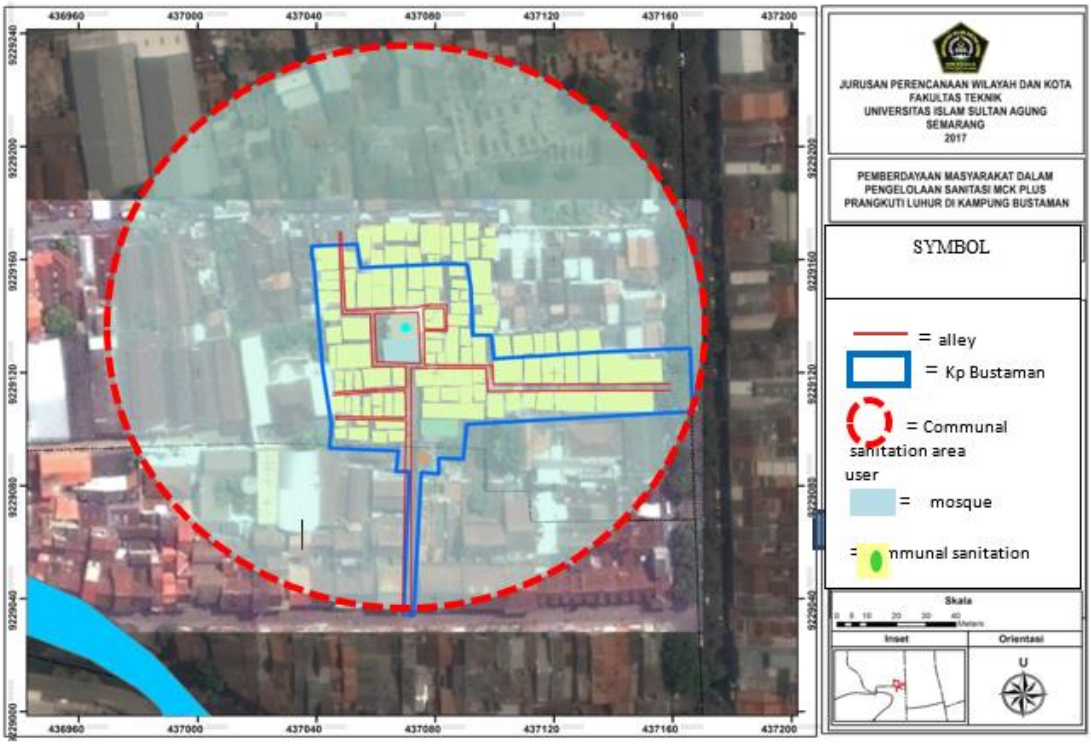

Figure 5. Coverage Area Communal Sanitation User.
Source: Masterplan Semarang City with Adjust 2017

In addition to awareness for using MCK+, the other impact resulted is the conscious effort to manage MCK+ wastes into renewable energy, becoming biogas which can be used by several households around the MCK+. Some households feel the benefits of having biogas even though they have to pay Rp. 500.00 each time using the

biogas. However, the existence of biogas does not last long due to the introduction of the government's program on cheap gas (*melon gas*) subsidies which eventually replace the use of biogas in the communal MCK+.

The study also found that before the SANIMAS Program all the people were using Kali Semarang for defection but after the SANIMAS Program running and built the communal sanitation, it is more than 75% use the sanitary latrine. Consequently, the intensity of waterborne diseases has reduced as a result of changes being practiced in hygiene behaviour.

The study reported that people are well aware about the safe sources of water including health and sanitation practices. It should be mentioned that about 98% of people use safe water for drinking and cooking purposes to avoid waterborne diseases. People are now aware of the need for immunization which also reduces the infant and maternal.

5. Conclussion

The management of MCK+ *Prangkuti Luhur* has been very good and can be said to have achieved self-sufficiency for the community of Bustaman Village. The MCK+ continues to operate until today and continues to realize the community's welfare in terms of sanitation health. Several factors make self-sufficiency to occur in the management of MCK+ in Bustaman Village:

- The community awareness and participation have shown that they are self-reliant, capable to set goals and can achieve the goals effectively and efficiently. Up to 12 years running, community participation remains high due to their awareness of a healthy life.
- In this case, potential and resources can be utilized optimally. However, there are still some resources that need to be explored further due to the limitations on the community side. This shows that in this case community becomes a self-reliant society because they are able to realize their capacity and develop it optimally without needing to force it to the maximum.
- Local understanding and wisdom among the community will be created from the existence of this MCK+, where the community has a clean and healthy lifestyle; there are no more people who defecate carelessly because they know it is an unhealthy lifestyle. Community expertise will also be created even though not all of them have it, at least the management has been able to introduce MCK+*Prangkuti Luhur* to transmit its success to other communities.
- The social institutions in this matter are seen from the strength of institutions, networks they have, community services and information that is delivered smoothly. In this case, the trust between the community and the management must continue to be strengthened for the sustainability of the MCK+. The success of management to date relates to membership, financial management, independence from external parties, and good contributions are given to the environment.
- There is a strong social cohesion in Bustaman Village which is very rare today. With this modality, the community can manage MCK+ to be used together.
- Through the MCK+, the community can be regarded as to achieve self-sufficiency, to give a better life for society, to be able to independently solve their problems and to optimize the existing resources according to their abilities.
- The existence of a good cooperation network between the community, government, universities and, NGOs, thus greatly accelerate the change in mindset for maintaining environmental cleanliness, this is because Bustaman village became one of the tourist areas in the Semarang city tourism agenda (Gebyuran Bustaman and Tengok Bustaman);
- There is local leadership that is capable to invite the community to support and encourage the good implementation of SANIMAS program.
- The local wisdom found in Bustaman village must continue to be strengthened and assured because kinds of social network such as an *arisan*[3], recitation, and other forms of it are effective means for delivering and disseminating programs and activities in sanitation management.
- The management of urban infrastructure which focused on the balanced division of roles between development actors (community, private sector, government and higher education) has been realized through the collaboration between planning and monitoring and clear organizational structures and community-based sanitation management in Bustaman village. Then the role of the community as a subject in this sanitation management activity has also

[3] *An **arisan** is a form of Rotating Savings and Credit Association in Indonesian culture, a form of Microfinance. Generally the **arisan** is a social gathering that takes place at a fixed interval (this being an informal social network this may be variable), at each member's home in turn.*

been going well which has finally led to the independence of the community in providing quality sanitation.

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Conflict of interests
The Authors declare no conflict of interest.

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Evaluation of Aesthetic, Functional, and Environmental Effects on the Design of Urban Open Spaces: A Case Study of İstanbul Şişhane Park, Turkey

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ABSTRACT

Urban spaces reflect the reality of city life, like a mirror. This research aims to examine and analyze the advanced aesthetic, functional, and environmental performance of urban public spaces by assessing the current situation and highlighting the role of creativity in developing these spaces. To clarify the research scope, Şişhane Park in İstanbul, Turkey was studied to define the requirements of creative standards, evaluate these competencies and choose the appropriate architectural style and urban furniture. In addition, to learn ways of preserving those elements for longer life. The analytical descriptive approach was the research method utilized in order to arrive at a set of results that ascertain the reality of the aesthetic, functional, and environmental performance of urban public spaces, and the reflection of the contemporary role in developing these spaces, which can contribute to addressing weaknesses and bolster the strength points in the formation of public urban spaces around the world.

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1. Introduction

Urban spaces are considered one of the essentials of the city's urban structure because of their great importance to the community and to human communication, to conduct many activities that can't be carried out within the residential area, and to achieve physical and psychological comfort in squares and parks to suit the community of diverse ages and socio-economic levels (Al-Dweikat, 2009).

The lack of sufficient green recreation space has garnered the attention of urban planners to create new recreational spaces.

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In addition, there is a clear deterioration in urban and visual perception such as: lack of creating a distinctive urban design, lack of arrangement and equipment with appropriate fixtures, and visual and noise pollution spread due to traffic jams, neglecting climate factors and not satisfying them with sufficient vegetation and water elements, places filled with rubbish, covered with graffiti, filled with unsightly, poorly maintained buildings, unsafe by the homeless at night. Moreover, there is an emergence of psychological problems caused by social diseases due to poor interaction between human and landscape (the relationship between observer and landscape), the neglect of the important role of art in our modern world, and social diseases are caused by a lack of understanding of how urban spatial structure affect psychological well-being of people who use urban space. The need for attention and clear intention to the urban environment has become greater and more important than ever, because it is the most important place in our cities, where the greatest human communication and interaction occurs (Tibbalds, 1992).

1.1 Significance of this Research and Its Objectives

The significance of this study is to describe some of the most important problems and challenges plaguing urban open spaces around the world, and Turkey in particular. These include the wasting of visual and aesthetic elements enjoyed in urban spaces, the lack of attractive elements that meet the needs of the population, unavailability of comfort and social activities, lack of intentional design to serve and promote the obvious interaction between the community and nature, and the lack of a satisfying response to the social, psychological, and behavioral needs of the users of these urban spaces.

The aim of this research is to improve aesthetic, functional, and environmental efficiency of urban open spaces through inspiring the possibility of addressing some aspects of the imbalance in space configuration. Upgrades to this configuration must match the importance of historical and touristic cities, thus this research seeks to demonstrate the role of urban open spaces in the aesthetic, functional, and environmental appearance of the city by presenting global examples that succeed in achieving the most important conditions required to reach the desired effect. Lastly, this study emphasizes the importance of the integration between the design process and urban planning, between science and art, to achieving functionality and meeting community needs.

2. Methods and Materials

Relying on the inductive analytical approach, the concept of integrated urban open space will be presented in this research. It highlights the most important standards and requirements to reach an efficient urban open space selected from published books and research by important authors in the urban design world. To make these practical, this paper analyses successful urban open spaces that meet the standards and requirements, while aptly demonstrating integration of aesthetics, function, and the environment:

- "Sound Wave" in China, characterized by its unique aesthetic characteristics, a new design idea, the use of appropriate materials, attractive color selection, and revitalization of the country's heritage through traditional Chinese music for visitors.
- "Superkilen" in Denmark notable for its success in meeting a variety of functional needs including containment of many recreational activities that can be performed, respect for all categories of people, embrace of many different nationalities in one urban open space, and the application of new taken ideas from the civilizations of different countries.
- "Victor Civita Plaza" in Brazil which is based on an innovative approach to revitalizing a polluted urban area and preserving the environment, creating a new sustainable solution, and continuing this approach by providing visitors with greater environmental awareness.

Additionally, this paper analyses the demonstration of the standards by case study of "Şışhane Park" in Istanbul, Turkey between the date of its establishment in 2014 and July 2019. Comprehensive assessment of these characteristics was conducted through visits to the site, review of changes to the urban space, and photos illustrating the current situation. The analysis of Şışhane Park asks:

- Have all the requirements of an efficient urban open space been met?
- Did the passage of time affect the quality and performance?
- What are the most affected elements?

3. Literature Review

- Urban spaces include a huge amount of activities and movement and large numbers of a city's population. The importance of urban spaces lies in their

influence on the lives and behavior of individuals in the urban environment, which serves multiple functions that are considered to be at the heart of the public's best interest. It can be a place of comfort and psychological balance for the urban population, stimulating social relations among the community, and instilling a sense of belonging and familiarity to their residential areas, while also providing aesthetic touches to the urban environment (Figure 1).

