ICONARP

ICONARP

International Journal of Architecture & Planning

INDEXED IN
EMERGING SOURCES CITATION (Web of Science)
CLARIVATE ANALYTICS

NSD Norwegian Register for Scientific Journals

E-ISSN: 2147-9380
Volume 8
Special Issue
December 2020

International Journal of Architecture & Planning
Volume 8, Special Issue, December 2020
DOI: 10.15320 / E-ISSN: 2147-9380
Online: http://iconarp.ktun.edu.tr/iconarp

ICONARP

This special issue was created by selecting the best papers presented at the International Congress of Architecture and Planning (ICONARCH IV) between 13-15 October 2020. The papers carefully selected by the ICONARCH IV Organizing Committee have been re-evaluated by the referees with a double blind peer review. Articles that received positive opinions from the referee reviews were published in the special issue after corrections.

Contact: *ICONARP Konya Teknik Üniversitesi Mimarlık ve Tasarım Fakültesi Akademi Mah. Yeni İstanbul Cad. No: 235/1 Selçuklu/KONYA* ***Tel:*** *+90332 2051000* ***E-mail:*** *iconarp.editor@ktun.edu.tr*

International Journal of Architecture & Planning
Online: http://iconarp.ktun.edu.tr/iconarp

ICONARP

Volume 8, Special Issue, December 2020
DOI: 10.15320 /E-ISSN: 2147-9380

ICONARP INTERNATIONAL JOURNAL OF ARCHITECTURE & PLANNING

ICONARP as a free academic e-journal considers original research articles and viewpoints in peer-reviewed.

Architecture, Planning and Design are strongly affected by other disciplines such as fine arts, philosophy, engineering, geography, economics, politics, sociology, history, psychology, geology, information technology, ecology, law, security and management. However, there are not enough academic journals which specifically focus on the connections of architecture, planning and design with other fields of science. ICONARP aims to fill that gap. Our scope is to provide a suitable space for theoretical, methodological and empirical papers, which use global and local perspectives together, in architectural and urban studies.

ICONARP aims to be a reputable platform for the studies of Architecture, Planning and Design. ICONARP's objectives are:

- To question global and local interactions in the field of Architecture, Planning and Design,
- To discover the relationship between Architecture, Planning and Design,
- To increase the contribution of Architecture, Planning and Design to social and behavioral sciences,
- To discover the relationship of Architecture, Planning and Design with other fields of science that are affected and affect,
- To develop theoretical and methodological foundations of Architecture, Planning and Design,
- To discuss the role of architects, planners and designers today and in the future,
- To compare the differences between architecture, planning and design research, practices and education in different countries,
- To bring a scientific view of current issues and discussions in field of Architecture, Planning and Design,
- To discover innovative methods and techniques in the field of Architecture, Planning and Design.

ABSTRACTING AND INDEXING

ICONARP is an Open Access Journal which presents its content freely for online researches with the aim of contributing to the global exchange of knowledge. ICONARP believes that providing free online access ensures a wider spectrum of research base and reading rate to develop the related literature.

"The abstracting, database and indexing services that ICONARP is included are: Emerging Sources Citation Index (ESCI) (Web of Science), DOAJ, Avery Index to Architectural Periodicals, Tubitak Ulakbim TR Dizin, Iconda Bibliographic (The International Construction Database), NSD Norwegian Register for Scientific Journals, ROAD (Directory of Open Access), Crossref, OpenAIRE, OCLC WorldCat, BASE (Bielefeld Academic Search Engine), Scilit, Google Scholar and D-Space (database)"

Cover Photo: Jakarta, Cover Owner: Fatih EREN, Cover Design: Mihrimah ŞENALP

CONTRUBITORS TO THIS ISSUE

Collins Ouma Agayi
PhD student, Faculty of Architecture and Design, Konya Technical University, Konya, Turkey.
E-mail: agaiagayi@gmail.com

Ümit Arpacıoğlu
Assoc. Prof. Dr., Faculty of Architecture, Mimar Sinan Fine Arts University, Istanbul, Turkey.
E-mail: umit.arpacioglu@msgsu.edu.tr

Ömer Bilen
Asst. Prof. Dr., Faculty of Architecture and Design, Bursa Technical University, Bursa, Turkey.
E-mail: omer.bilen@btu.edu.tr

Mehmet Gür
Dr., Faculty of Civil Engineering, Deparment of Geomatic Engineering, Yıldız Technical University, İstanbul, Turkey.
E-mail: gur@yildiz.edu.tr

H. Ercan Gürcan
Faculty of Architecture and Design, Konya Technical University, Konya, Turkey.
E-mail: mim.ercan.gurcan@gmail.com

Ayşenur Dağ Gürcan
Lecturer, Faculty of Fine Arts and Design, KTO Karatay University, Konya, Turkey.
E-mail: aysenur.dag@karatay.edu.tr

Kutay Karabağ
Lecturer, Faculty of Architecture, Bilgi University, Istanbul, Turkey.
E-mail: kutaykarabag@gmail.com

Ebru Kamacı Karahan
Asst. Prof. Dr., Faculty of Architecture and Design, Bursa Technical University, Bursa, Turkey.
E-mail: ebru.karahan@btu.edu.tr

Özer Karakayacı
Assoc. Prof. Dr., Faculty of Architecture and Design, Konya Technical University, Konya, Turkey.
E-mail: karkayaci@gmail.com

Ersan Koç
Asst. Prof. Dr., Faculty of Architecture and Design, Bursa Technical University, Bursa, Turkey.
E-mail: ersan.koc@btu.edu.tr

Sezgi Giray Küçük
Asst. Prof. Dr., Architectural Restoration Programme, Vocational School, Mimar Sinan Fine Arts University, Turkey.
E-mail: sezgi.giray.kucuk@msgsu.edu.tr

Duygu Okumuş
Lecturer, Faculty of Architecture and Design, Bursa Technical University, Bursa, Turkey.
E-mail: duygu.okumus@btu.edu.tr

Ayşıl Coşkuner Pamuk
Res. Asst., Department of Architecture, Istanbul Sabahattin Zaim University, Istanbul, Turkey.
E-mail: aysil.pamuk@izu.edu.tr

Zeynep Şahbaz
Graduate Student, Faculty of Architecture, Bilgi University, Istanbul, Turkey.
Email: zeysahbaz@gmail.com

İbrahim Agah Taştemir
Res. Asst., Department of Interior Architecture and Environmental Design, Istanbul Sabahattin Zaim University, Istanbul, Turkey.
E-mail: ibrahim.tastemir@izu.edu.tr

Veli Mustafa Yönder
Res. Asst. Faculty of Architecture, İzmir Institute of Technology, İzmir, Turkey.
E-mail: velimustafayonder@gmail.com

International Journal of Architecture & Planning
Online: http://iconarp.ktun.edu.tr/iconarp

ICONARP

CONTENTS

Volume 8, Special Issue, December 2020
DOI: 10.15320 /E-ISSN: 2147-9380

Research Article

ICONARP
International Journal of Architecture and Planning
Received: 13.10.2020 Accepted: 24.11.2020
Volume 8, Special Issue/ Published: 28.12.2020
DOI: 10.15320/ICONARP.2020.140 E- ISSN:2147-380

ICONARP

A Case Study on Generative Building Skin Forming by Employing Building Information Modelling (BIM) Tools

Veli Mustafa Yönder[1]

[1] Res. Asst. Faculty of Architecture, İzmir Institute of Technology, İzmir, Turkey. Email: velimustafayonder@gmail.com

Abstract

Purpose

This study aims to produce generative curtain wall geometries based on predetermined parameters such as storey information, shadow zones, preliminary building unit cost, frequency, etc. in a BIM platform for the preliminary design of a future project in Basmane and understand its novel outcomes and implications.

Design/Methodology/Approach

The methodology is construed over four successive phases, namely: the built environment modeling, analyses for a solid understanding of the study area, determination of the generative design criteria, and finally design solutions. In the initial phase, the case-study building in Basmane with the surrounding environment was digitally modeled for the following analyses. Several programs apart from BIM have been utilized for the daylight zones and wind simulations. The daylight areas affecting the surface of the studied building were marked schematically per the simulation data. Subsequently, the area of the curtain wall, material type, preliminary building unit cost (assembly/labor and material cost), the height of storey, the density of elements, and fixed shading devices parameters were tested via optimization thru generative design methodology and provide potential design solutions by utilization of BIM tools.

Findings

The findings of this study could be boiled down to a single comprehensive objective of generating outputs of assorted design solutions thru a generative design approach. When the output data set is visualized via parallel coordinate graphs, it could be well articulated that the classification of rule-based relationships and the criteria interrelations were based on the designer's decisions.

Research Limitations/Implications

This study was examined on a case basis by an experimental approach. It shall be considered that the curtain wall construction encompasses diverse materials, connection details, and construction techniques that affect the final cost thus this research was conducted at the preliminary design stage and might not reflect actual costs.

Social/Practical Implications

Albeit the technical aspect of the curtain walls is not included in this case study, it helps generative design culture by demonstrating the extent of the opportunities it offers to designers in the preliminary design stage.

Originality/Value

This study is a show-case of a preliminary design for an actual building stock in the vicinity of Basmane focusing on the building envelope design process with multiple parameters and should be regarded as an opportunity to understand how innovative solutions alike are put forward for the use of designers.

Keywords: *Building skin, BIM, generative design (GD), visual programming language*

INTRODUCTION

Multi-dimensional and intricate building design processes involve numerous dissimilar meta-design methodologies and complex building development procedures. Digital building design and modeling via BIM tools facilitate the holistic handling of the design and construction processes (Eastman et al., 2011, p. 1). Besides, the real benefits of digital information modeling are best appreciated in designing complex structures, overseeing construction phases and building operations, creating as-built drawings, and assisting project management efforts. Naturally, BIM improves design documentation quality by allowing the sharing and coordination of drawings across the entire design team to minimize errors and cross-discipline clashes (Migilinskas et al., 2013). Congruently, digital mockups guide not only the novice designers but also the experts starting from the preliminary design stage to the final product as computer-generated models with detailed representation of the building components eases the understanding of the whole design at varying levels of detail. In the façade design, manufacturing and assembly phases, making use of novel digital methods such as BIM tools and their innovative strategies in place of traditional approaches is feasible. Each building façade system has gained a unique physical character by advances and innovations in technology and its implementation contained multiple peculiar parameters that affected its design cycle directly. The harmony of aesthetic concerns with the building components and environmental factors is one of the main parameters that necessitates a series of analysis and revisions which is easily realized in the BIM environment and that entails virtual simulations and real-time calculations accordingly. Moreover, these calculations and simulations can be utilized to assist in pre-design approaches as well as digital fabrication techniques, pre-fabrication methods, and on-site production options which would force the designer to develop competent virtual 3D mock-ups. Furthermore, conjoined efforts of BIM and generative design tactics can make it probable to dominate the early design process and set ultimate design approaches.

Differing from the traditional design process, the generative design employs a set of algorithms that mimics nature's evolutionary approach in the pursuit of attaining a variety of design outputs thru manipulation of the parameters and goals (McKnight, 2017). Chase (2005) asserted that generative design tools are based on key design concepts known as "procedures, geometry, encapsulation, recursion, reiteration, spatial relations, and transformations". Furthermore, 'structural analysis, form-finding, and energy modeling' can be utilized in a framework with a generative design process (Mirtschin, 2011). Apart from the aforementioned concepts, daylight can be included in this operation cycle registering a wide range of values (Gagne & Andersen, 2012). The functions provided within Autodesk Revit 2021 software package, namely, the 'workspace layout' and the 'optimizing the window views'

DOI: 10.15320/ICONARP.2020.140

represent the intersection area between BIM and generative design (Autodesk Blog, 2020). These specialized tools help designers make preliminary design decisions and suggest optimized reactions to the design problems. Nowadays, the generative design approach is more BIM-based than CAD-based thus it is inevitable to adopt an unorthodox approach than what is originally available (Ferreira & Leitão, 2015). GD forms a bridge between the creator and the final product and serves as a medium for the automation of several connected steps. The affinity of designers with sophisticated digital tools empowers them to automate or semi-automate some geometry creation steps. Such as, the digital prototypes created by parametric design can be given their final form under the control of the designer. On the contrary, in the generative approach, multiple design solutions can be offered for the user thru optimization. Briefly, generative design (GD) workflow is phased in three sections, namely, "pre-GD (data collection, determining constraints), GD (generate, evolve, evaluate), and post-GD (critical human involvement/manual design refinement)" (Villaggi & Nagy, 2019). In this context, this study explores the implementation of generative design under the BIM environment in the case of the curtain wall geometries. For the preliminary design phase, the benefits and disadvantages of this approach are scrutinized through a study model via certain parameters.

BACKGROUND OF CONTEXTUAL FRAMEWORK

Before understanding the interaction between BIM technologies and generative design methodologies, it is essential to have a solid understanding of these two distinct concepts in an individual setting and discuss their co-development progress. For this reason, the relationships established by optimization models, genetic algorithms (GA), and artificial neural networks (ANN) are collectively put in use to comprehend the overall concept from the perspective of the generative design domain. Genetic algorithms (GA), listed among the techniques used in evolutionary design procedures, assist decision-makers by augmenting the possibilities offered by design evolution through specific software platforms (Abrishami, Goulding, Rahimian & Ganah, 2014). Moreover, the genetic algorithm (GA) has superior features that can be used in resolving engineering design perplexities (Tayfur, 2014, p. 203) via combining design components in a revolutionary way. Genetic algorithms, one of the most popular methods of evolutionary computing with application versatility (Renner & Ekárt, 2003), appeals also the architects and artists to develop ambidextrous solution strategies and overcome certain design challenges (Bentley, 1999) thru which the most appropriate route is selected in the presence of multiple convenient results for the target environment. Meanwhile, all phases are carried out with dependent and independent variables under the control of influential factors. The concept of generative design, which was initially adapted to architecture by a design theorist named John

Frazer in the 1970s, has been researched from a theoretic and avant-garde perspective holistically (Frazer, 2002). Generative design culture benefits from various processes such as “self-organization, swarm systems and ant colonies, evolution, and generative grammars” (McCormack, Dorin & Innocent, 2004). The generative design supports the design process and enhances the designer’s current abilities thru the utilization of parametric concepts such as grammar, rules, and a defined set of products which renders computers more than mere modeling mediums (Shea, Aish & Gourtovaia, 2005). CAD systems and generative design can be intermingled. As such in Krish’s (2011) study, CAD-based generative design variations are final outputs of designated design problems filtered thru certain semantic system criteria such as cost, manufacturability, geometric viability, etc. Albeit the well-defined problem is multi-dimensional, the designers expect rational outputs in concert with architectural concerns from the generative design technique.

Generative design (GD) systems have been auspiciously employed in various innovative ways (Singh & Gu, 2012). These “virtual geometric processes” require the use of parametric constraints and intense numerical controls (Garber, 2014). The design optimizations assist in describing the relationship between parameters and sub-parameters formed by measured datasets run through holistic sophisticated models. Besides, by the assistance of data harnessed from dependable quantitative sources, the ability of switching from primitive to advanced forms can be acquired with advanced algorithms. The boundaries of geometry can be iterated according to several parameters introduced by rule-based definitions. One of the prerequisites for the creation of geometric variations is to maintain the losslessness of the rule and determinants for the targeted criteria. Thus, when determining the design scheme, it is necessary to have an accurate definition of the precursors and successors of the problem while overseeing a compatible relationship between the inputs. Hence, it is possible to access and re-interpret the solutions desired by the designer using scripts inherent to the digital tool. Intensive calculations and analyzes can be performed through advanced softwares/add-ons to ensure the operability of the optimized algorithm. A special iterative automated design package called “Generative Components” by Bentley provides designers with advanced toolsets to combine geometric modeling and programming to form architectural databases (Aish, 2003). Another digital tool is the Grasshopper, which offers algorithmic modeling, an add-on for Rhinoceros 3D software (Grasshopper 3D, 2019). This advanced add-on can be used both in computational design and exploration of experimental geometries. This program can also contribute to the creation of the form for digital fabrication such as CNC and 3d-printing. Processing, a programming language, allows users to perform "generative artwork” and “visualization” (Gross, et al.,, 2012).

DOI: 10.15320/ICONARP.2020.140

Building Information Modelling (BIM) Systems

Advances in computer-aided design systems affect the perceptions of 2D architectural representations and 3D digital drawing environments. However, these perceptions play a key role in the diversification of the design not only thru the aesthetic concerns but also the systematic composition. In that sense, CAD is a unique tool for architects and designers to manage geometric operations with digital commands. Basic functions such as the creation of wireframe models, dimensioning of data, and the creation of surfaces that are keen to the CAD platform got transferred themselves onto BIM. The transfer of architectural geometry to a virtual environment is handled thru the principles of the CAD framework which is bound by X, Y, and Z input datasets (voxel). Besides, owing to the implementation of voxel definition, the designers gain the ability to transfer various geometric drawing types (2D and 3D) to the digital environment via a chain of commands at their disposal. Since the CAD environment only allows the creation of geometric objects, drawings cannot be converted into interrelated building components. One of the fundamental differences between BIM versus CAD-based platforms is the coexistence of architectural, structural, and mechanical objects. All components in the BIM environment (fonts, templates, doors, windows, curtain walls, columns, floors, mechanical elements, furnishings, etc.) carry semantic data with regards to geometric information (width, length, height), attribute tables, and non-graphical features. Moreover, the establishment of parametric links makes the interaction between the objects possible unlike 2D CAD-based drawings (Wong & Fan, 2013). BIM is a multi-layered virtual system that helps to understand and supervise the building's overall digital transformation process in detail. Furthermore, unified efforts of making digital replicas of all structural, architectural, and MEP elements under BIM allows effective control of the design process.

Currently, BIM is appraised as a new way of approaching the design, construction, and maintenance of buildings (Bryde, Broquetas & Volm, 2013). The client's project and building performance requirements could be met by utilizing BIM in the design phase. Meanwhile, the utilization of BIM throughout the construction process promotes communication between design, construction, and manufacturing teams with implications on schedule, rework, and cost (Sebastian, 2011). Besides, a partial and complete visualization of the building is advantageous for designers, engineers, and contractors (Eastman, et al., 2011, p. 503). Objectives of ensuring compliance with regulations and standards, working interactively in dissimilar domains, and expediting cost estimation are the main drivers for exploring BIM (Figure 1). Opportunities for facilitating coordination between the teams and solving mutual problems are the extent of BIM cooperation. Being able to work at different levels of detail (LoD) allows complicated building elements to be separated according to their detail levels, and helps reveal different layers of the project (Fai & Rafeiro, 2014). For a better

ICONARP – Volume 8, Special Issue / Published: 28.12.2020

model visualization and user interaction, BIM provides a set of eloquent visual instruments such as showing original joints in full detail or allowing partial sections of the 3D model.

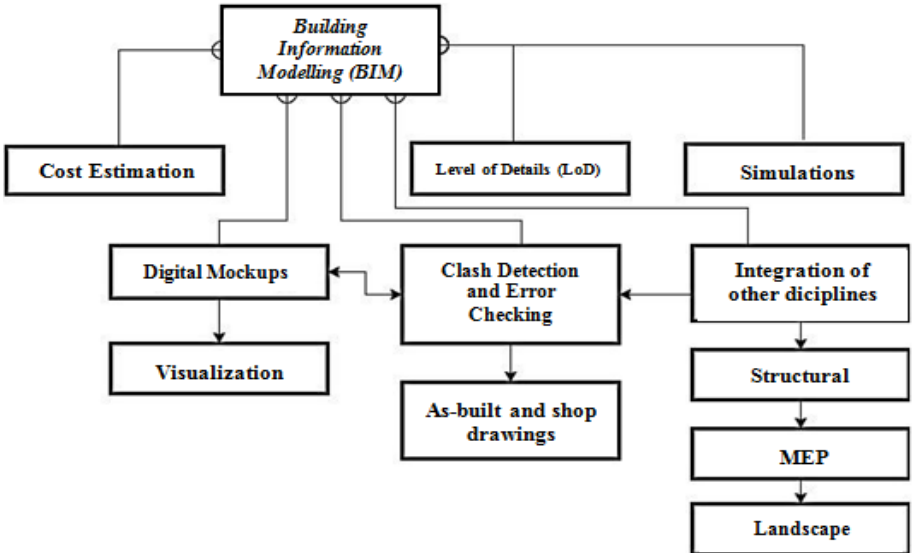


Figure 1. Operation scheme of BIM in a typical construction project.

Moreover, structural (columns, beams, slabs, etc.), mechanical (electrical, plumbing, ventilation, etc.), and architectural components (windows, doors, curtain wall, walls, ramps, stairs, etc.) can be overlapped in a BIM environment. Thus, the project's holistic perception and management gains are at disposal of decision-makers and project coordinators. Clash detection analysis, which requires the combined input of project stakeholders on a common 3D platform, can help prevent incorrect manufacturing and potential re-work, and costs and schedule impacts associated with it. Using BIM in the pre-construction stage has dissimilar purposes and obvious consequences (Latiffi et al., 2013). Besides, pre-construction design reviews can be carried out as part of error-checking procedures. Eventually, special material and detail solutions have been offered by custom add-ons to expand BIM capabilities to ameliorate how certain components of the building are created (roofs, façades, balconies, etc.). In particular, numerous add-ons provide solutions for the integration of prefabricated structural elements in the BIM model. Similarly, several specialized extensions could be exploited to create alternatives for a building skin design. Recently introduced technologies, namely, (VR) and augmented reality (AR) domains are gradually gaining a niche in building visualization and being implemented under the BIM hood. Design components can be examined in more detail via VR experience in the BIM environment (Wang et al., 2018). On the other hand, the collaboration between BIM and GIS (Geographic Information Systems) environment is capable of providing a holistic approach between construction, architecture, and engineering domains. Ability to exchange data between multiple environments, problems regarding infrastructure and superstructure can be handled with a holistic approach from a BIM, GIS, and facility

DOI: 10.15320/ICONARP.2020.140

management (FM) standpoint (Kang & Hong, 2015). Besides, cooperative use of GIS and BIM technologies contribute to urban planning with rational and sustainable solutions (Yamamura, Fan & Suzuki, 2017). Real-time simulations and calculations pertinent to building science can be accomplished with uttermost precision in the BEM (Building Energy Modelling) environment.

BIM, being an advanced digital tool, is at the disposal of sustainable architecture (Krygiel & Nies, 2008). The interpretation of the data from the simulations (building envelope thermal energy analysis, daylight and artificial lighting simulations, etc.) and the design decisions are reviewed in the early design phase (Negendahl, 2015). These decisions are later updated per the feedbacks. The outputs of artificial lighting analysis are not only appraised in the design evaluation process of the energy models but also forms a basis for lighting element assortments and their locations (Elbiz & Yönder, 2020). One emerging use of the BIM platform is the creation of as-built models of historical buildings (Barazzetti *et al*., 2015; Dore *et al*., 2015; Murphy, McGovern & Pavia, 2009). A 3D model replica of a historic building can be created using the reference images obtained via photogrammetric methods. Later on, structural and mechanical components are brought into this model and overlapped to achieve a complete design package. Thus, this final BIM document serves as a cultural heritage digital archive.

METHODOLOGY

This section is structured in four phases that examine the interoperability of BIM and generative design approaches on a case basis (Figure 2). The first step was to create a virtual model to understand the effects of daylight conditions and wind forces on the building and its surroundings throughout the year. Digital applications such as SketchUp 2019 for modeling the built-environment, Autodesk Revit 2020 for creating the BIM project, Autodesk Flow Design, a computational fluid dynamics (CFD) software, for simulating virtual wind behaviors, and Shadow Analysis 2 software for calculating shading time of the built environment were employed respectively. The second step was to create an approximate material list of the curtain wall construction and attain unit prices from varying sources such as the Ministry of Environment and Urbanization, private construction companies, and architectural offices to form a cost break-down list. Later, the assembly/labor and material costs were transferred to the Autodesk Revit environment and quantity take-off sheets were created accordingly. At this point, the objective of organizing data for comparative tabulation is met. The third step was to exploit complementary digital platforms such as Project Refinery Beta and Autodesk Dynamo for the generative design phase. These packages require knowledge of node-based visual scripting for defining the relationships between parameters. An initial accurate definition of the input data requires a certain degree of competency in the management of these advanced technological tools and iron out problems in the pace

of the process. As such, the creation and control of the geometry, the harmonious operation of the parameters, and the processing of outputs thru specialized definitions all facilitate the process.

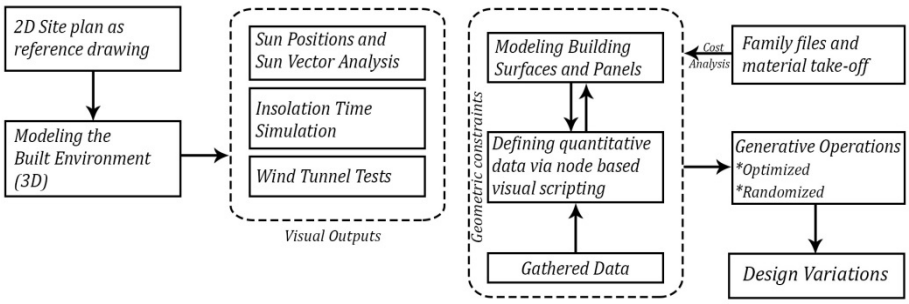


Figure 2. Presentation of the Methodology Workflow.

The highlighted building (Figure 3) subject to this case study is located in the Basmane district of İzmir which is also appraised for its historic organic urban texture. This district reserves an invaluable place in the urban memory with its multi-layered historical structure and enriched cultural heritage bestowed throughout the centuries.

Figure 3. The project area and its vicinity: Basmane, İzmir.

Geographically, the İzmir climate shows Mediterranean characteristics, thus summers are usually dry and hot, and winters mild and rainy (MGM, 2019). The temperatures throughout the year are the hottest between July and August and the coldest between January and February (MGM, 2019). Based on this meteorological information, protection from the daylight is mostly needed between summer and autumn. The

DOI: 10.15320/ICONARP.2020.140

environmental agents driving a designer's decision can be multi-layered. In the context of this study, the output of these agents aid in determining the orientation and position of the building skin components, and the location and size of the openings. Elements of computed geographical data comprise a series of values namely: latitude, longitude, time zone, and altitude. Likewise, this formation was elicited for the case project area. Months from summer to autumn, which have relatively higher temperature records, were best suited for understanding sun vectors and positions (MGM, 2019). Archetypally, the acquired geographical data (sun azimuth and sun altitude values) for the 28th of October (autumn season) at 03:00 pm were noted as 179° 49 and 38° 50 whilst for the 28th of July (summer season) at 11:00 am were noted as 86° 15 and 28° 2 respectively (Figure 4).

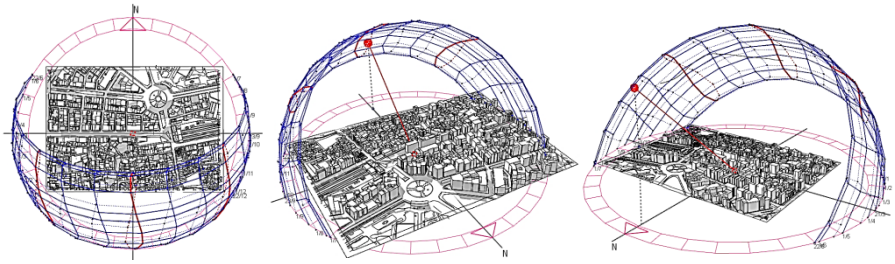


Figure 4. Sun vector positions in summer and autumn season at studied zone.

After calculating the sunlight behavior, the daylight conditions were tested on the case building model with the surrounding environment model. Analyzing the insolation conditions in this region with a high-dense building development will affect the transparency-solid ratio of the devised curtain wall. After entering the data set (seasonal and hour based sun positions) into the program's equitation, the daylight conditions of the region were formulated with Shadow Analysis software (Figure 5).

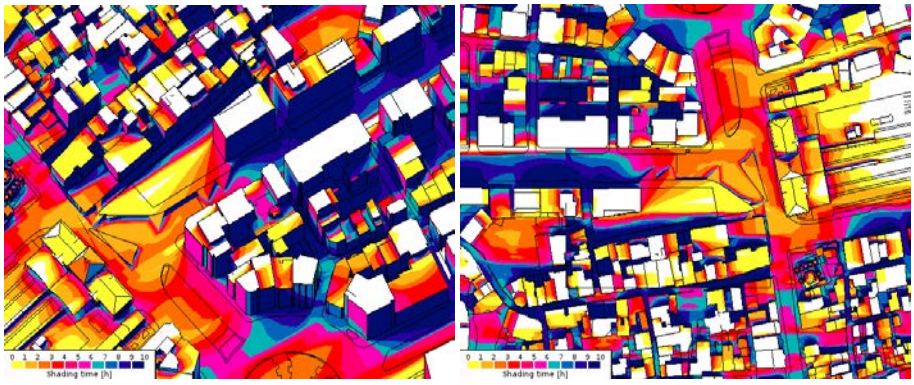


Figure 5. A daily shading duration analysis of the case study area during the summer season.
The analysis image sequence is marked with light yellow areas which represent the shortest shading duration and dark blue areas which represent the longest shad-Ing duration as shown in maps and isometric views.

The average shading duration on the main street was found to be approximately six hours per the performance map which was highly impacted by high and dense building stock. On the contrary, the case study having been located on a corner parcel has greatly decreased the shading duration compared to other neighboring buildings along the

street. Besides, for the single and two-storey buildings located in the south of the high buildings along the main street, shading duration was significantly high. Yet the shading duration of one and two-storey buildings on the east side was dramatically low. On 25 July 2019, a monitoring study accessing the extent of daylight and shading areas on the façade at various hours of the day was conducted to identify dispersion of the solid and porous/transparent surfaces schematically (Figure 6).

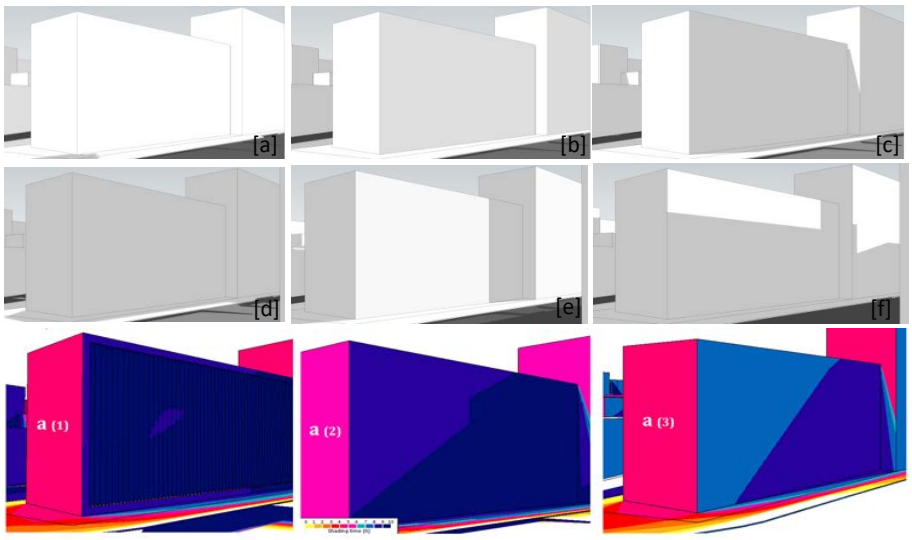


Figure 6. The visual presentation of the shading duration and daylight analysis of the building façade on 25th of July at below hours:
[a] 06:30 am 25 July 2019
[b] 07:30 am 25 July 2019
[c] 10:30 am 25 July 2019
[d] 01:30 pm 25 July 2019
[e] 05:30 pm 25 July 2019
[f] 06:30 pm 25 July 2019.

Finally, these observations transpired as schematic image-based outputs (2D) that will be used to decide on the type of building façade materials. Then, digital wind flow modeling studies on the entire 3D model were carried out to determine the wind forces and zones that the building and its surroundings were exposed to (Figure 7).

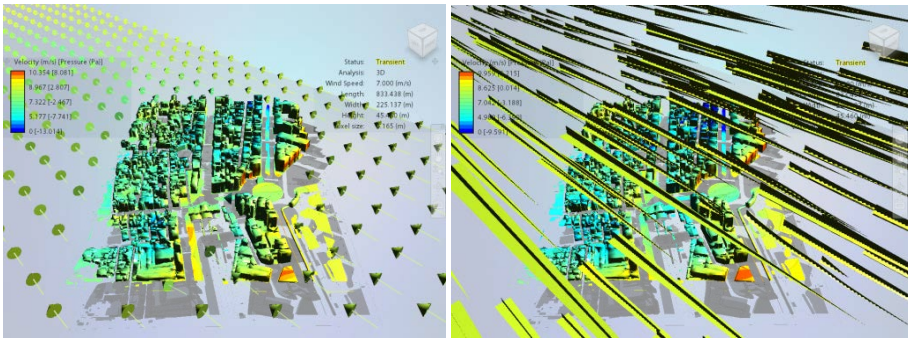


Figure 7. Wind flows and their distribution of the case district. The velocity value (m/s) is represented by a color scale ranging from blue to orange in an ascending magnitude.

The average velocity was marked as 3 km/h in the northeast direction during the winter season (MGM, 2019). Hitherto, color mapped analysis for the daylight conditions and wind are merely 2D sequential representations of the phenomenon to better understand physical environmental conditions. Preparation of an elaborate façade model before utilizing these reference images gives a rough idea about the project cost (assembly/labor and material) (Figure 8). It should be

DOI: 10.15320/ICONARP.2020.140

noted that input on floor heights, slab thicknesses, and proposed cladding techniques are needed before designing a variety of curtain wall systems and their virtual models. Based on these models, corresponding project material lists were prepared at a sufficient level of detail for the preliminary design phase. Furthermore, unit prices from varying sources such as the Ministry of Environment and Urbanization, private construction companies, and architectural offices were solicited to gather a cost break-down list for each design alternative. The cost estimation lists for assembly/labor and material were transferred to the Autodesk Revit environment and quantity take-off sheets were created accordingly (Figure 8). At this point, the processed data is suited for comparative tabulation.

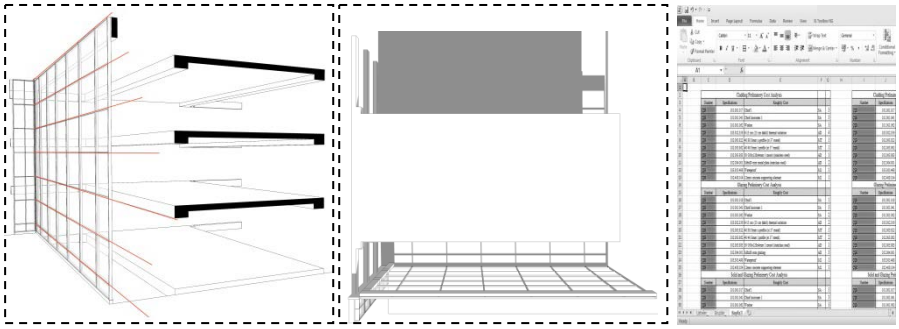


Figure 8. Curtain wall system modeled via BIM tools and corresponding material take-off lists in Excel

As it is indispensable for the generative process, the following phase involves algorithmic expression of the design geometry thru semi-automated definitions and inputs. The procedure of creating geometries for the generative design was accomplished thru Autodesk Revit 2020, Autodesk Dynamo environment, and Project Refinery Beta resources. By exploiting node-based visual scripting capabilities of the Dynamo, the geometry can be redefined and reiterated to meet design objectives set by common operations of independent or dependent parameters. Dynamo requires the input of a set of points before solving any form. In this respect, a series of points were created on the façade to form an evenly distributed grid line. Then, the width, length, and height values of the building volume were determined and made available before the processing of the façade geometry. The thickness and the area of the construction geometry are interrelated with the grid lines. These geometric data bridge operations are generally nested lists. This ensures minimal data loss between the control and compatibility of surface components so that area-based calculations and the intersection points of the grid lines can make a geometric connection between each other (Figure 9). The curtain wall components were placed to match the given grid lines. The rectangular solid surfaces match the user-defined base grid system(s) according to the building surface design. The number of divisions on a given grid could be manipulated by integer input sliders on the X and Y-axis. These manipulations have an immediate effect on the arrangement of vector lines, façade component

thickness and density. Per se vertical lines represents vertical curtain wall components fixed on the building structure. After the placement of low detailed horizontal and vertical curtain wall structures (except the load-bearing profiles, connection details, and glass material details) on the grid, material types (composite cladding and curtain wall glass) were identified according to reference 3D model created by traditional methods in the BIM environment.