- Through intentional design of urban open spaces, they can preserve the environment in thoughtful ways, for example by use of certain materials that are harmless to the environment. Its usefulness is
- also greater and more comprehensive if it meets all the aesthetic, functional, and environmental required terms and is designed with creative ideas, keeps pace with modernity and technology to reach the highest level to achieve its goal.

Figure 1. Anish Kapoor's Cloud Gate, in Chicago's Millennium Park, 2004 [URL1; URL2]

The city is described as an element representing the social and spiritual culture of society. Urban spaces in any urban configuration can be considered as the remaining non-built areas of the city, whether planned or unplanned, and these spaces include roads, public squares, green areas, and playgrounds (Krier, 1991). Urban spaces have the ability to focus representation of important parts of the city's culture and to show the relationships and ratios among its different parts (Figure 2). They even have the ability to form the city, serving as population assembly points and cross sections of movement, and the city supports these spaces through the good organization of its surroundings and good guidance for the paths leading to them (Lynch, 1960). Regardless of the diverse uses of urban spaces, these urban spaces are places where the physical elements are defined by the human activities conducted in them, each having a key role to influence how they are used.

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Figure 2: Left: Skaters exploring the urban microgeography, Melbourne; middle: performing as 'statues', Leicester Square, London; right: Play interrupts instrumental flows, entry to Flinders Street Railway Station, Melbourne (Stevens, 2006).

The researchers Kevin Lynch (1960), Jane Jacobs (1961), Allen Jacobs & Appleyard (1987), Francis Tibbalds (1992), Rob Krier (1979), and Carmona & others (2010) were interested in one of the urban space characteristics - aesthetics, function, or the environment. They elaborated on only one aspect, without explaining the relationship between the characteristics of urban space and their impact on each other (Table 1).

Table 1: Classification of aesthetic, functional, and environmental criteria for urban space from the perspective of several researchers.

Aesthetic Aspect of Urban Space	**Source**	**Functional Aspect of Urban Space**	**Source**	**Environmental Aspect of Urban Space**	**Source**
Compatibility and harmony between urban elements Proportionality Ability to sense and communicate Understanding the place Vitality, similarity, color, shape, transparency, simplicity Organization of the movement	**Kevin Lynch, 1960**	Method of organizing public spaces. Nature of activities. Outdoor open space. Entertainment. Sports events. Vehicles' and pedestrian's movement. Urban hygiene and reduction of pollution in all its forms.	**Rob Krier, 1979**	Climate Geology and Earth Form Water and discharge Topography Vegetation and ecological nature Natural visual features Social welfare Environmental awareness	**Turner, 1980**

Vitality Flexible spaces availability Linking users socially To be able to carry out various activities	Jane Jacobs, 1961	The multiplicity of uses the urban space. The multiplicity of activities that can be carried out within this space. Accessibility for all people. Creating clear and permanent environments. Encouraging and organizing the pedestrian movement.	Francis Tibbalds, 1992	Ethics and respect for individual Participation and democratization Structuring through net works The natural world and sensory experience Urban density Respect for a spirit of place Ecology and economy	Ekhart Hahn, 1987
Visual perception Achieving joy and social communication Maintain the identity of the place Originality	Allen Jacobs & Appleyard, 1987	*General criteria* Taking into account site topography. Nature of soil and climate. Provide an adequate share of the individual's activities and services. Achieving communication between the elements of the urban space and the surrounding environment. Maintain it as a continuous natural resource. Protect it from noise and pollution. *Spiritual criteria* Comforts. Diversity. Visual perception. Excellence and unique personality. Support positive behavior. Users the cultural and social characteristics *Special criteria* By type of activity. Achieving privacy. Appropriate guidance. Security. Movement organization.	Kevin Lynch, 1994	Achieve multiple urban spaces Social interaction Giving vitality to the neighborhood unity Link and sense of place Integration of land uses, which promotes social, economic and environmental returns Focus on mass transport (public) taking into consideration (private transport) Integrations between traditional principles with contemporary needs Achieving sustainability goals	Williams & others, 2000
Influence on the old architectural thought The link between past and present Human scale and Proportionality Clarity Texture	Francis Tibbalds, 1992				
Urban image quality Influence on the old architectural thought Clarity Imagination	Punter & Carmona, 1997				
Visibility of cultural identity The urban space should be natural Shape, lines, color, materials	Nasar, 1998				
Simplicity Harmony Clarity of visual perception Excellence Comforts Security	Borton & Mitchell, 2006	Movement and activity. Organizing the movement of vehicles and pedestrians. Communication and optical permeability. Activities in public space. Social communication. Privacy. Population density. Environmental design. Open public space. Design for walking. Benefit from the infrastructure of the place.	Carmona & others, 2010	Direct the spaces according to sunlight and shade The sunshine penetrate the urban spaces which makes it more enjoyable places Mobilize and assemble buildings Fountains to enhance natural cooling Environmental pollution Air and wind movement Supply of potable water Good drainage of wastewater Trash disposal	Carmona & others, 2010
Ratio and proportionality. The human scale. Movement. Lines and shapes. Colors, Texture, Items, Materials.	Hani Al Farran, 2010				

3.1. Aesthetic Classification Criteria for Urban Open Space

Aesthetics is the study of sensations, concepts, and judgments of people, derived from our understanding of art (Blackburn, 1994). It is essential to clarify there is a disparity between beauty and aesthetics. The term "beauty" is the peculiar attribute of an object, place, or element that the human senses experience as pleasure, satisfaction, and acceptance; but the term "aesthetics" refers to the philosophical side of beauty and its appreciation (Nia and Atun, 2015). The aesthetic concept refers to the importance of recognizing beautiful elements and images at several levels such as visual and auditory, as well as spiritual cognition, to reach the reality of any phenomenon that affects emotions. Aesthetics are also the sensory value that an individual feel about the contours of things, through which the individual is pleased, and with such pleasure and enjoyment that the individual self has felt of the value of his/her existence. Architecture, sculptural art, music, and other things that the individual, and society in general, enjoy are products created by creative thought, so the outcome is a concrete form to be dealt with, to please an innate need of humans (Abdullah, 2009). The relationship between the location and how to understand the population needs is an important factor for enhancing the urban life quality, which is why

aesthetics science has a key role in the development of space through the understanding of psychological sentiment (Alyari, 2018). To create a delightful urban space, many features are proposed, such as vibrancy, richness, multi-use environment, interactive, and full of people at night and on weekends, visually motivating, and attractive for residents and visitors (Figure 3) (Shaftoe, 2008).

Figure 3: Jaworznickie Planty Water Playground, Jaworzno, Poland [URL3]

By studying the opinions of the authors whose names were mentioned in Table 1, the essential aesthetic characteristics were chosen for their importance, and analysis was conducted on the best example of the required criteria for aesthetics in "Sound Wave" in China, and the use of the designer's approach to this distinctive urban open space, as shown in Table 2. There are ten essential aesthetic elements to consider when designing and analyzing an open urban space: harmony of design elements, ratios and measures, texture, color, materials, lighting, visual perception, audiovisual perception, urban space coordination, and psychological effect.

As the lack of interdependence of the elements of urban open space negatively affect the aesthetics clearly, the user will inevitably feel this imbalance, so the harmony of design elements is crucial for design. The aspect of ratios and measures were chosen because the human scale should be regarded when designing an urban open space, to be usable for all ages, and to make the user feel comfortable and belonging to the place.

Aesthetics of an urban open space also deals with texture, color, and materials. The texture has a clear effect on the perception of the space. Nature is characterized by a blend of colors, so choosing the appropriate colors, suitable for the place, and the way they blend with each other in the urban open space attracts users and make a good impression. Successful selection of specific materials when making any urban open space, has a role in highlighting its identity, the beauty of ugliness of the place.

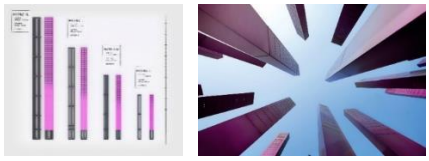
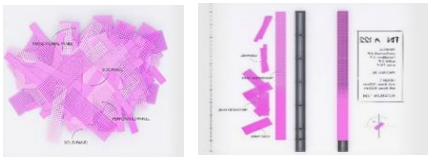
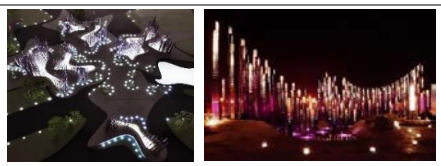
Aesthetics are affected by lighting, visual, and audiovisual perceptions. For the lighting factor, sun lighting and natural lighting adopt an important role in the formation of urban open space, as well as the distribution of artificial lighting and optical dots at night. These have a prominent role in the completion of its overall aesthetic image. As well, the visual and audiovisual perception factor of urban open space and surrounding area has a role in raising its efficiency, so they must be studied and considered carefully in design.

For the element of urban space coordination, all elements should be linked together smoothly and dynamically to facilitate the movement of visitors, and generate feelings of joy and the desire to discover the place. After incorporating all the above elements, the question arises about the generated psychological effect within the users – feelings of belonging or discomfort, positive or negative impression, and the desire to return to the same urban open space again or not.

3.1.1. Analysis of the Aesthetic Elements in the Study Area; Sound Wave in China

Table 2: Selection of the most prominent Aesthetic elements in "Sound wave" (analyzed by the authors) (Figures source: URL4)

Aesthetic Elements (Defined and selected by authors)	**"Sound Wave" In China**
The Harmony of design elements The "Soundwave" represents the entrance to a large garden. The music, rhythm, and dance with the surrounding landscape were the main landmarks that makeup it.	
Ratios and measures These fins kept the human scale according to their various heights, this urban space can be used by all age groups.	

Texture These fins suggest lightness, agility, and harmony in addition to their beautiful shape.	
Color The fins have vibrant colors, holds four degrees from the purple color.	
Materials The fins that make up the rhythm of the statue are covered with stainless perforated purple plates, through the process of electrocoagulation (oxidized), the panels are painted so that they maintain their main characteristics without defect and to resist corrosion. Light brightness and music volume are controlled by motion sensors around the site and are activated by pedestrian movement.	
Lighting The fins are located in four ponds of water, so the lamps are shining through the small holes in the steel at night, lighting the entrance and reflecting on the existing ponds of water to create a magnificent spectacle.	
Visual perception The statue consists of more than 500 perforated steel fins with vitality colors and varying in height, and the statue creates a visual milestone for the region.	
Audiovisual perception When visitors enter the Myrtle Tree Garden, they are surrounded by a lot of fins that spread like trees in the landscape, so that the speakers installed in some columns will play traditional Chinese music.	
Elements of urban space coordination This square is used during the evening by the local people for group dancing, the fins contain lines of lamps to produce the orchestra of 500 fins lighting connected to the square sound system and react in a direct and fast way with the movement in the square.	
Psychological impact When entering the square, the color and light will attract visitors in a sensual way to the landscape of Myrtle Tree Garden, to give visitors and local dance groups an opportunity to revive Soundwave during the day and night.	

3.2. Functional Classification Criteria for Urban Open Space

The integration between the aesthetic and function in the urban space is one of the most important conditions of successful design seeking to create the civilized development of any city. The efficiency of designing and coordinating urban spaces depends on a set of functional criteria that any urban space should acquire in order to be able to perform its function at the highest degree of efficiency.

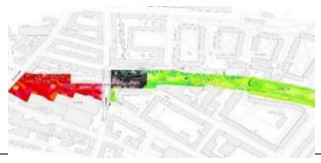
The functional urban space can be defined as the space in which it is possible to practice diverse activities according to the quality of the space and meeting the human needs from the space. These spaces are characterized by dynamism and movement, in which all forms of human activity interact with and through them. Functional urban spaces are formed as a result of the distribution of a set of buildings in a specific urban area, and it's non-random spaces without a target, but it is a functional necessity that integrates with the multiple uses of residential areas (Elmashad, 2011).

The Superkilen in Denmark was analyzed through the essential elements of a functional space in Table 3. The essential elements for function were selected for their association with the capacity of urban open space to achieve its function efficiently, and include: the method of organizing the public space, diversity, special character, traffic movement, sports activities, communication and visual clarity, entertainment, comforts, and support

of positive behavior. The way in which urban space is organized and the choice of a diverse style in the design of its elements to include sports activities and entertainment, clearly affect its function. The space should also be characterized by a unique character that distinguishes it from other public places. Preferably traffic within and through the space is considered in design to be easy for all users. Lastly, the space should create a sense of comfort for users and raises their morale to do positive behaviours.

3.1. Analysis of Functional Elements in the Study Area; Superkilen in Denmark

Table 3: Selection of the most prominent Functional elements in "Superkilen" (analyzed by the authors) (Figures source: URL5)

Functional Elements (Defined and selected by authors)	**" Superkilen" in Denmark**
The method of organizing the public space "Superkilen" is an urban open space in Nørrebro located in the Quarter of Mimersgade in one of the most ethnically diverse and socially cohabited neighborhoods in Denmark. It can be considered as a diverse exhibition of best urban practices, which come from 60 different nationalities of people living in residential areas around it.	 
Diversity "Superkilen" is a park that promotes diversity, it will be like a world exhibition filled with interesting things from around the world; including benches, lampposts, garbage cans, plants, and water fountains, as well as a variety of activities that can be done.	 
Special Character The main idea of Superkilen's design is to the park is divided into three main areas: The Red Square, The Black Market, and The Green Park. While the Red Square designates the modern, urban life with café, music, and sports. The Black Market is the classic square with fountain and benches. The Green Park is a park for picnics, sports and walking the dog.	  
Traffic movement The traffic regulation in the park has been taken into account, the current cycling paths will be reorganized, and new links will be established linking the surrounding neighborhoods, including full traffic development in the Norrebro area.	 
Sports activities There is a kind of integration among the local population through meetings and participation in physical activities, and entertainment shows held in the central square.	 
Communication and visual clarity There is a high open space next to the large facade towards Norrebrogade, which enables visitors to enjoy stunning views, In addition to the cultural and sports facilities.	 
Entertainment The square is covered with a multifunctional rubber surface to enable ball games, markets, parades, skating rinks in winter, and other activities. Portable platforms in Norrebrohallen can be moved there for open-air movie/outdoor sports performances. To the north, visitors will enjoy basketball courts, parking spaces, and an outdoor fitness area.	 
Comforts This park has included inspired furniture by different cultures; to attract different segments of the population; Such as the Moroccan fountain, Iranian Cuban and Swiss benches, Japanese cherry trees, Norway maple, Thai boxing bags, Indonesian swings, British litter bins, bollards painted with the Ghanaian flag and Irish manhole covers. On weekdays, tables, and permanent barbecue facilities serve as an urban living room for the table game and chess players.	 
Support positive behavior There is a playground where families with children can meet for picnics, sunbathing on the grass, as well as for hockey, badminton, and exercise. Many of the park's components were suggested by the residents themselves. In brief, Superkilen park might inspire many other cities as an example of how to approach the cultural diversity of their neighborhoods.	 

3.3. Environmental Classification Criteria for Urban Open Space

Urban planners currently face the challenge to revitalize neglected urban neighborhoods in ways that raise the level of health and promote equality (Corbum, 2009). They have the most important role in promoting a healthy environment to not only improve the quality of life of people living now, but also to plan for the health of future generations through design of the environment in urban spaces (Barton & Tsourou 2000). Natural factors such as sunlight, shade, temperature, humidity, wind, noise, pollution, and weather conditions affect the utilization of urban environments (Carmona & others, 2010). As for global sustainable development, multi-disciplinary environmental ideas are applied to start with urban planning and land use, aiming to improve living conditions of the urban population through achieving a balance between technological progress and improving the health conditions of urban spaces (Gauzin-Müller and Favet, 2002). Taking into account environmental, social, and economic dimensions, the application of environmental standards in urban spaces improves the quality of urban space and raises the environmental reality through the transfer of best practices in the environmental architecture field and urban planning to achieve the sustainable development of cities. It achieves important objectives such as: reducing the impact of urban development and technology on the natural system, preserving natural resources and discovering renewable energies, and attention to environmental areas that contain unique natural elements (Turner, 1980).

Figure 4: Usaquén Urban Wetland, Bogota, Colombia [URL6]

There are five essential elements to consider in urban space planning and design related to the environment: providing sustainable solutions, use of natural lighting and good ventilation, pollution treatment, return to nature and the sensory experience, and raising the environmental awareness of the users. It was found that in order to obtain a healthy urban open space and to preserve the environment, urban planners should consider sustainable solutions to the current environmental issues of the location. Spaces should consider relying on sun lighting and natural ventilation for creating comfortable spaces over the use of energy-consuming solutions to reduce the carbon footprint. Urban open spaces should seek to decrease environmental pollution through the activities of users. Further, it should be a space that gives people the desire to return to nature through positive sensory experiences. Lastly, the space should promote development of environmental awareness and a sense of responsibility to the space and the overall environment (Figure 4).

3.3.1. Analysis of the Environmental Elements in the Study Area; Victor Civita Plaza in Brazil

Table 4: Selection of the most prominent environmental elements in "Victor Civita Plaza" (Analyzed by the authors) (Figures source: URL7)

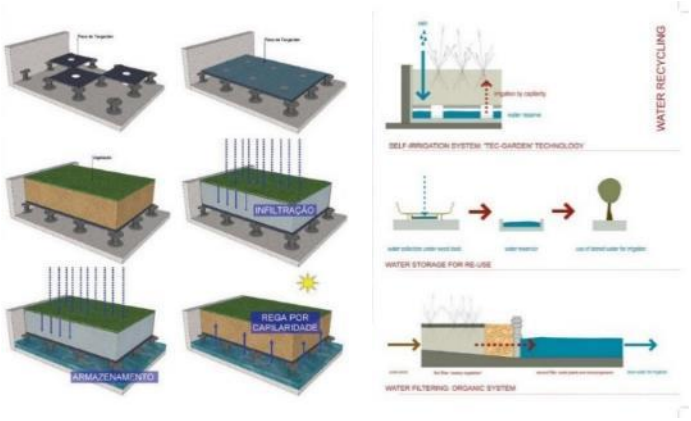
Environmental Elements (Defined by Authors)	**"Victor Civita Plaza" In Sao Paulo, Brazil**	
Provide a sustainable solution Located in a central urban area, the site of the garbage dump is also an innovative idea to revitalize a polluted urban area. A large wooden surface on the site was constructed without excavations.		
Natural lighting and good ventilation Natural lighting is relied upon and take advantage of sunlight for a more energetic feeling, and choosing the right direction to take advantage of the wind appropriately		

Pollution treatment
A new design has been proposed that addresses the problem of pollution through the application of a sustainable solution that integrates social, political, cultural and environmental elements.


Return to nature and sensory experience
Approved and recycled Brazilian hardwoods were selected over the site, supported by a steel structure, to reduce contact with contaminated soil, such as the frame of a ship.
The surface floats at a height of three feet above the original terrain and extends in a long diagonal shape. Exhibit panels explain the various sustainable processes in the plaza, including the recycling of wood.



Environmental awareness by users
This environmental project aims to promote community participation and development. Visitors will be able to learn about the organic water recycling system used in the plaza; in pursuit of increasing their environmental awareness.



4. **Case Study: "Şişhane Park" in Istanbul, Turkey**

Architects	SANALarc
Location	Bereketzade Mh., Büyük Hendek Caddesi No:50, 34200 Beyoğlu/Istanbul, Turkey
GPS Coordinates	41° 1´ 41.3364" and 28° 58´ 22.3248"
Design Team	Orkun Beydagi - Cibeles Sanchez Llupart - Leo Pollor - Begüm Öner
Area	30000.0 m2
Project Year	2014
Budget	$10M – 50M

"Şişhane Park" is located adjacent to the historical area of Galata Suriçi in the European part of Istanbul between the southwest corner of Beyoğlu and Tarlabaşı streets. The aims of the park are: to reduce the entry of cars into the historic area and to reroute traffic density to enable users to experiment with alternative public spaces. Şişhane Park cuts through the city's streets with alternative approaches and unconventional elements compared to other parks in Istanbul. It aims to have distinctive lines in a location with historical importance, be attractive for quality social life and make people interact with natural materials like wood rails and others. The design is elliptical so the users don't lose visual and cognitive comfort. It is an open public space that has been formed as a park connected by vertical turnover lines connected to each other by ramps and stairs. The park contains a playground, seating areas, walking trails, and six floors for parking where each floor is characterized by a different color, so the user has different spatial experiences (Tay and Canbay Türkyilmaz, 2018).



Figure 5: "Şişhane Park" Site Plan [URL8]

Table 5. Highlight the strengths and weaknesses of "Şişhane Park"; (Improved by author; Figures source: by authors).

Strengths of Şişhane Park	**Weaknesses of Şişhane Park**
 The location of the park gave it great importance and a beautiful view of Istanbul city.	 Having an outdoor café within the main square of the park is thoughtless and reduced the importance of the main square.
 The gradient method of heights is good for the best view.	 Putting the chairs and tables of the outdoor cafe in the middle of the main road for the park.
 The presence of closed garage.	 The elements of the Şişhane park are vulnerable to different weather conditions.

There are many elevators that link the closed garage's floors clearly.

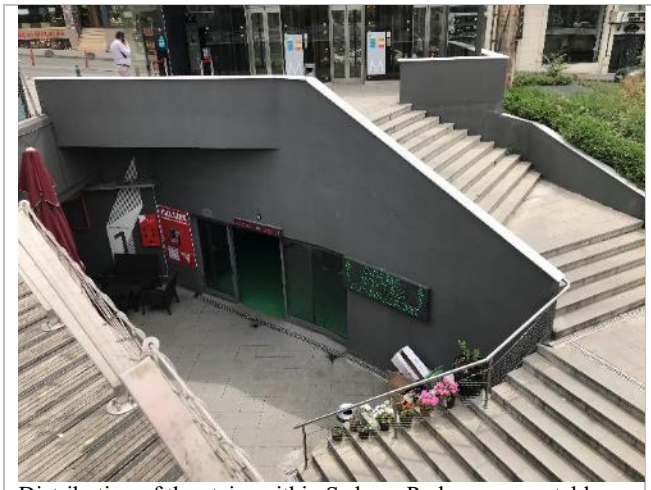
There is no urban furniture that protects users from sun, rain or any sudden weather fluctuations, reducing usability throughout the year.