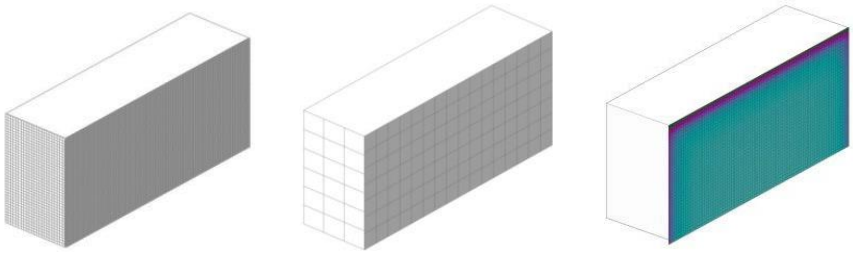


Figure 9. Identical façade elements and their intersection points on building skin surface

The quantity and cost variables pertinent to curtain wall components are taken into account with remaining inputs as material and total surface area information is essential for calculating the total cost of components. Subordinate inputs of other variables (width, length, and thickness) that go into the generative design process will instantly impact the total façade cost. The generative design method requires determining the delimiters and their value ranges (minimum and maximum) to set up a model. Later, this file which consists of six dependent parts was transferred to Project Refinery to obtain twenty design solutions with optimized option (Figure 10).

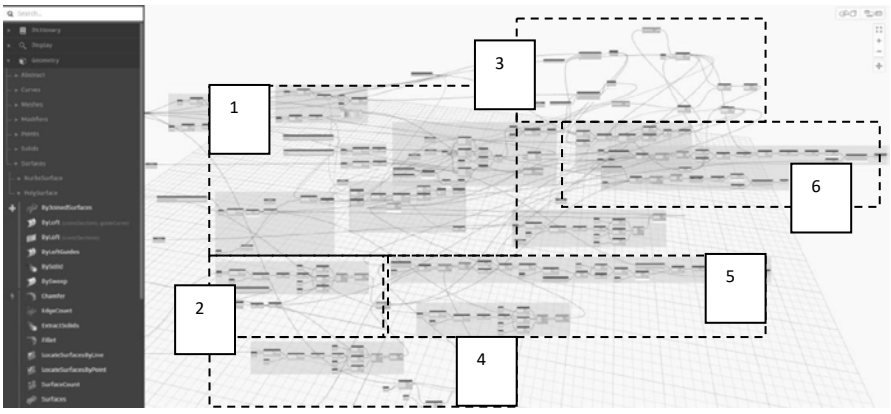


Figure 10. Backend development phases

RESULTS

A linear workflow, which starts with scrutinizing in-depth literature and continues with the creation of geometric definitions, the identification of the variables, and the preparation of datasets for the variables, was adopted to create a keen virtual environment for the generative design approach. After determining the case study parameters, initial settings were tested immediately on a trial-and-error basis. All input values were strictly bound to the case study surface area. The boundaries of trials were determined by the manual relay of shading lines on the

DOI: 10.15320/ICONARP.2020.140

façade. Twenty design solutions and six seed values were used with the optimized method in the automatic calculations. The parallel plot enumerates 12 parameters (length, height, thickness, unit area, void ratio, surface area, frequency, the building unit cost, slab thickness, storey height, assembly(labor) cost, and material cost) whose relationships are examined from left to right on a parallel coordinates (Figure 11). The three categories of materials (transparent, solid, and partial solid/transparent) were used separately in the optimization and the findings were monitored to create preliminary cost estimates. Among the three cost parameters in the list, building unit cost is the amalgamation of assembly (labor) costs and material costs.

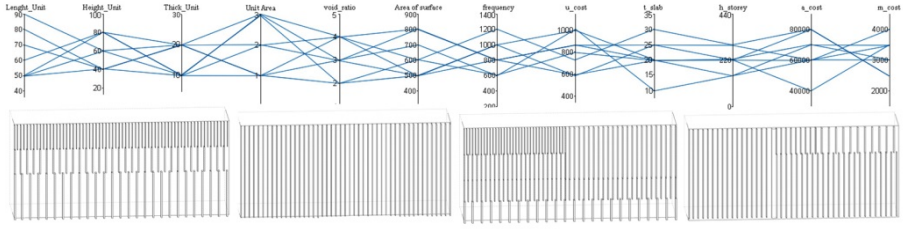


Figure 11. Output of parallel coordinates plot for the case study and initial design solutions

Considering the results, the floor height and slab thickness parameters are equally effective as frequency and material type parameters on the cost in the general equation. Besides, the type of material was shown to affect the unit price and its subcategories dramatically. It was also shown that the void area ratio had an inverse relationship to the surface area, building unit cost, assembly/labor unit cost, and material unit cost.

CONCLUSION

The use of the generative design in architecture provides numerous opportunities for the designer in the decision-making process. However, understanding design inputs and establishing meaningful relationships between them requires a series of steps, e.g., gathering, selecting, filtering, and managing raw data. Each step helps to sort out possible problems. In principle, algorithms are essential for supporting relationships between various design inputs during the pre-design phase. Architects/designers can choose one of the design variations and continue to improve it or test against their preliminary ideas. The tools that fall in-between building information modeling (BIM) and generative design (GD) systems enable designers to enjoy the multiple solution environment. With the increasing possibilities of design, it is obvious that many opportunities come forth. However, this requires careful organization and management of architectural and spatial geometries. Besides, form creation operations require a great deal of proficiency in both architectural design processes and programming knowledge. Unfortunately, not every novice designer is expected to be competent in programming so specialized applications and auxiliary instruments fill this gap. In this study, varying curtain wall types such as

glass, solid cladding, and hybrid were explored in schematic detail. Curtain wall construction techniques and materials are progressively improving and getting more attention as demand for high-rise buildings soars. Inherently, this raises concerns about the protection, design, and repair of façades. In this study, it was also attempted to create curtain wall geometries using generative design methods. One of the challenges encountered throughout the entire process was the collection of information needed to calculate the approximate cost. Since the approximate cost is calculated based on the preliminary design stages, it took time to identify the cost values. Therefore, the type and number of the material studied remained limited. In the scope of the this study, BIM and generative systems have been tested which will benefit more designers in the near future. One aspect that is considered advantageous during the study is the coordination caused by the fact that file transfers are in the BIM environment. Generative design models contribute to the implicit knowledge of the designer by characterizing the problem through multiple options for each condition. While in its infancy today, generative design models are likely to become one of the domains frequently used in the design works of the near future. Finally, future studies with comprehensive data sets are recommended to achieve the desired quality and quantity levels.

ACKNOWLEDGEMENT

I would like to thank Mr. Erhan Ertem (MSc. Architect) for his critical perspective and valuable comments.

CONFLICT OF INTEREST

No conflict of interest was declared by the author.

FINANCIAL DISCLOSURE

The author declared that this study has received no financial support.

ETHICS COMMITTEE APPROVAL

Ethics committee approval was not required for this article.

REFERENCES

Abrishami, S., Goulding, J., Rahimian, F. P., & Ganah, A. (2014). Integration of BIM and generative design to exploit AEC conceptual design innovation. *Information Technology in Construction*, *19*, 350-359.

Aish, R. (2003). Bentley's Generative Components: a Design Tool for Exploratory Architecture. *Bentley Systems Inc*.

Autodesk Flow Design Software. (2017, June). Flow Design Overview. https://www.autodesk.com/products/flow-design/overview

Autodesk Revit 2020 Software. (2019, August). General View. https://www.autodesk.com.tr/products/revit/subscribe

DOI: 10.15320/ICONARP.2020.140

Autodesk Blog. (2020, April 8). *Generative* Design *in Revit now available*. Revit Official Blog. https://blogs.autodesk.com/revit//2020/04/08/generative-design-in-revit/

Barazzetti, L., Banfi, F., Brumana, R., Gusmeroli, G., Previtali, M., & Schiantarelli, G. (2015). Cloud-to-BIM-to-FEM: Structural simulation with accurate historic BIM from laser scans. *Simulation Modelling Practice and Theory*, *57*, 71-87. https://doi.org/10.1016/j.simpat.2015.06.004

Bentley, P. (1999). An introduction to evolutionary design by computers. *Evolutionary design by computers*, 1-73. Morgan Kaufmann Publishers.

Bryde, D., Broquetas, M., & Volm, J. M. (2013). The project benefits of Building Information Modelling (BIM). *International Journal of Project Management*, *31*(7),971–980. https://doi.org/10.1016/ j.ijproman.2012.12.001

Chase, S. C. (2005). Generative design tools for novice designers: Issues for selection. *Automation in Construction*, *14*(6), 689-698. https://doi.org/10.1016/j.autcon.2004.12.004

Dore, C., Murphy, M., McCarthy, S., Brechin, F., Casidy, C., & Dirix, E. (2015). Structural simulations and conservation analysis -historic building information model (HBIM). *ISPRS - International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, *XL-5/W4*, 351-357. https://doi.org/10.5194/isprsarchives-xl-5-w4-351-2015

Dynamo. (2020, April). Open source graphical programming for design. https://dynamobim.org/

Eastman, C. M., Eastman, C., Teicholz, P. M., Sacks, R., & Liston, K. (2011). *BIM handbook: A guide to building information modeling for owners, managers, designers, engineers and contractors.* John Wiley & Sons.

Fai, S., & Rafeiro, J. (2014). Establishing an appropriate level of detail (LoD) for a building information model (BIM)-West Block, Parliament

Elbiz, G. & Yönder, V. M. (2020). The Daylight Quality in Educational Buildings in Terms of The Form of Skylight, *International Symposium of Architecture, Technology and Innovation (ATI)*, 26 - 33.

Gross, B., Bohnacker, H., Laub, J., & Lazzeroni, C. (2012). *Generative design: Visualize, program, and create with JavaScript in p5.js*. Princeton Architectural Press.

Ferreira, B., & Leitão, A. (2015). *Generative Design for Building Information Modeling*. CumInCAD. http://papers.cumincad.org/data/works/att/ecaade2015_118.content.pdf

Frazer, J. (2002). Creative Design and the Generative Evolutionary Paradigm. *Creative Evolutionary Systems*, 253–274. Elsevier. https://doi.org/10.1016/b978-155860673-9/50047-1

Gagne, J., & Andersen, M. (2012). A generative facade design method based on daylighting performance goals. *Journal of Building Performance Simulation*, *5*(3), 141-154. https://doi.org/10.1080/19401493.2010.549572.

Garber, R. (2014). *BIM design: realising the creative potential of building information modelling*. John Wiley & Sons.

Grasshopper 3D. (2019, August). About Grasshopper. https://www.grasshopper3d.com/

Kang, T. W., & Hong, C. H. (2015). A study on software architecture for

effective BIM/GIS-based facility management data integration. *Automation in Construction*, *54*, 25–38. https://doi.org/10.1016/j.autcon.2015.03.019

Krish, S. (2011). A practical generative design method. *Computer-Aided Design*, *43*(1), 88–100. https://doi.org/10.1016/j.cad.2010.09.009.

Krygiel, E., & Nies, B. (2008). *Green BIM: Successful sustainable design with building information modeling*. John Wiley & Sons.

Latiffi, A. A., Mohd, S., Kasim, N., & Fathi, M. S. (2013). Building information modeling (BIM) application in Malaysian construction industry. International Journal of Construction Engineering and *Management*, 2(4A), 1-6.

McCormack, J., Dorin, A., & Innocent, T. (2004). *Generative Design: a paradigm for design research*. *Proceedings of Futureground, Design Research Society, Melbourne*.

McKnight, M. (2017). Generative design: What it is? How is it being used? Why it's a game changer. *KnE Engineering*, *2*(2), 176. https://doi.org/10.18502/keg.v2i2.612

MGM. (2019, November). Turkish State Meteorological Service. www.mgm.gov.tr /veridegerlendirme /il-ve-ilceler-istatistik.aspx?m=IZMIR

Migilinskas, D., Popov, V., Juocevicius, V., & Ustinovichius, L. (2013). The

Benefits, Obstacles and Problems of Practical Bim Implementation. *Procedia Engineering*, *57*, 767–774. https://doi.org/10.1016/j.proeng.2013.04.097

Mirtschin, J. (2011). *Engaging Generative BIM Workflows* (pp. 1–8). http://ssi.wdfiles.com/local--files/about- us/Engaging%20Generative%20BIM%20Workflows%20submit.pdf.

Murphy, M., McGovern, E., & Pavia, S. (2009). Historic building information modelling (HBIM). *Structural Survey*, *27*(4), 311-327. https://doi.org/10.1108/02630800910985108

Negendahl, K. (2015). Building performance simulation in the early design stage: An introduction to integrated dynamic models. *Automation in Construction*, *54*, 39-53. https://doi.org/10.1016/j.autcon.2015.03.002

Project Refinery Beta. (2020, April). Information About Project Refineryhttps://www.autodesk.com/campaigns/refinery-beta

Renner, G., & Ekárt, A. (2003). Genetic algorithms in computer aided design. *Computer-Aided Design*, *35*(8), 709–726. https://doi.org/10.1016/s0010-4485(03)00003-4.

Sebastian, R. (2011). Changing roles of the clients, architects and contractors through BIM. *Engineering, Construction and Architectural*

DOI: 10.15320/ICONARP.2020.140

Management, 18(2), 176–187. https://doi.org/10.1108/09699981111111148

Shadow Analysis 2 Software. (2019, September). Info About Software. https://deltacodes.eu/en/ShadowAnalysis2

Shea, K., Aish, R., & Gourtovaia, M. (2005). Towards integrated performance-driven generative design tools. *Automation in Construction*, *14*(2), 253–264. https://doi.org/10.1016/j.autcon.2004.07.002

Singh, V., & Gu, N. (2012). Towards an integrated generative design framework. *Design Studies*, *33*(2), 185–207. Elsevier. https://doi.org/10.1016/j.destud.2011.06.001.

SketchUp Trimble Software. (2019, November). General Info About Products. https://www.sketchup.com/

Tayfur, G. (2014). *Soft computing in water resources engineering: Artificial neural networks, fuzzy logic and genetic algorithms*. WIT Press.

Villaggi, L., & Nagy, D. (2019). *Generative Design for Architectural Space Planning: The Case of the Autodesk University 2017 Layout*.

Yamamura, S., Fan, L., & Suzuki, Y. (2017). Assessment of urban energy performance through integration of BIM and GIS for smart city planning. *Procedia Engineering*, *180*, 1462–1472.

Wang, P., Wu, P., Wang, J., Chi, H. L., & Wang, X. (2018). A critical review of the use of virtual reality in construction engineering education and training. *International journal of environmental research and public health*, *15*(6), 1204.

Wong, K., & Fan, Q. (2013). Building information modelling (BIM) for sustainable building design. *Facilities*, *31*(3/4), 138–157. https://doi.org/10.1108/02632771311299412

Resume

Veli Mustafa Yönder continues his studies on computational design methodologies in architecture and earned a bachelor's degree in architecture from İzmir Institute of Technology, Turkey. He completed his master's degree in architecture at the same university in 2019. He is currently a Ph.D. candidate in the Department of Architecture at İzmir Institute of Technology. After completing his bachelor's degree, he focused on gaining professional experience in an Architectural firm until he began his academic career as a research assistant.

Research Article

ICONARP
International Journal of Architecture and Planning
Received: 13.10.2020 Accepted: 04.12.2020
Volume 8, Special Issue/ Published: 28.12.2020
DOI: 10.15320/ICONARP.2020.141 E- ISSN:2147-380

ICONARP

Darwinian Approach and Mutations: Bjarke Ingels (BIG) and Analysis of His Stepped Pixels Buildings

Ayşenur Dağ Gürcan [1], H. Ercan Gürcan [2]

[1] Lecturer, Faculty of Fine Arts and Design, KTO Karatay University, Konya, Turkey. (Principal contact for editorial correspondence), Email: aysenur.dag@karatay.edu.tr

[2]Faculty of Architecture and Design, Konya Technical University, Konya, Turkey. Email: mim.ercan.gurcan@gmail.com

Abstract

Purpose

Ingels, who was influenced by Darwin, designs new mutants by developing prototypes. This study, it is aimed to scrutinize the public space alternatives proposed for the 21st-century city through the comparative analysis of the stepped pixelated buildings, one of the mutants of the architect. It has been how much questioned the stages, which offer a public space proposal, in the stepped pixelated buildings allow urban dialogue.

Design/Methodology/Approach

While Ingels' design philosophy constitutes the conceptual approach of the study, this study is prepared by using the architect's discourse, interviews, videos, digital texts, and literature studies. In this context, the repetitive examples that the architect defines as mutation and adaptation are classified. The stepped pixels in this classification are the main subject of this study. Ingels' pixelated buildings; Suitable human scale, the language of mass and form, relationship between human and space, the suggestion of space for experience, public space concept, dialogue spaces were discussed based on architect's approach.

Findings

Ingels went in the way of dividing the object through pixels when designing macro-scale structures. Thus, he made the big picture more understandable and perceptible. He tried to achieve the human scale with the gradual pixels rising from the ground level. In this way, Ingels' pixels buildings have transformed themselves into an experiential part of urban.

Research Limitations/Implications

These parameters were evaluated under four dwelling buildings of the stepped pixel in the case study (Lego Tower, Mountain Dwellings, King Street West, 79 & Park).

Social/Practical Implications

At this research, it is foreseen that the new living space suggestions consisting of stepped pixels designed by Ingels will undergo different mutations and come up with new urban alternatives in the future.

Originality/Value

Pixelated dwellings, one of the mutations of Ingels, who constantly draws attention to the problem of not integrating the buildings into the city in today's architecture, have been analysed and evaluated in the context of urban alliterations. In this way, research, a first in its field is important in terms of opening to discuss the alternative urban living spaces proposed by the architect for 21st-century architecture in the contemporary architectural environment.

Keywords: *Bjarke Ingels (BIG), evolution, mutation, residential buildings, stepped pixels*

INTRODUCTION

The 21st century, thanks to technology, has not only allowed striking innovations in the field of architecture as in many other areas of the world but has also architecture has become distinct from its usual order for thousands of years. Today's architecture has turned into an experimental production laboratory where every architect experiences his own space. New approaches, suggestions, and manifestos about contemporary architecture and its problems have been put forward. One of these architects, Bjarke Ingels (BIG), advocates the necessity of new urban organizations and intends to provide innovative flexible urban vacancies.

By 1975, it can be accepted that architecture is the first and foremost production of not only constructed objects but also experiences and concepts (Hays, 2015, 120-121). As a result of the fast-developing techniques and technologies, architects who approach more conceptually than in context in the 1980s and afterward started to attract attention. The background of this tendency has been lying behind the economic power reconstructed by modernization and globalization in the neo-liberal era. As a result, the concept project stage of contemporary architecture has been changing from micro-scale to macro-scale as proof of the infinity of human imagination (Sağdıç, 2016, 182-183, 186).

Defining his designs between micro and macro scales, Ingels believes that architecture will lose its importance and the city will gradually gain importance in five years, in response to his approach focused on progress/process and development/growth (Kayım, 2010). At this point, the philosophical approach, discourse, and attitude of Ingels, which constructs life-oriented spaces, which criteria to provide a better urban environment in the design process, gain importance.

In Tschumi and Cheng's words (2003, 91), in today's global world, the architect is no longer just a person who deals with building art but also has a complicated definition of designing a website, linking relationships, managing information, managing and organizing affairs. Having this definition, Bjarke Ingels is seen as a new representative of Postmodern theory (Lægring, 2017, 334), and his architectural attitude in context is criticized (Yang Di, 2019, 71-72). Ingels ironically reactivates postmodernist communication strategies (painting, narrative, symbolism).

Ingles was influenced by Deleuze and Nietzsche, whom he discovered during his student years in Barcelona. In his designs, he exhibits ironic and metaphoric attitudes like Nietzsche. BIG architecture, which carries a high iconography and irony with storytelling using diagrams, drawings, and comics, has a more pragmatist perspective (Pastor, 2012, 15). In his approach to design, he has used irony extensively starting from the design dictionary which includes the concepts of 'accidents and misunderstandings', 'random opportunities', 'karma', 'surprise', 'luck', and 'unexpected' (Balık, 2014, 17).

DOI: 10.15320/ICONARP.2020.141

While irony, which was a postmodern tool, was closely related to the works of Venturi and Scott Brown, the recall and reinterpretation of postmodern features in contemporary architecture have re-emerged especially in BIG's works (Balık & Allmer, 2015A, 189). However, unlike the Venturian point of view, he does not refer to the history of architecture in his practices but instead includes contemporary celebrities, logos, and landscapes concerning the subject (Lægring, 2017, 333). The silhouette of the Swedish Princess who referred to Andy Warhol on the façade of the 'Arlanda Hotel' designed for Stockholm Airport and the view of Everest, which forms the façade of the car park floor of 'Mountain Dwelling', are ironic postmodern references.

According to Balık and Almer (2015A, 193), BIG's tendency to create 'a kind of hybrid' by combining historical references was interpreted as an ironic approach. These hybrid approaches, which are based on historical discourses are based on Mies Van der Rohe's 'Less is More', Venturi's 'Less is Bore' and Barrack Obama's 'Yes We Can' slogan ironically have been transformed by Bjarke Ingels into 'Yes is More' manifesto. Bjarke Ingels' discourse on 'Yes is More' is a summary of his pragmatist perspective. His attitude is an understanding of architecture that brings together contradictions and discrepancies. According to him, social conflicts are the main components of architectural creation. Rather than looking at the conflicts of a project as a constraint, he defined it as finding a way to connect and integrate differences by linking conflicting parts together (Møller, 2013). In an interview, Bjarke Ingels explained the "yes" philosophy as follows:

> "All BIG's ideas are based on the idea that we can have them all at once. The solution is not to choose between the two options, but to achieve a balance and ensure the satisfaction of both sides. ... Continuing a project by saying 'no' to everything is perceived as 'radicalism'. But perhaps we should realize the radical potential of saying 'yes' to everyone. We need to find a combination that seems impossible for everyone to achieve exactly what they want, not by meeting the minimum expectations." (Alpay, 2006).

Ingels was inspired by the Dutch architect Rem Koolhaas, who used the slogan 'f**k context' for pragmatism. This slogan was born in opposition to previous architectural philosophies and coexisted with a subtext that ignored the context. Ingels also ignores the context and wants to construct his context with experience. However, it also emphasizes proposing a positive, humorous, even hedonic, and utilitarian architectural form (Knudsen, 2016).

Ingels thinks that yes should be said instead of no and that it should be said for the society, not the individual. He says that architecture is not one-dimensional. He states that he advocates an architectural stance to listen to what the society says and wants to be (Ingels, 2011). In BIG's architecture, it is essential to design the physical environment that maximizes human life, not the production of the architectural object.

This physical environment is designed on the experience of a walkabout around the space. That is why Ingels prefers videos rather than photographs, arguing that architecture can be understood through experienced spaces.

Ingels defined their projects at the point between 'master plan' and 'masterpiece'. Most of the projects, which are single structures, can be said to have been designed as a neighborhood when evaluated at the urban scale. Urban spaces are designed with an interactive combination of public, semi-private, and private spaces. This new urban proposal within Ingels' idea of pragmatic utopia can be interpreted as an attitude towards the precise boundaries between architectural work and urban design. According to Ingels, volumes have been designed with different uses for the last eighty years, and designs are often made to separating spaces. Many problems have arisen due to physical, social, and culturally unconnected volumes and lack of an urban environment design (Ingels, 2010, 11-12). Thinking that architects have a responsibility to adapt to the new urban conditions and circumstances that shaped them, Ingels proposes innovative, flexible urban spaces for cities in the buildings he designs. In doing so, he wants to design urban conditions by capturing 'architectural alchemy' as he puts it and to construct spaces to increase spontaneous public interactions (Url-1).

In this context, the starting point of this study is the question of how much the architect allows for the spaces of interaction and dialogue in the public, semi-private and private spaces proposed in his designs for the city. This question has been tried to be resolved through the analogy method within the scope of the case study. First of all, the theoretical framework of the study was formed through the design philosophy of the architect. There are architectural forms that the architect repeats himself and defines as adaptation and mutation under the philosophy of evolution. These forms are classified in the theoretical part of the study. The sampling area was created with the stepped pixels in this classification. The architect has six projects of stepped pixels. One of them is the museum, the other is the pavilion and the remaining four are residential complexes. The examples were evaluated based on the criteria of stepped pixels, the relationship between human and space, mass and form language, approaching human scale, the suggestion of space for experiencing, public space proposal, and spaces of dialogue. These criteria are analyzed through diagrams, plans, images, fiction, and real interaction spaces.

Lego Tower, Mountain House, King Street West, 79 & Park projects, which offer a new habitat proposal, were evaluated based on the above parameters, and urban experience interaction areas were discussed. In this context, it has been determined that the cascaded pixelated structures, one of the mutations of Ingels, are examples that differ in themselves and are adapted and mutated according to the place.

DOI: 10.15320/ICONARP.2020.141

The responsibility of the architect to take urban inputs as a reference while creating his context and to develop solutions for the city is a new breath brought to 21-century architecture.

The 21st century, with the effect of rapidly developing technology and changing daily life, has made the history of architecture more diverse theoretically. In this context, it is no longer possible to talk about a movement or a common architectural thought and instead of this, the discourses of the architects defined a theoretical field. 21st-century architecture has turned into a changing paradigm even in the architect. At this point, this study is beyond monographic research, and it has been built based on an architect's design philosophy and tendencies. Thus, in the study, the tendency of the architect was evaluated based on his suggestions to the city and his discourses. The work is important to contribute to contemporary architecture on a specific subject (Figure 1).

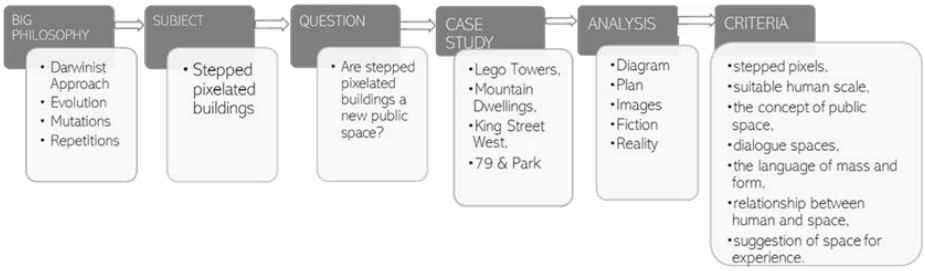


Figure 1. Diagram of research process (Drawings by the Authors, 2020).

THEORETICAL FRAMEWORK: REPETITIONS AND MUTATIONS FROM THE DARWINIST PERSPECTIVE

Ingels was influenced by Darwin and argued that his tree of evolution might be a diagram of BIG's way of working. In every architectural process, a lot of ideas initially arise, but only a few of them continue. In the architectural selection process, we combine them, that is, we create a mutant (Ingels, 2009). This architectural evolutionary process can be interpreted by natural selection, the main mechanism of evolution. The most advantaged of each species survives more and transfers the positive genes to future generations. Thus, advantageous properties are increased in number, disadvantageous properties are gradually reduced. As a result of this elimination mechanism, the evolving species gain adaptation ability (Futuyma, 2005, 8). In BIG architecture, strong ideas put forward during the selection process are developed and continued. The powerful design idea is shaped in the process according to its location by gaining adaptation ability. The importance of this adaptation ability is evaluated from a Darwinist perspective.

Charles Darwin mentions the idea of subspecies besides the idea of a single species. This situation is evaluated in BIG architecture as follows. Every idea spoken at project design meetings has value. If this did not work in the context of the project, there may be an answer to a different question of another client from another culture in another time frame

(Ingels, 2009). So, nothing is thrown away in the offices, the architecture office is home to biodiversity. This repetition mentality emerges concerning working in series and designing concepts, forms, and ornaments independently of the program and context (Lægring, 2017, 327). The problem of repetition has been discussed in critical articles on BIG, especially in the "Bjarke Ingels Group" issue of Clog magazine.

Ironically the repetition of shapes and concepts through slogans such as "repetitive transport operations" or "fit pyramid shape in any context" has also been criticized by Ho, (2012, 55) and Buinno (2012, 37), (Balık and Allmer, 2015A, 196-7).

Ingels' ability to adapt his designs can be explained by the capability to adapt to the environment in which the form takes place. For example, when a proposed building in Sweden was not implemented, it was made as a proposal in China with little change (Ingels, 2010, 26). It was tried to create context and define the public sphere by giving references to the local characteristics of China. At this point, Foster's (2011, x) effort to give a local appearance to the global one, which he said against the global style, can be said for the architectural attitude of Ingels.

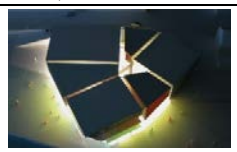
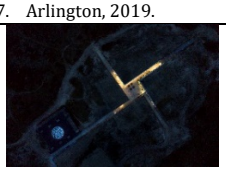
In BIG architecture, there is a specific representation for each project. Each project has a monographic history and natural selection for all. The basis of the story lies in how it evolved from the idea it came from. BIG defines diagrams in the project process with the desire to show traffic flow, climate change, location, settlements, contextual and historical references of a place and dynamic results (Pastor, 2012). Ingels explained the essence of the diagrams in his work by the Danish philosopher Søren Kierkegaard's words 'life is moving forward but being understood backward'. The evolutionary tree in the design process swallow ups every result and infinite possibilities, that is to say, by the simple expression, the diagram is obtained by going back to the result (Ingels, 2011).

According to Ingels, as the renewals and repetitions of a project increase, it will be richer, and more situations will be tested. Therefore, he believes that unsuccessful attempts in the design process will be appropriate. The rise of a series of miniature plastic mountains lived by tiny plastic people in the Copenhagen studio is a concrete demonstration of this approach (Davidson, 2017).

BIG has become a kind of urban laboratory that develops ideas by producing species that develop prototypes. For in support of BIG's tendency to multiply in this direction, Ingels points to Le Corbusier's 'Vers Une Architecture (1923)', emphasizing the production of typologies. Confirming its sameness through Le Corbusier, Ingels (2012, 106) believes that different architects can develop and use the typology produced instead of starting from scratch (Balık and Allmer, 2015A, 196).

DOI: 10.15320/ICONARP.2020.141

Table 1. BIG's repetitions and mutations (The images in the table are taken from the official website of BIG. [https://big.dk/#projects])

Mutations	**Examples**
Diagonals and mountain metaphor	 Via 57 West, New York, 2015.  Sluishuis Amsterdam, Under construction.  World Village of Women Sports Malmö, Idea, 2008.
stepped pixels	 Serpentine Pavilion, London, 2015.  King Street West Toronto, Under construction.  Mountain Dwelling Copenhagen, 2007.
shifting of the plaques	 Grove at Grand Bay Miami, 2016.  Suitsupply Headquarters Amsterdam, In progress, 2017.  Wilson Secondary School Arlington, 2019.
breaking of the form	 Arctic Cultural Center Hammerfest, Idea, 2005.  The Holy Road Athens Athens, Idea, 2008.  Tirpitz Museum Blåvand, 2017.
bending of the mass	 Scala Tower Copenhagen, Idea, 2007.  Vancouver House Under construction, 2012.  Walter Towers Prague, Idea, 2007.  People's Building Shanghai, Idea, 2005.
slit and holes opening to mass	 Tek Building Taiwan, Idea, 2009.  Singapore Tower Under construction, 2018.  Epiq Tower Quito, 2019.  MÉCA Cultural Center Bordeaux, 2019.
helical ramps and spiral tendencies	 Astana National Library Idea, 2008.  Museé Atelier Audemars Piguet Le Brassus, 2020.  St. Petersburg Pier City of St. Petersburg, Idea, 2011.

Apart from his projects that are shaped according to the situation, it is clear from the above statements that Ingels was referred to repetitions, as read from his expressions and images. Keeping the numerous changed mass in the design process against the possibility of later use

may be the reason why the architect does not abandon some passion and tendencies. Recurring forms in BIG's architecture have shown themselves as stepped pixels, diagonals designed with mountain metaphor, shifting of the plaques, breaking of the form, bending of the mass, slit and holes opening to mass, helical ramps and spiral tendencies (Table 1).

RESEARCH METHOD: ANALYSIS OF STEPPED PIXELS BUILDINGS

Today, our world is a giant ongoing urban laboratory, constantly conducting new experiments, evolving new life forms and inventing new spaces, tools and toys (Ingels, 2012A, 128).

One of Ingels' contributions to this laboratory is that he goes in search of alternative urban spaces using stepped pixels to transform legos into real architectural products.

According to Philippe Boudon (2015, 129), while architectural works of today have grown considerably, architecture has decreased paradoxically at this rate of growth, and the city itself has emerged as an object. At this point, Boudon which talks about the concept of scale emphasized the view that problems were overcome with the tendency to divide the real object Strauss (2000, 34-35) said about the virtue of reduction. With the downscaling of the scale, the whole object does not become as formidable as before. The quantitative downsizing of the object allows for the simplification of perception qualitatively. At this point, carrying Boudon's worry Ingels may have used the way of dividing the form into sections over pixels, while designing macro-scale structures. Another reason why Ingels uses pixel editing in his designs may be due to his passion for Legos.

The passion for Lego has been undeniably influential in the architecture of Ingels, who enjoys painting and playing with Legos as a child. Saying that he learned how to overcome clear hardness in a Lego system as a child, Ingels found how to turn restrictions into freedom by maximizing creativity with limited resources (Davidson, 2017, 60-61). In BIG architecture, Lego's are the pieces that the architect frequently refers to in his designs emulating the mountain metaphor. Although Lego's are built-in pixels in most Ingels projects, the Lego House project differs from other examples by moving a standard Lego brick to an architectural scale. Designed as an urban area as well as an experience center, Lego House consists of 21 Lego spaces located on different elevations around a central closed square. The staging of these Lego's indoors and outdoors allows users to experience and dialogue spaces. Two of the building's Lego terraces turn into a public amphitheatre consisting of pixelated steps, allowing for performance watching and sitting (Figure 2).

DOI: 10.15320/ICONARP.2020.141

Figure 2. Lego House and pixels (Url-3)

Another example of Ingels with stepped pixels is the Serpentine Pavilion. The building, which consists of 1800 fiberglass blocks, refers to the top of a mountain with the blocks placed on top of each other and rising 14 m (Url-2). This transparent mass; When connecting indoor and outdoor spaces, block steps have become an urban object that allows sitting, resting, chatting, and watching actions. This structure is an exhibition type of the small-scale version of Ingels' pixelated structures. The main idea focused on experience and dialogue is also seen in pixelated residential complexes of Ingels. The idea of suburban, which is the architect's expression, which aims to combine suburban life with urban space, manifests itself in stepped pixelated living spaces, from BIG mutations.

At this point in the study, the socialization areas of Ingels' topography, realized with his pixel or Lego attitude, were evaluated over seven criteria consisting of stepped pixels, suitable human scale, the concept of public space, dialogue spaces, the language of mass and form, relationship between human and space, and suggestion of space for experience. Urban experiences spaces were discussed through the Lego Tower, Mountain House, King Street West, 79 & Park projects that offer a new habitat proposal. Supported by the idea of Suburban, these residential complexes were analyzed in this section by tabulating on diagrams, plans, pictures, fictionalized, and real spaces. However, since the Lego Tower in the examples is an idea, and the King Street West project is under construction, the plans and real space visuals of these projects could not be reached.

Lego Tower, Copenhagen, 2006, Idea;

The building form was designed by shaping the elastic module's main idea defined by the regions with varying density. Then, the soft topography of urban gathering was adjusted by rough pixelation of the peaks and valleys of the landscape. One of the proposed urban alternatives is the amphitheatre. On the ground level of the building, sales units and parking areas are proposed. Terraces belonging to residences and offices are designed in rising steps. And it was aimed to create semi-private privacy areas by preventing access to these areas with the public spaces (Ingels, 2010, 113) (Table 2).

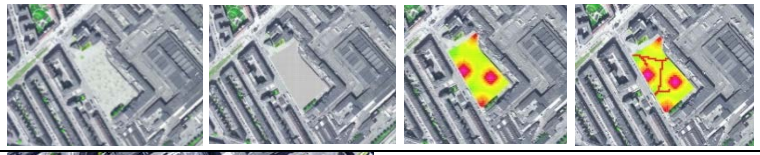
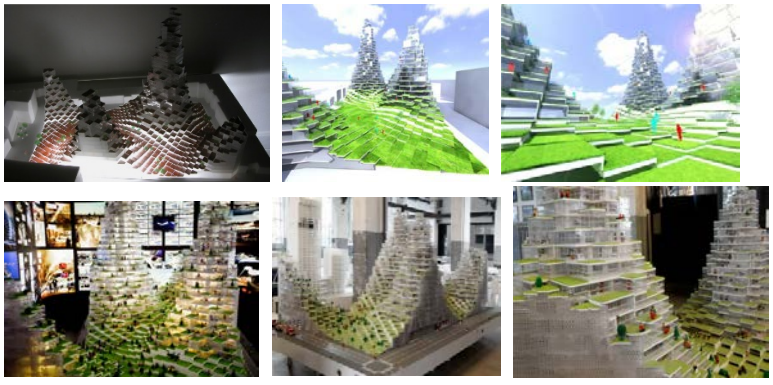
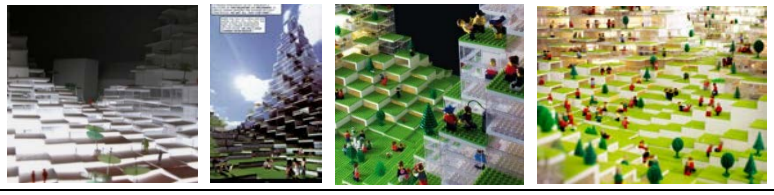
Here, the architect proposed an urban hill by configuring each square separated by pixels on flat ground at a different height. These pixels were presented in the 'Yes is More' exhibition with a 1/500 scale Lego model consisting of a square of the Lego. Ingels desired the urban hill

designed for Copenhagen, which has a flat topography, to give a new breath to the city's silhouette. He aimed to create spaces for urban dialogue in stages and designed these dialogues in his book 'Yes is More'. It has been stated with a pragmatic attitude that everyone is satisfied with this urban scenario.

Another issue that is considered in this study is the criticism of going beyond the human scale brought to high-rise buildings. The design approach following the human scale was considered within the scope of this project concept. In this case, the design suitable for the human scale is provided with consistent modules that continue throughout the building cover.

As in Pallasmaa's (2016, 83) testimony 'When the body finds its resonance in the place, we feel pleasure and security', for this reason, an effort to make a high-rise building suitable for human scale can be seen here. In fact, this effort was supported using people in models. Thus, it was expected to allow sincere dialogue and urban alliterations. However, the fact that this project remains an idea and has not been implemented yet does not allow us to experience the desired dialogue spaces in the fiction of urban steps.

Table 2. Lego Tower and stepped pixels (The images in the table are taken from the official website of BIG [Url-4]).

Diagrams	
Plan	 [Url-5]
Image	 [Url-6]
Fiction	
Reality	The project is an idea, so reality images could not be found.

DOI: 10.15320/ICONARP.2020.141

Mountain Dwellings, Copenhagen, 2007:

The project, built next to the VM house previously built by BIG, located in Ørestad, the new urban development area of Copenhagen, was produced as a solution to a parking lot and housing demand. In the building designed on flat ground again, the architect, in his own words, if you want a beautiful view looking south in Copenhagen, you simply do this yourself (Ingels, 2009) defined his artificial mountain.

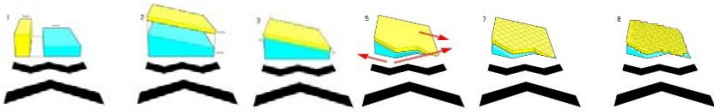
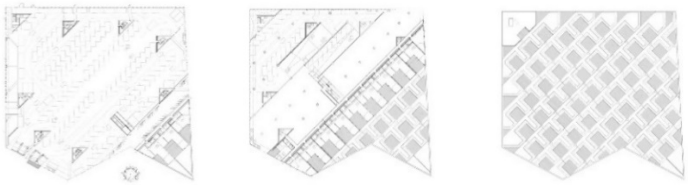
Keeping the city and suburban life together is the basic concept of the project. Ingels described this structure in an interview as follows. "What was interesting in Mountain Dwellings was the merging of a large residential building with the parking garage.

The fact that the parking lot was placed under the housing units made the apartments a flat with a garden. If you look at the project, it seems as if you cut a piece from a very huge suburban area and placed it in the parking garage. If you enlarge the parking area we take as the ground, you get more suburbs. With this approach, the suburban lifestyle combines with the urban lifestyle represented by the parking lot." (Alpay, 2006). Describing the design approach with this explanation, Ingels proposes a gradual vertical suburb.

While each pixel represents a residential unit, terraces serve as a garden. These pixelated terraces facing south have risen from the ground level and when viewed from this point, the building has been brought closer to the human scale (Table 3). The parking garage, gymnasium, and commercial units are designed by evaluating the space under the graded residential units. Reference was made to the mountain metaphor on the stepless surfaces with these functions, and the image of Mount Everest was pixelated on the perforated metal coating and displayed on the facade. In the project, which presents the 'imitation' experience of living in a mountain, the architects have prepared a project that includes not only the wrapped image of a mountain applied to the facade of the building but also other 'mountain' experiences such as climbing (Balık & Allmer, 2015B, 31-33).

In Mountain Houses, the experience idea of the architect was tried to be kept alive with the metaphor of the 'mountain', but a common open area where the users could be together was not described. While the gym, car park, and commercial spaces located on the ground level are open to everyone, the pixels containing the residences do not have any concerns about creating an urban common area. Each of the levels is private terraces belonging to the users. At this point, it is noteworthy that the terraces on the same floor are connected by the door. Here, the architect touched on neighborhood relationships and defined semi-private open spaces for the dialogue between neighbors by a transitive terrace pattern. At this point, the concepts of the architect have been mutated, but the passion to rise by pixelation and the desire to create experience has not changed.

Table 3. Mountain Dwelling and stepped pixels (The images in the table are taken from the official website of BIG [Url-7], [Url-8] and google maps [Url-9]).

Diagrams	
Plans	
Image	
Fiction	
Reality	 (Ingels, 2010, 81) (Ingels, 2010, 86) (google maps)

King Street West, Toronto, 2016, in progress:

King Street West is in the transition area between Toronto's high and low-rise buildings. Ingels' inspiration for this project was Moshe Safdie's Montreal Habitat (1967) project and it was aimed to define an innovative living space that refers to this project. The architect used the idea of the stage and the courtyard together. These stages, which surround the historical buildings in the study area, are handled in pixels. Each pixel rotated 45 degrees to the street for increased access to daylight and open-air and it was adjusted to the size of a room. The wavy design obtained by the gradual placement of the pixels allowed the light to reach the building and the courtyard all year round.

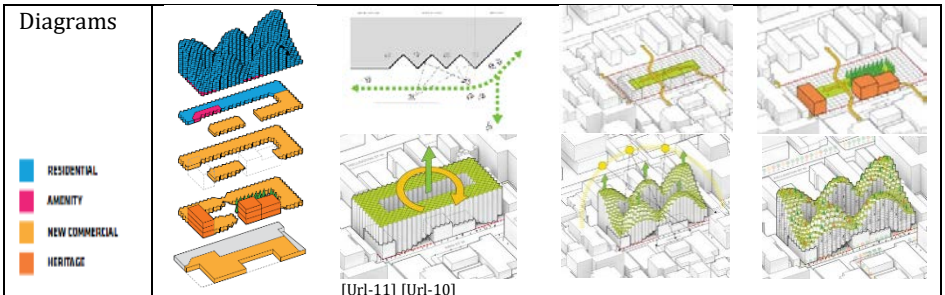
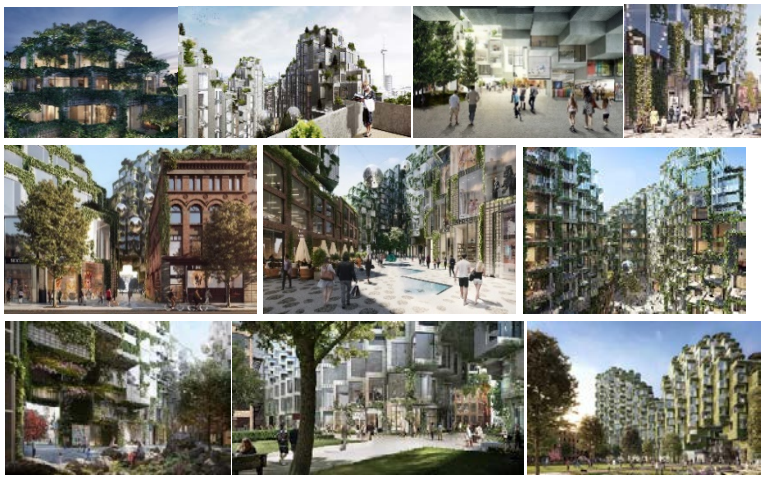
Stages are designed in two ways as private terraces and shared terraces. Shared terraces are considered as urban agriculture potential and gathering places. However, in this project, it is not possible to say that terraces are a real public space since the steps do not go down to the ground. The courtyard idea of the architect describes public space. There are no steps in the courtyard, but the different heights of the pixels in the mass are felt here. As understood from the diagrams, the courtyard also acts as a nodal point connecting the different neighborhoods of the city (Table 4).

DOI: 10.15320/ICONARP.2020.141

The emptied pixels of the levels that surround the courtyard invite the people to the courtyard, and at the same time, it is designed as a living passage place with cafes, boutiques, seating units, and green areas in the courtyard. However, since the project is under construction, there is not mentioned real urban experience yet.

The mutation of Ingels here is that the stepped pixels are formed around a courtyard. The public space proposal that differs here is for the courtyard located under and in the center of the graded pixelated units rather than the stepped terraces, which are private and semi-private spaces.

Table 4. King Street West and stepped pixels (The images in the table are taken from the official website of BIG [Url-10] and [Url-11, 12, 13, 14])

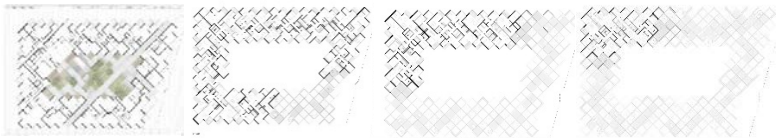
Diagrams	 [Url-11] [Url-10]
Plans	 [Url-12, 13]
Image	
Fiction	
Reality	 (The project is under construction.) [Url-14]

79 & Park, Stockholm, 2018:

The mass housing project in Stockholm is one of the completed projects of BIG. Continuing the pixelated building custom, Ingels has adopted an environmentally sensitive design approach. The mass directed towards Gardet Park gradually descended with a pixel tongue scaled according to human size. The southwestern facade of the building facing the Gardet park is the lowest point of the pixelated building. Pixelated terraces, which are a passage between nature and the building, turn into a public platform. Wooden covered pixels, consisting of 3.6 x 3.6 modules, organized around a green courtyard in the center, are a new representation of BIG's artificial mountains (Table 5).

In the words of the architect, "This manipulation not only allows for a more organic expression, perfectly reflecting the surrounding landscape, but also provides a way to accomplish the building topography in a controlled and inexpensive way through the use of prefabricated units of standardized sizes"(Url-15).With the various commercial areas on the ground floor and a platform open to the public at the southwestern point of the building, the usual closed housing form has been turned into an urban space.

Table 5. 79 & Park and stepped pixels (The images in the table are taken from the official website of BIG [Url-16])

Diagrams	
Plans	
Image	
Fiction	
Reality	

BIG proposed the integration of public and private spaces that allow new experiences in the city with a pragmatist perspective. Steps from 7

DOI: 10.15320/ICONARP.2020.141

to 35 meters form the boundaries between public, semi-private, and private areas. The courtyard in the center of the graded pixels defines a semi-public space. The courtyard offers activity areas with different textures and elevations placed in a grid system with pixels of 3.6 x 3.6. The pixels in the courtyard offer various experience areas such as circulation, green area, small activity pockets for activities, dog park, bicycle park, and activity areas (such as sandbox) reserved for preschool education for residents and visitors.

All residences have access to private and shared terraces. Although this structure of Ingels showed similarity with the fiction of the courtyards and pixels in the King Street West project, it was mutated. The mutation here is due to the location of the building, the courtyard closes a little further and the gradual pixels are special, as well as functioning as shared terraces.

EVALUATION

In the study, while living areas of stepped pixels, one of BIG's mutations, have been criticized, the status of being an experiential part of the city has been questioned. Since Lego Towers remains an idea project, the real urban experience cannot be mentioned. But it is the first example of stepped pixels in BIG's architecture. It was designed in response to the question of how to reduce a tower to the human scale. Urban interaction areas have been proposed on the terraces of different grades that rise from the ground level and provide the experience of climbing a mountain. In these multifunctional towers with urban experience, it is seen that thousands of pixels at different levels starting from the ground level define the degree of privacy at the same time.

In Mountain Dwelling, pixels have been brought together with the idea of a vertical suburb. Experience terraces in graded pixels in Lego Towers have been replaced by private terraces of the residential units. There is no public space proposal for the pixels here. Pixels serve the purposes of landscape orientation, terrace, and mountain metaphor.

The King Street West project is an example of the pixel mutation supported by the idea of a courtyard. While the stepped pixels are designed as private and shared terraces, the publicly recommended space has been the courtyard. Although a public area cannot be defined for the pixels that do not go down to the courtyard level, the integration of the public courtyard and the pixels surrounding it strengthened the urban dynamics of the project. The location of this building is an important place in the city center made it possible for the building to function as a nodal point. With the idea of being a nodal point, openings were created in the courtyard and pixels, and a closed-form concept was rejected. Therefore, in this example, it is predicted that the fiction of a courtyard with a pixel will be more integrated into the city. Since the building is currently under construction, predictions have been made through diagrams, plans, visuals, and fiction for urban experience and reality.

Another example with courtyards and pixels is the 79 & Park project. In this building, Ingels turns the pixelated terraces into a public platform towards the park. As in Lego Towers, rising gradually pixels form the boundaries between public, semi-private, and private spaces. The courtyard here is designed to be less passive due to its location compared to King Street West, which will be located at an important point in the city center, while the terraces of the building offer more shared areas. The idea of pixelating the mass that the architect repeats itself has mutated according to the changing time and the proposed location, as in the examples critical in the study. In the early examples (Lego Towers and Mountain Dwelling), the fiction of pixel was used alone, while in the recent examples (King Street West and 79 & Park), the courtyard was included also in this fiction (Table 6).

Table 6. Evaluation of criteria based on examples

→Examples / **↓ Criteria**	**Lego Tower, (Idea)**	**Mountain Dwelling**	**King Street West, (Process)**	**79 & Park**
Stepped Pixels	Public, Semi-private, Private	Private	Semi-private, Private	Public, Semi-private, Private
Suitable Human Scale	Fiction: ✓ Reality: —	Fiction: ✓ Reality: ✓	Fiction: ✓ Reality: —	Fiction: ✓ Reality: ✓
Concept of Public Space	✓ / Pixel	×	✓/Courtyard	✓/ Pixel
Dialogues spaces	Fiction: ✓ Reality: —	Fiction: ✓ Reality: ✓	Fiction: ✓ Reality: —	Fiction: ✓ Reality: ✓
Language of Form and Mass	Hills, Towers, Lego Landscape: Walley and Peaks	Mountain, Scenery, Vertical Suburb	Habitat 67, Stepped Pixels and Courtyard, Surround the Historical Buildings, Nodal Point	Directed towards Park, Prefabrication, Stepped Pixels and Courtyard,
Relationship between Human and Space	House, Office, Commercial, Auto park, Amphitheatre	House, Commercial (ground floor) Auto park, Sport Hall	House, Commercial, Courtyard, Café, Greenspace	House, Courtyard, Public platform, Greenspace, Commercial
Suggestion of Space for Experience	Amphitheatre Public, Semi-private and Private Terraces, Experience of Climbing to Mountain	Suburban apartment and house with a garden) Sequences and Transitional Private Terraces, Experience of Entered into the Mountain	Public courtyard, Semi-private and Private Terraces: Urban Agricultural Potential, Meeting Places	Semi-private courtyard, Relation to park, Public platforms, Semi-private and Private Terraces

At this point, it is expected that new living space proposals consisting of stepped pixels, which Ingels frequently refers to, will come together

DOI: 10.15320/ICONARP.2020.141

with different spaces and undergo different mutations, as in the courtyard example, and come up with new urban alternatives in the future.

CONCLUSION

Ingels has gone on the way to divide the object by pixels while he is designing macro-scale buildings that keep up with the philosophy of his age, create his context, and organize his own space. Advocating that the focus should be on the big picture, Ingels tried to reduce by pixelating the main form to make the big picture better understandable and perceptible. He aimed to approach the human scale with the gradual pixels that started from the ground level. Thus, the structure transformed itself into an experiential part of an urbanism without intimidating the user. Ingels also tried to define the units of the building with the pixelation method. While pixels constitute a module for living spaces, they also define terraces. In this context, stepped pixels enabled open and closed living spaces at different levels while defining the boundaries of private, semi-private, and public spaces. The pixelation approach, which offers the opportunity to limit and define the space in the context of plan and height, emerges as a new quest in 21st-century architecture. It is predicted that Ingels, which has only four pixelated dwellings on the macro scale, will continue this mutation with different alliterations in the future.

In this context, Ingels' urban design-oriented approach is an architectural approach that seeks new scenarios for 21st-century architecture, suggests urban experiences and dialogue spaces, constructs positive scenarios, and questions the demands of the age. In response to the architects who criticized BIG, Ingels stated that they tried to observe how life develops instead of personal biased ideas about how the world should be, and at this point, they aim to realize life-oriented designs rather than architectural purposes.

Ingels whose star is shining in the Globalizing World maybe succeeded in becoming a starchitect in the 21st-century environment, by making references to the popular culture and being in this culture, performing its own utopia with a utilitarian attitude. Bjarke Ingels, which creates its own context in the topography that it has created, has drawn a common portrait of 21st-century people and has an architectural attitude towards this portrait in a world whose borders have disappeared. Despite all the criticisms directed at him, to understand the society and architecture of today, it will be important to evaluate Ingels, his architectural approach, and the new proposals he presented to the city through different mutations. At this point, the study is expected to form a basis for future research at the intersection of urban and architecture.

ACKNOWLEDGEMENTS

The main plan of this study was shaped by the doctorate lecture taken by Ayşenur Dağ Gürcan in Gazi University Department of Architecture.

For her contributions, I would like to thank Prof. Dr. Aysu Akalın who is the lecturer of the 'Form and Structure of Spatial Image: Perceptual Process Between Man and Space' course.

CONFLICT OF INTEREST

No conflict of interest was declared by the authors.

FINANCIAL DISCLOSURE

The authors declared that this study has received no financial support.

ETHICS COMMITTEE APPROVAL

Ethics committee approval was not required for this article.

LEGAL PUBLIC/PRIVATE PERMISSIONS

In this research, the necessary permissions were obtained from the relevant participants (individuals, institutions and organizations) during the survey, in-depth interview, focus group interview, observation or experiment.

REFERENCES

Alpay, Z. (2006, November 23). *Mimarca Bir Meydan Okuma; Bjarke Ingels ile Söyleşi. [A Challenge by Architect; Interview with Bjarke Ingels].* https://v3.arkitera.com/soylesi_55_bjarke-ingels.html

Balik, D. (2014). *Deciphering Ornament, Dissecting "Big": The Return of Ornament in Contemporary Architectural Theory and Practice*. Doctoral dissertation, Dokuz Eylül University, Graduate School of Natural and Applied Sciences.

Balik, D., & Allmer, A. (2015). This is not a mountain!: Simulation, imitation, and representation in the Mountain Dwellings project, Copenhagen. *Architectural Research Quarterly*, *19*(1), 30–40. https://doi.org/10.1017/S1359135515000196

Biunno, J. (2011). Architects! Out of Ideas? In *Clog: Bjarke Ingels Group* (pp. 1–37). CLOG.

Boudon, P. (2015). *Mimari Mekan Üzerine, Mimarlık Epistemolojisi Üzerine Deneme (Sur l'espace architectural)*. Janus.

Davidson, J. (2017, June). Designing Tomorrow. *Smithsonian*, 56–65. https://www.smithsonianmag.com/innovation/bjarke-ingels-makes-impossible-concrete-180963301/

Di, Y. (2019). Architects and Global Marketing – Buying and Selling in China. *2019 XJTLU International Conference: Architecture across Boundaries, KnE Social Sciences*, 66–75. https://doi.org/10.18502/kss.v3i27.5515

Foster, H. (2011). *The Art-Architecture Complex*. Verso.

Futuyma, D. J. (2005). *Evolution*. Sinauer Associates.

Hays, M. K. (2015). *Mimarlığın Arzusu Geç Avangardı Okumak (Architecture's Desire: Reading the Late Avant-Garde)*. YEM.

DOI: 10.15320/ICONARP.2020.141

Ho, H. H. (2011). [Trans]planted / [Re]placed. In *Clog: Bjarke Ingels Group* (pp. 54–55). CLOG.

Ingels, B. (2011, October 7). *CLOG: BIG Launch Interrogation of Bjarke Ingels*. CLOG. http://www.clog-online.com/news/clog-big-storefront-transcript/

Ingels, B. (2010). *Yes is More: An Archicomic on Architectural Evolution*. Taschen.

Ingels, B. (2009, November 20). *TEDxTalks*. TEDxAmsterdam. [Video] https://www.youtube.com/watch?v=8fIeg8Q2ZLU

Ingels, B. (2012). Public Participation Extreme. *Perspecta*, *45*, 127–130. http://www.jstor.org/stable/24728122

Ingels, B. (2011). Responses. In *Clog: Bjarke Ingels Group* (pp. 102–111). CLOG.

Kayım, E. S. (2010, November 3). *Dünya Mimarlık Festivali'ne Ingels ve Griffiths Dopingi [Ingels and Griffiths Doping to the World Architecture Festival]*. Mimarizm Mimarlık ve Tasarım Yayın Platformu. https://www.mimarizm.com/haberler/dunya-mimarlik-festivali-ne-ingels-ve-griffiths-dopingi_116789

Knudsen, L. E. D. (2016, August 22-26). *Context-free pragmatism in Danish campus architecture* [Paper presentation]. 2016 ECER Leading Education: The Distinct Contributions of Educational Research and Researchers International Conference, Dublin, Ireland, 1–15. https://pure.au.dk/portal/en/publications/contextfree-pragmatism-in-danish-campus-architecture(d6ba667e-9095-4513-8c3b-5bc673b2a0ff)/export.html

Lægring, K. (2017). Bjarke Ingels and The Return of Representation: A Challenge to The Post-critical. *Architecture and Culture*, *5*(2), 315–340. https://doi.org/10.1080/20507828.2017.1328206

Levi-Strauss, C. (2000). *Yaban Düşünce (La Pensée Sauvage).* YKY.

Møller, A. (2013). *Yes Is More: The BIG Philosophy*. ArchDaily. https://www.archdaily.com/366660/yes-is-more-the-big-philosophy

Pallasmaa, J. (2016). *Tenin Gözleri*. YEM.

Pastor, C. E. (2012). La Arquitectura Diagramática Y Sostenible De BIG (BIG's Diagrammatic and Sustainable Architecture). *Revista de Expresión Gráfica Arquitectónica*, *20*, 184-193. https://doi.org/10.4995/ega.2012.1440

Sağdıç, Z. (2016). The 21st Century Architecture: Searching of The Concept. *Megaron/Yıldız Technical University, Faculty of Architecture E-Journal*, *11*(1), 179–186. https://doi.org/10.5505/megaron.2016.93064

Tschumi, B., & Cheng, I. (2003). *The State of Architecture at the Beginning of the 21st Century*. Monacelli.

Url-1: Hedonistik Sürdürülebilirlik, [Hedonistic Sustainability] XXI. Retrieved from https://xxi.com.tr/i/hedonistik-surdurulebilirlik

Url-2: Geçicinin Gerekliliği, [Necessity of the Temporary] XXI. Retrieved from https://xxi.com.tr/i/gecicinin-gerekliligi

Url-3: Lego House Images: Retrieved from https://www.archdaily.com/880900/lego-house-big

Url-4: Lego Tower Images: Retrieved from https://big.dk/#projects-lego

Url-5: Lego Tower Images: Retrieved from http://files.archinect.com/uploads/ai/aiu_LegoHousingBIG.jpg

Url-6: Lego Tower Images: Retrieved from https://www.designboom.com/architecture/big-architects-yes-is-more-exhibition/

Url-7: Mountain Dwelling Images: Retrieved from https://big.dk/#projects-mtn

Url-8: Mountain Dwelling Images: Retrieved from https://www.archdaily.com/15022/mountain-dwellings-big

Url-9: Mountain Dwelling Images: Retrieved from https://www.google.com/maps/place/Mountain+Dwellings/@55.6350579,12.5828625,14z/data=!4m13!1m7!3m6!1s0x465254baa9662891:0x812d83688f74c488!2sMountain+Dwellings,+2300+K%C3%B8benhavn,+Danimarka!3b1!8m2!3d55.63525!4d12.582917!3m4!1s0x0:0x1533b77107bf0ea3!8m2!3d55.6350579!4d12.5828624

Url-10: King Street West Images: Retrieved from https://big.dk/#projects-king

Url-11: King Street West Images: Retrieved from https://urbantoronto.ca/news/2016/04/bjarke-ingelsgroups-king-street-vision-detailed-consultation

Url-12: King Street West Images: Retrieved from https://urbantoronto.ca/news/2017/05/update-bigs-king-west-20-impresses-public-planning-less

Url-13: King Street West Images: Retrieved from http://kingtoronto.com/floorplansUrl-12

Url-14: King Street West Images: Retrieved from https://urbantoronto.ca/news/2020/10/excavation-setting-stage-rise-king-torontos-mountains

Url-15: 79 & Park Images: Retrieved from https://www.archdaily.com/905534/79-and-park-big

Url-16: 79 & Park Images: Retrieved from https://big.dk/#projects-st7

Resume

Ayşenur Dağ Gürcan is a PhD student in Architecture at Gazi University, Ankara, Turkey. She was graduated from Balıkesir University, Department of Architecture in 2014. She received her MSc degree in Architecture from KTO Karatay University, in 2017. She is currently working as an academic lecturer at the Department of Architecture at KTO Karatay University. Her research interests include architectural history and theory, contemporary architecture, Turkish Islamic architecture, and vernacular architecture.

H. Ercan Gürcan is an MSc student in Architecture at Konya Technical University, Turkey. He got his B.Arch. degree in Department of Architecture at Erciyes University in 2014. He is currently working as an architect.

DOI: 10.15320/ICONARP.2020.141

Research Article

ICONARP
International Journal of Architecture and Planning
Received: 13.10.2019 Accepted: 27.11.2020
Volume 8, Special Issue/ Published: 28.12.2020
DOI: 10.15320/ICONARP.2020.142. E- ISSN:2147-380

ICONARP

Spatial Distribution Analysis of Syrian Immigrant Population Problem in Fatih - Istanbul

Ömer Bilen[1], Mehmet Gür[2], Ersan Koç[3], Ebru Kamacı Karahan[4]

[1] Asst. Prof. Dr., Faculty of Architecture and Design, Bursa Technical University, Bursa, Turkey. (Principal contact for editorial correspondence), Email: omer.bilen@btu.edu.tr

[2] Dr., Faculty of Civil Engineering, Deparment of Geomatic Engineering, Yıldız Technical University, İstanbul, Turkey. Email: gur@yildiz.edu.tr

[3] Asst. Prof. Dr., Faculty of Architecture and Design, Bursa Technical University, Bursa, Turkey. Email: ersan.koc@btu.edu.tr

[4] Asst. Prof. Dr., Faculty of Architecture and Design, Bursa Technical University, Bursa, Turkey. Email: ebru.karahan@btu.edu.tr

Abstract

Purpose

The paper reflects the impacts of the "Arab Spring" that broke out in Tunisia and Syria and led to the loss of more than 300,000 people. A wave of migration began in 2011, especially from Syria to its neighbouring countries including Turkey and Lebanon. Syrian migratory flows have caused social, economic, and ecological problems in the hosting countries. Turkey is one of the countries most affected by the wave of migration from Syria. Syrian refugees were unequally distributed or dispersed not only in leading metropolitan areas of western Turkey but also in many neighbouring cities in the southeast. The distribution of Syrian refugees in Turkish cities revealed considerable spatial heterogeneity and differences.

Design/Methodology/Approach

The sample size of the study is 953 and the margin of error of this sample size is ± 3.17 at a 95% confidence level. Stratified simple random sampling was used. Interviews were

Findings

Fatih in İstanbul is one of the districts where Syrian immigrants most often settle. As part of the research on social risk mapping for Fatih District, immigrants - especially Syrian immigrants - have been identified as the main cause of problems by residents (the locals), with this group experiencing higher layoffs in terms of economic opportunities. Our analysis found that the main reason why Syrian immigrants are cited as a problem is "economic motivation". The rate at which Syrians are declared a problem in the districts of Fatih district is directly proportional to the distribution of the Syrian immigrant population.

Research Limitations/Implications

Time restriction, unfavourable weather conditions, missing information for socio economic status calculation, reluctance of women to join the survey.

Originality/Value

This study is the first research which examined spatially, how forced migration has an impact on local residents. Its results that can be useful for social measures towards urban planning and management to reduce the negative effects caused from forced migration population.

Keywords: *Forced migration, Syrian refugees, urban security, social integration, spatial analysis*

INTRODUCTION

Due to its geographical location and historical background - amidst Asia, Africa, the Middle East, and Europe - Turkey has a multidimensional social, cultural, and geographical character. Turkey is a country, to which people who are forced to leave their homes after encountering several problems in their country of origin flee in order to benefit from relatively advanced public services. Those who have chosen to use Turkey either as a transit corridor to move to prosperous regions or as a country sometimes take up permanent residence. These processes generally lead to mutual acculturation processes. Among the most important reasons why Turkey is favoured by people who migrate from their country as the geography of interaction and settlement are internal and international stability, peace and political trust in the country, open-door policy, and protection of those in need. (Provincial Immigration Administration, Annual Immigration Report, 2013). Citizens of countries defined as irregular migrants in Turkey are from Iraq, Afghanistan, Pakistan, Syria, Moldova, Palestine, Myanmar, Georgia, and Iran. In this context, the scope of our research covers the most influential immigration wave of the last decade: "Syrian Forced Migrants".

On December 18, 2010, the turmoil and uprising - the so-called "Arab Spring" and/or "Democracy Wind", which led to the forced migration of the Syrian population from their country mainly to Turkey - began in Tunisia. The reflection of the "Arab Spring" in Syria caused the loss of more than 300,000 people. The total number of forced migrations of about 6,000,000 people is due to brutal and violent policies pursued by the Assad Syrian regime (Sandal, Hançerkıran, & Tıraş, 2016). As a result of the bloody attacks by the Syrian regime against legitimate claims, about half of the country's population, whose population was 21.5 million in 2010, was evacuated from their homes. (Ağır & Sezik, 2015). Today about 65% of the population defined as "displaced" by Ağır and Sezik (2015) had to abandon their country according to UNHCR data.

As already mentioned, Syrians are often forced to leave their country. Also, they chose Turkey as their first choice for asylum. Syrians who have immigrated to Turkey are considered "temporary protection classes" as critical for the country. The process of forced immigration, which began in 2011, is continuing while the speed of the process has slowed down. Due to civilian deaths in military attacks on Idlib, a new wave of immigration pressure on Turkey is arising. When the statistics on Syrian refugees and emergency shelters were announced, the actual migration to Turkey in 2012 was 14237. In 2013, the amount of temporarily protected Syrians rose to 200,000, and in 2014, this number was observed to reach 1,519,286.

While the number of Syrians taken under temporary protection reached 2,503,549 in 2015, this figure stood at 3,576,370 in 2019. Forced migration from Syria, which displayed a significant upward trend between 2011-2015, lost its rate of increase between 2015-2018. There is a slight decrease in the number of Syrians covered by temporary

DOI: 10.15320/ICONARP.2020.142

protection in 2019. (Provincial Immigration Administration, Annual Immigration Report, 2013).

The multifactorial waves of migration from Syria to Turkey with a high acceleration have made it difficult to mitigate, manage, and/or control them. For this reason, Syrian immigrants are scattered and dispersed in the major cities of the border regions, such as Şanlıurfa, Gaziantep, Hatay, and Kilis, and national metropolitan settlements such as Istanbul, Ankara, and İzmir. 3.72% of the Turkish population are legal and registered Syrians under "temporary protection". The provinces with the highest number of Syrians are Istanbul (563,791), Şanlıurfa (471,955), Hatay (442,909), and Gaziantep (390,204).

The provinces where the proportion of Syrians in Turkey is over 3.72% are Adıyaman, Adana, Hatay, Kayseri, Kahramanmaraş, Mardin, Osmaniye, Mersin, Şanlıurfa, Gaziantep, and Kilis (Çiftçi, 2018). While the number of Syrian forced immigrants is highest in Istanbul when looking at Syrian immigration rates by population, it is noteworthy that the Syrian forced immigration rate reaches 80% in Kilis province. Other provinces with a high percentage of the Syrian population in the total population are Hatay, Şanlıurfa, and Gaziantep. In these provinces, the percentage of Syrian forced immigrants in the total population is over 20%.

Considering the distribution of Syrian forced immigrants in the cities, it is clear that there is no even and/or balanced distribution. When looking at the distribution of Syrians within cities and districts, parallel phenomena and location choices can easily be observed. For reasons of reasonable cultural and linguistic practice, forced Syrian immigrants prefer to live close to each other in certain ghettos and neighbourhoods in order to form cultural and economic clusters within the cities. Istanbul is the city that the majority of Syrian immigrants proportionally prefer. According to Kaya and Kıraç (2016), the vulnerability report of the Syrians in Istanbul, the districts with the highest proportion of the proportional distribution of the Syrian population are Küçükçekmece, Bağcılar, Fatih, Sultangazi, Esenyurt, and Başakşehir. These districts are the districts with over 15,000 Syrian forced immigrants.

The district of Fatih is one of the central districts of Istanbul affected by forced migration from Syria. According to Kavas (2019), Syrian forced immigrants live in varying densities in all 39 districts of Istanbul. One of the districts studied in the study, which was carried out as part of the TEPAV's 2018 project "Post-War Syrian Ghettos in Istanbul", is Fatih. According to the research results, the spatial distribution of the Syrian population in the district is summarized below;

- In the Fatih district, 30,747 Syrian immigrants are registered under temporary protection. Together with the unregistered population, this number reaches up to 55,000.
- In the period between 2011 and 2016, it was determined that the Turkish population decreased and migrated to the districts of

Beylikdüzü, Başakşehir, and Esenyurt due to Syrian forced immigration.

- The Syrian population is mainly concentrated in the districts of Akşemsettin, Aksaray, Ali Kuşçu, and Molla Gürani.
- The population in Akşemsettin neighbourhood is close to the Turkish population. The street Akşemsettin is called "Syria Street". 90% of Syrian craftsmen work and live in this street.
- The Syrian population rate in Ali Kuşçu neighbourhood is high, and the "Malta Bazaar" in the neighbourhood is called the "Syrian Bazaar".
- Yusufpaşa Street in the Aksaray neighbourhood is also a place where Syrians live densely together.
- Fındıkzade and the millet roads in the neighbourhood of Molla Gürani are also places where Syrian craftsmen are concentrated

The effects of forced migration from Syria, which can be clearly comprehended through examples based on country, province, district, and neighbourhood, are quite visible and critical. In the settlements affected by migration, both demographic and cultural structures are changing, causing ghettoization that paves the way for the migration of the Turkish population to other neighbourhoods. Such observations are indications that social and cultural problems will arise in the coming years.

This study analyses the reactions of the inhabitants of the Fatih district in Istanbul to the spatial migration from Syria and the spatial distribution of these reactions. The data used in the study were collected within the project "Fatih Social Risk Map". Syrian migration is not one of the main objectives of this project, and the knowledge gained from the field study was obtained by evaluating the responses to the open question "What are the main problems of the Fatih district". In the context of this question, the profiles of persons who directly or indirectly indicated Syrian migration were examined in relation to the reception, gender, age, educational level, time spent living in the neighbourhood, time spent living in the district, and the neighbourhood in which they lived. The selected variables illustrate the effects of forced migration on the quality of urban life in physical, social, and economic contexts.

BACKGROUND OF CONTEXTUAL FRAMEWORK

Globalization, defined as a composite medium of social, cultural, and technological innovations brought about by the progress of communications infrastructure and transport and delivery systems, considerably deteriorates the distance factor. The concept of distance refers to the use of space and time. Reducing the time cost of the distances that have to be covered with different tools and vehicles leads to an easing of migratory movements and, consequently, to a restructuring of space (Cengiz, 2015). In the literature, there are different definitions of migration, which has important implications for the (re)design and

DOI: 10.15320/ICONARP.2020.142

redefinition of space. In the following subsection, the definition of migration in the context of forced and compelled migratory movements from Syria to the world, especially to the countries of the region, will be reviewed in relation to migration theories.