Each floor in the garage has a distinctive color.

The entertainment corner in the Şışhane park is unusable because of damage to the used materials.

Garden paths link with each other well.

The material in the entertainment corner has deteriorated and is left unmaintained.



Distribution of the stairs within Şışhane Park was acceptable.

Ground floor tiles are short-lived and poor quality.

The shape of the planting ponds is suitable for the park elements.

The quality of the used wood materials in the park is very poor and needs maintenance.

The gradient colors of plants were appropriate.

The plants in Şışhane park need attention and care. More thoughtful landscaping with diversity of types.

The assessment of the Aesthetic elements of Şışhane Park (2014- 2019) has revealed that most of the aesthetic characteristics of this park have deteriorated. The harmony of the elements of the design existed previously, but the addition of exterior cafe has not been studied. The harmony between the elements of the park has been weakened. The characteristics of the scale, texture, color, materials and visual perception have become worse over time. The psychological impact now is weaker due to neglect of the park's maintenance.

Table 6. Analysis of "Şişhane Park" according to derived aesthetic standards; (Improved by author); figures source (Before: URL8, after: by authors)

	BEFORE (2014)		AFTER (2019)	
The Harmony of Design Elements		√	 There is an additional outdoor cafe at the core of the park.	×
Ratios and Measures		√	 There is no equal access for disabled persons in the park.	√
Texture		√	 Most of the textures have deteriorited.	×
Color	 Good variation in color accents.	√	 Only plants provide accent color in the park environment.	×
Materials	 Wood and concrete	√	 Most of the textures have deteriorated.	×

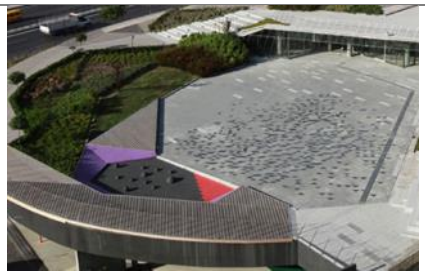
Lighting		√		√
Visual Perception		√		×
Audiovisual Perception	City noises can be heard.	×	The highway traffic can be heard prominently, and wooden elements don't absorb sound to reduce echo.	×
Elements of Urban Space Coordination		√	 The option to add the outdoor cafe was not successful.	×

Şişhane Park offers a large public open space for cultural events as well as smaller intimate spaces for resting, enjoying the shade of trees, playing, and spending time in groups. It also features well designed and visually engaging underground parking for up to 1000 vehicles which partly connects with some of the nature in the park above. It is a place to experience the urban context of Istanbul while having a strong connection with the surrounding natural environment.

It was observed that the functional characteristics of Şişhane Park were slightly affected by the deterioration of the aesthetic properties of its elements. For the characteristics of diversity, traffic movement, communication, entertainment, comfort, and the support of positive behavior, these characteristics have not weakened over time. However, the method of organizing the public space is worse because of the external cafe on its main road. There is no possibility of doing sports activities there.

Table 7. Analysis of "Şişhane Park" according to derived functional elements; (Improved by author) (Figures source: Before- URL8, after- by authors).

	BEFORE (2014)		AFTER (2019)	
The Method of Organizing the Public Space		√	 There is an outdoor café on the main circulation road of the park.	×
Diversity		√		√
Special Character		√		×
Traffic Movement		√		√
Sports Activities		×		×
Communication and Visual Clarity		√		√

Entertainment		√		×
Comforts		√		×
Support Positive Behavior		√		√

The intention behind Şışhane Park is to revitalize the level of interaction of residents and visitors with the natural characteristics of this unique urban environment.

Energy + Natural Light/Ventilation:

The motion sensor system for lighting and LED lighting makes it possible to supply the park with sustainable power. The upper level of parking is open to the air and natural light while the five lower levels are ventilated by cross ventilation and an automatic fan system. Also, the drawings of a walking man encourage people to take the stairs for more movement.

Water Recapture, Stormwater + Heat Island Effect:

The water restoration system for the large green roof panel does not require maintenance. This reduces the surface of the landscape, wooden floors and light granite options by 30% of the damage to the heat island effect. These features also reduce the project's impact on stormwater infrastructure in the historic region.

It was observed that most of the environmental characteristics of Şışhane Park were not achieved except to provide a sustainable solution, natural lighting, and good ventilation. This project aims to form the Şişhane Park gate to Galata and other Beyoğlu neighborhoods as well as to promote social life in Kasımpaşa. The upper terrace creates a view surface through Haliç which enhances the dense and noisy area of the Tarlabaşı road consisting of six lanes. The center creates a protected outer space, and the third allows the flow of natural light and ventilation to the entrance level near the parking area. Both upper and lower seats are formed in the face of moderation and summer solstice while plants and terraces ease noise pollution in the city center.

Table 8. Analysis of "Şişhane Park" according to derived environmental elements; (Improved by author); figures source (Before: URL8, after: by authors).

	BEFORE (2014)		AFTER (2019)	
Provide a Sustainable Solution		√	Damage to the park has weakened its environmental performance	×
Natural Lighting and Good Ventilation		√		√
Pollution Treatment		×		×
Return to nature and sensory experience		×		×
Environmental Awareness by Users		×		×

Table 9. Analysis of "Şişhane Park" according to derived aesthetic, functional and environmental standards; (Improved by authors).

AESTHETIC ELEMENTS			FUNCTIONAL ELEMENTS			ENVIRONMENTAL ELEMENTS		
	Before	**After**		**Before**	**After**		**Before**	**After**
The Harmony of Design Elements	√	×	**The Method of Organizing the Public Space**	√	×	**Provide A Sustainable Solution**	√	×
Ratios and Measures	√	√	**Diversity**	√	√	**Natural Lighting and Good Ventilation**	√	√
Texture	√	×	**Special Character**	√	×	**Pollution Treatment**	×	×
Color	√	×	**Traffic Movement**	√	√	**Return to nature and sensory experience**	×	×
Materials	√	×	**Sports Activities**	×	×	**Environmental Awareness by Users**	×	×
Lighting	√	√	**Communication and Visual Clarity**	√	√			
Visual Perception	√	×	**Entertainment**	√	×			
Audiovisual Perception	×	×	**Comforts**	√	×			
Elements of Urban Space Coordination	√	×	**Support Positive Behavior**	√	√			
Psychological Impact	√	×						

6. Results and Discussion

This research highlights the main characteristics of successful urban open space in terms of aesthetics, function, and the environment, the importance of their integration, and their close association with each other. This was achieved through the study of established views by prominent researchers on this subject to identify essential elements to efficient and successful urban open spaces. For further verification, the previously inferred Standards (aesthetic, functional, and environmental) have been applied to successful global examples that have met these criteria and received numerous

architectural awards, as well as people- and user- satisfaction.

These examples were presented and analyzed to clarify the main reasons for their construction and the successful methods of dealing with the imbalance in the place. Lastly, this research provided an analysis of the essential design elements for urban open spaces in "Şişhane Park" to display the strengths and weaknesses, with a view to raising the quality of public spaces in the world generally, and in Istanbul in particular.

Overall the condition of the Şişhane Park was previously better and has shown severe deterioration over time (5 years) that has affected the park's efficiency and use by the population.

- In aesthetic terms, many of its characteristics have been lost, and its condition deteriorated badly; such as harmony, texture, color, materials, visual perception, elements of urban space coordination and psychological effect.
- The deterioration of aesthetic properties in "Şişhane Park" weaken the functional and environmental characteristics.
- There is a clear shortfall of environmental characteristics.
- According to the analysis part of the study, it can be said that aesthetic aspects have greatly affected the use and success of the space more than other factors – the neglected value of the park make it useless and unusable, and turned it into a mere multi-story garage.
- Environmental aspects were the hardest hit among other aspects, followed by aesthetics aspects, and functional aspects were the least affected.

The purpose of this research is to clarify the importance of the interrelation of aesthetic, functional, and environmental factors among them, and their impact on urban open space. Taking into account these factors in the process of urban design is important to the product's efficiency and success. It was also noted that most of the previous studies dealt with one of these factors affecting urban open space. Therefore, it is important that characteristics must be met across all three aesthetic, functional, and environment for the success of urban open space. Additionally, the criteria across these considerations should be integrated, both in research and in urban planning and design. Examining the case study of Şişhane Park, which is considered one of the most important modern parks located in a historical area, helps to understand the inter-relationships between these elements, and how they affect one another in failure. Although "Şişhane Park" has won many awards for its unique design, the current state of it has become very poor. It has lost many of its advantages over time. It becomes clear that application of urban open space standards to design and planning of any urban open space will result in a truly aesthetically pleasing, functionally successful, and environmentally respectful space that preserves the environment and is used by people.

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Conflict of interests

The authors declare no conflict of interest.

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Industrialization and Urbanization in Turkey at the beginning of the 20th Century

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ABSTRACT

The starting point of this study is the fact that every production system entails a specific spatial organization and changes its physical environment. This research is an attempt to understand the industrialization period of Turkey's Early Republican Period (1930's) and the spatial effects of the new production system. Right after the Turkish War of Independence, The Republican Government of Turkey had aimed to establish an independent country and started to carry out a modernization and contemporization project. This project had different dimensions appealing to the institutional, economical, social and civic aspects of Turkey. The economical dimension included the industrialization and economical independence of Turkey. Besides from its economical, political and social goals, the Republican Government had aimed to change the physical appearance of the country. The Government's first goal was to turn the country into the space of National Turkish Republic State from an empire's land. Secondly, the small towns or settlements of the country were supposed to become modern cities, the places of modernity, just like the modern cities of the industrial and developed countries of the world. That explains why the factories which were set up all around the country had played such a crucial role in the modernization period of Turkey at the beginning of the Republican era. They were not only economical achievements of the state; they also affected their physical and social environments and introduced the modern way of living particularly where they were set up.

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1. The Industrial Revolution

The dynamics of the industrialization process of Turkey differed from those of the Industrial Revolution of European Countries. The economical, political and social structure of Ottoman Empire did not allow such kind of industrialization. In the 18th century, Great Britain was subject to the rapid economic development and urban population growth. The invention of machinery sealed the fate of the cottage industry and concentrated industry in factories. These factories, which were sited near water and coal deposits, encouraged migration from the agricultural settlements so that new urban developments mushroomed (Curl,1970)

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After the Enclosure Acts and the deprivation of the yeomen of their ancient rights, the class differences were accentuated, wealth being concentrated in fewer hands, and the free men and their families became the proletariat, forming the labour factor of production. Rural depopulation was caused by several factors, but one which is often overlooked, was the fact that the urban slums were probably a lot better than the rural ones (Curl,1970).

2. The Social and Economic Structure of the Ottoman Empire

During the 18th century, the Ottoman Empire had appeared to carry the characteristics of a pre-industrial economy; poverty, stagnation, dependence on agriculture, lack of occupational specialization and the low degree of geographical integration (Curl,1970).The reasons for this situation were the economic and social structure of the Ottoman Empire. Firstly, the majority of the population was formed of villagers, called as "reaya". They worked on the lands of the empire and paid taxes, and they did not actually constitute a class system. Secondly, the priority of the land was belonging to Sultan, and the local authorities (timar owners) of these lands were only responsible to collect the taxes from the reaya. They did not have the right to own land because the Ottoman's land policies did not allow any Enclosure Acts within the Empire. The whole system of the government was established on the gathering of surplus by the government from the reaya, so that any event that could possibly cause accumulation of capital was prevented by the government (Kongar,1998).