Forced Migration from Syria in the Context of Migration Theories

Immigration can simply be described as "human mobility". Migration is a concept that has existed since the beginning of time, social structures, and human history. And it has been differentiated over time according to its causes and results (Deniz, 2014). People abandon the place where they were born and live because of various problems and situations they encounter. So they might decide to move away from the place they live. Over time, a connection is established between people and the place where they live, based on personal and/or family history, memories, and experiences. Migration is a change in the place where the migrant lives. It is one of the important factors that change and/or damage the connection between the place where the person builds social and cultural bonds and ties (Ekici & Tuncel, 2015). According to Özkarslı (2014), 5 different categories of immigration styles can be classified. These categories and subcategories are listed below:

- Destination: Internal migration, External migration
- Time: Temporary, Continuous
- Willpower: Voluntary, Compulsory
- Size: Person, Group, Family, Mass
- Legality: Legal, Illegal

According to the definition of Özkarslı (2014), forced Syrians can be defined as "forced - mass - external" migration depending on their characteristics. Migration movements from Syria have both legal and illegal characteristics, depending on the attitude of the country to be migrated. As a result of this migratory movement, some of the migrants will return when the process in Syria returns to normal, while others will definitely prefer to stay in their country. Therefore, this migration movement has both continuity and volatility.

As indicated in the paper's introduction, since the definition of migration has changed, the concept of migration has different characteristics among them in migration theories. When Syria's forced migration movement is evaluated in the context of migration theories, it can be associated with different theories in different ways. Ravenstein has attempted to reveal his migration-related analysis with generally applicable laws (Tobler, 1995). Some of the laws that can be associated with forced migration from Syria include the following:

- Migration is close to the countries of origin, such as Turkey and Lebanon, while resources that are remote from more immigration receive less immigration in European countries.
- Similarly, the vast majority of immigrants are harboured in countries like Turkey, which has a border with Lebanon.

ICONARP – Volume 8, Special Issue / Published: 28.12.2020

- Geographically similar routes are generally preferred for migratory movements.

Lee gathered the impulsive and attractive characteristics concerning immigration in 4 factors. These factors are those associated with the source of migration, the destination, disruptive barriers, and personal characteristics (Lee, 1966). When forced migration from Syria is evaluated in this context, the risk of violence and life security at the source of migration is the most important driving factor. The peaceful and stable environment in the destination countries is the main attractive factor. Factors that may occur during migration, human trafficking, and the choice of sea route as a migration route are intermediate obstacles. Qualified immigrants can legally enter European countries, but the legal transit of migrants defined as unqualified workers for these countries is not possible.

William Peterson is another theorist who attempts to explain migration with push-pull factors. Peterson has classified immigration taking into account individual and class differences (Savaş, 2006), (Çağlayan, 2006). Types of migration defined by Peterson (1958) include primitive, forced, and enforced (compelled), free (mass) migration. The Syrian migration movement corresponds to Peterson's definition of forced migration. Whereas he defines forced migration, Peterson demonstrates for example the violence of the Nazis against the Jews. The violence against the opposition by the regime in Syria is the main source of migration. Despite the existence of mass immigration from Syria outside the country, Peterson's definition of mass immigration does not fit this context.

The Immigration Systems Theory is an approach based on international relations that explains forced migration from Syria. This approach recognizes that there are historical relationships between the country of immigration and the country of destination, which provide the necessary infrastructure for pre-migration immigration. It is based on the former relations with French colonial relations, which may exist between African countries in the economic relations between Turkey and Germany. The underlying historical relations between Syria and cultural relations with Turkey are located within the relationship defined by the theory of the immigration system.

In this context is the forced migration that took place from Syria to Turkey:

- It depends on the historical and cultural relations between the two countries,
- While the brutality of the regime in Syria is a driving force, Turkey, which creates a peaceful and secure environment, is an attractive force.
- There are obstacles such as human trafficking and the risk of death during migration.

DOI: 10.15320/ICONARP.2020.142

- Individual characteristics of migration from Syria to Turkey in case of threat or on the permanence of migration of individuals are effective to bring migration to an end. Turkey welcomes all immigrants regardless of individual characteristics.
- The migration from Syria to Turkey has arisen from the need for security of life

Impacts of Irregular Migration on Turkey and World Countries

When studying the impact of irregular migration on countries, it is necessary to consider the conditions under which immigrants become immigrants. It is a fact that people who have become immigrants for reasons of war or conflict arrive in the destination countries with the financial assets they have left in their home countries. Consequently, the problems and negative effects of these problems that immigrants face in the destination country should be taken into account. The outstanding problems that Yılmaz (2011) cites in the report highlight the problems faced by Syrian immigrants:

- The presence of crowded families
- Children have to sell on the streets the items such as water and handkerchiefs due to the lack of a livelihood.
- Difficulties in paying the rent
- The difficulty of processes related to obtaining financial support from the public
- Those who cannot find accommodation are obliged to sleep in parks and gardens
- The most serious problem is that Syrian women and children have to beg for money and food in the streets.

These problems experienced by immigrants in their country of origin have the potential to create new problems for the destination country. The labour force structure in the destination country is one of the factors that will be affected by irregular migration. (Ceritoglu, Yunculer, Torun, & Tumen, 2017) Migration from Syria has been studied in terms of its impact on the labour market in Turkey. According to this study, the rate of informal employment in Turkey decreased by 2.2% after migration. The main reason for this decline is that Syrian immigrants are employed informally because they do not have a formal work permit and are generally uneducated. While men who lost their jobs became unemployed, women lost their characteristics as workers.

In addition to the granting of work permits to Syrians, the balance on the labour market also brought about a change. In Turkey, where 1 million people need integration into the labour market, unemployment is a major problem. In cities with high unemployment rates, Syrians are rival to local workers and unemployed classes. The number of companies founded by Syrians has increased since 2011. Although these companies would prefer to employ Syrians who are cheaper workers, they could lead to an increase in informal employment.

ICONARP – Volume 8, Special Issue / Published: 28.12.2020

The Syrians' competition in the labour market also creates social problems. In cities where the unemployment rate is high, the idea that Syrians occupy local jobs and other negative thoughts can trigger social conflicts. The most important solution to overcome these problems is to create a strong, harmonious, and equitable labour market. This will ensure the social and economic integration of the Syrians. (Özpınar, Çilingir, & Düşündere, 2016). At the beginning of the migration period in Syria, it was not on the agenda as an immigration problem in Turkey. The spread of immigrants to all cities in the country has made this an important problem.

The problem of Syrian immigrants in relation to the economic, social, and political context in Turkey is not only a domestic problem of our country but also a global problem. The European Union and the United Nations are important international and global players who must play an active role as cost generators and providers of solutions to these problems. Despite the fact that the European Union has committed itself to support migrants in Turkey with 3 billion Euros, such a commitment has not been fulfilled so far (Paksoy & Gümrah Can Başdağ, 2019). Simply because the migrants in Turkey might encounter problems or a step towards creating better opportunities for migration to the countries of the European Union is possible, if the predictions are to be heard. Therefore, Syrian refugees in Turkey are primarily a problem in other countries, including the European Union. The analysis of the report on the economic impact of Syrian Immigration on Turkey, prepared by ORSAM in 2015, has highlighted the impact of migration with its positive and negative aspects. The migration effects that come to the fore in this report are listed below (Öztürkler & Göksel, 2015).

- Except for Mersin, cities with large numbers of Syrian migrants receive less internal migration. This was due to the perception of increasing unemployment, rising costs of living, and declining security conditions in these cities.
- In the import and export balances of the cities, different effects occurred after migration. In Gaziantep, Adana, Kahramanmaraş, and Mardin, the import-export balance has changed positively in the direction of exports. Economic relations, especially with the countries of the Middle East and North Africa, have improved positively in the direction of exports due to Syrian traders. This situation also had positive political repercussions.
- The goal of reducing the class sizes targeted in education was negatively influenced. Class sizes increased on average by up to 1 to 5 times
- Locals working in the informal sector have lost their jobs. There has been a drop in wages.
- The new demand created by the Syrians and the investments made in the region, for this reason, expanded the labour market,

DOI: 10.15320/ICONARP.2020.142

even if only partially, and at the same time created new employment opportunities.

- The rise in food prices and rents in regions that experience high immigration had a negative impact on inflation.
- The locals indicate that health services are increasingly worsening and it is becoming more and more difficult to get health services.

One of the countries preferred by Syrian immigrants is Lebanon, where the problems caused by immigrants are gradually increasing. Lebanon's existing systems and infrastructure are not sufficient to meet the growing needs of immigrants. Migrants are also isolated from economic activities and society (Hamdar and Hejase, 2018). The impact of immigrants in Jordan has been assessed in the context of political, economic, socio-cultural, and environmental factors, with the result that these four factors are interdependent. Although the economic effects increased social tensions, they also led to political intervention. The economic stagnation has had negative effects on the ecosystem and the use of natural resources. (Alshoubaki & Harris, 2018). In Germany, it is considered an important problem that immigrants can work for relatively low wages in jobs that are equivalent to those of the native population. Unemployment rates for immigrant groups are high as immigrants do not have these qualifications, while those employed in Germany often work in occupations that require higher education and greater autonomy. Immigrants are confronted with the language, the equivalence of diplomas, and the legal inability to work in the host countries (Chatzichristou, 2018).

METHODOLOGY

The sample size of the study is 953 and the margin of error of this sample size is ± 3.17 at a 95% confidence level. However, due to the limitations mentioned in the next section, a deterioration of the sampling design may lead to an increase in this rate.

The households in which the individuals to be interviewed live were determined using a stratified simple random sampling method. It is divided into 25 strata based on the quarters of the Fatih District. Depending on the population of the quarter, neighbourhoods with less than 15 samples are grouped as a single stratum under the other stratum. It was observed that the neighbourhoods grouped under the other were in the former Eminönü district and were generally in the workplace.

The interviews in the selected neighbourhoods of the sample were randomly distributed to the streets/streets, as the sampling frame was not available.

Population: Individuals aged 15+ living in Fatih District
Sampling Method: Stratified simple random sampling
Sample Frame: Streets in the neighbourhoods of Fatih District
Sampling Unit: Individuals aged 15+

ICONARP – Volume 8, Special Issue / Published: 28.12.2020

Sampling Features

- The share of household heads is 52.3%, the share of other household members is 47.7%.
- The percentage of women is 40% and the percentage of men is 60%.
- The average age of men in the district is 25.08 years and 22.01 years for women.
- The average age of men in the neighbourhood is 22.52 years, that of women 16.8 years.
- The proportion of 15-30 year-olds is 30%, the proportion of 31-45 year-olds is 34.9% and the proportion of over 45-year-olds is 35.1%.
- The ratio of those who have completed elementary and elementary school is 36.9 %, the ratio of secondary and high school graduates is 48.3 %, and the ratio of graduates from vocational high schools and above is 14.8 %.
- 13.6% of the SES group calculated in AB, 69.4% in C1-C2, 17% in DE SES group is located, especially gender in the distribution of the sample by neighbourhood and demographic variables.

There were a few limitations to the study. These limitations are listed as follows.

- Based on the work plan of the field company, an attempt was made to complete the field study in 3 days.
- One of the obstacles experienced during the field studies was the unfavourable weather conditions in Istanbul at the time of the survey.
- Time restrictions in interviews, as women are reluctant to participate in the survey. For this reason, male persons were preferred in the household.
- SES results of some respondents; the income used to calculate the SES, profession, etc. could not be calculated because they did not answer their questions.
- In the question in which the immigrant problem was used as a dependent variable, it was assumed that those who state the most important problem of Fatih as an immigrant mean Syrians among other immigrants in Fatih.

FINDINGS OF THE STUDY

In the 2015 survey, the rate of those who say that they consider foreigners or immigrants to be the most important problem of the Fatih district is 20.7%. This ratio differs spatially in terms of distribution by location. Among the problems grouped as foreigners, the rate of those who identify Syrians as problems is 41.0%. The spatial distribution of those who identify Syrians as a problem also differs spatially in terms of the distribution of locations, as do those who identify foreigners as a problem. The neighbourhoods with 50% or more foreigners as the main

DOI: 10.15320/ICONARP.2020.142

problem are Muhsine Hatun, Nevbahar, Aksaray, Kalenderhane, and Molla Gürani. Among these neighbourhoods, the Aksaray and Molla Gürani neighbourhoods are the districts with the highest Syrian population. The regions where those who cite foreigners as a problem are 50% or more, especially those that cite Syrians are Muhsine Hatun, Molla Hüsrev, Kalenderhane, Balat, Ayvansaray, Ali Kuşçu, Yavuz Sultan Selim, Sümbül Efendi, Karagümrük, Topkapı, Akşemsettin, Hirkai Şerif, Silivrikapı, and Koca Mustafapaşa. To these districts belong Akşemsettin and Ali Kuşçu, which represent the densest Syrian population. Examining the distribution of the districts in which the immigrant problem is most strongly perceived, it is obvious that these districts are concentrated in the centre of Fatih.

It is observed that there is a linear relationship between the spatial distribution of the immigrant problem and immigrant density. The districts of Muhsine Hatun, Aksaray, and Kalenderhane, which are among the districts where most immigrants live, were defined as urban deterioration areas at the time the study was conducted. In the interviews with the district municipalities, it is stated that the districts İskenderpaşa and Molla Gürani are now becoming collapsed areas. It has been noted that the immigrant population is finding housing primarily in the deteriorated areas and accelerating the transformation to the deteriorated area in other regions where they are settled and densely populated.

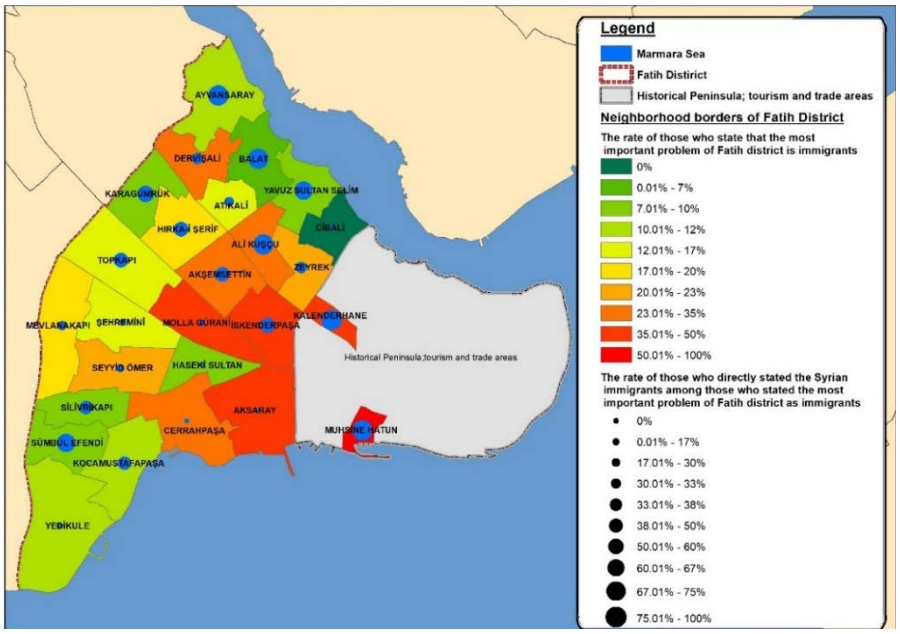


Figure 1. Distribution of people who define "Foreign People" and "Syrians" as Fatih District's most important problem.

The second variable that, according to spatial distribution, causes differentiation in specifying strangers as a problem is "homeownership" (Chi-square = 5.883, df = 2, p = 0.054). The percentage of those who specify foreigners as a problem is listed as follows: Living without paying rent, tenants, and landlords. It is assumed that non-house owners see Syrians as a threat, which is supported by the fact that, as outlined in the

conceptual framework section, rents are rising and food prices are increasing in areas with high immigrant populations. The third variable that causes differentiation in specifying Syrians as a problem is "gender". Men were 2 times more likely than women to specify Syrians as a problem (Chi-square = 8.501, df = 1, p = 0.004). The greater problem of job security for men can be linked to this result. It can be seen that economic concerns come to the fore in both the " specifying Syrians as a problem" and the "specifying immigrants as problems in general".

In the studies conducted today in the Fatih district, it is noted that the dissatisfaction from Syrian immigrants continues to increase and the natives migrate to different districts or districts in the neighbourhoods where Syrians live only sparsely. These findings clearly show the impact of the migrant problem caused by forced migration on the economic dimension of urban quality of life. It is evident that the decline in the economic dimension of urban quality of life will have a negative impact not only on the urban quality of life but also on the social dimensions.

Decision tree modelling has been used to determine the profile of those who have identified foreigners as a problem. In the modelling study, the state of specifying foreigners as a problem was used as a dependent variable (0=Do not rate foreigners as a problem, 1=Rating foreigners as a problem). The independent variables used are homeownership, age, gender, length of stay in the district, educational status, and length of stay in the neighbourhood.

As a result of modelling studies, the decomposition of the model obtained with the CRT algorithm was accepted as successful. According to the model results, the most effective factor for seeing foreigners as a problem was determined as "homeownership". The second effective factor to see foreigners as a problem was determined as "age".

Corresponding to the model results, the possibilities to specify strangers as problems are listed below:

- Tenant without renting=%35.3
- Homeowner/Tenant and age>24.5=%22.0
- Homeowner/Tenant and age <=24.5=%10.4

According to the results of the decision tree model, the last variable that is effective in identifying immigrants as a problem is age. The fact that persons over 24.5 years of age are a working population, which appears as a threshold value, should also be taken into account.

CONCLUSION

Irregular Syrian migration is not a phenomenon that is occurring for the first time in Turkey.

The political and military tensions in Iraq in the 1990s forced tens of thousands of immigrants to move to the Turkish border. Especially after the massacre in Halabja in 1988, there were massive waves of immigration. In this respect, our case describes a chapter in which we can explore how to develop a holistic approach with migrants who are

DOI: 10.15320/ICONARP.2020.142

welcomed with conscientious, humanitarian, and historical responsibility within the borders of our country.

The fact that the Anatolian geography, which we referred to in the introduction as "crossroads, corridor of passage and interaction pot", raises the question of "what impact the estimated total number of immigrants based on the estimated 5-6 million in the sociology and cultural geography of the country will have in the near future". Another key question that we would like to highlight is that the phenomenon of immigration if successfully managed, will force an enrichment of cities in terms of social relations, economic diversity, and cultural assets. Thus, a place that is not migrated as the first choice actually means a place that is not preferred among the migration options. It can be ascertained that the countries of the American continent, artificially and brutally constructed over the last centuries exclusively with waves of immigration, perceived immigrants as economic, social, and cultural catalysts. In the present study, we believe that this perception has not been directly investigated. Furthermore, we believe that when there are differences between countries of origin and destination in terms of cultural environments such as languages, religions, etc., mass migration flows pose valuable questions to defined new reservoirs of resources about what types of test, conflict, compromise, and synergy areas can be created. In summary, we can stress that regular or irregular migration can reveal both the opportunities and the threats that lead us to reflect on effective and beneficial models of migration management that are only possible in political ecosystems where cultural conflicts or codes of racial hatred can be suppressed.

Syrians who had to leave their country because of the ongoing repression in the Syrian civil war and the regime are problematic not only for Turkey but also for the industrialized countries. The literature review shows that the countries most affected by forced migration from Turkey, such as Lebanon, Jordan, and European countries, are not fully prepared for this phenomenon. Turkey has been relatively late in taking measures for the economic and social integration of Syrian immigrants. In this study, the integration problems of Syrian forced immigrants were discussed and evaluated in the context of the study.

The results of the research conducted in 2015 show that initiatives to integrate Syrian migrants should be taken at that time. Today it is clear that not enough attempts have been made since this issue was discussed. It is clear that due to Syrian immigration, negative changes in the social, economic, and demographic structure have been observed in the Fatih district, the case study area. The density of immigration is increasing, and the level of dissatisfaction among the local population is rising Syrians are considered a problem because of economic concerns. This situation shows how important it is to take the necessary steps to ensure the economic integration of Syrian migrants.

However, Syrian migration does not have only negative aspects. The expansion of the labour market and the opening of new markets abroad

by Syrian traders are remarkable positive effects. It is advantageous to share these positive effects with the public in areas where Syrian immigrants are concentrated. At the same time, measures should be taken to inform Syrians who work informally that they are dismissing the natives or posing a threat to the workforce. Unregistered employment should be prevented. Syrian immigrants are also seen as a security threat, which may pose a risk for future social conflicts. The necessary measures should therefore be taken to address this problem. Syrian women and children should not be forced to beg. Begging is one of the irregularities that increase the perception of crime.

In areas where Syrians live close together, measures should be taken to eliminate disruptions to health services. Problems that arise in the education system should be identified locally and solved with proper interventions. It should not be forgotten that Syrians flee and immigrate from the pressure and violent environment in their countries. International efforts should be made to end the civil war in Syria. Steps such as the creation of a safe zone to allow Syrian immigrants to return to their countries should be taken quickly.

The study clearly shows that in places where the immigrant population is concentrated, the quality of urban life decreases in physical, social, and economic terms. Ensuring a more controlled spatial distribution of immigrants, which has a negative impact on the quality of urban life, ensuring the integration of immigrants into the city, legalizing the participation of immigrants in economic activities will at least contribute to reducing the problems that will arise in relation to urban quality of life.

ACKNOWLEDGEMENTS

Special thanks to the Method Research Company for allowing us to conduct the field process of this project free of charge.

CONFLICT OF INTEREST

No conflict of interest was declared by the authors

FINANCIAL DISCLOSURE

The authors declared that this study has received no financial support. Method Research Company conducted the field process of this project free of charge.

ETHICS COMMITTEE APPROVAL

“Ethics committee approval was not required for this article”

LEGAL PUBLIC / PRIVATE PERMISSIONS

“In this research, the necessary permissions were obtained from the relevant participants (individuals, institutions and organizations) during the survey, in-depth interview, focus group interview, observation or experiment.”

DOI: 10.15320/ICONARP.2020.142

REFERENCES

Ağır, O., & Sezik, M. (2015). Suriye' den Türkiye' ye yaşanan göç dalgasından kaynaklanan güvenlik sorunları. *Birey ve Toplum, 5*(9), 95–124.

Alshoubaki, W., & Harris, M. (2018). The impact of Syrian refugees on Jordan: A framework for analysis. 11(2), 154–179. https://doi.org/10.14254/2071-8330.2018/11-2/11

Cengiz, D. (2015). Spatial effect of forced migration and perception of local community; Case of Kilis. *Turkish Studies*, 10, 101–122.

Ceritoglu, E., Yunculer, H. B. G., Torun, H., & Tumen, S. (2017). The impact of Syrian refugees on natives' labour market outcomes in Turkey: evidence from a quasi-experimental design. 1–28. https://doi.org/10.1186/s40173-017-0082-4

Chatzichristou, M. (2018). The Impact of Syrian Refugees on German Labour Market. Erasmus Unıversiteit Rotterdam.

Çiftçi, H. (2018). Türkiye Cumhuriyeti vatandaşlarının Suriyeli sığınmacılara yönelik tutum, algı ve empatik eğilimlerinin analizi. *İnsan ve Toplum Bilimleri Araştırmaları Dergisi,* 7(3), 2232–2256.

Deniz, T. (2014). Uluslar arası göç sorunu perspektifinde Türkiye. *TSA*, 18(1), 175–204.

Ekici, S., & Tuncel, G. (2015). Göç ve insan. *Birey ve Toplum*, 5(9), 9–22.

Kavas, A., Avşar, İ., Kadkoy, O., & Bilgiç, E. Ç. (2019). İstanbul' da Suriyeliler ve Savaş Sonrası Suriye Gettoları.

Kaya, A., & Kıraç, A. (2016). İstanbul'daki Suriyeli Mültecilere İlişkin Zarar Görebilirlik Değerlendirme Raporu.

Lee, E. S. (1966). A theory of migration. Demography, 3(1), 47–57.

Özkarslı, F. (2014). "Suriye'den Türkiye'ye göç ve Suriyelilerin enformel istihdamı" Artuklu Üniversitesi.

Özpınar, E., Çilingir, Y. S., & Düşündere, A. T. (2016). Syrians in Turkey: Unemployment and Social Cohesion.

Öztürkler, H., & Göksel, T. (2015). Suriyeli Mültecilerin Türkiye'ye Ekonomik Etkileri: Sentetik Bir Modelleme.

Paksoy, H. M., & Gümrah Can Başdağ. (2019). The neccessity of externalization of costs of Syrian refugees*. Gaziantep University Journal of Social Sciences*, 18, 1113–1120.

Petersen, W. (1958). A general typology of migration. American Sociological Review, 23, 256–266.

Sandal, E. K., Hançerkıran, M., & Tıraş, M. (2016). Türkiye' deki Suriyeli mülteciler ve Gaziantep ilindeki yansımaları. *Gaziantep University Journal of Social Sciences*, 15(2), 461–483.

Savaş, Ç. (2006). Göç Kuramları, Göç ve Göçmen İlişkisi. *İLKE*, (17).

Tobler, W. (1995). Migration: Ravenstein, Thornthwaite, and beyond. *Urban Geography*, 16(4), 324–343.

Yıllık Göç Raporu. (2013). (2020, January 10). https://www.goc.gov.tr /2013_yillik_goc_raporu.pdf

Yılmaz, H. (2011). Türkiye' de Suriyeli Mülteciler - İstanbul Örneği – (C. 90).

Resume

Ömer Bilen received his B. Arch and M. Arch from Yıldız Technical University in the major of statistics. Ömer Bilen received his PhD degree from Yıldız Technical Universtiy in the major of urban planning. He currently works as an Assist. Prof. Dr. at Urban and Regional Department of Bursa Technical University.

Mehmet Gür currently works at Yıldız Technical University, Deparment of Geomatic Engineering, Division of Land Management as a researcher. He received his M. Arch and PhD degrees from Yıldız Technical University, Turkey. His main areas of research are land management, urban transformation, land valuation and GIS.

Ersan Koç *is assistant professor at Bursa Technical University, Department of Urban and Regional Department. His major research topics are urban design and implementation, urban-regional-global geography and planning theory, risk society and resilient cities, industrial history, innovative clusters and local development models, technology, and space.*

Ebru KAMACI KARAHAN is assistant professor at Bursa Technical University, Turkey. She completed her PhD dissertation at Middle East Technical University entitled "Re-reading Urbanization Experience of Istanbul through Chancing Residential Mobility Behavior of Households". She researches housing with particular focus on the intra-urban mobility, migration, GIS and socio-spatial changes.

DOI: 10.15320/ICONARP.2020.142

Research Article

ICONARP
International Journal of Architecture and Planning
Received: 13.10.2020 Accepted: 04.12.2020
Volume 8, Special Issue/ Published: 28.12.2020
DOI: 10.15320/ICONARP.2020.143 E- ISSN:2147-380

ICONARP

Bosphorus Coastal Road and Settlements Between Beşiktaş and Bebek in 1939 Plan

Sezgi Giray Küçük[1]

[1] Asst. Prof. Dr., Architectural Restoration Programme, Vocational School, Mimar Sinan Fine Arts University, Turkey. E-mail: sezgi.giray.kucuk@msgsu.edu.tr

Abstract

Purpose

The aim of the study is to question whether this plan, which was signed by Henri Prost and showing the settlements between Beşiktaş and Bebek on the European side of the Bosphorus in detail and explains them in cross-sections, is implemented or not, and to reveal the effect of the plan on the formation of current state of the Bosphorus coasts. In the study, which decisions are taken during the planning process are also questioned.

Design/Methodology/Approach

In the study, the city centers of Beşiktaş, Ortaköy, Arnavutköy, Kuruçeşme, Bebek and the settlements between them and the conditions of the coastal road before, in and after 1939 are examined with the help of maps and aerial photographs. With the aerial photographs that have survived until today, the physical change of the urban texture over time and its current situation are also revealed.

Findings

As a result of the examination, it was determined that most of the plan, which was approved in 1939, was implemented between 1956-1958, during the Menderes period. In this process, many settlements lost their original urban texture, historical structures, and architectural identities. It can be said that the seeds of the pile road, which was built during the Dalan period and cut the connection of the mansions with the sea, was planted with this plan. It was also possible to obtain some clues about the planning approach of the Prost period from this plan. Accordingly, it can be listed as opening squares, turning dead-end streets into streets, widening the streets, and cleansing industrial-related spaces from the coastline. The fact that these plan decisions are encountered in other regions of Istanbul during the Prost period, suggests that although Prost did not draw the 1939 plan, it had a share in its design.

Research Limitations/Implications

Due to the lack of a clear aerial photograph or map after 1939 until 1955, the year in which the changes foreseen in this plan were applied could not be determined clearly, and the time interval was stated.

Originality/Value

This plan, being one of the first steps of the Bosphorus coastal regulations on the European side, is an original document that has not been evaluated in previous research. This plan was drawn when Henri Prost was working as an urban planning specialist in the Istanbul Municipality Zoning Directorate and it bears the signature of Prost's approval.

Keywords: *Bosphorus, coastal road, Henri Prost, urban texture, Menderes*

INTRODUCTION

In the historical perspective, Istanbul, like all Islamic cities, has the appearance of a spontaneous city, in other words, an unplanned city (Kuban, 1996). In time, due to fires and earthquakes, the buildings were demolished and the plan of Istanbul was renewed as a grid system regionally. In the 19th century, the first planned studies on the urban plans of Istanbul began. Map studies initiated during the 2nd Mahmut period (1808-1839) are indicative of the transition of Istanbul to the planned development period. The first map was drawn to Helmuth Von Moltke by the Ottoman State. Moltke was sent to Istanbul in 1835 by the Prussian government as a consultant to the Ottoman army. During his stay in Istanbul, he prepared a zoning plan alongside the map. This study, which could be considered as the first zoning plan in the whole city scale in the Ottoman Empire, maintained its effect for a while and at least created an acceleration that continues its effect for similar studies in Istanbul today (Beydilli, 2005). However, the proposals prepared without coming to Istanbul were prepared by ignoring the Istanbul topography consisting of hills and valleys, they couldn't form a holistic plan (Akpınar, 2014). In 1933 Herman Elgötz from Germany, Alfred Agache and J.H. Lambert from France was invited for urban problems. It is seen that the reports they prepared as a result of their investigations are aimed at general level and urban transportation problems (Salman, 2004). Their recommendations in areas such as growth, transportation, historic preservation and the creation of regions have not been implemented, but their reports have survived to the present day (Çelik, 2015). Dr. Ing. M. Wagner's work titled "Plan of Istanbul and its environs" is based on environmental analyzes and emphasizes the necessity of protecting agricultural lands. This plan proposal was not adopted.

In 1936, the Municipality of Istanbul called on Henri Prost, the chief urbanist of Paris, to prepare Istanbul's master plan. Prost have made plans, sketches, projects and proposals about Ayasofya, Atmeydanı, Archeology Park, Atatürk Boulevard, Fatih and Taksim Squares, Beyoğlu neighborhood, Bedesten Metro stop, Grand Bazaar and Eminönü Square. He also has studies about the road system. Atatürk Boulevard, Yenikapı-Aksaray road, Millet Street, the coastal road along the coasts of the Marmara Sea and the Golden Horn, Yenikapı-Yeşilköy airport road are among these studies (Gül, 2013). In addition to these, Prost has also made some studies on the planning of the Bosphorus, one of the historical and culturally valuable areas of Istanbul.

Bosphorus which was opened to settlement after the conquest of Istanbul, became a suburb of the city in the 19th century. With the establishment of the Republic in 1923, its population increased, its urban texture changed in relation to the planning and urban development of Istanbul. In this process, the coasts of the Bosphorus started to be preferred for permanent residential use (Aysu, 1989). This

DOI: 10.15320/ICONARP.2020.143

situation led to an increase in population density and planning studies in these areas. Prost's work on the Bosphorus coincides with this period. In the 1/5000 scale master plan report completed by Prost in October 1937 and approved in 1939, it was proposed about Bosphorus, only to remove the warehouses and industrial establishments on the coast (Prost, 1938). Prost then discussed the planning of the settlements along the Bosphorus, dealing with this from 1939 to 1948 (Bilsel, 2010). He delivered the development plan in 1948. According to this plan, mansions, which are unique to the Bosphorus, are architectural heritage buildings and their protection is also important. Prost showed a planning approach that emphasizes sea, green texture and mansions, in Beşiktaş, Beylerbeyi, Kuruçeşme, Arnavutköy, Bebek, in its reports. According to Prost, white colour should be used for palaces and mansions in the Bosphorus whereas the other buildings should be red, yellow, gray according to the traditions. These structures should be carefully planned by trained architects in order not to damage the view of the Bosphorus. Prost's proposal is a realistic and less interventionist approach that aims to protect the urban texture consisting of houses and historic mansions along the coasts of the Bosphorus with its historicist and conservative approach (Coşkun, 2017). Prost stated that the upper and lower cornices should be planned alongside the coastal road in order to create alternatives to the coastal road which is the only way to reach the Bosphorus villages. He envisions a triple cornice model inspired by the Côte de Variose regulations in France on the Bosphorus (Salman, 2004).

Another contribution of Prost to the studies on the Bosphorus, is the 1/2000 scale plan approved in 1939 (Figure 1). This plan was drawn up in October 1938 approved and signed by Henri Prost in December 1938 on condition that the two regions (Ortaköy and Beşiktaş) are revised again, and in June 1939, the same regions were approved by the zoning manager. The plan is about the arrangement of the coastal settlements in the European side of Istanbul, from Beşiktaş to Bebek, their nearby surroundings and the coastal road (Atatürk Library, Hrt_006246). Although it covers a large area, a detailed planning has been made for each settlement. In the plan, existing streets, squares, building blocks, green areas, monumental structures are drawn, and the structures planned to be built are expressed with writing. The plan has been made more defined by supporting contour lines and sections. The planned changes are indicated with red lines on the plan used as a base. This original plan, which has not been the subject of any publication until today, has been the starting point of this study. In this study, the issues taken into account in the design of the mentioned plan are tried to be revealed. It is questioned whether this plan was implemented, in what period it was implemented, and how this planning affects the urban identity of the region. Accordingly, an answer is sought to the question of what the share of the plan in the formation of the present-day Bosphorus coastline is.

Figure 1. 1939 plan showing the settlements between Beşiktaş and Bebek and the coastal road.

Information about the planning of the Bosphorus is generally available in publications on the planning and reconstruction of Istanbul (Doğusan, 2004; İstanbul'un kitabı, 1957; Tekeli, 2009; Ünsal, 1968) or directly in publications related to the planning of the Bosphorus (Yıldız *et al*., 2018; Salman, 2004; Salman & Kuban, 2006; Diker *et al*., 2008; Ergen, 2005). However, in publications directly related to the planning of the Bosphorus, it generally emphasizes the post-1950 period when the threats related to the protection of the Bosphorus due to the density of the population, and generally examines the role of laws in the change of the region. Prost period Istanbul plans were also investigated in the study. Many researchers such as Akpınar (2010), Bilsel (2010), Bilsel & Zelef (2011), Cansever (1994), Coşkun (2017), Enlil (2011), Gül & Lamb (2004), Suher (1993), Uluengin & Turan (2005), Uluskan (2007), Tekeli (1993) have worked on this issue. However, the map that constitutes the subject of this study has not been found among these publications. Besides, there are publications examining the physical change of Bosphorus villages in the study area. In the context of historical development, urban change and transformation and protection of historical regions, Arnavutköy (Ünal, 2011; Ansel, 2016), Beşiktaş (Gökyay, 2009; Özsoydan, 2018; Metin, 2010; Üresin, 2019), Kuruçeşme and Ortaköy (Atalan, 2008) has been the subject of many publications. However, there is no publication that collectively deals with the change of settlements between Beşiktaş and Bebek.

In the study, Beşiktaş, Ortaköy, Kuruçeşme, Arnavutköy, Bebek and the areas between them are examined under individual headings and analysed in three stages: the situation before the 1939 plan, the 1939 plan and after.

The physical change of the region was tried to be determined by comparing the maps and aerial photographs. Firstly, information about the pre-1939 situation of the region was obtained from the old maps which the oldest one dated 1793. Some of the maps used in the work are involving the entire Bosphorus are undetailed and they are indicating whether there are settlements in the region or not. Some of them are detailed maps up to the parcel. After identifying the urban texture before 1939 by maps, what was foreseen to change in the 1939 plan was revealed. These were usually building blocks sizes, street types, street and avenue widths. It was then compared with the first map or aerial photograph available after 1939, to determine whether this proposal had been implemented until that date. It has been tried to determine whether the region has undergone any changes by comparing it with the later aerial photographs. With the aerial photographs that have survived until today, the change of the urban texture in time and its current

DOI: 10.15320/ICONARP.2020.143

situation are also revealed. In short, the study questions the periods of changes in urban settlements.