The economic development of the European countries also affected the Ottoman's economical system. Firstly, the new trade ways eliminated the Mediterranean trade ways, thus the Ottoman Empire lost an important source of taxes it gathered from the control of these trade ways. Secondly, the metals like gold and silver which introduced into European economy from the New World had caused inflation and increased the prices. Ottoman Empire turned into a cheap source of food and raw material.

The Ottoman Empire had a stagnant economic and social system which obstructed the flow of money throughout the country. The low population rate, the production which depended on agriculture or crafts and its locally connectedness, and the insufficiency of transportation and communication systems did not allow the labour to transfer from agricultural production to the activities concerned with industrial production. As a result, the rural population had no chance to move into urban communities. On the other hand, there was no demand for manufactures or services from the society, because of the poverty and low population, thus there had never been a demand for a big capacity of industrial production. The only places which were integrated with the world's market system were the harbour cities or the settlements which were set up on the trade ways of the caravans. But the hinterland of the Ottoman Empire could not integrate with this system. The delay of technological developments and education in the country made it obligatory to transfer specialists from European countries, and there was a lack of occupational specialization. Besides from these reasons, the social status of the workers were always humiliated within the paternalist structure of the guild system, and being a soldier or an official for the government had always been preferred to being an industrial worker by the society members (Toprak,1985).

Table 1. The number of factories and workers according to the statistics of 1913-1915 (Ökçün,1998)

	Number of Factories		Number of Workers	
The Production of the factory	1913	1915	1913	1915
1. Food	76	78	4281	3916
2. Earth	20	21	980	336
3. Leather	12	13	930	1270
4. Wood	19	24	705	377
5. Weaving	75	78	7765	6763
6. Paper	55	55	1897	1267
7. Chemistry	12	13	417	131

3. The Industrialization Process of Turkish Republic

At the beginning of the Republican Era of Turkey (1920's), most of the consumer goods were imported from other countries. The world's Financial Crisis at the beginning of the 1930's affected Turkey's economy as well. The effects of the crisis on Turkey's economy were the deterioration of international terms of trade, the decrease of exportation and the decrease of government's budgetary incomes. The most important source of income of Turkish economy, the agricultural exportation, was becoming less profitable during this period, and the idea of industrialization was becoming more charming each day (Tezel,1994).

The new Republican Government had aimed to develop the country and provide its economic independence by introducing contemporary industrial production. Thus, the private sector had been granted many privileges in order to realize

the industrialization process of Turkey, but due to lack of enough experiment and capital, and the untrustworthy situation of the economic crisis of the day, the private sector could not handle this project (Kepenek,1996).

At the beginning of the 1930's, the government decided to undertake the economical course of Turkey, by introducing many legislations and new applications. This was also one of the results of the state ruling policy of the government. One of the most important applications of this period was "The First Five Year Industrialization Plan" of Turkey, which had been prepared during 1932 and put into practice in 1934(İnan,1933).

To find technical and financial support for the government's new economic policies, the Prime Minister İsmet Pascha (İnönü) visited many countries like Soviet Union and Italy, in 1932. At the same year, a group of Soviet technicians came to Turkey to make surveys about the investigation programme of Turkish government and at the end of the year, the group presented a report to the government.

But the government was not contented with this report and in 1933, a group of American specialists, in which the famous American economist Edwin Kemmerer had participated, was invited to Turkey. These specialists prepared a detailed report on Turkey's economic conditions, natural sources, capital resources, industry, transportation system, national and international trade system, money and banking system, foundations, working conditions, health and education system, and public administration. They presented their report to Ministry of Economy in 1934. These researches forecasted that it could be possible to set up factories in Turkey more profitable than other countries of the world (Tezel,1994).

These reports of Soviet and American Specialists determined the contents and form of the investment programme of Turkish government. Most of the projects were supposed to be realized with the financial support of Soviet Union. However, the priorities of the governmental capitalism were different from those of the realities of capitalist thinking during the realization of this plan. Instead of assembling at certain points of the country, the factories were dispersed throughout the country (Kessler,1948). According to the plan, many factories producing consumer's goods were set up among Turkey's many different regions.

Table 2. The factories and their regions, (Tayanç, 1973)

Region	The production of the factory
1. Marmara Region İstanbul İzmit Gemlik d. Bursa	cotton, glass paper, cellulose, phosphate, sulphur artificial silk merino wool
2. Agean Region Kütahya Nazilli c. Bodrum	ceramics cotton sponge
3. Mediterranean Region Keçiborlu Isparta	sulphur oil of rose
4. Black Sea Region Kastamonu Karabük	hemp iron-steel
5. Middle Anatolia Region Ereğli Kayseri	cotton cotton
6. Eastern Anatolia Region Malatya Iğdır	cotton cotton

This Industrialization plan was not only an economical plan but also put into practice the spatial strategies of the modernization project of the Republican Government (Tekeli,1999). The places for the factories were chosen among the small cities or towns of Turkey which laid on the railway system, so that even the smallest settlement could take the advantage of the factory and its services. The factories yielded employment, increase of population, industrialization and as a result urbanization of the small towns-settlements where they had been set up.

These factories resembled the company towns of Europe and America which firstly occurred in the 19th century. A company town was a community inhabited by the employees of a single company or groups of companies which also owns a substantial part of the real estate and houses (Crawford,1995).These company towns were the challenges of the paternalist investors against the intolerable conditions of living and the new values system of the new industrial era.

Pullman in the United States of America is a good example for the company towns. It was a healthy and rational environment with its well organized plan. It was not only an industrial complex, but also it was offering a new way of life with its

accident insurance, a company doctor, a school system, athletic clubs, a company band, social and educational clubs for workers.

Saltaire in Yorkshire (1860) was another important company town, with its district social rules and clear landscape planning. The factory building and the church are just opposite of each other. On the main axial road of the settlement lies the factory schools, club and institute buildings. Behind these buildings, there are the workers houses (Kostof,1991).

In Turkey, the factories, the new production system, put their effects on the economic and social structure of the community, and also on physical environment. Firstly, the people who used to earn their livings by agriculture or crafts, began to learn how to work in a factory system, from turning the machines on, to coming to work on time, or from living in mass houses of factory to negotiating for their salaries. They began to be the members of a working class, not only a family or a tribe. The workers coming from the rural areas of Anatolia to the settlements where the factories were set up caused an increase of population and that was the first and a very important step for urbanization. The increase of population necessitated new houses, new services and new recreational facilities all through the settlement. The industrial production also revitalized the economic structure with its demand for raw material and small industrial production. Secondly, the factory complexes, with their grid layout plans, housing units for workers, social services, infrastructures and recreational areas, introduced a new kind of building type into the small and rural settlements of Anatolia. These services of the factory also affected the urbanization process of the settlements.

These complexes were not only the spaces of production, but also they served as the cultural centres and gathering places for the community. As women started to work at the factories, they became the active members of the social life. The social activities organized by the factories (among these the celebration parties of the national ceremonies, sports activities, theatre performances, reading and writing courses for non-readers can be listed) played an effective role in the education of people. The people living in the town were able to use the green areas of the factory for recreational activities. By that means, the factory complex served also as a public space where people could meet with each other, educate, recreate, and took the advantage of many services. Those were the first steps of a community towards a modern way of life through the factories, which introduced them the industrial production system.

Here two of these factories are compared with each other according to their spatial properties. One of them is the "Sümerbank Nazilli Basma (printed cotton cloth) Factory", which was set up between the years 1935-937. This factory was a very important step of the First Five Year Industrialization Plan, as it was one of the first factories that was realized and began production. The plans of the factory were drawn by a Soviet firm "Turkstroj", and during the building of the factory, engineers from the Soviet Union worked in Turkey, both to build the factory and to educate Turkish engineers and workers. Another factory is "Sümerbank Kayseri Weaving Factory" which was opened in 1935. Kayseri factory was also set up by the technical and financial support of the Soviet Union (inan,1972). The plans of the two factory buildings are very similar to each other.

When we take a look at the layout plans of the factories, we observe a rational grid system, and very huge buildings which oppose with the organic and traditional layout of the small towns. This is because an industrial landscape is a direct

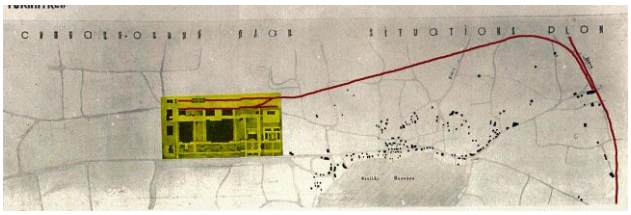

Figure 1. The Sümerbank Nazilli Basma Factory 1934, the original plan drawing, Factory Library.

translation of the technical and social necessities of a particular method of industrial production into a settlement form(Crawford,1995).The factories are connected to the main railway system with a narrow gauge railway where possible. This maintained the transportation of raw materials and the products of the factory, and also served to carry the workers to factories in some places.

Both of the factories are symmetrical in planning and a hierarchy is visible among the building groups. The production units of the factories are located at the centre of this hierarchy, after them are the administration offices, and the residential units of the administrative staff in the boundaries of the factory settlements. The workers houses had been added by time in case of need, and they are located just opposite of the factory. The infrastructure of the factories like power station or water plumbing system served the whole town. Other services and facilities of the factories included health care centre, primary school, nursery centre, cinema, sports complex, library,

fire station, and a restaurant which could be used as an assembly hall.

These two factory buildings were built with steel frame and concrete, which were the most contemporary building technologies of their era. The buildings are, simple and functionalist buildings, which reflect the modernist tendencies of the of 20th century's industrial production systems. When we take a look at the production units of the factories, we can even observe the effects of the Russian Constructivism on these

Figure 2. the general view of Kayseri Factory, on the left the weaving ateliers (1930's).

buildings (the combination of rational elements in harmony to form a unity) (Iakov,1981).

4. Conclusion

The Industrialization of Turkey in the Early Republican Period was an attempt to build up an economically independent and modern country. After war of independence, the government had to undertake the economical course of Turkey, and the First Five Year Industrialization Plan was a successful application of the government during this period, because all the projects that had been intended in this plan were realized, either with national or out coming budgets.

This industrialization process differed from the "Industrial Revolution" of European countries during the 18th and 19th centuries and had its own social and economical dynamics. Firstly, the economical activities of the Ottoman Empire were depended on agriculture and crafts and the only factories limited in number were producing for the army. Thus, the industrialization of the whole country was a new situation for the Republican government and the public. Secondly, the population was very low with the effects of wars, and stabilized to rural settlements, and the beliefs and traditions of the community were not appropriate to form the immobile society which the industrial production system needed. The insufficiency of the transportation system was another reason for this. Thirdly, the factories were not private investments, they were the investments of government, so the industrialization process of Turkey could not be named as a public wide "revolution", it was only a governmental policy applied during a limited time and with limited resources.