From 1936 to 26 December 1950, Prost worked as an urbanism specialist at the Istanbul Municipality Development Directorate. He was dismissed by the Democratic Party, which won the local elections with a great victory after the 1950 general elections. Between 1950 and 1956, Turkish planners undertook the revision of the Prost Plan. Then, in 1956 Prime Minister Adnan Menderes personally directed the reconstruction of the city. In the following four years, until the military coup of May 27, 1960, intensive road construction, street widening, demolition of old buildings and construction of new ones continue (Akpınar, 2010), so an irreversible urban change took place in Istanbul. Afterwards, these demolitions continued in the period of Bedrettin Dalan between 1984 and 1989.

ANALYSIS OF THE SETTLEMENTS BETWEEN BEŞIKTAŞ AND BEBEK, IN THE BOSPHORUS COASTAL ROAD PLAN DATED 1939

Istanbul is a unique city with the Bosphorus that divides the city into two. For this reason, Bosphorus settlements also have a special importance. The settlements, which were the Bosphorus villages of the 1930s, are the favorite districts of Istanbul today. These settlements are included in general maps describing Istanbul or the Bosphorus or on more detailed maps drawn on the basis of regions (Figure 2).

Figure 2. Bosphorus villages in the current aerial photo and study area.

T. Mollo map dated 1793-1802 (Figure 3a), Benar Sampierdarena Oliver map dated 1800 (Figure 3b), M. Bourgoulou map dated 1803 (Figure 4a), 1894-95 dated map in Atatürk Library (Hrt_Gec_000006) (Figure 4b), Nedjib map dated 1918 (Figure 4c) and Mamboury map dated 1929 (Figure 5) are the general maps used in this study about Istanbul and Bosphorus.

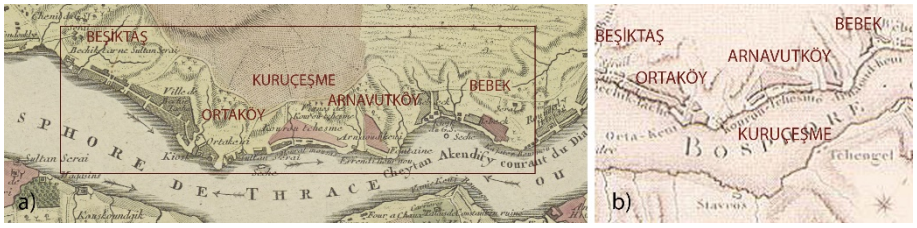


Figure 3.
a) 1793-1802 dated T. Mollo map
b) Benar Sampierdarena Oliver map, 1800's, (Atalan, 2015).

Figure 4.
a) 1803 dated M. Bourgoulou map (Atalan, 2015)
b) 1894-95 dated Istanbul and Bosphorus map, (Atatürk Library, Hrt_Gec_000006)
c) 1918 dated Necip map.

Figure 5. 1929 dated Mamboury map.

Beşiktaş

Beşiktaş having a deep-rooted history, has been included in many maps from past to present. In the Mollo map dated 1793-1802, the Sultan's Palace is the only structure took place in Beşiktaş (Figure 3a). Beşiktaş can be seen on the map of Dolmabahçe, which was prepared in 1834 in Mühendishane (Figure 6a). However, it was realized that the traces on the map did not coincide with the current traces on building blocks-road basis, and it was assumed that a precise drawing could not be made during this period (Gökyay, 2009). An important information learned from this map is the coastline trail. Compared to the current map, it is understood that the coast is quite filled. In the map dated 1882, Sinan Pasha Bath, Valide Mosque on the north of Beşiktaş Street and three docks on the coast can be seen. The coastline on this map is similar to that of 1834 (Figure 6b).

Althought Gökyay says 1894 Moltke map shows that the river in Beşiktaş reaches the Bosphorus (Figure 7a), in 1882 map the river can not be seen. This river dried up in the 19th century and was filled during the construction of Akaretler (Gökyay, 2009). In the 1914 dated Alman Mavileri maps, streets and the monumental buildings is highlighted. The monumental buildings shown in this map are Sinan Pasha Mosque, tramway station, police station, the Barbaros Hayrettin Pasha Tomb, the Sinan Pasha Fountain, the Yedi-Sekiz Hasan Pasha Tomb, and the Beşiktaş Dock (Figure 7b). The 1918 Nedjib map includes the building

DOI: 10.15320/ICONARP.2020.143

blocks, streets and their names, green areas and buildings (Figure 7c). The 1922 Jacques Pervititch map contains a lot of detail on a parcel basis and is the most detailed map used in the study (Figure 8a). According to this map, there are various docks and their buildings on the coast, including the Beşiktaş ferry dock. To the west of ferry dock, there is a material warehouse of Atlas company, its dock and one-storey wooden sheds, a firewood dock, a custom and a two-storey masonry building. To the east of the ferry dock there is a straw dock, sand storage, lime storages and wooden sheds. On Beşiktaş street, there are two storey shops, cinema, central police station, Municipality building, Barbaros Hayrettin Pasha and Yedi-Sekiz Hasan Pasha tombs. Towards Dolmabahçe Palace, on the coast there are wooden mansions and their docks, with their gardens at the back, horse stables, warehouses, there is a complex and adjacent structuring (Figure 8a). In the map of Rumeli Ciheti (2005), dated 1924, only the streets and monumental buildings are shown, as in the Alman Mavileri map. The street boundaries are the same as the Alman Mavileri map, but fewer monumental structures such as Sinan Pasha Mosque and Fountain and Barbaros Hayrettin Pasha Tomb are shown this map (Figure 8b).

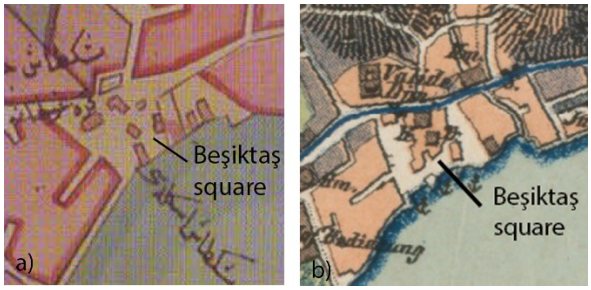


Figure 6.
a) Beşiktaş in "Dolmabahçe and surroundings" map, prepared by Mühendishane (schools of engineers), 1834 (Çetintaş, 2005).
b) Istanbul map, 1882.

Figure 7. Beşiktaş in
a) Moltke map, 1894 (Çetintaş, 2005)
b) Alman Mavileri, 1914.
c) Necip map, 1918, (SALT Online Archive, access code: APLNEDOT02A)

Figure 8. Beşiktaş in
a) Jacques Pervititch map, 1922 (the notes on the aerial photos are written by the author).
b) Rumeli Ciheti map, 1924.

According to the map approved in 1939 where the change of centers on the coast was planned, the coastline is planned as a smooth line (Figure 9). To implement this, it has been proposed to increase the triple of Hayrettin Dock Street parallel to the coast and on the west of Beşiktaş Ferry Dock. Mahkeme dead end street, parallel to Hayrettin Dock Street,

was transformed into a normal street and increased to approximately twice the width. The street, which is connected to the Beşiktaş Ferry Dock remains on the central axis, squares has been created in the east and west. In the west, the streets in the area where Barbaros Hayrettin Pasha's tomb is located and a few dead-end streets in the east have been removed. Streets at different angles in Beşiktaş are arranged perpendicular to the beach. Beşiktaş-Ortaköy Street (also known as Dolmabahçe Street and Beşiktaş Street) has been almost doubled to 25 meters, and it is planned to end with straight lines. In the north of this street, the organic textured streets around Sinan Pasha Mosque were removed and instead a new avenue as wide as a main street (today's Barbaros Boulevard) was planned to be opened. The Serencebey slope to the east of it also has been almost doubled. This zoning plan was approved in 1939, provided that the area within the ABCD was re-studied (Figure 9). However, no plan was identified that those etude studies done.

Ünsal (1968) published a photo showing the just opened Beşiktaş square (Figure 10). The applied version of the regulations in the 1939 plan can be seen in this photo. However, the fact that the photo was dated in 1938 contradicts the 1939 approval date of the plan. It is thought that the date of photo is after 1939. In another photograph dated 1943, Beşiktaş square is seen again. (Figure 11).

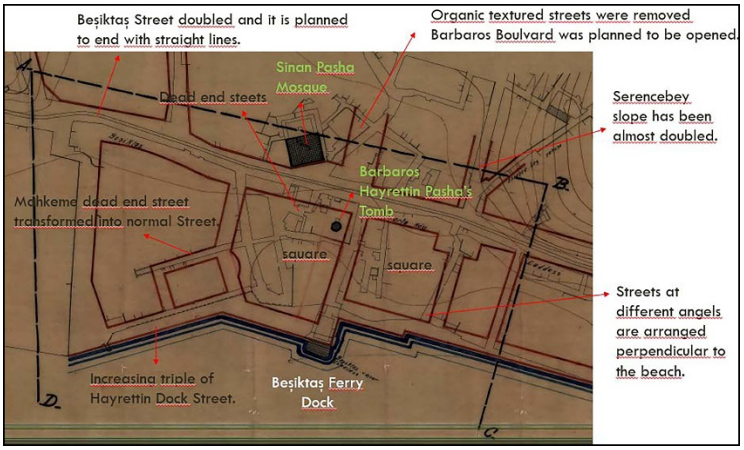


Figure 9. The plan of 1939 was approved on condition that the ABCD area should be re-studied (Atatürk Library, Hrt_006246) (the notes on the aerial photos are written by the author).

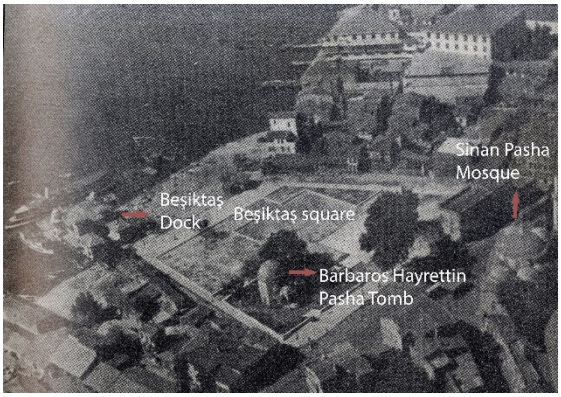


Figure 10. Just opened square in Beşiktaş, 1938 (Ünsal, 1968) (the notes on the aerial photos are written by the author).

DOI: 10.15320/ICONARP.2020.143

Figure 11. Beşiktaş Square in 1943 (Daver, Resmon and Günay, 1943).

In Istanbul's transportation system proposal plan, which was prepared by Prost in 1940, the coastal road, Barbaros Boulevard and Beşiktaş square were marked in the Bosphorus region. This shows that the biggest change in the Bosphorus is foreseen in Beşiktaş (Figure 12).
The oldest map obtained after 1939, Bülent Tuvalo's 1955 map of Istanbul (Figure13) shows that the square was opened against Beşiktaş Ferry Dock while the other regions of Beşiktaş, the street texture has not changed.

Figure 12. 1940 dated Istanbul transportation system proposal by Prost, Bosphorus part.

Figure 13. Bülent Tuvalo map, 1955 (SALT Online Archive, access code: APLBTISTNDX01) (the notes on the aerial photos are written by the author).

Beside the square, urban texture of Beşiktaş, changed considerably between the years 1956-1958 in the reconstruction arrangements of the Menderes period, and many historical buildings were destroyed in this process. In 1956, while Beşiktaş Avenue was enlarged, the bath,

fountain, and clock room (Muvakkithane) of the Sinan Pasha Complex and Hacı Ahmed Ağa Fountain were also destroyed (Figure 14). The bath was built as a part of Sinan Pasha Complex, across the road, southwest of the mosque. The complex, dated 1555, was built by Mimar Sinan for Kaptan-ı Derya Sinan Pasha. The location of the bath was at the corner of Beşiktaş Street and Hayrettin Dock Street. Sinan Pasha Bath was also known as Köprübaşı Bath because it was located at the head of bridge which was on the Beşiktaş river dried in the late 19th century. It was built as a double bath (Kuban, 1994). Köprübaşı Bath, which is one of the most beautiful examples of the classical period Ottoman baths in Istanbul, was demolished with the decision of "High Council of Monuments" with the thought it does not have any artistic value. The demolition of historical buildings has caused great damage to Beşiktaş's historical texture (Doğusan, 2004).

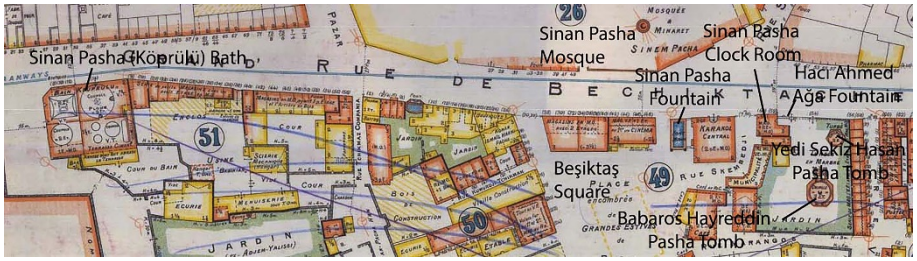


Figure 14. Historical buildings in Beşiktaş on the Pervititch map (the notes on the map are written by the author).

Within the scope of the reconstruction of the Menderes period, between 1956 and 1958, Barbaros Boulevard, which divides the settlement into two, ignores the existing texture and connects Beşiktaş to Zincirlikuyu, was opened and thus the neighborhood lost many cultural assets. Approximately 270 buildings were expropriated in order to open the 50 meters wide Barbaros Boulevard and this boulevard is also intended as the port on the European side of the Bosphorus Bridge in 1973. This boulevard is also intended as the junction point of the Bosphorus Bridge on the European side (Doğusan, 2004).

The changes made during the Menderes period can be seen in the 1966 aerial photo (Figure 15a). It is noteworthy that many of the arrangements in the 1939 plan were implemented during the Menderes period. In addition to Beşiktaş Street and Barbaros Boulevard, as suggested in 1939, the avenue descending to Beşiktaş Dock was enlarged and the area to the west of this avenue was arranged and Barbaros Hayrettin Pasha monument was added. During this process, the Governor's Office, tobacco warehouses on the coast and other warehouses and buildings were expropriated. However, as in the 1939 plan, the street in the west of the building block was not arranged perpendicular to the coast and the existing street contours were preserved. Mahkeme dead end street was completely abolished. The east of the street descending to the dock was destroyed in 1966 to create another square. In 1970 aerial photo, this region is also arranged. In 1982 aerial photo, a road was passed through the region and

DOI: 10.15320/ICONARP.2020.143

connected to Barbaros Boulevard (Figure 15b). Aerial photo of 2011 shows that the historical Tobacco Store on Hayrettin Street has been converted into a hotel.

Nowadays center of Beşiktaş is on the verge of a major transformation. With the Beşiktaş Square Project, which has been on the agenda since the 1990s, vehicle traffic is planned to be underground and the square is planned to be pedestrianized (Istanbul Metropolitan Municipality, 2020).

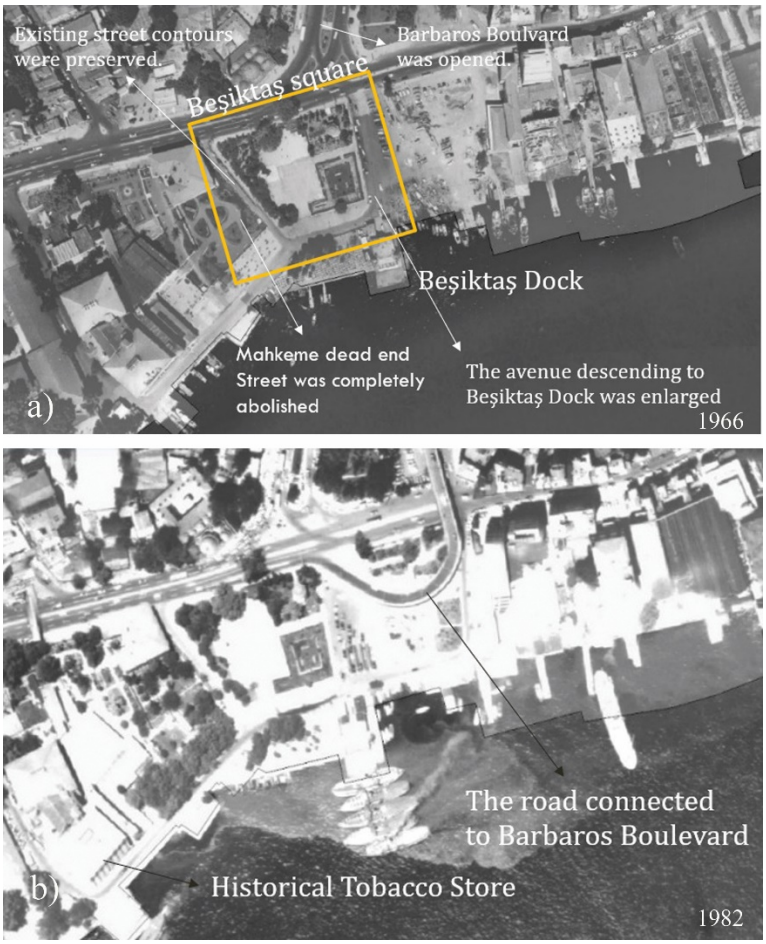


Figure 15.
a) 1966 aerial photo.
b) 1982 aerial photo (the notes on the aerial photos are written by the author).

The Area Between Beşiktaş and Ortaköy

In old maps, seen structuring between Beşiktaş and Ortaköy since the 18th century (Figure 3). The most mentioned of these structures is the Çırağan Palace (Figure 5, 12 and 16a). At the end of the 19th century, Feriye Palaces were located between Beşiktaş and Ortaköy squares. In addition to the palaces, mansions such as Gazi Osman Pasha Mansion were located here (Figure 16a). In 1927 Pervititch map, there were masonry coal depots and warehouses. Besides them there were Turkish girls' schools in the place of Kabataş Erkek High School today (Figure 16b). Beşiktaş Street, which passes behind the warehouses, consists of 15 and 10 meters streets at different elevations in the 1939 plan. Between these roads, which are separated as departure and arrival, the right and left trees are afforested (Figure 17).

Figure 16. The area between Beşiktaş and Ortaköy in
a) 1882 map.
b) 1927 dated Pervititch map (the notes on the maps are written by the author).

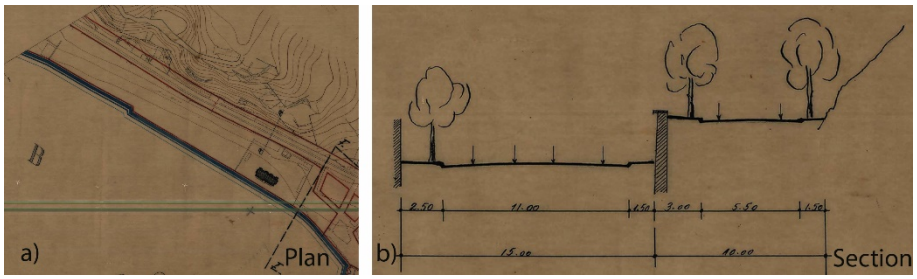


Figure 17. In 1939 plan, the area between Beşiktaş and Ortaköy (on the left) and Beşiktaş Street section (on the right) (Atatürk Library, Hrt_006246).

Ortaköy

In the general maps of the 18th and 19th centuries the most prominent structure is the Great Mecidiye Mosque (Ortaköy Mosque). Alman Mavileri maps (1914) (Figure 18a) shows only the streets and monumental buildings. Ortaköy Alman Mavileri map include dock, church, synagogue, many fountains, schools, and Ortaköy Mosque. The streets and monumental structures on the Plan d'Ensemble de la Ville de Constantinople (1922) (Figure 18b) are almost the same as the 1914 map. 1927 dated Pervititch map reveals that Dereboyu Street to the east of the mosque divides the city texture into two (Figure 19). While the west side of this street consists of smaller and adjacent buildings and smaller building blocks, there are larger and discrete ordered buildings with gardens in the east side.

DOI: 10.15320/ICONARP.2020.143

Figure 18. Ortaköy in
a) 1914 dated Alman Mavileri map (the notes on the map are written by the author)
b) 1922 dated Plan d'Ensemble de la Ville de Constantinople.

In the case of implementation of 1939 plan for this region, it is seen that many streets and building blocks and organic texture will be destroyed (Figure 20a). In this plan, Beşiktaş street widened to 25 metres. The new streets are planned parallel to the sea and wider. The small streets near the Ortaköy Mosque have been destroyed and the mosque is located in a larger area, increasing its visibility. As the street expands, a Greek church and school, a synagogue and a tobacco store on Ortaköy street were demolished. This plan was approved provided that the EFGH region was re-studied (Figure 20a). The dock on the beach is not available in the 1939 plan. The 1955 Istanbul map shows that these proposals are not implemented (Figure 20b).

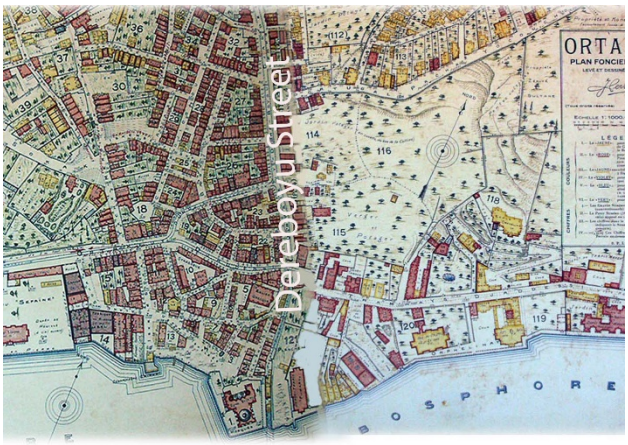


Figure 19. In Pervititch map, Dereboyu street dividing the city texture into two.

Figure 20. Ortaköy in
a) 1939 plan (Atatürk Library, Hrt_006246)
b) 1955 dated Bülent Tuvalo map (SALT Online Archive, access code: APLBTISTNDX01).

During the Menderes period, various arrangements were planned to be made around the Ortaköy Mosque, as suggested by the 1939 plan. The

purpose of these arrangements is to ensure that the Ortaköy Mosque and Ortaköy Dock can be seen from the enlarged street (İstanbul'un kitabı, 1957).

However, since there are many buildings between the street and the mosque, this draft has not been implemented because of the demolition of these buildings will cost a lot. In the 1966 aerial photo it is detected that, the city texture around the Ortaköy Mosque is same as that seen on the Pervititch map (Figure 19). During this period, the coastal road in Ortaköy was enlarged by the demolition of the northern walls (Figure 21). After Ortaköy, the coastal road extending up to Sarıyer has a width of 30 meters and casinos, entertainment places and beaches have been built along the road in order to gain a touristic appearance (İstanbul'un kitabı, 1957). As determined from the aerial photos, a small filling area was built in the southeast direction of Ortaköy Mosque between 1966 and 1970. This filling area still has its limits in 1970 (Figure 22). Today, Ortaköy preserves its old texture to a great extent.

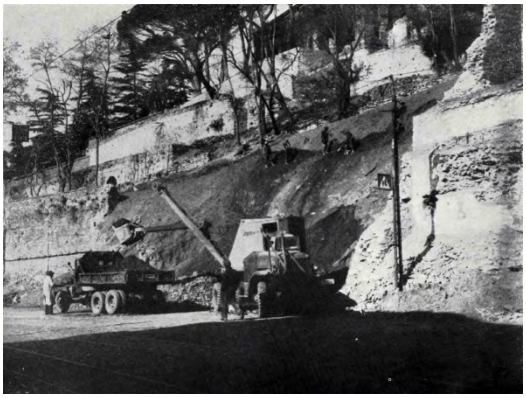


Figure 21. Ortaköy tram street widenings (İstanbul'un kitabı, 1957).

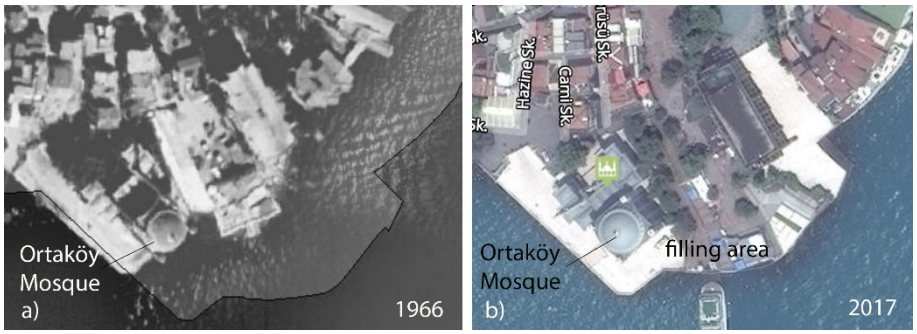


Figure 22. Ortaköy Büyük Mecidiye Mosque and filling area around it, in 1966 (on the left) and 2017 (on the right) aerial photos.

The Area Between Ortaköy and Kuruçeşme

The area between Ortaköy and Kuruçeşme has been home to mansions since the 17th century. The coastal structure is seen in general maps from 1793 to 1918 (Figure 3 and 4). The map dated 1860-1870 includes the Saliha Sultan and Esma Sultan Palaces. By the passage of the tram road behind the mansions in 1907, their architectural compositions consisting of gardens, groves and pavilions were destroyed (Atalan, 2008). The 1914 Alman Mavileri maps does not show structures, but it can be seen how much the distance between the coast and the road

DOI: 10.15320/ICONARP.2020.143

decreased from 1870 to 1914 (Figure 23). Again, on this map, there are orphanage (Darüleytam) and a police station near Ortaköy.

The buildings along the coastline which were the palaces and mansions belonging to the Ottoman dynasty and wealthy families, were burned, sold, demolished, and some of the lands were exposed.

It is seen that most of the buildings seen as "Sahilhane" in the 1920s were demolished and small sheds constructed instead, then they were used as coal depots in 1949s (Atalan, 2008). 1924 dated Rumeli Ciheti map shows coal depots on the coast (Figure 24a). On the 1927 dated Pervititch map, there are also tobacco stores close to Ortaköy (Figure 16b). In the 1936 development plan report, it was proposed to remove all the warehouses and industrial buildings in the Bosphorus. In the zoning plans, the groves and green areas in the Bosphorus were opened to low density housing. In the proposals made in 1943, it was stated that the coal depots in Kuruçeşme may remain in the same place (Atalan, 2008).

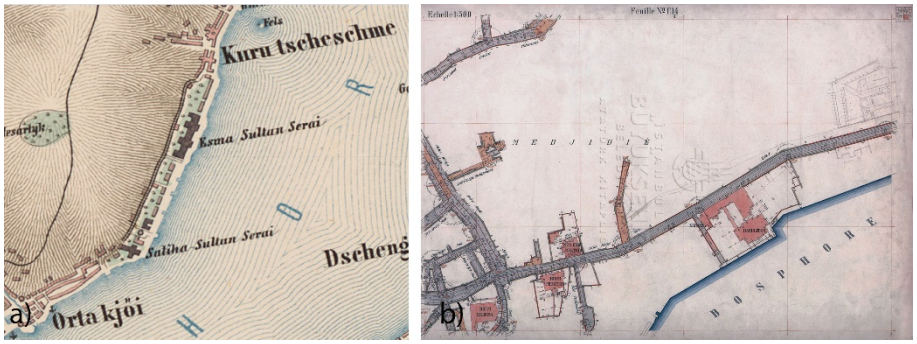


Figure 23. The area between Ortaköy and Kuruçeşme in
a) 1860-1870 dated Istanbul map
b) 1914 dated Alman Mavileri map.

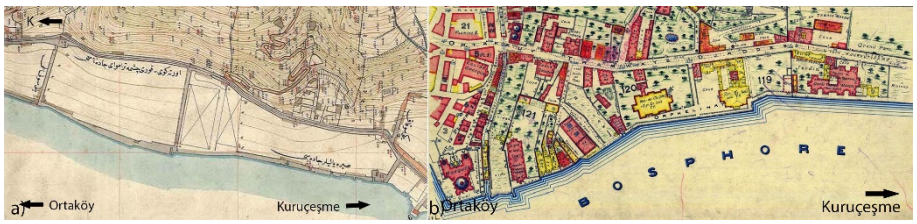


Figure 24. The area between Ortaköy and Kuruçeşme in
a) 1924 dated Rumeli Ciheti map
b) 1927 dated Pervititch map.

Beşiktaş Street (Ortaköy-Arnavutköy tram street) in 1939 plan is today Muallim Naci Street. To the east of Defterdar Mosque, there is "Sıra Yalılar Avenue" close to the beach and "Yalı Street" connecting this avenue to the north (Figure 25). In the 1939 plan, a green coastline was established between Ortaköy and Kuruçeşme, including individual buildings. It is proposed that the coal depots close to Kuruçeşme will be demolished and turned into green areas. This plan was implemented in Menderes period. In 1956-58, the buildings on the coast between Kuruçeşme and Arnavutköy were completely removed and the continuation of the road was ensured. During this period, it was planned to transfer the loading and unloading facilities located on the coast between Lido Casino (the place of Reina which is closed until 2017) and Kuruçeşme and to evaluate the region as a tourism area. For this purpose, casinos, entertainment and bathing areas were planned and

implemented. Kuruçeşme Island has been turned into a sports and camping area (İstanbul'un kitabı, 1957).

Figure 25. The area between Ortaköy and Kuruçeşme in 1939 plan (the notes on the plan are written by the author).

As seen from the aerial photos, while the building blocks on the west side of Kuruçeşme Square consisted of coal depots, parking areas and single buildings in 1982, in 2006 facilities such as hotels and restaurants were built on the north side of the island. Today, construction works continue in place of the collapsed coal depots. Fatma Sultan Mansion, which is seen on Pervititch map was demolished in 1960s and today there is the foot of the Bosphorus Bridge on its place (Figure 26).

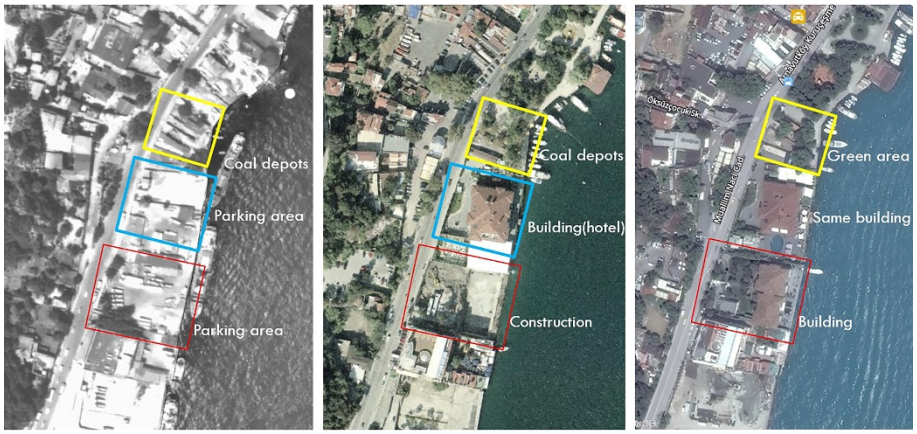


Figure 26. 1982, 2006 and 2017 aerial photos of Kuruçeşme coastline (the notes on the aerial photos are written by the author).

Kuruçeşme and The Area Between Kuruçeşme and Arnavutköy

Kuruçeşme has taken its name from the waterless fountain next to the mosque built by Tezkireci Osman Efendi. After it was rebuilt by Köprülüzade Fazıl Ahmed Pasha's sister in 1682, it continued to use the same name. Another fountain was built here by Damat İbrahim Pasha in 1728-29. Lots of mansions have been built in Kuruçeşme like Tırnakçı Mansion, Süreyya Pavilion, Esma Sultan (1763) and Atiye Sultan (1838) coastal palaces (Gökbilgin, 1992).

In the 1918 Nedjib maps, Kuruçeşme is seen as a smaller settlement with fewer structures compared to other settlements. The buildings in Kuruçeşme is seen in the old general maps (Figure 3) and the map of 1860-70 (Figure 27). By 1860-70 map, in the 19th century there was only a few settlements in the region, and there are three islands in this axis in Bosphorus (Figure 27). The island opposite Kuruçeşme Dock is

DOI: 10.15320/ICONARP.2020.143

Sarkis Bey Island, which is approximately 10.000 m2 in size. It was used as a coal depot in the 1900s and later turned into a park (Gökbilgin, 1992).

Figure 27. Kuruçeşme, Arnavutköy and the setllement between them in the years of 1860-70.

In the 1939 plan, Kuruçeşme is seen with a semi-circular square arrangement (Figure 28). It has been proposed that the existing Kuruçeşme Ferry Dock be rebuilt as bigger and a large area will be left as a square towards the dock. This proposal is quite different to the urban texture of Kuruçeşme consisting of organic streets. It has been suggested that the coal depots to the east of the Kuruçeşme Ferry Port will be demolished and the area will be left as a green area. The Kuruçeşme-Arnavutköy tram street is envisaged to be expanded to 25 meters as it is along the coast. This expansion is planned to be completed by filling the sea averagely 11 meters (Figure 28).

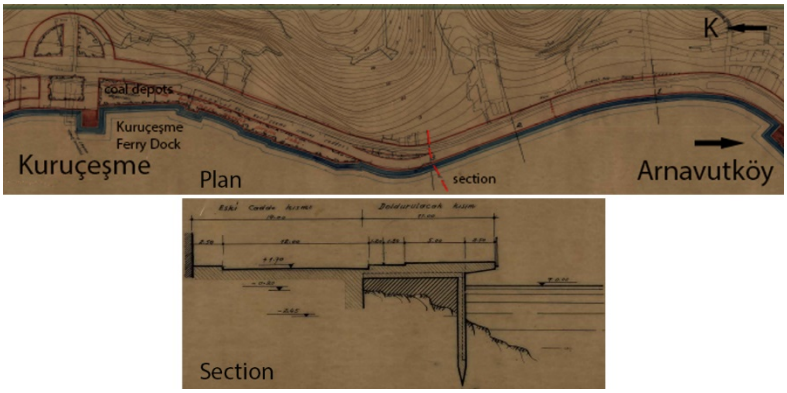


Figure 28. Kuruçeşme and the area between Kuruçeşme and Arnavutköy in the 1939 plan with its section (the notes on the aerial photos are written by the author).

Arnavutköy

Arnavutköy, taking its name from the Albanians which are the first inhabitants of this region, was a very crowded village. Alongside the Albanians, Greeks and Jews also resided here and because not taking place Muslim people in the 17th century, there was no Muslim religious structure in Arnavutköy till 19th century.

In 1804, a fountain by III. Selim and between 1832 and 1833 Tevfikiye Mosque by II. Mahmud was built (Gökbilgin, 1992).

The map dated 1860-70 shows that the two rivers in Arnavutköy have reached the Bosphorus and the settlement started around these rivers.

In 19th century, the buildings were located in two different ways, located close to each other or seperately with their gardens (Figure 27).
As the maps of usually includes historical peninsula and end in Ortaköy, Arnavutköy region cannot be seen in many maps. The oldest map could be found in this study for this region is dated 1860-70. In this map, it is seen that settlement started around a river reaching the Bosphorus. While the buildings around the river are parallel to the river and close to each other, the buildings which are a little further away are within the garden. 1918 Nedjib map shows dock and structures on the coast (Figure 29a). 1918 dated Nedjib map shows dock and buildings on the beach. 1924 dated Rumeli Ciheti map is quite detailed. Tevfikiye Mosque on the coast, Taksiarsis Greek Orthodox Church and Greek school are the buildings that are seen on this map and still exist today. The urban texture is also very clear on this map. At this date, some of the settlements were grid and some were organic textured (Figure 29b).

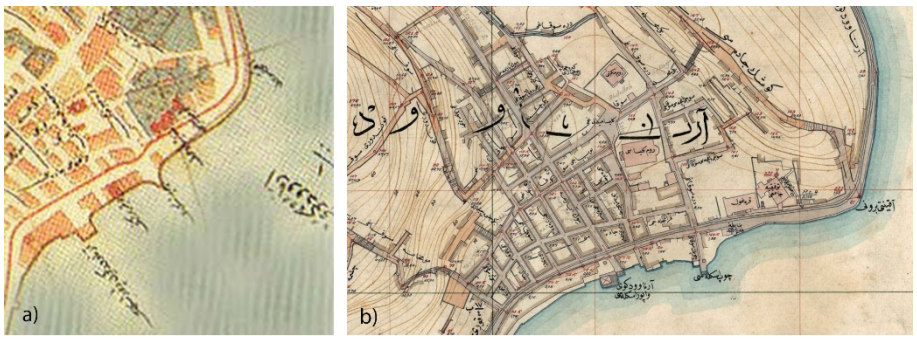


Figure 29. Arnavutköy in
a) 1918 Necip map
b) 1924 Rumeli Ciheti map.