In addition, there had been a sudden change in the governing of the country and parallel with the policies of the modern government, the factories changed the socio-economical structure of the society and affected the physical environment of the settlements where they had been set up. The increase of population and the development of the economic activities depending on the demands of the factory and production for and integrating with the world's market system caused the urbanization of these settlements. The cities took their shape according to these factories and new industrial sites and new neighbourhoods surrounded the factories. The social activities organized by the local authorities and the administrations of the factories gathered the public together and these were new kinds of activities for a previously agricultural community (including sports activities, theatre performances, cinemas, the celebrations of the public days, libraries, reading and writing courses).

But the success of this period could not be sustained long. Especially after 1950's, the factories began to lose their effectiveness, and most of them are closed now. Luckily enough, the above mentioned factories are now properties of two different state universities. The buildings and the land of "Nazilli Basma Factory" was purchased by Aydın Adnan Menderes University and there are some projects prepared by the municipality of Nazilli to turn these places into a techno-park. The Weaving Factory of Kayseri became the property of Erciyes University in Kayseri, and the university is planning to change some of the buildings of factory into a campus for the university.

With above mentioned effects of the factories, it can be said that the government's spatial goals concerned with the towns and cities of Modern Turkey were realized particularly, where the factories were set up. The modernization process of these towns depended on industrialization and urbanization. Therefore, these factories exemplify spatial forms of new means of production, which on the last analysis changed the social aspects. In other words, these were the factories that produced "cities".

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Conflict of interests

The Authors declare no conflict of interest.

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Compliance with Planning Standards Related to the Setbacks around Domestic Buildings: Empirical Evidence from Kenya

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ABSTRACT

This study investigates the extent to which planning standards that regulate the setbacks around domestic buildings are complied with by developers in Kenya, a case study of Kisii Town. Using proportional random sampling targeting seven neighbourhoods, a sample of 364 was drawn from the target population of 7430 developments. While checklists were used to collect data on the extent of compliance with the planning standards, data were analyzed using means, mode, standard deviation and a one-sample t-test. Results established that most developments disregarded the planning standards on setbacks. Hypothesis tests further reported significant differences between the respective recommended setbacks (front, side and rear) and extent of developers' compliance, t (289) = -14.746, p = .000; t (289) = -8.937, p = .000; and t (289) = -20.3826, p = .000. The study concludes that developers flout planning standards owing to insufficient development control by the County Government of Kisii. A recommendation is made for the adoption of locally nurtured standards that addresses the existing socioeconomic attributes as an alternative of relying on those generated at the national level. This study enriches the current body of literature in planning by validating how compliance with planning standards may be statistically assessed.

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1. Introduction

The global urban population has been rapidly escalating since 1950. As a case in point, the population increased from 746 million in 1950 (29.6 per cent of the world-wide population) to 2.85 billion in 2000 (46.6 per cent of the world-wide population) and further projected to 5.06 billion by 2030 (60 per cent of the world-wide population) (UN-Habitat, 2015).

Ritchie and Roser (2020) in actual fact confirm that over 50 per cent of the global population is already residing in urban areas. With this trend in mind, the UN-Habitat (2019) forecasted that by 2050, two-thirds of the global population will be living in urban areas. If this change is not well planned, it is bound to undesirably contribute to challenges such as urban decay (Addedeji & Arayela, 2018), urban sprawl (Fuladlu, 2019), and noncompliance with recommended land use planning standards with a particular reference to the developing countries.

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Accelerated increases in the population of urban dwellers are likewise being witnessed in Africa (Hope Sr., 2012). According to the African According to the Africa Development Bank (2014), just a century ago, Africa had an urban population that was less than 8 per cent of its total population. An interesting fact is that by the end of 2020, Africa's urban population will have surpassed that of Europe's total urban population. A question that arises at this juncture is whether African countries have a well-structured development control regime for containing the rapidly expanding urban population. This confirms the arguments of UNDP (2012) that economic growth and concomitant demographic changes in Africa have given rise to urbanization without the much-needed land use planning. Evidently, although urbanization should make residents more successful, most African urban areas have remained unprepared for the transition (Institute of Economic Affairs, 2016). Rapid urbanization is not a new occurrence in Kenya where the growth has been accompanied by the noncompliance with the applicable planning standards resulting in urban neighbourhoods which are characterized with challenges such as land-use conflicts, and the proliferation of informal settlements. Moreover, even though development control should be prescriptive on the account of being used as a panacea for land-use planning through enabling pieces of legislation, this to date remains as one of the central weaknesses within Kenya's planning system with much development proceeding in contravention of recommended planning standards (World Bank, 2016).

From the foregoing insight, through a case study of Kisii Town, the objective of this study was to investigate if developments in Kenya are complying with the recommended planning standards that are used in regulating the spaces around domestic buildings (commonly known as setbacks). To achieve this, the study was guided by the following three related hypotheses:

a) H_{o1}: There is no statistically significant difference between the recommended planning standards for the front setbacks and the observed extent of compliance by developers in Kisii Town.
b) H_{o2}: There is no statistically significant difference between the recommended planning standards for the side setbacks and the observed extent of compliance by developers in Kisii Town.
c) H_{o3}: There is no statistically significant difference between the recommended planning standards for the rear setbacks and the observed extent of compliance by developers in Kisii Town.

The findings of this study are expected to benefit the international audience by filling the existing gap in knowledge on how compliance with planning standards related to the setbacks around domestic buildings may be statistically analyzed after the undertaking of on-site measurements.

2. Literature Review

Urban planning is an important process in guiding spatial development towards the promoting of environmental, cultural and socio-economic tenets of the society (Beattie & Haarhoff (2017). In view of this, planning standards, therefore, outlines the minimum conditions that ought to be fulfilled by developers during the design and development phases of buildings (Karibasappa, Raja, Jayakkumaran & Jegan, 2016). Developers are consequently required not to go below the minimum planning standards that have been predetermined notwithstanding the fact that the desired target is usually the upper limits (Olujimi, 2008). This, without doubt, includes standards that regulate setbacks around domestic buildings in urban areas.

A growing body of literature has so far attempted to appraise the extent to which developers are complying with the recommended planning standards. While examining the variables which influenced the level at which developers observed planning standards in the Old Salt City of Jordan, Alnsour and Meaton (2009) established that compliance was low. This was occasioned by variables such as inadequate enforcement by the planning authority, household monthly income, the dominant culture within the planning authority, size of the household, and the vagueness of the applicable standards. A study in Wales and England by Baiche, Walliman, and Ogden (2006), however, found out that although compliance was not high, the main challenge was inadequate skills and lack of awareness of the applicable planning standards on the part of the operators, inadequate construction site management and the utilization of sub-standard labour. These findings could be likened to that of Sarkheyli, Sharifi, Rafieian, Bemanian and Murayama (2012) who gave an account that the level of developers' awareness and the average monthly income were among the top drivers of noncompliance with the floor area ratio planning standard in the City of Tehran. Noncompliance was equally impelled by variables such as the housing per capita, the price of buildings,

building coverage ratio, and the status of transportation infrastructure. Unlike Sarkheyli et al. (2012) whose study was descriptive, Karibasappa et al. (2016) quantified the disregarded standards in the Bangalore's Neeladri Nagar, Electronic City Phase-1 and established that regarding road widths, while the average violation was 49 per cent, that of plinth height was 87.17 per cent. In the same vein, recommended building heights, setbacks, plot coverage, and the floor area ratio was exceeded by more than 39 per cent. A related study in terms of the methodology by Boob and Rao (2014) in India's local authorities of Yavatmal District of Maharashtra State established that roadside, side and rear margins were disregarded in all subdivided land. Further violations for the floor space index and the building coverage ratios were also recorded. At the same time, all main road junctions had been encroached on by developers.

Studies in Africa have also given an account of how planning standards are seldom complied with by developers. For example, in Ado-Ekiti, Nigeria, Ojo-Fajuru and Adebayo (2018) observed that unawareness of the benefits of development control and inadequate enforcement by the planning institutions were the main reasons why most developers encroached on the designated public open spaces. These arguments agree with that of Twum-Darko and Mazibuko (2015) who averred that developers in South Africa flouted the National Building Regulations because they were unaware of its existence. The findings, however, contradict that of Arimah and Adeagbo (2000) that confirmed the lack of a significant correlation between developers' awareness of the existence of planning standards (such as a building coverage ratio, and setbacks), on one hand, and the extent to which they complied with them on the other hand. In other words, awareness of the standards was not a predictor for conformity. Noncompliance was mainly instigated by inadequate inter-agency coordination. Developers without planning permission are likely to flout planning standards. This was corroborated by Obongha, Ojikpong, Emri and Upuji (2016) in Calabar South where over 100 buildings were developed without the requisite planning permission, consequently disregarding the requirements of the Cross River State Building Regulations of 1984. These findings may further be compared to that of Jimoh, Al-Hasan, Imimole and Ahmed (2018) established that developers in the Auchi Edo State contravened planning control regulations such as setbacks, and exceeding of building coverage ratio, a problem blamed on the socioeconomic characteristics of respondents, and inadequate staff establishment within the Auchi Planning Authority. A different study in Calabar by Offiong (2017) provided a new insight that the age of the buildings, possession of approved building plans, housing development density and competency in supervision jointly affected compliance with planning standards. A similar line of argument was maintained in Wa Municipality, Ghana, by Dambeebo and Jalloh (2018) who discerned that weak enforcement provided room for noncompliance leading to disorganized spatial development. This appears to agree with what Tasantab (2016) already found out in Sekondi-Takoradi that most developers flouted planning standards on account of inadequate enforcement. In Eldoret, Kenya, Ngetich, Opata and Mulongo (2016) established that although a planning standard of 3 meters had been recommended for building lines, 100 per cent, 95 per cent, 84 per cent and 74 per cent of developers in that order from Elgon View, Maili Nne, Kimumu and Langas disregarded it. Further, 11per cent of developers who had approved building plans amended them without seeking for a new approval from the local authority.

There is no doubt that the reviewed body of empirical evidence suggests that developers seldom comply with planning standards. However, there is still a dearth of knowledge on how compliance with planning standards that are used in regulating the setbacks around domestic buildings may be statistically determined after undertaking pragmatic on-site measurements. Most studies have moreover delved on what causes non-conformity with recommended planning standards instead of quantifying their extent of conformity. The current study fills this new gap in knowledge since planning standards provide the basis for undertaking development control, in addition to acting as a precursor for implementing urban land use development plans.

3. Materials and Methods

3.1 The Study Area

Kisii Town is located 120 kilometres northwest of Nairobi City County, the capital city of the Republic of Kenya (Figure 1). The town is currently designated as the administrative and commercial headquarters of Kisii County. It is spatially segregated into five selections, namely: Mwamosioma, Bobaracho, Bomwanda, Nyanchwa, Township, and Nyaura. In reference to the Constitution of Kenya (the Republic of Kenya, 2010), the County Government of Kisii

(CGOK) retains the exclusive legal jurisdiction of undertaking land use planning and enforcement of development regulations control in Kisii Town.

Figure 1: Kisii Town location in Kenya, Source – Writerstake (2019)

According to the Constitution of Kenya (the Republic of Kenya, 2010), the CGOK operates under legislative and executive arms. While the legislative arm makes county legislation, the County executive, in contrast, implements the national and county legislation, including managing and coordinating the functions of all devolved county departments. This indicates that once the County legislature has pronounced itself in a way of passing applicable legislation on planning and development control, it is the responsibility of the County executive which is headed by the Governor to undertake monitoring and enforcement.