In 1939, two piers on the coast and green areas between them and three square-shaped building blocks in the west were proposed for this region. In addition, the widening of the tram street and the demolition of three building blocks during this process are among the suggestions. The Aya Dimitros Greek Church, which still exists today, was preserved in the 1939 plan. 1966 and 1970 aerial photos show that this plan was not applied (Figure 30).

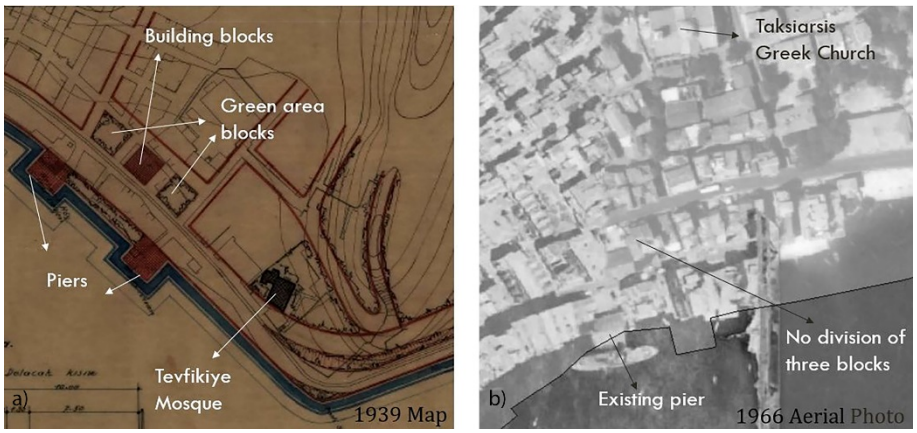


Figure 30. Arnavutköy in
a) 1939 plan
b) 1966 aerial photo (the notes on the plans are written by the author).

DOI: 10.15320/ICONARP.2020.143

The Area Between Arnavutköy and Bebek

In 1860 there are some buildings on the coast and a river between Arnavutköy and Bebek. Mihrimah Sultan Palace on the map dated 1860 and a few mansions close to Bebek have been destroyed and the buildings between Arnavutköy and Bebek cannot be seen in 1924 (Figure 31).

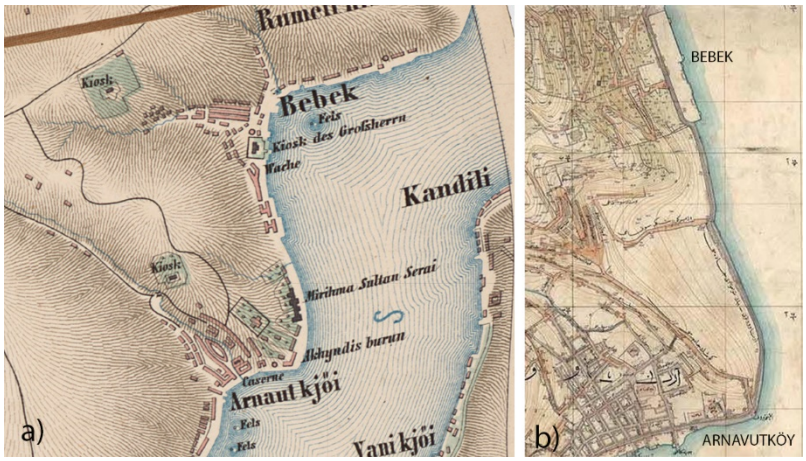


Figure 31. The area between Arnavutköy and Bebek in
a) 1860-70 dated map
b) 1924 Rumeli Ciheti map

According to the plan of 1939, it was proposed to expand the tram way in Arnavutköy (Figure 32). In Akıntıburnu, the solution was dividing the road into two and greening the middle of the two roads. It has been proposed that the coastal part of this road be expanded by filling the sea. The width of the road varies between 19.5-25 meters and the filling area ranges between 7.5-11 meters (Figure 32). During the reconstructions of Menderes period between 1956 and 1958, a large bund was built on the coast between the bend in Akıntıburnu and Bebek. By filling the coastal part of the road, the bund was formed and the old building of Boğaziçi High School, which coincides with this bund route, was destroyed and the surrounding area was enlarged (İstanbul'un kitabı, 1957) (Figure 33). In 1988, during the reign of Prime Minister Bedrettin Dalan, a new road was built by filling the sea in front of the mansions. The road, which was built on 720 steel piles, was built with a length of 1200 meters (Aksu, 2015) (Figure 34).

Figure 32. The area between Arnavutköy and Bebek in the 1939 plan with its section (the notes on the aerial photos are written by the author).

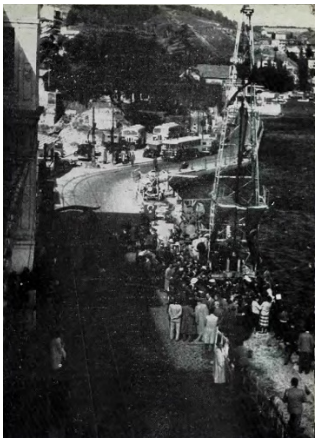


Figure 33. Removal of structures and widening of the road in Arnavutköy, Akıntıburnu (İstanbul'un kitabı, 1957).

Figure 34. The road built by filling the coast is seen in 2006 (on the right) when it was not seen in 1982 aerial photo (on the left) (the notes on the aerial photos are written by the author).

Bebek

Bebek was taken its name from Bebek Çelebi, who was responsible for this region during the Ottoman period and had vineyards and gardens in the region. The most important and oldest structure in the region was Yavuz Sultan Selim's Bebek Pavilion which was built in 16th century. In 19th century, pavilion demolished, and its area is being used as park of Bebek now. The Bebek Mosque, located to the east of the garden, was built in the 18th century and later rebuilt by Architect Kemaleddin in the 20th century (Gökbilgin, 1992). In 1860-70 map, the buildings in Büyük Bebek in the south are denser than Küçük Bebek in the north. And there are mansions and the sea bath on the beach.

Nedjib map dated 1918 shows Prince Halim Pasha Mansion and Valide Hidiv Pavilion on Bebek coast (Figure 35). The mansion of Halim Pasha was demolished by giving it to a destructor between 1930-1935 (Koçu, 1961). Valide Hıdiv Pavilion is currently used as Egyptian Consulate.

In 1939, it was proposed that the tram way in Bebek should be enlarged to 25 meters, while the primary school, another building and Bebek casino should be demolished, and surroundings of casino should be arranged as a green area (Figure 32).

DOI: 10.15320/ICONARP.2020.143

Figure 35. Bebek coast in 1918 dated Necip map.

FINDINGS AND THE CONCLUSION

The following conclusions have been reached in the study, which examines the 1939 plan decisions drawn for the planning of the coastal road between Beşiktaş and Bebek and the settlements there and questions the periods in which this plan was implemented and how the urban identities of the regions were affected by this application.

While making plan decisions;

• Settlement centers and squares were opened to make them more visible.

• Streets were widened, including the coastal road over which the tram passes, and dead-end streets turned into streets. However, during this process, the integrity of the building blocks was disrupted, some monumental buildings were destroyed, and some were tried to be preserved.

• With the coastal arrangements, it is aimed that the coastal line will have a smooth line.

• It is suggested that the coastal line be cleared of warehouses and low-rise buildings and turned into a green area.

It is noteworthy that these decisions are the decisions Prost takes into consideration in all of its planning (Daver, Resmon and Günay, 1943).

Most of what was drawn in the plan was implemented, some of it was not. When classified according to the implementation periods, it is seen that the plan is implemented in the periods below;

- During the Prost period, who worked as an urban planning specialist at the Istanbul Municipality Zoning Directorate between 1936-1950, when Lütfi Kırdar was the prime minister.
- During the period of Prime Minister Adnan Menderes between 1956-1958.
- During the period of Prime Minister Bedrettin Dalan between 1984-1989.

The continuation of the implementation of the Prost plans during the Menderes and Dalan periods is also seen in the plans in other regions of Istanbul (Tekeli, 1993).

When it was questioned which practices were used in which settlements periodically within the framework of the 1939 Plan and how these affected the originality of the settlements, the following conclusions were reached:

During the Prost period;

• The arrangements specified in the plan have been implemented for Beşiktaş Square. In this process, the dead-end streets were removed, the streets were expanded, storages, wooden sheds and warehouses were demolished.

During the Menderes period;

• The coastal road was widened from land or sea fronts, and the sea was filled in places. Ortaköy and Arnavutköy-Akıntıburnu are the places where the coastal road is mostly intervened. During this period, many historical buildings were destroyed.

• In Beşiktaş, Barbaros Boulevard was opened, and the street leading to Beşiktaş Street, Serencebey Slope and Beşiktaş Pier was expanded. During this period, important historical buildings such as the bath and fountain of Sinan Pasha complex were also destroyed. With these interventions, Beşiktaş is the settlement that has suffered the greatest damage both in terms of urban texture and ancient artifacts. The changes in Beşiktaş, which is a business center located at the intersection of Istanbul's busy streets, continue today.

• The loading and unloading facilities on the coast between Kuruçeşme and Arnavutköy were removed and entertainment venues were built instead.

• In Bebek, due to the extension of the coastal road, a part of Bebek Park, which has existed as the garden of Bebek Pavilion since the Ottoman period, and the baby casino, which is one of the important structures of the republic period, have been demolished.

During the Dalan period;

• The road between Arnavutköy and Akıntıburnu was built by filling the coast and driving piles. In this process, the relationship of Arnavutköy mansions with the sea was damaged, and the architectural identity of the mansions was also damaged.

• In Ortaköy, Kuruçeşme and Arnavutköy city centers, no implementation has been made in line with the plan. It is known that during the Menderes period, planning in Ortaköy was not implemented because it would cause high costs (İstanbul'un kitabı, 1957). Since Ortaköy was not intervened in line with the plan, compared to other settlements, it preserved its old texture and works.

It can be said that the plan of 1939 played a major role in making the Bosphorus coastal road and its surrounding settlements become today. So much so that although this plan was approved in 1939, most of the changes foreseen in this plan were implemented in the Menderes period and continued to be implemented in the Dalan period in 1988. This plan includes one of the first applications of sea fillings, which are being done quite often today.

With the findings obtained, it has been determined that this plan has many similarities with the conception of planning that Prost has

DOI: 10.15320/ICONARP.2020.143

adopted in other regions of Istanbul. Although Prost did not draw the 1939 plan, he approved it, and perhaps made the plan decisions himself. Considering that there may be other documents such as this document, which has not been handled in publications related to Prost because it was not drawn by Prost, it is understood that his contribution to the planning of Istanbul is more than known. Prost also supported the planning of Istanbul with plans such as the 1939 plan, which he guided to design.

FINANCIAL DISCLOSURE

The author declared that this study has received no financial support.

ETHICS COMMITTEE APPROVAL

Ethics committee approval was not required for this article.

LEGAL PUBLIC/PRIVATE PERMISSIONS

In this research, the necessary permissions were obtained from the relevant participants (individuals, institutions, and organizations) during the survey and in-depth interviews.

REFERENCES

Akpınar, İ. Y. (2014). The rebuilding of Istanbul: The role of foreign experts in the urban modernisation in the early republican years. *New Perspectives on Turkey*, *50*, 59–92. https://doi.org/10.1017/S0896634600006580

Akpınar, İ. Y. (2010). İstanbul'u (yeniden) inşa etmek: 1937 Henri Prost planı. In E. Ergut & B. İmamoğlu (Eds.), *2000'den kesitler II: Cumhuriyet'in Mekanları/Zamanları/Insanları, Doktora Araştırmaları sempozyumu* (pp. 107–124). Dipnot Yayınları ve ODTÜ Yayınevi.

Aksu, F. (2015, August 8). *'Boğaz'ımıza kadar doluyoruz*. https://www.hurriyet.com.tr/gundem/bogazimiza-kadar-doluyoruz-29757923

Alman Mavileri 1913—1914. 1. Dünya Savaşı Öncesi İstanbul Haritaları (Vol. 1). (2006). İstanbul Büyükşehir Belediyesi Kütüphane ve Müzeler Müdürlüğü.

Ansel. E. (2016). *Continuity and change on the Bosphorus shore: Arnavutköy before and after the Greek Revolution of 1821* [Master's Thesis]. Boğaziçi Üniversitesi.

Atalan, Ö. (2008). *Boğaziçi kıyı yerleşmelerinin tarihsel değişim süreci ve koruma yöntemleri üzerine bir araştırma; Ortaköy-Kuruçeşme sahili* [Ph.D. Thesis]. Yıldız Technical University.

Atalan, Ö. (2015). Rekonstrüksiyon Uygulamalarına Yönelik Kriterler Ortaköy- Kuruçeşme Sahili Örneği. *Journal of Turkish Studies*, *10*(6), 227–246. https://doi.org/10.7827/TurkishStudies.8087

Aysu, Ç. (1989). *Boğaziçi'nde Mekansal Değişim* [Ph.D. Thesis]. İstanbul University.

Beşiktaş—Bebek—Dolmabahçe arası istikamet haritasıdır (Hrt_006246). (1938). [Plan]. İstanbul: İmar Bürosu; Haritalar Arşivi. http://ataturkkitapligi.ibb.gov.tr/

Beydilli, K. (2005). Moltke, Helmut von. In *Türkiye Diyanet Vakfı İslam Ansiklopedisi* (Vol. 30, pp. 267–268). Türkiye Diyanet Vakfı Yayınevi.

Bilsel, F. C. (2010). *"Henri Prost's" Planning Works in Istanbul (1936-1951): Transforming the Structure of a City through Master Plans and Urban Operations* (P. Pinon & F. C. Bilsel, Eds.). Suna ve İnan Kıraç Vakfı İstanbul Araştırmaları Enstitüsü.

Bilsel, F., & Zelef, H. (2011). *Mega Events in Istanbul from Henri Prost's master plan of 1937 to the twenty-first-century Olympic bids*. *26*, 621–634. https://doi.org/10.1080/02665433.2011.599931

Cansever, T. (1994). *Ev ve Şehir*. İnsan Yayınları.

Coşkun, H. (2017). *20. Yüzyılın ilk yarısında konut sorununun ele alınış yöntemleri ve Henri Prost İstanbul örneği* [Ph.D. Thesis]. Mimar Sinan Fine Arts University.

Coşkun, H., & Doğrusöz, U. (2017). 20. Yüzyılın Başlarında İstanbul Tarihi Yarımada'da Henri Prost Dönemi Planlamaları; Prost Sonrası 1950'lerden İtibaren Kentin Morfolojik Dönüşümü. *"DeğişKent" Değişen Kent, Mekân ve Biçim Türkiye Kentsel Morfoloji Araştırma Ağı II. Kentsel Morfoloji Sempozyumu*, 579–586.

Çelik, Z. (2015). *19. Yüzyıl Osmanlı Başkenti: İstanbul*. Tarih Vakfı Yurt Yayınları.

Çetintaş, M. B. (2005). *Dolmabahçe'den Nişantaşı'na: Sultanların ve Paşaların Semtlerinin Tarihi*. Antik A.Ş. Kültür Yayınları.

Daver, A., Resmon, M. N., & Günay, S. (1943). *Güzelleşen İstanbul*. İstanbul Maarif Matbaası.

Diker, N., Dinçer, İ., & Enlil, Z. (2008). Conservation of Bosphorus' spirit in spite of the spatial conflicts and threats. *16th ICOMOS General Assembly and International Symposium: 'Finding the Spirit of Place – between the Tangible and the Intangible.'* Quebec, Canada. https://www.icomos.org/quebec2008/cd/toindex/77_pdf/77-8v98-152.pdf

Doğusan, G. N. (2004). *İstanbul "imar"ı: 1956-1960* [Master's Thesis]. İstanbul Technical Univesity.

Enlil, Z. M. (2011). The Neoliberal Agenda and the Changing Urban Form of Istanbul. *International Planning Studies*, *16*(1), 5–25. https://doi.org/10.1080/13563475.2011.552475

Erdener, O. (1994). *Boğaziçi Sahilhaneleri*. İBB Kültür İşleri Dairesi Başkanlığı Yayınları.

Ergen, B. (2005). Boğaziçi Doğal ve Kültürel Sit Alanının Korunamamasında Planlama Faktörünün Büyükdere Örneğinde İncelenmesi. *Korunan Doğal Alanlar Sempozyumu*, *6*, 313–318.

Gökbilgin, T. (1992). Boğaziçi. In *Türkiye Diyanet Vakfı İslam Ansiklopedisi* (pp. 251–262). https://islamansiklopedisi.org.tr/bogazici

DOI: 10.15320/ICONARP.2020.143

Gökyay, D. (2009). *Beşiktaş Köyiçi Kentsel Sit Alanının 20. yy başından günümüze değişimi ve korunması için öneriler* [Master's Thesis].

Gül, M. (2013). *Modern İstanbul'un Doğuşu: Bir Kentin Dönüşümü ve Modernizasyonu*. Sel Yayıncılık.

Gül, M. M., & Lamb, R. (2004). Urban Planning in Istanbul in the Early Republican Period: Henri Prost's Role in Tensions among Beautification, Modernisation and Peasantist Ideology. *Architectural Theory Review*, *9*(1), 59–81. https://doi.org/10.1080/13264820409478507

Güngör, N. (1999). *Boğaziçi Büyüsü*. İnkılap Kitabevi.

Gökbilgin, T. (1992). Boğaziçi. In *Türkiye Diyanet Vakfı İslam Ansiklopedisi* (pp. 251–262). https://islamansiklopedisi.org.tr/bogazici

İstanbul Rumeli Ciheti Haritaları. (2000). İstanbul Büyükşehir Belediyesi Kütüphane ve Müzeler Müdürlüğü.

İstanbul'un kitabı. (1957). İstanbul Vilayeti Neşriyat ve Turizm Yayınları.

Kentsel Dönüşüm ve Meydanlar. (n.d.). Retrieved December 11, 2020, from http://www.ibb.gov.tr/tr-tr/documents/kentseldonusumvemeydanlar/meydan/besiktas/besiktas.htm

Koçu, R. E. (1961). Bebek'de Ali Paşa Yalısı. In *Dünden Bugüne İstanbul Ansiklopedisi* (Vol. 5, p. 2334). Reşat Ekrem Koçu ve Mehmet Ali Akbay İstanbul Ansiklopedisi ve Neşriyat Kolektif Şirketi.

Kuban, D. (1994). Sinan Paşa külliyesi. In *Dünden Bugüne İstanbul Ansiklopedisi* (Vol. 7, pp. 2–4). Kültür Bakanlığı ve Tarih Vakfı Ortak Yayını.

Kuban, D. (1996). *İstanbul bir kent tarihi Bizantion, Konstantinopolis, İstanbul*, Türkiye İş Bankası Kültür Yayınları.

Mamboury, E. (1929). *Guide constantinople* (APLMAM03) [Map]. SALT Online Archive. https://archives.saltresearch.org/handle/123456789/93750

Metin, A. B. (2010). *Beşiktaş'ın kentsel tarihi ve barındırdığı mimari eserler* [Master's Thesis]. Mimar Sinan Fine Arts University.

Mollo, T. (1793). *Plan de Constantinople et du Bosphore* [Map]. https://upload.wikimedia.org/wikipedia/commons/c/cd/Plan_De_Constantinople_et_Du_Bosphore.jpg

Nedjib, Ş. H. M. (1918). *İstanbul rehberi. Heyeti Umumiye. Sekizinci Pafta* (APLNEDOT02A) [Plan]. Hozel Matbaası; SALT Online Archive. https://archives.saltresearch.org/handle/123456789/97344

Özsoydan, G. (2007). *Kentsel korumaya stratejik yaklaşım (Beşiktaş köyiçi kentsel sit alanı örneği)* [Master's Thesis]. Mimar Sinan Fine Arts University.

Pervititch, J. (1922). *Plan cadastral d'assurances. Béchiktache. No: 5.* (APLPEBECH05) [Plan]. SALT Online Archive. https://archives.saltresearch.org/handle/123456789/105066

Pervititch, J. (1927). *Plan cadastral d'assurances. Ortakeuy.*(APLPEORTA01) [Plan]. SALT Online Archive. https://archives.saltresearch.org/handle/123456789/124841

Plan d'Ensemble de la Ville de Constantinople. (1922). [Plan]. Société Anonyme Ottomane D'études et D'entreprises Urbaines; Princeton University Library. https://upload.wikimedia.org/wikipedia/commons/3/35/Istanbul_PU889.jpg

Prost, H. (1938). *İstanbul'un nazım planını izah eden rapor,* İstanbul Belediye Matbaası.

Prost, H. (1940). *Prost transportation study* [Map]. http://www.istanbulurbandatabase.com/

Salman, Y. (2004). *Boğaziçi tarihi sit alanının yok olma süreci ve kalan sınırlı değerlerin korunma olasılıkları* [Ph.D. Thesis]. İstanbul Technical Univesity.

Salman, Y., & Kuban D. (2006). Boğaziçi Tarihi Sit Alanının Yokoluş süreci. *İTÜ Journal A, 5(1),* 104-114.

Suher, H. (1993). Planlama. In *Dünden Bugüne İstanbul Ansiklopedisi* (Vol. 6, pp. 265–275). Kültür Bakanlığı ve Tarih Vakfı Ortak Yayını.

Tekeli, İ. (1993). İcabında plan. *İstanbul Dergisi*, *4*, 26–37.

Tekeli, İ. (2009). *Modernizm, modernite ve Türkiye'nin kent planlama tarihi*. Tarih Vakfı Yurt Yayınları.

Turan, Ö., & Uluengin, M. B. (2005). İmparatorluğun ihtişam arayışından Cumhuriyet'in radikal modernleşme projesine: Türkiye'de kentsel planlamanın ilk yüz yılı. *Türkiye Araştırmaları Literatür Dergisi*, *3*(6), 353–436.

Tuvalo, B. (1955). *İstanbul şehri umumi planı. Beyoğlu—Ortaköy—Beşiktaş* (APLBTISTNDX01) [Map]. SALT Online Archive. https://archives.saltresearch.org/handle/123456789/111072

Uluskan, S. B. (2007). Atatürk döneminde İstanbul'un imarı ve Henri Prost planının basındaki yankıları (1936-1939). *Erdem*, *16*(48), 109–156.

Ünal, N. (2011). *Boğaziçi'nde dini yapılaşmanın tarihsel süreci bağlamında Arnavutköy yerleşimi ve Arnavutköy Sinagogu'nun incelenmesi* [Master's Thesis]. Mimar Sinan Fine Arts University.

İstanbul'un imarı ve eski eser kaybı. (1968). In *Türk Sanatı Tarihi Araştırma ve İncelemeleri* (Vol. 2, pp. 6–61).

Üresin, M. (2019). *Sermaye ve politikanın şehirleri yeniden üretmesi ve kamusal alanların dönüşümü: Beşiktaş örneği*. [Master's Thesis]. İstanbul Technical University.

Yıldız, R., Senlier, N., & Özyılmaz Küçükyağcı, P. (2018, March 21). Planning process of the İstanbul Bosphorus area, conflicts and challenges. *Fifth International Symposium Monitoring of Mediterranean Coastal Areas: Problems and Measurement Techniques*. Fifth International Symposium Monitoring of Mediterranean Coastal Areas: Problems and Measurement Techniques, Livorno, Italy.

1860-70 Map. (1860-1870). [Map]. http://istanbulurbandatabase.com

1882 Map. (1882). [Map]. http://istanbulurbandatabase.com

DOI: 10.15320/ICONARP.2020.143

1966, 1970, 1982, 2011, 2017 Aerial Photos. [Aerial Photos]. İstanbul Büyükşehir Belediyesi. https://sehirharitasi.ibb.gov.tr/

Resume

Dr. Sezgi Giray Küçük received her B.Arch from Mimar Sinan Fine Arts University in Architecture, M.Arch and PhD in Restoration from Istanbul Technical University. She currently works as an Assistant Proffesor at the Architectural Restoration Programme, Vocational School of Mimar Sinan Fine Arts University. Her fields of interest are Conservation, Renovation and Restoration, Materials in Architecture, History of Architecture and Art, Urban History, Urban Change and Transformation.

Research Article

ICONARP
International Journal of Architecture and Planning
Received: 13.10.2020 Accepted: 24.11.2020
Volume 8, Special Issue/ Published: 25.12.2020
DOI: 10.15320/ICONARP.2020.144 E- ISSN:2147-380

ICONARP

Challenges to Urban Housing Policies Implementation Efforts: The Case of Nairobi, Kenya

Collins Ouma Agayi[1], Özer Karakayacı [2]

[1] PhD student, Faculty of Architecture and Design, Konya Technical University, Konya, Turkey. (Principal contact for editorial correspondence), Email: agaiagayi@gmail.com

[2] Assoc. Prof. Dr., Faculty of Architecture and Design, Konya Technical University, Konya, Turkey. Email: karkayaci@gmail.com

Abstract

Purpose

The arrival of native African communities from rural Kenya looking for opportunities led to population growth. Nairobi, therefore, has rapidly urbanized and sprawled 18 km2, and 688 km2 in 1900, and 1963 respectively. With population growth, housing demand has surpassed supply resulting in the housing crisis. The aim of this paper is to a) examine the policy and legal efforts put forward to address the housing problem in Nairobi, b) discuss the challenges to the urban housing policies implementation efforts, and c) make suggestions based on the findings of social, economic and infrastructural impacts of the intervention measures.

Design/Methodology/Approach

The research establishes that government efforts to address the housing problem through measures like urban migration restriction, employer housing, housing schemes, slum demolitions, and slum upgrading have not been successful due to challenges of land security tenure, gaps in policy enforcement, and compliance, insufficient public participation among others.

Findings

The paper makes appropriate suggestions to reform the policy approaches by focusing not only on housing aspects but economic, and land tenure reforms, and the extent of public involvement.

Research Limitations/Implications

The study analyses secondary sources including research articles, theses, and governments whose data were collected through primary methods like interviews, field observation, and administration of questionnaires. It, therefore, limited the findings in case of Nairobi.

Practical Implications

The study contributes to recommend that provision of the basic services be carried out in the slums alongside and economic empowerment programs to relieve the residents of financial poverty. Slum upgrading programs should therefore seek to impact the socio-economic lives of the slum dwellers.

Originality/Value

This study explores past and present efforts by different regimes and non-governmental organizations to give an answer to the housing crisis in Kenya. and the subsequent development of slums and informal settlements.

Keywords: *Citizens participation, housing demand, housing crisis, housing policies, informal settlements*

INTRODUCTION

As the world's population is growing, so is the rate of urbanization. The recent figures by the United Nations project that by 2050, approximately 66% of the world population will be residing in urban areas, an increase from the 54% figures provided in 2014 (UN, 2014). Despite positive influences attributed to urbanization like economic growth, negative outcomes like inequality, poverty and slum development could also be linked to it (Sulemana, Nketiah-Amponsah, Codjoe, & Andoh, 2019). Agayi and Karakayacı (2020) also attribute the rising land prices and demand for housing in urban areas to rapid urbanization, therefore, affecting the affordability and access of housing by low- and middle-income earners. This is the case in Nairobi where at least 50% of the residents live in informal settlements that account for only 5% of the total residential land (Amnesty International, 2009). The same is reflected in homeownership and demand for housing in Nairobi with the high-income earners having a 60% surplus while the low and middle-income earners have a housing deficit of 95% (Presidency, 2017). Despite the efforts by the various regimes and organizations to find solution to housing and slums problems in Nairobi through measures like restriction of urban movement, housing of employees, allocation of sites for self-help housing construction to African and forceful eviction and demolition of slums, the number of slums and informal settlement continue to grow pointing to a weakness in the efforts (Everett, 2001).

In case of Nairobi (the capital city of Kenya) and Kibera (the biggest slum in Nairobi), this study explored past and present efforts by different regimes and non-governmental organizations to give an answer to the housing crisis in Kenya and the subsequent development of slums and informal settlements. The study did not only reveal the inhuman and harmful (Syagga, 2011), discriminative and segregative (Home, 2012), and less participatory (Anderson & Mwelu, 2013) natures of the methods adopted by the government to address the housing challenges, but also the legal, legitimacy and logistical challenges in the implementation.

METHODOLOGY AND DEFINITION OF THE CASE STUDY AREA

The high population growth rate in Kenya coupled with the desire for better living conditions forced many to look for opportunities in the urban areas of Kenya, leading to rapid urbanization. While the rural-urban migration is not new as it started in the colonial period, it became so rampant after easing of the restriction to movement by Africans at independence in 1963. The rapid urbanization caused the housing crisis especially in Nairobi as there was no adequate house to accommodate African 'immigrants. Lack of comprehensive housing policy for Africans exacerbated the crisis with many opting to set up informal settlements. The mushrooming of slums and the inability of the government to provide decent and affordable housing to citizens is what led to housing

DOI: 10.15320/ICONARP.2020.144

challenges in Kenya. This study examined efforts put forward both in the colonial period and after independence to address the housing problem in Kenya. In the pre-independence era, the study examined academic, government and institutional reports, policies and research work to understand the historical context of African housing problems which was racial in nature and the interventions put forward to address them. After independence, the housing problem shifted from racial to a class problem with many low- and middle-income earners unable to afford houses, preparing grounds for slums formation. The research, therefore, relied on secondary data materials like policies, regulations, academic research, government reports, and non-governmental organization research outputs to identify and assess present interventions like slum upgrading. By examining these sources of data, the research also established the weakness of the intervention efforts by the government.

The study focused on Nairobi, the capital city of Kenya which received the highest numbers of African 'immigrants' being the central administrative unit of the country and the settlement of Asian railway workers and Europeans during the construction of the railway line. Most of the housing policies formulated by the colonial government were thus intended to address the housing problem in Nairobi. The latest efforts have, however, focused on upgrading slums in urban areas. Poor urban policies coupled with a housing deficit have seen many people move to informal settlements where the cost of living is slightly affordable compared to the formal settlements. The living condition in the slums is however very wanting due to the lack of basic services need for day to day life of human beings. Corburn (2013) best describes the social, economic, and infrastructural deprivations in Kenyan slums that have been neglected and denied services due to their informal and illegal status. In the book "*Healthy City Planning: From Neighbourhood to National Health Equity*", Mathare Slums in Nairobi is described as having many socio-economic and infrastructural deficiencies including a) insufficient water and sewage services, b) inaccessible earth roads without sidewalks, c) tin-roofed mud-surface structures, d) constant power outages, e) insecurity from gangs like "Mungiki" who frequently blackmail and threaten slum residents, and who are alleged to have conducted atrocities in Mathare slum by beheading and chopping off legs of slum residents following a disputed presidential election of 2007, f) high child mortality rate with one in every five children dying before reaching the age of five, g) 40% of children are out of schools, h) two-thirds of girls are alleged to engage in premarital sexual activities to meet the daily needs, and i) open defecation due to lack of enough latrines.

By focusing on government efforts to address the sprawling problems of the informal settlement in Kenya, this study has examined two of such programs; Kenya Slum Upgrading Program (KENSUP) and Kenya Informal Settlements Improvement Programs (KISIP) and the extent to

which they were successfully applied in Kibera (the biggest slum in Nairobi). Kibera, which has a total population of 185,777 according to 2019 population statistics, is located just 5 kilometers away from the Nairobi city center (GOK, 2019a). Ogundele (2014) describes Kibera as the biggest slum in the country. The slum has 12 villages including Gichinjio, Kisumu Ndogo, Mashimoni, Silanga, Makina, Soweto East, Kianda, Raila, Lindi, Soweto West, Laini Saba and Gatuikira (MacDonald, 2014). However, the study on slum upgrading efforts focused on Soweto East village where the pilot project was initiated.

EFFORTS TO ADDRESS THE HOUSING PROBLEMS IN KENYA

Efforts to address the housing, and slums and informal settlements' proliferation problems are not new as they were started by the colonial government through measures aimed at controlling land ownership, settlement, labor, and movement of Africans in the urban areas especially Nairobi. The post-independent governments in Kenya later adopted different strategies in light of rapid urbanization, slum proliferation, and increasing housing prices. The various methods used at different eras and periods to address the housing problems in Kenya include; Use of pass laws to prevent African urbanization, requiring employers to host their workers (mainly Africans), Encouraging self-accommodation among Africans by allocating them settlement spaces in the urban areas, slum demolition and evictions, slum upgrading and through legal and policy frameworks.

Restricting African Urban Migration through Pass Laws

The colonial government sought to control urbanization in Kenya through a series of legal measures that were aimed at preventing or controlling the movement of Africans into and within towns. This was done through the enactment of laws that targeted the Africans and restricted any urban land ownership, guided employment, authorized eviction, outlined housing for Africans, etc. Restricting the number of Africans migrating to the towns was implemented through the 1930 *Public Health Act* and the *Vagrancy Acts* of 1922 ostensibly to ensure the safety and health of the Europeans in the city. However, as pointed out by Otiso (2005), the Public Health Act was the basis for racial residential segregation in urban areas while the Vagrancy Act was used to ensure European dominance in urban areas by controlling the urban growth of non-white populations especially Africans. In accordance with the Vagrancy Act, anyone without a *kipande* (identification card) could be detained in prison or repatriated from the urban areas (Home, 2012). Although discriminatory, these pass laws regulated the rate of urbanization in Kenya thus preventing housing crisis and development of slums as the few who were allowed in the towns got some forms of accommodation. Though not very common, rural-urban migrations restriction as a means of regulating population growth in urban areas has been practiced in other countries. Au and Henderson (2006)

DOI: 10.15320/ICONARP.2020.144

describe how China attempted to restrict migration to urban areas through *"the hukou system*" which is similar to an internal passport system detailing an individual's local citizenship and entitlements like housing, public health care, public education among others for legal residents in a city while denying migrants the services. Applying the *Hukou system and* the policy of *"incomplete Urbanization",* the government *denied* 800 million migrants the right to settle in the city by not extending to them the most basic services (Chan and Buckingham 2008).

Employee Housing Strategy

Solving the housing problem in the colonial period was also done by enacting laws ensuring that employers provide housing to their employees. This was done through the enactment of *Employment of Servants Ordinance* that compelled employers (European and Asians) to provide proper housing to their employees at their places of work or rent a house for them (Hay & Harris, 2007; Obudho & Aduwo, 1989). In instances where the servants were not able to return to their homes after work or not able to obtain proper housing close to their working places, it was the responsibility of the employer to house the employee (Home, 2012). Many Africans working for Railways (biggest employer of Africans) were therefore housed in single room timber-frame structures without water and electricity while those working for Europeans and Asians were housed in the same plots in servant quarters, usually a single room for unmarried men as shown in Figure 1.

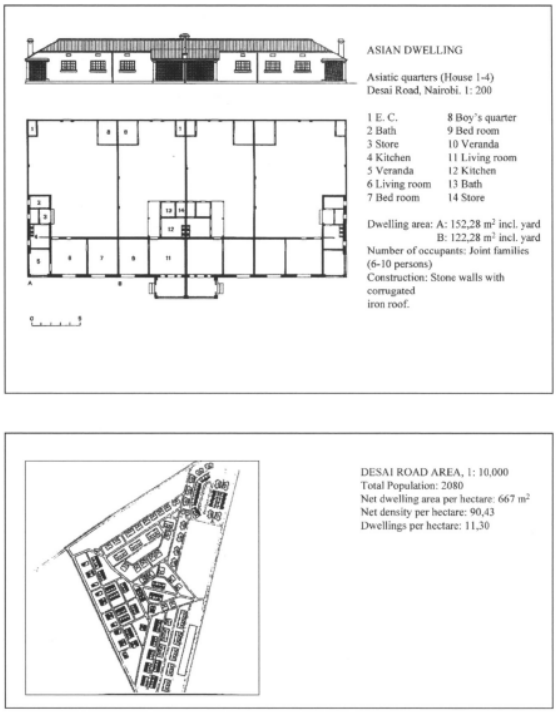


Figure 1. Kenya Uganda Railways dwelling for an Asian staff complete with African Servants Quarter in 1927 along Desai Road. (Barnow et al., 1983 cited by Hay & Harris, 2007)

Obudho and Aduwo (1989) attribute lack of a comprehensive housing policy to cater for the housing needs of Africans to their status in the city as temporary migrants who were meant to provide cheap labor. This strategy didn't come to fruition as many employers failed to comply with the requirement to house their employees. For example, in 1939, while the number of legitimate African workers in Nairobi was 40,000, the number of houses available to accommodate the African employees was only 9,000 (Ogilvie, 1946).

Self-Accommodation through Self-Help Housing Schemes.