The town's population was estimated at 90,700 by the Kenya Population and Housing Census Survey in 2019 (the Republic of Kenya, 2019a). This is projected to 135,000 by 2032. Kisii Town has also the third-highest population density (2,862 per km^2) in Kenya (after Nairobi and Mombasa cities). A combination of a high population growth rate and density in the absence of adequate development control by the CGOK has compounded the challenges which are related to compliance with planning standards.

3.2 Theoretical Context

This study was anchored in the Theory of Regulatory Compliance (TRC) which is primarily concerned with the necessity to comply with regulations or rules. The theory, according to Fiene (2016), first came to light in the 1970s, the era when the association between compliance with regulations was correlated with best-practice standards and outcome data. From this comparison, it became manifest that total compliance with stipulated rules and regulations contributed to positive results. When related to the current study, TRC makes a justification on why developers in Kisii Town should comply with the planning standards that regulate setbacks. The aim is to attain the objective of sustainable spatial urban development. To achieve this, the CGOK uses development control to ensure total compliance by developers in regard to planning standards that relate to the spaces around domestic buildings. To additionally link the theory with the existing policy and legislative framework, the Ministry of Lands (the Republic of Kenya, 2007) prepared the Physical Planning Handbook in 2007 with an intention of providing clear guidelines on the minimum standards that developers should comply with as a way of promoting the best practice in land use planning.

Further, in an attempt to enforce regulatory compliance, section 57 (2) of the Physical and Land Use Planning Act of 2009 (the Republic of Kenya, 2019b) states that any person who commences any development without obtaining a development permit is liable to be convicted to a fine of not less than five hundred thousand shillings (50,000 USD) or to incarceration for a term not less than two months or to both. Compliance with planning standards that regulate setbacks is, therefore, realized through statutory regulatory compliance.

3.3 Population, Sample and Sampling Design

The CGOK does not maintain a spatial database of residential developments in Kisii Town. As such, there was no readily available sampling frame for residential developments. To overcome this limitation, high-resolution satellite imagery that covered the seven neighbourhoods and QGIS software was used to digitise all building developments from the seven neighbourhoods.

A comprehensive ground truthing exercise was afterwards undertaken to ensure that the digitised developments were residential in addition to determining the boundary for each neighbourhood to ensure no overlaps in data collection. A total of 7,430 residential building developments was successfully mapped (Table 1). This provided the required sampling frame and the target population which was used to determine the extent to which developments were complying with the recommended planning standards as regards the spaces around domestic buildings.

Determination of sample size was carried out using Krejcie and Morgan (1972) sample size determination table which recommends that if the population range from 7,000 to 7,999, a sample size of 364 should be selected.

Table 1: Neighbourhoods sampling promotions.

Neighbourhood/ Strata	Mapped Houses	Sample Size
Jogoo	1,551	220
Mwembe	1,105	54
Nyamage	1,171	57
Nyanchwa	673	33
Nyamataro	808	40
Egesa	821	40
Daraja Mbili	1.301	64
Total	7,430	364

Having determined the sample size, seven residential neighbourhoods were taken as strata and proportional random samples afterwards drawn to arrive at a sample size of 364 residential developments. Based on the sample of 364, proportional random sampling through the random numbers was applied to select the desired sample size for each neighbourhood. Random numbers were used because they permit the selection of samples without any bias. As such the sample can be said to be representative of the whole population.

3.4 Data Collection and Analysis

A structured observation checklist was used to collect data from each sampled residential development. The checklist was divided into four columns. The first indicated the description of the applicable planning standards. Conversely, while the second and the third columns respectively, showed the value for each recommended planning standard and their observed extent of compliance, the fourth column recorded the ensuing deviation from each of the recommended planning standards. In this case, a negative variance denoted noncompliance while a positive deviation confirmed compliance.

Collected data were analyzed using a one-sample t-test to statistically determine the extent at which each planning standard had been complied with by sampled developments. The observed extent of compliance was determined through factual on-site measurements. This is a key attribute of positivist research philosophy which advocates for a deductive method of inquiry where analysis involves working on quantifiable and measurable observations including hypothesis testing using statistical analyses. The research hypotheses were also tested using a one-sample t-test.

The Republic of Kenya (2007) through the Physical Planning Handbook recommends that domestic buildings be sited (setback) by leaving an open space in front, which shall extend throughout the whole width of the front of the building to a distance of not be less than 6 m, measured at right angles, provided that, if the building fronts a street of lesser width, the width of such open space may not be less than the width of the street, together with one half of the difference between that width and 6 metres.

The Handbook further prohibits the construction of any part of a building (normal housing) within 4.5 metres and 3 metres of the rear and side boundary of a site respectively. Figure 2 gives an illustration of the recommended setback planning standards as per the Handbook.

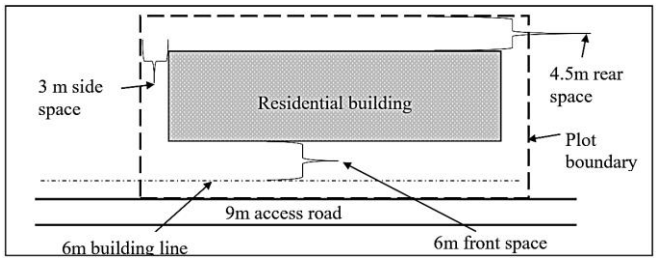

Figure 2: An illustrated guide on recommended planning standards for setbacks.

As illustrated (Figure 2), the recommended setbacks promote adequate outdoor spaces and well lightened and ventilated building interiors. They also promote fire safety planning by spacing buildings away from each other, therefore allowing easy passage of vehicles. These are the planning standards for setbacks that are used by the CGOK in regulating the development of domestic buildings. The current study is, therefore, concerned with the extent to which developers comply with them. This is because the provision of such setbacks further permits sufficient space for accommodating amenities such as septic tanks, water and sewer reticulation. They also create space for parking.

The current study finally tested for the assumption of normality in the collected data through the application of the Kolmogorov-Shapiro. This is because assessing the normality assumption is necessary if the collected data is parametric in nature, in consequence a key determinant of its validity. The rule of thumb is always that if the Sig. value of the Shapiro-Wilk Test is greater than 0.05, the data is considered as normally distributed. However, if it is below 0.05, the data significantly deviate from a normal distribution.

4 Results and Discussions

The objective of this study was to determine the extent to which developers in Kenya, a case study of Kisii Town, comply with the recommended planning standards that regulate the spaces around domestic buildings. This section therefore concurrently presents and discusses the research findings per residential neighbourhood. It commences by presenting the results of the normality test in addition to the outcome of the response rate. The section caps by testing the research hypotheses.

4.1 Tests for Statistical Assumption of Normality and Response Rate

The results Kolmogorov-Smirnov Test for normality reported a high p-value of 0.316. Since this was greater than 0.05, it was concluded that the data were normally distributed. The response rate for the checklists that were used to record the extent of conformity with the recommended planning standards was also determined. This is because response rate generally provides an indicator that can be used to better understand the validity of survey data. The response rate for the checklists used in the current study was 80% (290 out of 364). This was way above the minimum threshold of 50% as suggested by Mugenda and Mugenda (2003) thereby giving credibility for data analysis and reporting.

4.2 Compliance Assessment to Planning Standards

4.2.1 Nyanchwa

Analysis commenced in Nyanchwa by examining the extent to which residential building developments in the study area were complying with the recommended planning standards that are used by the CGOK in regulating spaces around and in front (setbacks) of domestic buildings.

Initial results showed that observed mean compliance (M = 1.88, SD = 0.52) for side spaces was lower than recommended mean of 3 metres by 1.12. Regarding rear spaces, the mean (M = 2.40, SD = 1.17) was lower than the recommended standard of 4.5 meters by 1.6. With reference to front spaces, the mean (M = 2.17, SD = 1.83) was also lower than the recommended 6 metres by 0.83. From this background, using one-sample t-test, the study further sought to determine if the observed noncompliance by developers were by any chance statistically significant (Table 2).

Table 2: One-test for observed compliance in Nyanchwa.

Planning Standard	t	df	Sig. (2-tailed)	Mean Difference	Test Value
Side space	-10.570	23	.000	-1.124	3m
Rear space	-8.757	23	.000	-2.096	4.5m
Front space	-2.226	23	.036	-.8333	6m

In the first incident, observed measurements for side spaces were found to be statistically significantly lower by 1.124 than the recommended planning standard of 3 metres, t (23) = -10.570, p = .000. Similarly, in the second case, observed measurements for rear spaces were also statistically and significantly lower by 2.096 than the recommended planning standard of 4.5, t (23) = -8.757, p = .000.

As regards front space, observed measurements were correspondingly lower by .833 than the recommended standard of 6, t (23) = -2.226, p = .036, attesting that both enforcement and monitoring of residential building developments by the current and previous planning authorities in Nyanchwa have not been effective.

4.2.2 Jogoo, Egesa, Nyamataro, and Daraja Mbili

These four neighbourhoods were jointly analysed because they are located in the same sublocation of Mwamosioma, the largest sublocation in Kisii Town. It was found out that in Jogoo, the means for front space (M = 5.56, SD = 1.82), side space (M = 1.97, SD = 1.31) and rear space (M = 2.89, SD = 1.93) were lower than respective test values of 6.0, 3.0 and 4.5. In Nyamataro, observed means for front space (M = 3.91, SD = 1.84), side space (M = 1.51, SD = 0.78) and rear space (M = 2.36, SD = 1.44) were in the same way less than the corresponding planning standard test values.

A similar pattern repeated in Egesa where the means for front space (M = 4.97, SD = 1.82), side space (M = 1.73, SD = 1.30) and rear space (M = 2.25, SD = 1.44) further fell below the test values. Daraja Mbili was no exception where means for front space (M = 3.59, SD = 1.56), side space (M = 1.92, SD = .931) as well as rear space (M = 2.34, SD = 1.80), were below their respective test values (See Table 2).

Table 2: One-sample statistics on compliance in Egesa, Nyamataro and Daraja Mbili

Description of Planning Standard/Neighbourhood	N	Mean	SD	SEM	Test Value
Jogoo					
Front space	70	5.56	1.82	0.22	6.0m
Side space	70	1.97	1.31	0.16	3.0m
Rear space	70	2.89	1.93	0.23	4.5m
Nyamataro					
Front space	35	3.91	1.84	0.31	6.0m
Side space	35	1.51	0.78	0.13	3.0m
Rear space	35	2.36	0.88	0.15	4.5m
Egesa					
Front space	31	4.97	1.82	0.33	6.0m
Side space	31	1.73	1.30	0.23	3.0m
Rear space	31	2.25	1.44	0.26	4.5m
Daraja Mbili					
Front space	60	3.59	1.56	0.20	6.0m
Side space	60	1.92	.931	.120	3.0m
Rear space	60	2.34	1.80	0.23	4.5m

A determination of the significance of noted differences (observed compliance against test values) was further tested using a one-sample t-test (Table 3).

Table 3: One-sample test on compliance in Jogoo, Egesa, Nyamataro and Daraja Mbili

Description of Planning Standard/Neighbourhood	t	df	Sig. (2-tailed)	Mean Difference	Test Value
Jogoo					
Front space	-2.03	69	.05	-0.44	6m
Side space	-6.58	69	.00	-1.03	3m
Rear space	-6.95	69	.00	-1.61	4.5m
Nyamataro					
Front space	-6.717	34	.00	-2.08	6m
Side space	-11.37	34	.00	-1.49	3m
Rear space	-14.45	34	.00	-2.14	4.5m
Egesa					
Front space	-3.16	30	.00	-1.03	6m
Side space	-5.45	30	.00	-1.27	3m
Rear space	-8.73	30	.00	-2.25	4.5m
Daraja Mbili					
Front space	-11.93	59	.00	-2.41	6m
Side space	-8.98	59	.00	-1.08	3m
Rear space	-9.27	59	.00	-2.16	4.5m

Results disclosed that in Jogoo, compliance with front spaces was statistically lower as corroborated by a mean difference of -0.44, t (69) = -2.03, p =.05. The mean compliance with side space was correspondingly lower with a mean difference of -1.03, t (69) = - 6.58, p =.00. The same applied to rear space, whose mean difference (-1.61), was highly significant, t (69) = -6.95, p =.00. In Nyamataro neighbourhood, front space compliance as well, fell short of meeting the test value as shown by a significant mean difference of -2.08, t (34) = -6.717, p = .00. Additionally, compliance with side space recorded a significant mean difference of -1.49, t (34) = -11.37, p = .00, so was the mean difference in the observed rear space of -2.14, t (34) = -14.45, p = .00. As regards Egesa, front spaces reasonably recorded declined mean differences (-1.03), t (30) = -3.16, p = .00. Moreover, observed mean difference (-1.27) for side spaces was significant, t (30) = -5.45, p = .00.

Akin to other standards, the mean difference (-2.25) for rear spaces was highly significant, t (30) = -8.73, p = .00. In Daraja Mbili, the situation was not different where the mean difference for front space showed noncompliance (-2.41) that was significant, t (59) = -11.93, p = .00. The same applied to side spaces where mean difference was -1.08, t (59) = -8.98, p = .00, in addition to rear spaces which also had a significant mean difference (-2.16), t (59) = -9.27, p = .000, thus inadequate development control by the CGOK.

4.2.3 Mwembe and Nyamage

Data analysis for these two neighbourhoods were analyzed together since they have been zoned by the CGOK as low density. Regarding front spaces, observed mean compliance for Mwembe (M = 3.10, SD = 1.60) was less than six (6) metres with a resultant modal frequency of three (3) metres. Likewise, in Nyamage, observed mean compliance on front space (M = 4.6, SD = 2.16) fell short of complying with the recommended standard (6 metres). The modal frequency for Nyamage (Mo = 4) was higher than that of Mwembe. It was observed that while the mean compliance with side spaces in Mwembe (M = 1.06, SD = 0.81) was less than recommended six (6) metres, the same applied to Nyamage (M = 1.12, SD = 0.92) with a modal frequency of zero (0). A further descriptive analysis on rear space confirmed that observed mean compliance (1.47) for Mwembe was lower than 4.5 metres, so was a comparable trend in Nyamage (M = 1.76, SD = 1.31). Both Mwembe and Nyamage reported equivalent low modal frequencies (Mo = 0) for rear spaces (Table 4).

Table 4: One-sample statistics on compliance in Mwembe and Nyamage

Description of Planning Standard/Neighbourhood	N	M	SD	SEM	Mo	Test Value
Front space						
Mwembe	40.00	3.10	1.60	0.25	3	6m
Nyamage	30.00	4.60	2.16	0.39	4	6m
Side space						
Mwembe	40.00	1.06	0.81	0.13	1	3m
Nyamage	30.00	1.12	0.92	0.17	0	3m
Rear space						
Mwembe	40.00	1.47	1.43	0.23	0	4.5m
Nyamage	30.00	1.76	1.31	0.24	0	4.5m

Based on observed deviations, additional analysis was further conducted to determine whether all the resultant nonconformities in the neighbourhood were statistically significant in relation to the respective test values (Table 5).

Table 5: One-sample test on compliance in Mwembe and Nyamage

Description of Planning Standard/Neighbourhood	t	df	Sig. (2-tailed)	Mean Difference
Front space (Test Value = 6m)				
Mwembe	-11.48	39.00	0.00	-2.90
Nyamage	-3.55	29.00	0.00	-1.40
Side space (Test Value = 3m)				
Mwembe	-15.11	39.00	0.00	-1.94
Nyamage	-11.17	29.00	0.00	-1.88
Rear space (Test Value = 4.5m)				
Mwembe	-13.44	39.00	0.00	-3.03
Nyamage	-11.47	29.00	0.00	-2.74

As concerns front space setbacks, test results confirmed that mean compliance differences for Mwembe (-2.90) and Nyamage (-1.40) were individually statistically significant, t (39) = -11.48, p = 0.00 and t (29) = -3.55, p = 0.00 respectively. In all cases, mean compliance denoted deviations from the standard test values. Similar observations were made in the side spaces where corresponding mean differences for Mwembe and Nyamage (-1.94 and -1.88) were statistically significant, t (39) = -15.11, p = 0.00 and t (29) = -11.17, p = 0.00.

A final analysis on rear space confirmed significant negative mean differences (-3.03 and -2.74), t (39) = -13.44, p = 0.00, and t (29) = -13.44,

p = 0.00 respectively. An illustration of noncompliance with the recommended 4.5 metres rear setback planning standard in Daraja Mbili is demonstrated in Figure 3.

Figure 3: Noncompliance with rear setback planning standard in Daraja Mbili

In the above occurrence, the entire 4.5 metres rear setback has been used to develop servant quarters and stores, oblivious of the important role that it provides. A challenge is bound to arise in case of emergencies such as those associated with fire disasters. This undermines development control principles of safety, access, convenience, and aesthetics, consequently signifying inadequate development control.

4.3 Results of Hypothesis Testing

The research findings have so far demonstrated that most residential developments from each of the neighbourhoods of Kisii Town do not comply with the stipulated planning standards for the setbacks around domestic buildings. This further provides an insight that development control by the CGOK is inadequate.

From the foregoing background, this section now presents the results of the significance tests for the three research hypotheses which were tested using one-sample t-test:

4.3.1 First Hypothesis

"H_{01}: There is no statistically significant difference between the recommended planning standards for the front setbacks and the observed extent of compliance by developers in Kisii Town" (Table 6).

Table 6: Significance test for the first hypothesis.

	Test Value/planning standard = 6 m			
Front space setbacks	t	df	Sig. (2-tailed)	Mean Difference
Recommended planning standard *vs* observed extent of compliance	-14.746	289	.000	-1.68931

As indicated in Table 6, the test found a statistically significant difference between the two variables, t (289) = -14.746, p = .000. The null hypothesis was, for that reason, rejected at the 95% confidence level owing to the fact that on average, compliance with the recommended planning standard for the front setbacks declined by a calculated mean of 1.68931m.

4.3.2 Second Hypothesis

"H_{02}: There is no statistically significant difference between the recommended planning standards for the side setbacks and the observed extent of compliance by developers in Kisii Town" (Table 7).

Table 7: Significance test for the second hypothesis.

	Test Value = 3m			
Side Space setbacks	t	df	Sig. (2-tailed)	Mean Difference
Recommended planning standard *vs* observed extent of compliance	-8.937	289	.000	-.86917

As the case of the first hypothesis, the results presented in Table 7 reports a statistically significant difference between the two variables (recommended planning standards for side setbacks and the observed extent of conformity by developers in Kisii Town), t (289) = -8.937, p = .000. The null hypothesis was consequently rejected at the 95% confidence level on the

account that compliance with the recommended setback planning standard significantly declined by a mean of. 0.86917m.

4.3.3 Third Hypothesis

''H_{03}: There is no statistically significant difference between the recommended planning standards for the rear setbacks and the observed extent of compliance by developers in Kisii Town'' (see Table 8).

Table 8: Significance test for the third hypothesis

Rear space Setback	Test Value = 4.5 m			
	t	df	Sig. (2-tailed)	Mean Difference
Recommended planning standard *vs* observed extent of compliance	-20.382	289	.000	-2.01079

It is clear from Table 8 that there is a statistically significant difference between the recommended standards for the rear setbacks and the observed extent of compliance by developers for the reason that, t (289) = -20.382, p = .000. This made a justification for the rejection of the null hypothesis at the 95% confidence level given that on average, the observed compliance declined by a mean of 2.01079 m.

The results of the three hypotheses that have been tested outwardly demonstrate that owing to inadequate development control by the CGOK, most developers continue to flout the recommended planning standards for setbacks. If the status quo remains, it is anticipated that the challenges related to unregulated housing development in Kisii Town are bound to further escalate in the near future at the detriment of sustainable urban development.

To this end, the findings of the current study concur with that of Babatunde and Emmanuel (2014) which appraised development control in Ogbomoso South Local Government, Oyo State, Nigeria, and consequently found a relationship between the extent of compliance with development control regulations and attainment of development planning objectives. The current study, however, determined the difference between the recommended planning standards for the setbacks and their observed extent of compliance by developers, thus further filling the research gap that hitherto existed on compliance assessment of recommended planning standards.

5. Conclusion

Planning standards that regulate spaces around domestic buildings in Kisii Town are widely disregarded owing to inadequate development control as well as weak monitoring regime by the CGOK. The problem continues notwithstanding the legal framework that has clearly given the CGOK the statutory powers of enforcing compliance. Disregard of planning standards may suggest why Kisii Town continues to experience problems such as inadequate parking within residential areas, encroachment on road reserves, pressure on infrastructural services and environmental degradation. The current setting dents the development control principles of aesthetics, access, convenience and safety. It further overlooks the United Nation's much-publicized goal on sustainable cities and communities which targets that all countries should by 2030 have promoted inclusive and sustainable urbanization as well as enhanced their capacity for integrated and sustainable human settlement planning.

Having ascertained the prevailing status of affairs, there is a dire need for the CGOK to rethink of a workable strategy that would address the problem at hand because it is obvious that very little can be done to reverse the deeply rooted nonconformities as this might call for unpopular initiatives such as demolition of the affected buildings. The move is likely not to succeed as it would derail the national government's current ambitious plan of developing at least 500,000 affordable residential housing units by 2022.

Henceforward, a recommendation is made that the CGOK should in accordance with section 46 of the Land Use and Physical Planning Act, 2019, urgently endeavour to prepare a comprehensive Local Physical and Land Use Development Plan for Kisii Town to provide, among other statutory requirements, clear zoning guidelines including those related to planning standards on setbacks. The zonal guidelines should be unique to the specific niche of Kisii Town hence addressing the limitations of the guidelines hitherto issued under the Physical Planning Handbook, 2007. The

central argument is the CGOK should purpose to develop standards that are customized to fit and address the current and the unique needs of its environment instead of relying on general standards whose development was conceptualized at the national level, therefore, not compatible within the prevailing local socio-economic dynamics and spatial structure. While developing the new standards, care should be taken to ensure that the entire process is stakeholders driven. The planning standards should, thereafter, form the basis for approving subsequent applications for development permits once they have been approved.

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Conflict of interest
The Author declares no conflict of interest in this research publication.

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