The inability of the employers to house all African workers and the desire by the government to relieve itself of the housing burden made the government rethink its strategy of banning property ownership by Africans. To enable Africans to build and own houses in the towns, the government, therefore, encouraged the provision of plots to Africans for housing construction which led to the development of the first self-help African housing schemes Pumwani and Shauri Yako estates in Nairobi (Obudho & Aduwo, 1989). The lands allocated for African housing development was separate from the areas of settlements by other races as the colonial government continued with its racial residential segregation policy. The residentials were thus divided into African locations, the hilly areas for Europeans and the Asian 'Bazaar' area meant for the Indians.

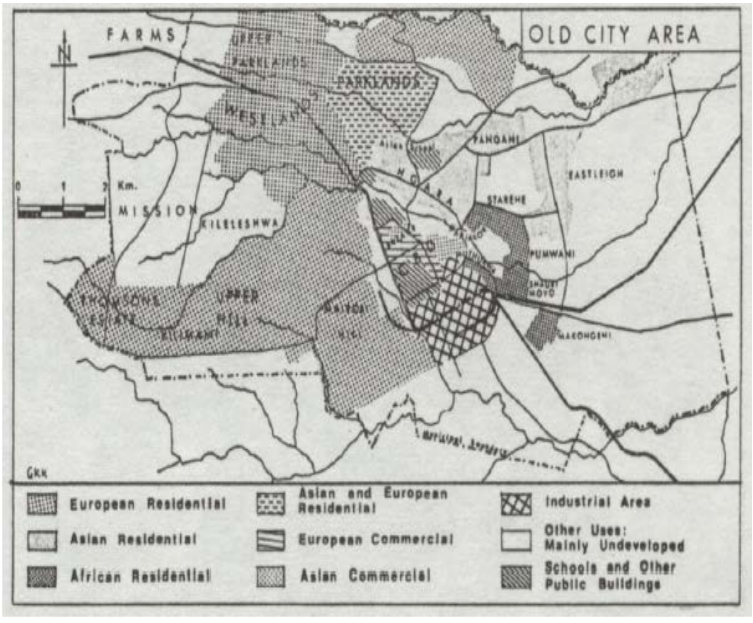


Figure 2. Racial segregation in 1939. (Kingoriah, 1983)

Besides the racial residential segregation, Otiso (2005) points out that the residential places allocated to Africans were very unpleasant such as next to sewerage plants and many Africans couldn't afford housing due to acute urban housing shortage in the African locations. Many, therefore ended up living on streets, under verandas, in shacks and overcrowded rooms. The Inadequacy of urban housing led to the

DOI: 10.15320/ICONARP.2020.144

development of first slums in Nairobi in the1940s and located next to major employment areas, with some of the major slums in Nairobi like Mathare and Kibera having been established at that time (Obudho & Aduwo, 1989).

Forceful Slum Evictions and Demolition.

Amnesty International (2009) found that more than 50% of Nairobi's population, live in informal settlements occupying less than 5% of the residential land and less than 1% of the total land area. This situation is not unique to Kenya, indeed, approximately 59% of the sub-Saharan African population lives in slums and this is projected to increase as the African urban population is expected to reach 1.2 billion by 2050 (UN-Habitat, 2016). Syagga (2011) describes the conditions in slums as lacking clean water, having poor sanitation, overcrowded, lack land tenure security, thus, exposing the slum dwellers to arbitrary evictions. Slum management in Kenya as a way of addressing the housing challenges started in 1895 when Kenya became a British protectorate. Though still applicable today, slum demolition and evictions to create spaces for urban development was a common approach to slum development from 1895 until the 1970s (Syagga, 2011). Lack of alternative accommodation for the evicted slum residents caused them to move to other parts of the towns and reestablish slums. Therefore, the more the government demolished slums, the more the new slums were formed.

Informal settlements formation was more rampant in Nairobi than other towns during colonial periods. The Railways was the major source of employment to most Africans whom they housed according to the requirement of *Employment of Servants Ordinance* (Hay & Harris, 2007). Almost every other person not housed by Railways was considered unwanted or surplus labor and could effectively be detained or deported back to the native lands under the *Vagrancy Act of 1922.* The government attempted to solve the housing shortage by the construction of the first housing estate for Africans (Kariokor) in 1929 in Nairobi. Insufficient financial allocation for African housing compared to their European counterparts (£40,000 for Africans and £586,430 for Europeans accommodation) in 1930 coupled with the increasing number of local natives moving to Nairobi, led to construction of temporary structures (informal settlements) in 'Kariokor' by Africans without proper sanitation and clean water (Macharia, 1992). The First demolition of African settlement was conducted in 'Kariokor' in 1931 through the 1930 *Public Health Act.* A total of 120 shacks were demolished on the ground of poor sanitation and lack of clean water and 3,375 Africans convicted of vagrancy (Macharia, 1992). According to Mitullah (1993), the policy of slum demolitions was also applied in In 1938. This was an attempt by the colonial government to clear Nairobi off the illegal settlements,

especially in places occupied by Africans. This led to the demolition of Pangani estate (an old African settlement in Nairobi) in 1938.

Slum eviction and demolition policy didn't stop with the achievement of independence. In fact, the *National Housing Policy* of 1966/67 was unambiguous in calling for slum clearance as a housing strategy (ROK, 2004). The eviction and demolition strategies continued in the 1970s and 80s with no alternative settlements offered and with the decision being taken centrally without the involvement of the affected residents (Wafula, 2004). Lack of compensation to affected households and the failure to provide alternative settlements caused the affected households to find other places where they reestablished the slums. Therefore, whereas the goal of slum clearance has been to get rid of the slums, it has resulted into further proliferation (Everett, 2001).

Figure 3. Kibera slum demolition to create room for road construction. (News from Reuters dated 2018)

Slum evictions and demolitions are carried out for many reasons. Other than housing purposes, most slum evictions are aimed at improving slum infrastructures, urban resettlement programs, and land expropriation for public use (e.g. roads, railways, schools), urban redevelopment and for speculation purposes usually initiated by private developers (Otiso, 2002). Due to international pressure and the rise of civil rights groups in 1980s, the government has shifted away from forceful evictions and demolitions which were harmful to lives, properties and sources of livelihood, the new methods have since been adopted including the need to improve the conditions in slums through multi-lateral findings (Syagga, 2011).

Slum Upgrading Programs

Many governments, international development agencies, and local authorities tend to respond to urban informalities like slums through either demolition or slum upgrading (Muchadenyika & Waiswa, 2018). The inhuman nature and the levels of destruction to properties

DOI: 10.15320/ICONARP.2020.144

associated with demolition have drawn international concerns and condemnations thus making it a less popular strategy (Kamete, 2009). Slum upgrading, on the other hand, improves the condition of the slums with very minimum cases of displacement to residents involved (Minnery et al., 2013). Contrary to slum demolition that delegitimizes the slum, slum upgrading integrates the slums into the city while improving the conditions in the slum and formalizing its existence (Olthuis, Benni, Eichwede, & Zevenbergen, 2015). The upgrading process targets the improvement of physical, social, economic, environmental and organizational aspects of the slum and integrates various actors like citizens, authorities, businesspeople among other stakeholders (UN-Habitat, 2003).

In Kenya, slum upgrading is being conducted through two major initiatives: Kenyan Slum Upgrading Programme (KENSUP) and Kenya Informal Settlement Improvement Project (KISIP). Both initiatives aim at improving the conditions of those living and working in the slum areas without displacing the residents (Muraguri, 2011). These two initiatives were a response to the continued proliferation of the slums in Kenyan towns, with the government records indicating that for every three Kenyans, one lived in slums and informal settlements in 1999. This figure was projected to rise to 50% by 2015 (GOK, 2010a). Kenyan Slum Upgrading Programme (KENSUP) was initiated by the government of Kenya in collaboration with the UN-Habitat in 2004 to among other objectives improve slums' social and physical infrastructures, housing conditions, address the land tenure security issues among slum dwellers and to empower the slum residents through income-generating activities (Syrjänen, 2008). While the project is being managed and executed by the Government of Kenya, the UN-Habitat, civil society organizations, private sector, the affected community, and other relevant actors complement and support their efforts with, UN-Habitat specifically providing technical assistance and consultancy through UN volunteers, also assist with financial and other resource mobilization by liaising with donors (Anderson & Mwelu, 2013; Syrjänen, 2008). The government estimates that the project would improve the lives of 5.3 million urban slum dwellers by 2020 at a cost of Kshs 884 billion or $13 billion (Anderson & Mwelu, 2013). The initial funding for the project would come from the Cities Alliance and the UN-Habitat at USD 240,000 and USD 110,000, respectively. The Pilot project for KENSUP was initiated in Kibera, the biggest slum in Kenya going by population and located on 225-hectare piece of land, 5 kilometers away from Nairobi City Centre (Syagga, Mitullah, & Gitau, 2001). According to GOK (2019a), the population of Kibera is 185,777 far below the estimations by many previous studies which put it between 170,000 and 1 million, making it the biggest slum in Kenya (Ogundele, 2014). The project focused on Soweto, one of the 12 villages in Kibera including Gichinjio, Kisumu Ndogo, Mashimoni, Silanga, Makina, Soweto East, Kianda, Raila, Lindi, Soweto West, Laini Saba and Gatuikira (MacDonald, 2014).

Successful upgrading of Soweto East was pegged on successful relocation of 25,000 residents to a decanting site in Langata (nearby neighborhood), thereby creating room for the construction of new housing units and infrastructures (Amnesty International, 2009). A total of 1,200 households have since been relocated to the decanting site from Soweto, and the first phase of the project completed with 822 housing units having been constructed, of which, 691 units were allocated to the successfully vetted beneficiaries (GOK, 2020b). Necessary infrastructure in the area was also provided beside the construction of a 0.5 kilometers access road in Soweto (Hakijamii, 2015). The KENSUP, however, failed to integrate four of the 12 basic principles of slum upgrading outlined by the UN-Habitat. According to UN-Habitat (2015), slum upgrading should be: People-centred by aiming to lift the slum residents from poverty and not just focusing on physical aspects of the slums, participatory and involve the members of the public and other stakeholders, address the land issue to provide the slum residents with security of tenure, combine slum upgrading with employment generating activities and also invest on the social capitals existing to improve cohesiveness. Amnesty International (2009) established from their interviews with the residents that there wasn't consultation on the design and location of the relocation sites which was far from the slum area thus cutting them off from their daily income activities and destroying the social networks that existed between neighbors. More than half of the families relocated also moved back to the slums while selling or renting their new homes citing affordability of the new houses and insufficient information (Amnesty International, 2009; Kajilwa, 2017a).

Slum Upgrading in Kenya is also implemented through the Kenya Informal Settlement Improvement Project (KISIP). Just like KENSUP, it is a collaboration between Kenyan Government and international development agencies; The World Bank, the Agence Française de Dévelopement (AFD) and the Swedish International Development Cooperation Agency (SIDA) who jointly initiated the program in 2011(GOK, 2020a). According to Anderson and Mwelu (2013), the cost of KISIP projects was shared by the Kenyan Government (10%), World Bank (60%), SIDA and AFD (30%). The program intended to address the slum problem of land tenure security and improve the living condition of slum dwellers through income-generating activities. The main weakness of the program is the top-down approach to development it adopted by excluding the civil societies and not involving members of the public fully in the implementation (Anderson & Mwelu, 2013).

Policy, Legal and Institutional Efforts

The Kenyan Government has sought to address the housing crisis through legislations, policies and establishment of institutions meant to implement them. After independence, the government embarked on addressing the housing shortage and slum problems through *The*

DOI: 10.15320/ICONARP.2020.144

Sessional Paper No.5 which became the first comprehensive *National Housing policy* for Kenya. The policy required the government to take steps to provide adequate shelters to the citizens and offset the housing shortage of 7,600 and 38,000 per annum in rural and urban areas respectively (ROK, 2004). The policy created the National Housing Cooperation (NHC) in charge of low cost and civil servants housing construction, besides utilization of government and donor funds for housing. The National Housing Policy has since been updated to reflect the increasing demand for affordable housing and slum and informal settlements proliferation through the formulation of *Sessional Paper No.3 of 2004, National Housing Policy for Kenya.* With an annual housing unit production of 20,000-30,000 and demand of 150,000, Kenya has an acute shortage of housing causing many to live in informal settlements (ROK, 2004). The updated policy, therefore, seeks to narrow this gap in production.

The *Vison 2030* formulated in 2008 is also a long-term plan intended to transform Kenya into an industrializing middle-income country by 2030, by addressing among others the housing shortage (Matanga, 2015). In a short term plan, the policy intended to increase the annual housing output from 35,000 to 200, 000 by 2012 and increase the accessibility of housing mortgage among Kenyans by establishing a secondary mortgage finance corporation and National Housing Fund (Mwenzwa & Misati, 2014). The targets set by the Vision 2030 are set to be fast-tracked by *Big four Action Plan,* delivering a record 500,000 low-cost affordable houses across 47 counties of Kenya between 2017 and 2022 (Presidency, 2017). Through this policy, the government established the Kenya Mortgage Refinance Company (KMRC), jointly owned by Kenyan Government and commercial banks and whose goal is to lend mortgage to aspiring homeowners at a reduced interest rates of a single-digit value and an extended repayment period of more than 20 years from the 7 years (Kimanthi, 2018). This policy also intends to lower the housing deficit gap among middle and low-income earners by 60% from the current deficit of 95% by lowering homeownership and construction cost by 50% and 30% respectively (Presidency, 2017).

The implementation of these policies was necessitated by the formation of various institutions. The Ministry of Transport, Infrastructure, Housing, Urban Development, and Public Works is responsible for formulation of and implementation policies for sustainable housing and urban development and currently undertaking the construction of 500,000 affordable houses, slum upgrading, civil servant housing schemes and setting construction and building standard (GOK, 2017). National Housing Corporation is also mandated to undertake the construction of low-cost houses and do housing research. The corporation builds decent housing in Kenya through Outright Sale, Tenant Purchase, Rural and Peri-Urban Housing Loans and Rental Housing (GOK, 2020c). The Civil Servants Housing Scheme Fund (CSHSF) another institution entrusted to implement the housing policies

was formed in 2004 as part of the implementation of National Housing Policy (2004) which required employers to support their employees to acquire housing(GOK, 2019b). The institution has since enabled more than 3000 civil servants to access housing through the provision of housing loans and sale of residential units and 600 others have been able to purchase or construct homes through loans provided by the scheme. Finally, the Kenya Mortgage Refinance Company (KMRC) which is a government-private financial institution was formed to offer cheaper loans so that more Kenyans can buy homes. The sole function of the KMRC is to provide cheap long-term loans to primary mortgage lenders like banks and microfinance banks who can then lend to Kenyans a cheaper mortgage (PSCU, 2019).

Table 1: The housing policy and institutional framework

Policies and Implementation Bodies	**Roles**
National Housing Policy	Construction of affordable housing and slum clearance.
Vison 2030	Reduce housing shortage by raising annual output from 35,000 to 200,000.
Big four Action Plan	Provision of 500,000 affordable houses to Kenya by 2022.
Ministry in charge of Housing	Housing Policy formulation
National Housing Corporation	Construct affordable and decent houses for Kenyans.
Civil Servants Housing Scheme Fund	Enable civil servants buy or construct homes.
Kenya Mortgage Refinance Company	Offer cheaper loans for Kenyans to buy homes.

KEY CHALLENGES TO HOUSING POLICIES IMPLEMENTATION EFFORTS

Efforts to address housing problems in Kenya though measures like slum upgrading have encountered numerous challenges. Lack of land tenure security which is common in the slums is a major issue that should be looked into for successful slum upgrading. The process should also be conducted in a legal and humanitarian manner to avoid legal hurdles and victimization of the residents. Legitimacy and viability of the project also depend on the level of involvement of stakeholders as discussed in this section.

Land Tenure Problems in Slums

Nairobi, the capital city of Kenya has more than 260 slums that host more than 2 million people and account for less than 5% of the total residential land in the city (Amnesty International, 2009). Despite attempts to raise the living conditions in the slums, there still exists a disparity between the formal and informal settlements in Nairobi in terms of access to basic services like infrastructures and housing

DOI: 10.15320/ICONARP.2020.144

(Talukdar, 2018). Inadequate sanitation and unhygienic methods of waste disposal in the slums have exposed slum residents to dangerous diseases and sanitation-related problems. In 2002, a study revealed that among children below 5 years of age and living in slums, the prevalence of diarrhea at 32% was more than double the rate for Nairobi and the entire country average (Kimani-Murage & Ngindu, 2007). Hanchett, Akhter, Khan, Mezulianik, and Blagbrough (2003) attribute the use of unhygienic means like pit latrines, hanging latrines, and open spaces for human wastes disposal to inadequate provision of sanitation facilities in the slums. In Kibera, high population density, poverty, and inadequate provision of sanitation has led to the overusing of latrines, in some instances more than 200 people sharing a single latrine (Schouten & Mathenge, 2010). The situation is similar in Mathare Slums of Nairobi where an average of 85 households share a single toilet, and on average a household must cover a distance of 52 meters to access the toilet. Consequently, poor health is reported among 83% of the household without private toilets in Mathare slums (Corburn & Hildebrand, 2015). Inadequate access to clean water for drinking is another major deprivation among the slum dwellers in Kenya. In their survey about access to water in informal settlements, UN Human Rights (2020) reported that more than 35% of slum residents in Nairobi takes more than 30 minutes to access water due to few water points. Besides, the poor conditions of water and sewerage lines often results into water contamination, thus, leading to high incidences of water-borne diseases like cholera. Water inadequacy in the informal settlements also means that households in the slums pay up to 50 times the price of water per liter than middle class household in the formal settlements.

Housing is similarly in poor state in slums compared to other formal parts of Nairobi. According to Bird, Montebruno, and Regan (2017), only 24 % of slum dwellers live in structures with solid walls while the number is quite high in the formal settlements of Nairobi (84%). In most cases, the wall structures in slums are made of corrugated iron sheets or mud. Overcrowding is also a major problem experienced in the slums. Whereas close to 60% of the Nairobi population live in the informal settlements, the slums only occupy about 6% of the total city land. The tiny 12ft by 12 ft structures in the slums hosts families of eight or more, with many sleeping on the floors (Onyango & Tostensen, 2015). Just like other basic services, access to primary health facilities in the slums is also a major challenge. A study in three major slums of Nairobi. i.e. Kibera, Viwandani and Korogocho revealed that access to public health services was very low among the slum communities due to the existence of few public health facilities. It was determined that only 1% of the health facilities were public, 16% were private non-profiting while 83% were private-for-profit facilities (UNICEF, 2012). Considering the high cost of treatment in private facilities and the low-income levels among the slum communities, the lack of access to health services is major threat to their health.

A major factor contributing to poor infrastructural investment by tenants and property owners in the slums is the absence of secure land and property rights (Kim, Yoon, & Mutinda, 2019). Nakamura (2017) also argues that lack of secure land tenure discourages able slum residents from self-help housing constructions due to risks of forceful eviction or demolition of properties. In Kenya, most of the slums are built on public lands. Lack of land tenure security has exposed slum tenants and dwellers to constant threats of eviction and demolition of their properties thus hampering any meaningful housing and infrastructural investments. Syagga (2011) argues that security of tenure guarantees one legal protection against such threats of evictions, harassment, and arbitrary deprivation of one's property.

Poor Public Participation

Community involvement in the implementation of projects is very crucial in ensuring that projects are successfully implemented, and lack of it has often led to the failure of projects (Abatena, 1997). It is important to involve members of the public at all stages of the project like problem identification and the project execution/implementation. Anderson and Mwelu (2013) identified inadequate involvement of slum residents in the implementation of KENSUP and KISIP projects as one of the key challenges. Instead, the ministry involved adopted a top-down approach in decision making without adequately involving the public and the civil societies despite stressing otherwise. Insufficient consultation with the residents was also reflected on the decision by more than half the residents who deserted the new houses and moved back to slums citing inability to afford the new houses, distance of the new sites from their main areas of economic activities, social relation problems (Amnesty International, 2009; Kajilwa, 2017b). Projects like slum upgrading, social housing and, affordable housing are targeting the middle and low incoming earners, who need to be involved in the specific details about the projects that have the potential to hugely impact their daily lives.

Legal Challenges

Implementatıon of development projects often faces legal challenges that affect the duration of implementation or even realization. Noncompliance with the rights of the stakeholders in a project, and the rules and regulation guiding development are some of the reasons that may affect the completion of a project. Even in cases where the residents of a slum lack the land tenure security, the international human rights is against demolition and forceful eviction, which should be a means of last resort after alternative ways of solving the problem like consultation have been explored (Amnesty International, 2009). While Kenyan laws do not expressly prohibit forceful eviction, the high courts have issued court injunctions again eviction of slum residents for development projects as was the case with the railway project in Kibera. This happens

DOI: 10.15320/ICONARP.2020.144

especially when there is no adequate notice served on residents prior to eviction, no compensation offered and no efforts made to find alternative places for resettlement of those affected (Amnesty International, 2009). Court injunctions delay the implementation of projects and may have huge cost implications. The law of eminent domain, which according to Lai (2014) empowers the government to confiscate private properties for public use and interest upon compensation, has been misapplied by authorities to forcefully grab slums without resettling the residents. While the residents may lack the security of tenure as they don't legally own the land, the Kenyan constitution calls for compensation in good faith to people who are not the rightful owners of land but have been occupying it for a period of time (GOK, 2010b).

CONCLUSION AND SUGGESTIONS

While important steps have been taken to address the housing deficit and its manifestation in the form of slums in Kenya, more need to be done to find answers to land tenure security problems, public participation, socio-economic and infrastructural deprivations, and legal challenges that delay the implementation efforts of housing policies. Slum upgrading has wildly been accepted as a more humane and efficient way of responding to poor conditions in the slums as opposed to previous efforts like forceful evictions that destroyed properties. The upgrading process must however not just focus on the physical aspects of the slums like housing and infrastructures, but also address the social and economic issues like unemployment and community cohesiveness within the slum.

Based on the analysis of available data from the secondary sources, the study suggests several actions to improve the effectiveness of urban housing intervention efforts by the government and policymakers. The study identifies socioeconomic and infrastructural deprivation, insufficient public participation in critical decision-making processes, the illegal status and legitimacy of informal settlements, and gaps in the law as the main challenges to finding the solution to urban housing problems in Kenya, especially in the informal settlements. Firstly, there is evidence of socio-economic and infrastructural deprivations in the informal settlements when compared with the formal parts of Nairobi. Efforts must therefore not be limited to addressing the housing problems but also poverty elimination in the slums. The study established an imbalance in distribution and allocation of basic services like health facilities, water, and sanitation among others, thus affecting accessibility and raising the cost for slum residents using the services. This contributes to slum poverty. It is therefore recommended that provision of the basic services be carried out in the slums alongside and economic empowerment programs to relieve the residents of financial poverty. Slum upgrading programs should therefore seek to impact the socio-economic lives of the slum dwellers.

Secondly, the study reveals that most slum residents lack land tenure security because they don't own the lands. This has contributed to the dire state of slums in Kenya i.e. untarmacked roads, lack of sidewalks, inadequate provision of sewerage systems, poor housing conditions, poor electric connections etc. In the study, it has also been revealed that the illegal status of the slums has caused successive governments to neglect them by not providing essential services, thus contributing to the poor conditions. Provision of important infrastructures by developers requires a long-term certainty about the security of the investment without fear of eviction or demolition. It is recommended that necessary documents like title deeds be issued to the slum dwellers and developers to legitimize these informal settlements and consequently encourage infrastructural investments through assured security.

Thirdly, although there was evidence of public participation in the projects carried out by the government to upgrade the informal settlements, the level of involvement is determined to be insufficient and, in some instances, the decisions were made at the top with less community contribution. Involving slum residents is particularly significant in slum upgrading programs because of the direct impact it has on the residents' mobility, social cohesiveness, economic disruption, and financial expenditures. Abandonment of almost half of the newly constructed building by KENSUP exposed the danger of a decision-making process that does not avail adequate information to members of the public. A bottom-up approach to slum upgrading is therefore recommended to ensure that the views of slum dwellers regarding their need priorities, and satisfaction are considered. This would also boost projects' legitimacy by ensuring that they are accepted and utilized as intended.

Finally, while the development of informal settlements is mainly blamed on failed housing policies in urban areas, this study shows that non-compliance with the construction regulations plays a role in the emergence of substandard buildings in the city. Insufficient enforcement of planning rules and regulations by the authorities also contributes enormously to the growth of slums in the city. Full compliance and enforcement of existing policies, rules, and regulations are therefore proposed to stop further deterioration of housing conditions in Nairobi and other urban areas. Implementation of slum upgrading through evictions, demolitions, and relocations must however be done in a way that respects the dignity of slum residents and in line with both national and international laws of justice.

ACKNOWLEDGMENT

This article was firstly presented at the ICONARC IV congress. It was selected by the congress science committee for the ICONARP Special Issue. We thank the referees for their valuable contribution to the ICONARCH congress and ICONARP special issue process.

DOI: 10.15320/ICONARP.2020.144

CONFLICT OF INTEREST

We declare that the study has no conflict of interest. We confirm that this work is original and has not been published elsewhere nor is it currently under consideration for publication elsewhere.

FINANCIAL DISCLOSURE

This study has received no financial support anywhere.

ETHICS COMMITTEE APPROVAL

The ethics committee approval was not required for this article.

LEGAL PUBLIC/PRIVATE PERMISSIONS

The legal public/private permissions was not required for our paper.

REFERENCES

Abatena, H. (1997). The significance of planned community participation in problem solving and developing a viable community capability, *Journal of Community Practice, 4*(2), 13-34.

Agayi, C. O., & Karakayacı, Ö. (2020). The Role of Changing Housing Policies in Housing Affordability and Accessibility in Developing Countries: The Case of Kenya, *Journal of Contemporary Urban Affairs, 4*(2), 49-58.

Amnesty International (2009). Kenya: The Unseen Majority: Nairobi's Two Million Slum-Dwellers, Amnesty International Publications. https://www.amnesty.org/download/Documents/44000/afr32005200 9eng.pdf

Anderson, M., & Mwelu, K. (2013). Kenyan Slum Upgrading Programs: KISIP & KENSUP, UC Berkeley Center for Global Healthy Cities. https://static1.squarespace.com/static/58d4504db8a79b27eb388c91/ t/58e686c23a0411e265af3783/1491502788579/2013_KENYAN_SLUM _UPGRADING_PROGRAMS_ANDERSON_MWELU.pdf

Au, C.-C., & Henderson, J. V. (2006). How migration restrictions limit agglomeration and productivity in China, *Journal of Development Economics, 80*(2), 350-388.

Barnow, N. F., Hansen, N. W., Johnsen, M., Poulsen, A., Rønnow, V., & Sølvsten, K. (1983). *Urban Development in Kenya: The Growth of Nairobi 1900-1970*, Kunstakademiets Arkitektskole, Institut 1.

Bird, J., Montebruno, P., & Regan, T. (2017). Life in a slum: understanding living conditions in Nairobi's slums across time and space, *Oxford Review of Economic Policy, 33*(3), 496-520

Chan, K. W., & Buckingham, W. (2008). Is China abolishing the hukou system? *The China Quarterly*, *195*, 582-606.

Corburn, J. (2013). *Healthy City Planning: From Neighbourhood to National Health Equity*. Routledge.

Corburn, J., & Hildebrand, C. (2015). Slum sanitation and the social determinants of women's health in Nairobi, Kenya, *Journal of Environmental and Public Health*, *2015*, 1-6.

Everett, M. (2001). Evictions and human rights: land disputes in Bogotá, Colombia, *Habitat International, 25*(4), 453-471. doi:https://doi.org/10.1016/S0197-3975(01)00015-7

GOK. (2010a). *The 2009 Kenya population and housing census* (Vol. 1). Kenya National Bureau of Statistics.

GOK. (2010b). *Constitution of Kenya, 2010.* Nairobi: Government Printer. http://kenyalaw.org/lex/rest/db/kenyalex/Kenya/The%20Constitution%20of%20Kenya/docs/ConstitutionofKenya%202010.pdf.

GOK. (2017). *Ministry of transport, infrastructure, housing and urban development - service charter*. Nairobi: Government Printer.

GOK. (2019a). *Kenya population and housing censusvolume i: Population by county and sub county*. Nairobi: Government Printer. https://www.knbs.or.ke/?wpdmpro=2019-kenya-population-and-housing-census-volume-i-population-by-county-and-sub-county.

GOK. (2019b). The Civil Servants Housing Scheme Fund (CSHSF). http://www.housingandurban.go.ke/project/porto-building/

GOK. (2020a). The Kenya Informal Settlement Improvement Project (KISIP). https://www.housingandurban.go.ke/project/jet-hotels/

GOK. (2020b). Kenya Slum Upgrading Programme (KENSUP): Key milestones. https://www.housingandurban.go.ke/kenya-slum-upgrading-programme-kensup/

GOK. (2020c). The National Housing Corporation. https://www.nhckenya.co.ke/index.php?option=com_content&view=article&id=218&lang=en

Hakijamii. (2015). *Slum upgrading manual-May 2015.* Nairobi.

Hanchett, S., Akhter, S., Khan, M. H., Mezulianik, S., & Blagbrough, V. (2003). Water, sanitation and hygiene in Bangladeshi slums: an evaluation of the WaterAid–Bangladesh urban programme, *Environment and Urbanization, 15(2),* 43-56.

Hay, A., & Harris, R. (2007). 'Shauri ya Sera Kali': the colonial regime of urban housing in Kenya to 1939, *Urban History, 34(3),* 504-530.

Home, R. (2012). Colonial township laws and urban governance in Kenya, *Journal of African Law, 56*(2), 175-193.

Kajilwa, G. (2017a). Why Kibera residents opted to give out new houses. Standard Digital. https://www.standardmedia.co.ke/article/2001252370/why-kibera-residents-opted-to-give-out-new-houses

Kajilwa, G. (2017b). Why Kibera residents opted to give out new houses. The Standard. https://www.standardmedia.co.ke/article/2001252370/why-kibera-residents-opted-to-give-out-new-houses

Kamete, A. Y. (2009). In the Service of Tyranny: Debating the Role of Planning in Zimbabwe's UrbanClean-up'Operation, *Urban Studies, 46*(4), 897-922.

DOI: 10.15320/ICONARP.2020.144

Kim, H.-S., Yoon, Y., & Mutinda, M. (2019). Secure land tenure for urban slum-dwellers: A conjoint experiment in Kenya, *Habitat International, 93*, 1-14.

Kimani-Murage, E. W., & Ngindu, A. M. (2007). Quality of water the slum dwellers use: the case of a Kenyan slum, *Journal of Urban Health, 84(6),* 829-838.

Kimanthi, K. (2018). Uhuru Kenyatta outlines 'Big Four' progress. Daily Nation, December 13 2018. https://www.nation.co.ke/news/Uhuru-Kenyatta-outlines-big-four/1056-4893040-14u1vl6/index.html

Kingoriah, G. K., (1983). The causes of Nairobi's city structure. *Ekistics*,, *50(301)*, 246-254.

Lai, L. W. (2014). Private property rights not to use, earn from or trade land in urban planning and development: A meeting between Coase and Buchanan, *Habitat International, 44*, 555-560.

MacDonald, M. (2014). *Community Perception of Slum Upgrading Initiatives in Soweto East, Kibera (Nairobi, Kenya).* McGill University Libraries.

Macharia, K. (1992). Slum clearance and the informal economy in Nairobi, *The Journal of Modern African Studies, 30*(2), 221-236.

Matanga, B. O. (2015). *Implementing the right to housing for residents of slums and informal settlements in Kenya: Legal, policy and institutional challenges and prospects.* [Master's thesis, University of Nairobi, School of Law]. University of Nairobi Library.

Minnery, J., Argo, T., Winarso, H., Hau, D., Veneracion, C. C., Forbes, D., & Childs, I. (2013). Slum upgrading and urban governance: Case studies in three South East Asian cities, *Habitat international, 39*, 162-169.

Mitullah, W. V. (1993). *State policy and urban housing in Kenya: the case of low income housing in Nairobi.* University of York.

Muchadenyika, D., & Waiswa, J. (2018). Policy, politics and leadership in slum upgrading: A comparative analysis of Harare and Kampala, *Cities, 82*, 58-67.

Muraguri, L. (2011). Kenyan government initiatives in slum upgrading, *Les Cahiers d'Afrique de l'Est/The East African Review, 44,* 119-127.

Mwenzwa, E. M., & Misati, J. A. (2014). Kenya's Social Development Proposals and Challenges: Review of Kenya Vision 2030 First Medium-Term Plan, 2008-2012, *American International Journal of Contemporary Research, 4(1),* 246-253.

Nakamura, S. (2017). Does slum formalisation without title provision stimulate housing improvement? A case of slum declaration in Pune, India, *Urban Studies, 54*(7), 1715-1735.

Obudho, R., & Aduwo, G. (1989). Slum and squatter settlements in urban centres of Kenya: Towards a planning strategy, *The Netherlands Journal of Housing and Environmental Research*,*4,* 17-29.

Ogilvie, G. C. (1946). *The housing of Africans in the urban areas of Kenya.* Kenya Information Office.

Ogundele, A. (2014). *Decanting and Social Sustainability: Kenya Slum Upgrading Programme (A Case Study).* University of Waterloo.

Olthuis, K., Benni, J., Eichwede, K., & Zevenbergen, C. (2015). Slum Upgrading: Assessing the importance of location and a plea for a spatial approach. *Habitat international, 50*, 270-288.

Onyango, P., & Tostensen, A. (2015). The Situation of youth and children in Kibera, CMI Report, (3).

Otiso, K. M. (2002). Forced evictions in Kenyan cities, *Singapore Journal of Tropical Geography, 23*(3), 252-267.

Otiso, K. M. (2005). Colonial urbanization and urban management in Keny. In S. J. Salm, T. Falola (Eds.). *African Urban Spaces in Historical Perspective* (pp.73-97). University of Rochester Press.

Schouten, M., & Mathenge, R. (2010). Communal sanitation alternatives for slums: A case study of Kibera, Kenya, *Physics and Chemistry of the Earth, Parts A/B/C*, *35(13-14),* 815-822.

Presidency, T. (2017). The Big Four: Affordable Housing. http://www.president.go.ke/affordable-housing/

PSCU. (2019). Mortgage refinance company to boost affordable housing agenda – Uhuru. *The Star*. https://www.the-star.co.ke/news/2019-05-23-refinance-company-to-provide-mortgages/

Reuters. (2018). Slums demolished for new Kenyan road. https://www.reuters.com/news/picture/slums-demolished-for-new-kenyan-road-idUSRTX6CG6R

ROK. (2004). *Sessional Paper No.3 of 2004 on National Housing Policy for Kenya*. Nairobi: Government Printer. http://www.mintoreal.com/policy-documents/kenya-national-housing-policy?download=8:kenya-national-housing-policy.

Sulemana, I., Nketiah-Amponsah, E., Codjoe, E. A., & Andoh, J. A. N. (2019). Urbanization and income inequality in Sub-Saharan Africa, *Sustainable Cities and Society, 48*, 101544.

Syagga, P. (2011). Land tenure in slum upgrading projects, *Les cahiers d'Afrique de l'est*, 103-113.

Syagga, P. M., Mitullah, W. V., & Gitau, S. K. (2001). Nairobi situation analysis. *Government of Kenya and UNCHS Collaborative Nairobi Slum Upgrading Initiative, Nairobi*.

Syrjänen, R. (2008). *UN-Habitat and the Kenya slum upgrading programme: strategy document*: United Nations Human Settlements Programme.

Talukdar, D. (2018). Cost of being a slum dweller in Nairobi: Living under dismal conditions but still paying a housing rent premium, *World Development, 109*, 42-56.

UN. (2014). World urbanization prospects: The 2014 revision, highlights. United Nations Department of Economic and Social Affairs, Population Division, Methodology Working Paper No. ESA/P/WP.238.

UN-Habitat (2003). The challenge of slums: global report on human settlements, 2003. United Nations Human Settlements Programme

DOI: 10.15320/ICONARP.2020.144

UN-Habitat (2015). *Slum Almanac 2015/2016 :Tracking Improvement in the Lives of Slum Dwellers*. https://unhabitat.org/wp-content/uploads/2016/02-old/Slum%20Almanac%202015-2016_EN.pdf

UN-Habitat (2016). Slums Almanac 2015-16: Tracking Improvement in the Lives of Slum Dwellers.

UN Human Rights (2020). Kenya's informal settlements need safe water to survive COVID-19. https://www.ohchr.org/EN/NewsEvents/Pages/COVID19_RighttoWaterKenya.aspx

UNICEF. (2012). The State of The World's Children 2012: Children in An Urban World. In *Focus on-Maternal and Child Health Services for the Urban Poor. A case Study of Kenya.* New York.

Wafula, N. (2004). Affordable housing in Kenya: A case study of policy on informal settlements*.* 3rd FIG Regional Conference Jakarta, 3-7 October 2004, Indonesia.

Resume

Collins Ouma Agayi holds a Bachelor of Urban and Regional Planning degree which he was awarded by the University of Nairobi, Nairobi, Kenya, and a Master of City and Regional Planning which he received from Selcuk University in Turkey. He is currently pursuing a Ph.D. in city and Regional Planning at Konya Technical University in Turkey. His research interests include housing and human settlement, regional development, and rural poverty.

Özer Karakayacı; (B.Arch, M.Sc., PhD.) He received his B.Arch and MSc. in City and Regional Planning from Selcuk University, Faculty of Architecture (1996-2003). He earned his PhD. degree in Regional Planning from Yildiz Technical University (2011). He is currently working as an Assoc. Prof. at Konya Technical University. Major research interests include regional planning, economic geography, social capital, industrial geography, and rural planning.

Research Article

ICONARP
International Journal of Architecture and Planning
Received: 13.10.2020 Accepted: 27.11.2020
Volume 8, Special Issue/ Published: 28.12.2020
DOI: 10.15320/ICONARP.2020.145. E- ISSN:2147-380

ICONARP

A Comparative Study on Daylight Performance of Konya Mosques Built in Anatolian Seljuk and Ottoman Period

Ayşıl Coşkuner Pamuk[1], İbrahim Agah Taştemir [2], Ümit Arpacıoğlu[3]

[1] Res. Asst., Department of Architecture, Istanbul Sabahattin Zaim University, Istanbul, Turkey. (Principal contact for editorial correspondence), Email: aysil.pamuk@izu.edu.tr

[2] Res. Asst., Department of Interior Architecture and Environmental Design, Istanbul Sabahattin Zaim University, Istanbul, Turkey. (Principal contact for editorial correspondence), Email: ibrahim.tastemir@izu.edu.tr

[3] Assoc. Prof. Dr., Faculty of Architecture, Mimar Sinan Fine Arts University, Istanbul, Turkey. Email: umit.arpacioglu@msgsu.edu.tr

Abstract

Purpose

Daylight control and energy efficiency in architectural design is accepted as one of the main inputs of sustainable architecture. In the present study, we investigate the importance of light factor and daylighting design criterias as the construction technique of mosques improves by adhering to different periods.

Design/Methodology/Approach

Interior space designs of three different Mosques are displayed via plan sketches, therefore every mosque is evaluated particularly in summer term periods when users pray inside mosques in particular day and hour periods. In-situ evaluation results are tested by a luxmeter and comfort device. Each mosques' technical plans are modelled in 3D programme. Measures are evaluated only when there is natural light inside.

Findings

The major design criterias and construction techniques stated in this study will give inspiration to builders to design praying halls which have perfect lighting performance with sacred sense of worshipping activities with full of serenity and concentration.

Research Limitations/Implications

Short-term and very limited in situ measurements were taken in Konya mosques due to pandemic precautions. Also evolved computational datas of DB programme are the main limitation of this study.

Originality/Value

This study is the first to emphasise the importance and development of daylight in places of worship in the center of Konya, depending on the order of architectural design according to different periods. There are very few studies that examine the effect of daylight in worship places and its impact on construction and design. Daylighting in historic Islamic architecture can be further studied via simulation programme.

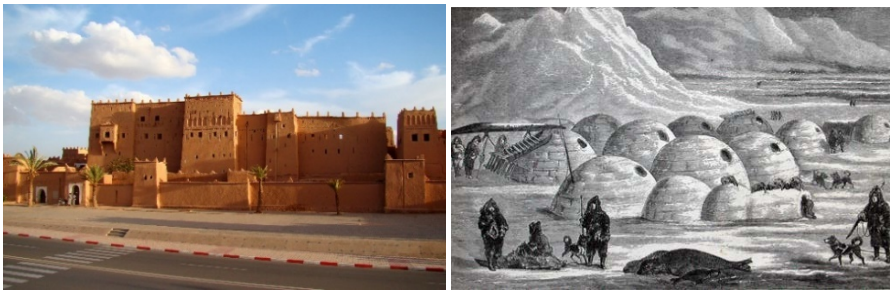
Keywords: *Daylight, traditional mosque design, interior space, daylight comfort*

INTRODUCTION

One of the basic human need is living in comfort. Daylight is one of the important factors that affect the comfortable indoor environment. In buildings, the most important building component that creates the balance between natural environment and space is the building envelope. Daylight is used in architectural design to provide internal space needed to carry out activities in accordance with a space. The light in architecture is responsible for improving living space. Daylighting also provides consistency of creating the inner atmosphere, effecting texture, colour, and dynamic sense of the space which is related to the dynamical changing between day and night (Yahya,2014).

Daylight affects the design of buildings destined to house religious activities as ancient cultures. Ancient cultures used daylight to try incorporataion in the design of their most representative buildings. Ancient Egyptians used daylight in orientation, sanctuary and processional paths, designed according to movement of the sunlight. Ancient Greeks used these in their templates to orientate towards the east to relate directly to the first light of the day. The Romans, the first to consciously design interior space, used daylight in their templates to enhance and articulate space. (Antonakaki, 2007) On religion and cultural side, throughout history, light's symbolic role has been related to sacred, religious and cosmologic beliefs. Light was given great significance in the Jewish , Christianity and Islamic beliefs (Arel, etc.,2017).

Early architecture and building structure technology use local environmental factors influenced the shaping of building faces and restricted the role of the building envelope for secure and protect the indoor environment and occupants. Early architecture primary task to build was keeping building structure to standing and providing indoor climate for health. In hot and cold climates early architecture buildings openings was limited because of climatic conditions (Figure 1), (Lechner N. 2001), (Stein, 2000).



a. **b.**

Figure 1. Early architecture examples from hot and cold climates.

a: Traditional Kasbahs, Morocco
b: Eskimo, Inuit Houses
(Bjørn, 2011;
Philip J.H., 2016)

Structural technology and development of architecture brings to arch and the dome, and they create potential for larger openings that can admit to advancing use of daylighting strategies. The architectural form of buildings, placement of windows, and location of rooms lead by the availability of daylight as the primary source of illumination. Especially in

DOI: 10.15320/ICONARP.2020.145

monumental architecture like religious buildings, daylight is used for not just providing indoor climate, also as visual comfort for occupants. (Phillips, 2004), (Chepchumba,2013)

In Ancient Rome period, the advancements in openings were square-headed or circular. Especially the first application of glazing allowed daylighting. Ancient Roman building skylights and clerestories were larger and provided more light into deep interiors. (Figure 2) In Byzantine period, buildings were centralized around a primary dome surrounded by secondary spaces covered with half domes intersecting below the main dome. Daylight admitted through many small stained-glass windows grouped together piercing the base of the dome (Chepchumba,2013).

a. **b.**

Figure 2. Ancient Rome and Byzantium Construction Development effect of daylighting

a: Pantheon, Rome
b: Hagia Sophia, Istanbul
(Deutsche Welle, 2017; Burney, 2016).

In Islamic Architecture, daylight im mosque design is used for providing the creation of an environment where the worshipper can fulfil his religious needs and regular visual comfort objectives. Mosques are the first Islamic building types wherever built. With the spreading of Islam, there had a lot of diversity in mosques architecture affected Byzantine, Persian architectural styles by multiple reasons such as building materials and techniques, elements of environment and culture (Figure 3).

a. **b.**

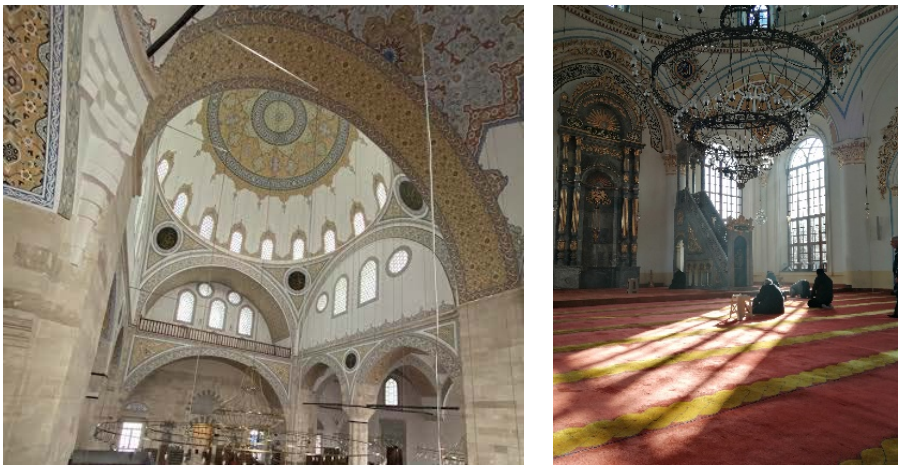
Figure 3. Early Islamic Architecture and usage of daylighting

a: Umayyad Mosque, Damascus
b) Alhambra Palace, Granada
(Horsey, 2019; Greatest Paka Photography, 2012).

After the 11th century in Islamic architecture, with the influence of the Anatolian Seljuks, mosques were built in a unique style which was fed from different cultures. This architectural style continued to develop with Ottomans. Ottoman and Seljuks Islamic architectural style and construction system is seen in a wide geography from Central Asia to

Europe from 11th Century to 20th century. Anatolian Seljuks built many monumental buildings in Anatolia with the effect of local cultural identity and Asian Turkish cultural identity. Subsequently Anatolian Seljuks and Ottomans continued to develop this architectural design and construction system. Especially in the 16th century, the age of architect Sinan period is an important development point in Ottoman and Islamic architecture.

The architect Sinan designs, and his construction system is still considered one of the architects of Ottoman's Architecture. One of the most important properties of Sinan's designs was the concern in employing physical environmental factors like ventilation, sound and especially light in the interior space, which derives from the structural development. Sinan construction system brought the covering system on to columns and piers, an important potion of which was moved to the exterior parts for supply the unification of the space and increase interior light. Sinan Period and after, Ottoman Mosque architecture continued to grab light intentionally, which yielded a bright and spacious interior (Figure 4) (Yahya, 2014).



a. **b.**

Figure 4. Classical and Late Baroque Ottoman Architecture Period usage of daylighting

a: Sultan Selim Mosque, Konya
b: Aziziye Mosque, Konya
(Photographs by the authors, 2019).

The aim of this study is to identify the lighting performance of mosques which were constructed in Konya region within different periods. All mosques were constructed in Anatolian Seljuk, Ottoman Classical Architecture and Ottoman Late Baroque Periods.

This paper consists of five consecutive parts. First part includes the case study description. It starts with the methodology of study including the daylighting analysis. In second part, methods is described in which different design strategies and construction techniques are defined. In the third part of study, daylighting analysis comparative results are explained and discussed with graphics method. The fourth and final part concludes the analysis with graphical results and give advice and suggestions.

DOI: 10.15320/ICONARP.2020.145

LITERATURE REVIEW

There are very few studies that examine the effect of daylight in mosque design. Arab *et al.*,2013 measure lighting performance of single pendentive dome type and pyramid roof type in Islamique mosque design built during the Ottoman Empire in Istanbul, Turkey and Mostar, Bosnia Herzegovina. The authors prove the fact that having excellent illuminance level distributed at all the locations is one of the crucial reasons why the mosques with pedentive dome roof cover are built by Ottoman master builders. The study is simulated during winter solstice and analysis are measured using Autodesk software known as 3D Studio Max Design 2011 programme. As a different type of study Mazloomi.,2010 examines the importance of Window to Wall Ratio [WWR] seeks its influence on daylight factor in southern part of Malaysia by modeling in Ecotect V5.60. These two studies jointly investigate the effect of the dome form in mosque function on daylight analysis. Another study belongs to Antonakaki., 2007 and two religious buildings belonging to two different religions but found at the same time are discussed in terms of daylight. The study compares the relation between the spatial structure and the lighting in Early Ottoman mosques and Byzantine churches. There is no information on which modeling program is used regarding lighting levels and daylight results. Another research that evaluates the daylight analysis in mosque architecture without using any simulation program belongs to Shahani, 2018. This research analyze how daylight pervades the sequential spaces of Sheikh Lotfollah Mosque, Isfahan, Iran, one of the most well-known mosques, during the day. The spaces of the mosque present several appearances of daylight, controlled during different time intervals. Photographs of the spaces taken with the help of a camera depict the different daylight penetrations from outside to inside the mosque, categorized into different episodes. Another method of daylight measurement in mosques is researched and used by El-Darwish *et al.,*2016. The study emphasize that there is very few theories regulating mosque design. Climate-based simulations are done in Rhino as a modeling platform with the DIVA lighting analysis plug-in to present a general overview of the role of fenestration on daylight performance in order to examine the close relationship between fenestration and day-light autonomy. Aljofi,2018 conducts a pilot field investigation of daylight performance through domes for more than 10 domes mosques in the Eastern province of Saudi Arabia. In situ measurements by a lightmeter is evalutaed and a physical model is used for the experiment. Very parallel to our research Kammoun *et al.,*2016 proves that the daylight distribution in the studied mosque is directly related to the shape of mosques and particularly, the courtyard shape, the presence of galleries, the architectural devices used to favor the introduction of the natural light and the naves orientation by using Radiance software Ecotect Programme. Another research whith similar pupose to our study belongs to Hareri *et al., 2020.* The study analyses the physical characteristics of two Mosques located in Jeddah city, Saudi Arabia, built at different time

periods. The analysis focuses on investigating different design techniques used to lighten the interior space, and how this can be related to the identity of the mosques. In addition, it explores how the orientation of mosques, determined by the Qibla direction, has impacted the indoor lighting quality. Unlike our study, in Hareri *et al.,* 2020*;* illuminance level comparisons were made only through observation.

CASE STUDY DESCRIPTION

A selected sample of three mosques built in different centuries was studied on a simulation tool to compare illuminance levels.

Inner Space Description of Selected Mosques

The indoor lighting performance is evaluated using illuminance level as the measurable scale. This illuminance level is measured in lux per metre square (lux/m2), which means the amount of luminance (lux) affected on a 1×1 m surface area. By referring to this measurement, this study can determine the indoor lighting performance inside the mosque (Runsheng ,2009). Building design using daylight system is considered as having excellent passive lighting design. (Arab,2012) Daylight is lighting, obtained from indirect sunlight source which provides the best source which matches with human visual response. The windows above the dome allows sunlit penetration. The amount of daylight penetration into a building through sunlit area from windows and door openings provides dual functions not only of admitting natural light into the indoor area but also allowing the occupants to have visual contact with the outdoor environment.

Tahir and Zühre Mosque

The first mosque chosen for the study was Tahir and Zühre Mosque (Fig. 5) located in Meram neighbourhood. The mosque was constructed in 13th century by Sahip Ata who is one of the characters who had the longest political career in Anatolian Seljuk period. Sahip Ata, who had all the important assignments during his governmental job for approximately forty years, is the patronage of some of the most important magnificent buildings. (Yavaş, 2008) It was designed as Classic Seljuk architecture style. The mosque is located on north-eastern side of Konya. The prayers' area located on southwestern side of the mosque is a square shaped with 6 m*6 m dimensions. The square shaped zone is covered by a single dome. The main element of the mosque represents a void with double volume space surmounted under a pendentive dome as the roof cover. It was constructed by 'Türk Üçgeni'' a characteristic squinch type. There are no windows at the bottom of the dome. There are three windows on the northern side, one on the western side and two on the eastern wall. There are no clerestory windows. The dome measurement based on the building plan and section has 2.7m in radius and the square wall height is 5m. The building height (dome with square wall) is 6.70m.

DOI: 10.15320/ICONARP.2020.145

Figure 5. Tahir Zuhre Mosque Indoor Photo and Plan
(Photographs by the authors, 2019).

Sultan Selim Mosque

The second mosque (Fig. 6) selected for the purpose of this study is Sultan Selim mosque which is a 16'th century Ottoman Mosque constructed in Classical Ottoman architectural style. It is located in Konya's Karapınar neighbourhood 97 km away from Central Konya and near Mevlana mausoleum. The mosque's construction began in 1558 and was not renovated till 18th century. The almshouse called 'imarethane'' located on the western side of the mosque was constructed as additional building to the mosque when Selim II was on the throne. The mosque is located on southern side of Konya.

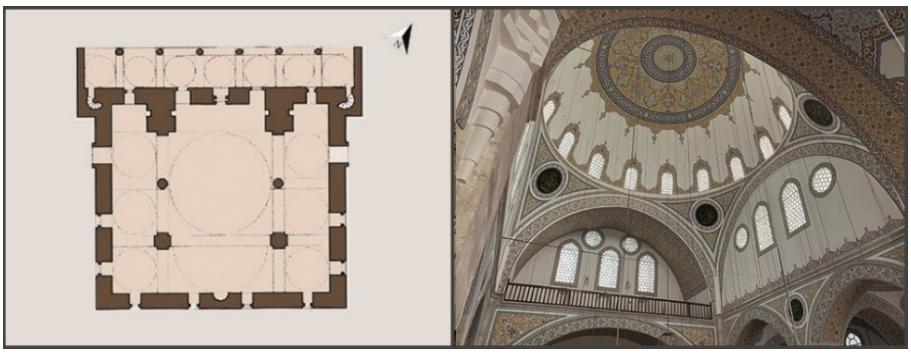


Figure 6. Sultan Selim Mosque Indoor Photo and Plan (Photographs by the authors, 2019).

The prayers' area located on the south-eastern side of the mosque is square shaped with 25 m*25m dimensions. The square shaped zone is covered by a single dome and semi-dome roof covers, This square form is developed by half domes attached to main square, known as ''Riwaq''. There are two major and two circular shaped windows on every side except the southern bottom of the dome. There are seven windows on northern part, four on the western side and three on the eastern wall. There are eight clerestory windows. The dome measurement based on the building plan and section has 9m in radius and the square wall height is 12m.

Aziziye Mosque

The third (Fig. 7) selected purpose of this study is Aziziye Mosque which is a 19'th century Late Ottoman building constructed in Baroque architectural style. It is located in Konya's Karatay neighbourhood in Central Konya and near Bezirganlar Çarşısı. It was exposed to fire in 1867 and reconstructed in1872. The mosque is located in southwestern edge of central Konya. The prayers' area located on the western side of the mosque is a square shape with 20 m*20m dimensions. Fig.7.1) The square shaped zone is covered by a pendentive single dome. Pendentive dome is a construction of 'dome above dome' concept, dome design is supported by four giant arches (Mango, 1976). With simple plan design, this square form is highlighted by square wall construction with a minaret at the west wall adjacent to the building entrance on the north wall. At the bottom of the dome there are eight windows two on each side.

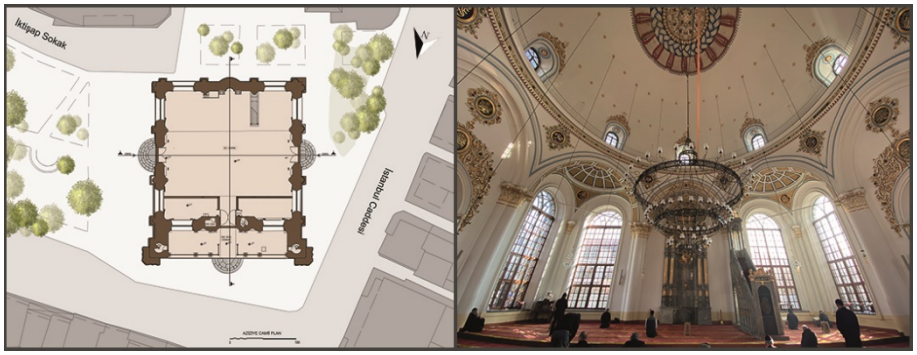


Figure 7. Aziziye Mosque Indoor Photo and Plan (Photographs by the authors, 2019).

There are two windows on each side of the walls. There are no clerestory windows. The dome measurement based on the building plan and section has 9m in radius and the square wall height is 12m. The building height (dome with square wall) is 19.81m. The dome is supported by four arches covered as a part of the building stone walls with 1.31 m in thickness. A mihrab is also an important element of mosques which is a niche area always located at the south wall (2003, Eyice).

RESEARCH METHOD

The in situ measurements and simulation analysis results are taken into consider. The measurement results tested on 21st December and 8th August have benefited for the verification of simulation results. It is important to consider that the in situ illuminance results match up with the simulation results. This simulation was conducted on 21st of June, 21st of September, 23rd of December and 21st of March on the occurrence day of winter, summer and midseason equinox. On 21st of June 2019 when summer solstice occurs, sunrise in Konya is at 5:28am and sunset at 8:16 pm. On 23rd of September when summer solstice occurs, sunrise in Konya is at 6:37am and sunset at 6:48pm. On December,21 when summer solstice occurs, sunrise in Konya is at 8:02am and sunset at 5:34pm. On March,21 when summer solstice occurs, sunrise in Konya is at 6:52am

DOI: 10.15320/ICONARP.2020.145

and sunset at 7:03pm. The simulation dates and hours considered as 09.00,12.00,15.00 and 17.00 depending on sunrise and sunset data's.
This daylight simulation deployed a computer based calculation of the amount of daylight inside the building using Designbuilder programme. Before simulation analysis was conducted, three-dimension drawings of the three mosques were created using AutoCAD software based on one to one scale illustrating exact measurement of the building form with reference to the mosque's two-dimensional AutoCAD plan and section. After that, these three-dimension drawings were redesigned in Designbuilder Programme. A daylight system was created according to dates and hours stated above. The weather data files of Konya in typical year format was created depending on meteorological stations by means of Meteonorm 7 software. In the software, Konya has the only international meteorological station. This station, located in Konya airport region which is approximately 17 km away from the area where the three mosques are located, was taken as reference in the study. Typical year was created in TMY2 format using the meteorological data between 1991-2010 and then converted to EPW format for DB's use.
Apart from simulations in situ measurements in each prayer area was created by setting points of incidence which specified the illuminance levels at each point. As shown in Figure 8, a lightmeter, Hobo comfort analyser devices and DO9847 climate analyser device were used during measurements.

Figure 8. Hobo comfort analyser devices and DO9847 climate analyser device were used in prayer halls on 21st December. (In situ measurements) (Photograps by the authors, 2019).

Each subdivision represented a point at which incident illuminance normal to the grid was calculated. The devices were set at human body level for praying at 45 cm above the ground level of the floor. The results were compared with each other and verified based on the devices and as well on the simulation results. The simulations were done in all three mosques and in situ measurements were done in two selected mosques in 21st December and 8th August. These results allowed us to have comparative analysis of lighting performances among these three mosques which have different construction techniques and built in different centuries.

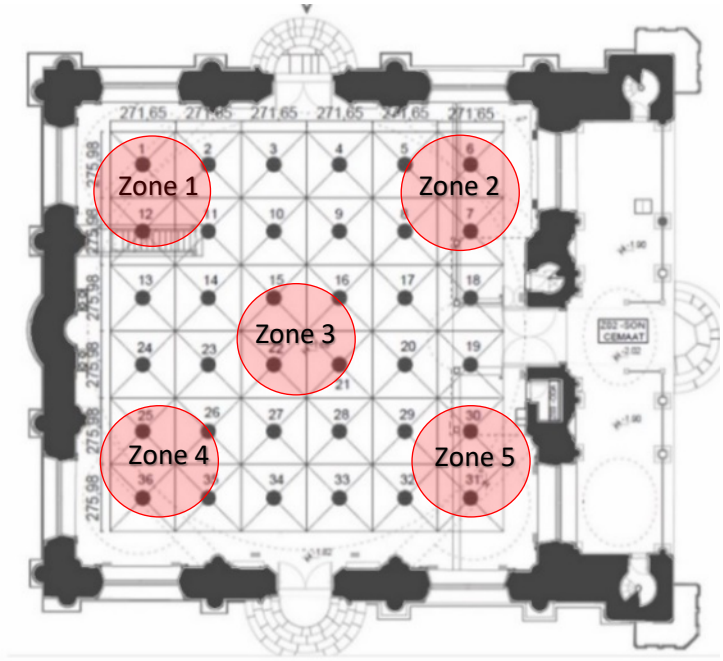


Figure 9. Aziziye Mosque daylight analysis in situ measurements on August 8, 2019

Table 1. Aziziye Mosque daylight illuminance values (in situ measurements including the 5 zones) on August 8,2019

Konya/ Date: 08.08.2019 02.00-03.00 PM/ Clear Sunny Day					
Selected Points	**Illuminance Level (lux)**	**Selected Points**	**Illuminance Level (lux)**	**Selected Points**	**Illuminance Level (lux)**
1	1100	**7**	704	**13**	208
2	580	**8**	500	**14**	275
3	660	**9**	414	**15**	359
4	415	**10**	443	**16**	376
5	966	**11**	515	**17**	340
6	1072	**12**	690	**18**	350
Selected Points	**Illuminance Level (lux)**	**Selected Points**	**Illuminance Level (lux)**	**Selected Points**	**Illuminance Level (lux)**
19	248	**25**	478	**31**	436
20	330	**26**	411	**32**	353
21	340	**27**	345	**33**	345
22	330	**28**	335	**34**	324
23	320	**29**	341	**35**	445
24	297	**30**	371	**36**	623
Average Illuminance values for each zone	Zone1: 1100 lux	Zone 2: 1000 lux	Zone 3: 350 lux	Zone 4: 550 lux	Zone 5: 300 lux

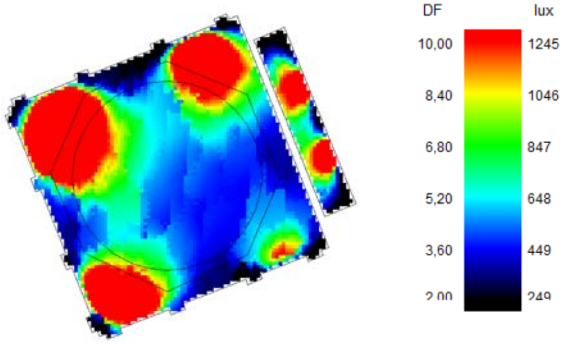


Figure 10. DB Simulation results (Illuminance results) for Aziziye Mosque on August 8,2019 clear sunny day, 14pm

DOI: 10.15320/ICONARP.2020.145

As stated in Figure 10 and Table 1, the in-situ measurements described as Zones and the simulation results in DB daylight simulation analysis for Aziziye Mosque on August 8, 2019 overlap. Zone 1 and Zone 2 have better illuminance levels than the other three zones. The lowest illuminance value is at Zone 5. This order coincides with the simulation results for Aziziye Mosque on August 8, 2019.

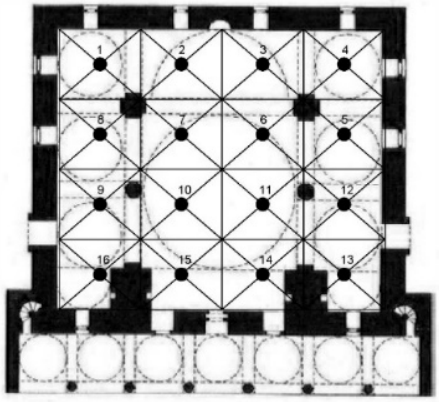


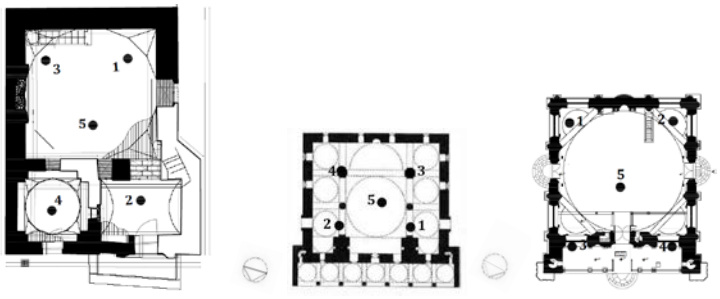
Figure 11. Sultan Selim Mosque daylight in situ measurements on December 21, 2019

Table 2. Sultan Selim Mosque daylight illuminance values (in situ measurements) on December,21 2019

Konya Merkez/ 21 December 2019 10.30-11.00/ Very Cloudy Intermediate Day					
Selected Points	**Illuminance Level (lux)**	**Selected Points**	**Illuminance Level (lux)**	**Selected Points**	**Illuminance Level (lux)**
1	11,8	**6**	30	**11**	9,5
2	27	**7**	27	**12**	24
3	9	**8**	100	**13**	3
4	21	**9**	82	**14**	12,6
5	25	**10**	28	**15**	23
				16	35

As stated in Figure 11, the in-situ measurements for Sultan Selim mosque on December 21,2019 is compatible with the simulation results stated in Table 6.

For the simulation data's especially five selected points were taken into calculations. These points are located as 1=northwest side prayer hall; 2 north eastern side prayer hall; 3=southwest side prayer hall; 4=southeast side prayer hall; and 5=under dome inside the building for each mosque (Figure 12.1,2,3,) The results for each selected points were collected and then converted to tables and line charts.



a. **b.** **c.**

Figure 12. Selected five points for the simulation daylight analysis.

a. Tahir and Zuhre Mosque
b. Sultan Selim Mosque
c. Aziziye Mosque

As simulation methodology, programme daylighting simulations are verified with respective to radiance parameters values in Designbuilder shown in Table 3.

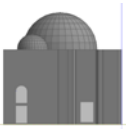
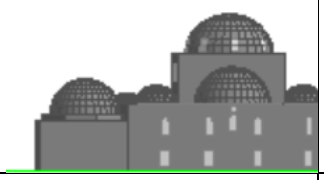
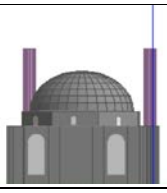
Table 3. Radiance parameters for simulation

Ambient Bounces	Ambient Divisions	Ambient Sampling	Ambient Resolution	Ambient Accuracy	Direct Treshold
7	1024	20	512	0,22	0

RESULTS and DISCUSSION

A comparative research between different design features of different mosques are carried out and average ılluminance levels for each mosque are calculated. Area of studied space, total height of buildings, number of openings and window to wall ratios for each mosque are stated in Table 4. Entrance facades for each mosques are also shown in Table 4 which is in direct proportion to window to wall ratios.

Table 4. Daylighting properties of case study mosques

Case Study Mosques	**13th Century**	**16th Century**	**19th Century**
	Tahir and Zühre	**Sultan Selim**	**Aziziye**
Area of studied space (m²)	80,785	857	513
Height of studied space (m)	8,7	24,71	20
Peripheral WWR	9%	6%	26,5%
North	2%	9,31 %	%26,5
West	2%	6,76%	%26,5
South	0%	4,75%	%26,5
East	23%	4%	%26,5
Upper Clerestory WWR	0%	5,89%	6,19%
North	0%	5,89%	6,19%
West	0%	5,89%	6,19%
South	0%	5,89%	6,19%
East	0%	5,89%	6,19%
Number of openings	3	40	16
Entrance Façades			
Annual Illuminance Level (lux)	***119,05***	***1700,30***	***2308,99***

DOI: 10.15320/ICONARP.2020.145

Annual indoor daylighting performance of Tahir and Zuhre Mosque is expressed in Table 5. The illuminance levels including the equinox dates and prayer periods are illustrated in Tables 5,6,7. This study comprises a comparative study between the Tahir and Zuhre, Sultan Selim and Aziziye Mosques.

Table 5. Annual Indoor daylighting performance of Tahir and Zuhre Mosque

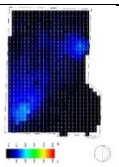
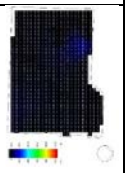
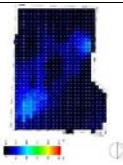
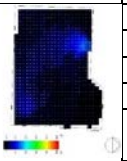
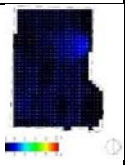
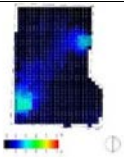
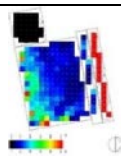
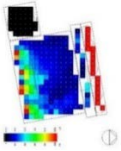
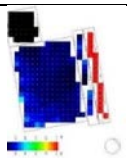
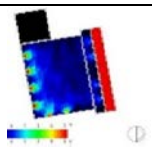
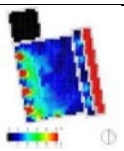
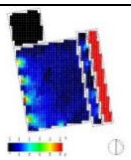
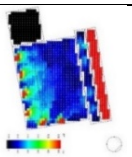
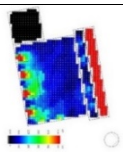
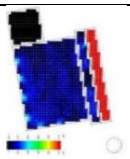
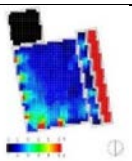
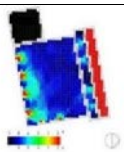
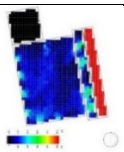
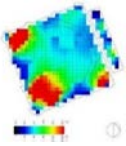
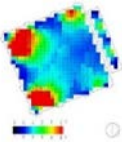
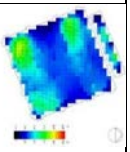
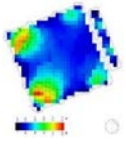
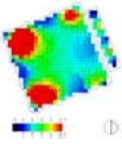
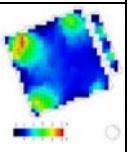
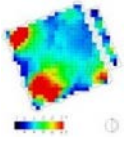
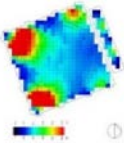
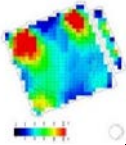
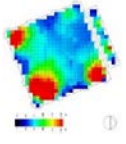
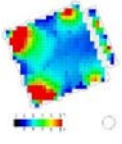
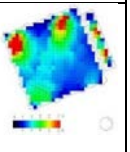
September,23 Clear Day					
Illuminance (Lux)	**09.00**	**Illuminance (Lux)**	**12.00**	**Illuminance (Lux)**	**17.00**
1 11		7		12	
2 5		5		18	
3 13		13		24	
4 150		53		33	
5 56		36		15	
Average Value: 163		**Average Value:** 147,5		**Average Value:** 104,46	
December,21 Cloudy Intermediate Day					
Illuminance (Lux)	**09.00**	**Illuminance (Lux)**	**12.00**	**Illuminance (Lux)**	**15.00**
1 3		7		19	
2 4		9		7	
3 2		4		6	
4 69		69		41	
5 16		31		21	
Average Value: 130,65		**Average Value:** 159,29		**Average Value:** 119,05	
March,21 Clear Day					
Illuminance (Lux)	**09.00**	**Illuminance (Lux)**	**12.00**	**Illuminance (Lux)**	**17.00**
1 11		5		6	
2 22		3		7	
3 18		10		11	
4 153		56		25	
5 18		18		9	
Average Value: 164,16		**Average Value:** 141,25		**Average Value:** 105,86	
June,21 Clear Day					
Illuminance (Lux)	**09.00**	**Illuminance (Lux)**	**12.00**	**Illuminance (Lux)**	**17.00**
1 9		13		20	
2 23		7		15	
3 13		16		15	
4 226		70		30	
5 49		30		53	
Average Value: 242		**Average Value:** 212,82		**Average Value:** 175,28	

Table 6. Annual Indoor daylighting performance of the Sultan Selim Mosque

September,21 Clear Day						
Illuminance (Lux)		**09.00**	**Illumin. (Lux)**	**12.00**	**Illumin. (Lux)**	**17.00**
1	78		64		44	
2	138		110		46	
3	184		245		45	
4	227		302		90	
5	62		870		35	
Average Value:	649,42		**Average Value:**	985,06	**Average Value:**	200,61
December,21 Cloudy Intermediate Day						
Illuminance (Lux)		**09.00**	**Illumin. (Lux)**	**12.00**	**Illumin. (Lux)**	**15.00**
1	40		44		35	
2	68		80		37	
3	115		616		170	
4	169		438		165	
5	47		90		48	
Average Value:	550,70		**Average Value:**	1362,32	**Average Value:**	570,49
March,21 Clear Day						
Illuminance (Lux)		**09.00**	**Illumin. (Lux)**	**12.00**	**Illumin. (Lux)**	**17.00**
1	50		60		30	
2	118		89		43	
3	230		300		59	
4	290		400		80	
5	88		93		61	
Average Value:	942,88		**Average Value:**	1447,34	**Average Value:**	211,76
June,21 Clear Day						
Illuminance (Lux)		**09.00**	**Illumin. (Lux)**	**12.00**	**Illumin. (Lux)**	**17.00**
1	60		70		66	
2	152		96		105	
3	164		215		65	
4	1211		282		1190	
5	90		91		68	
Average Value:	1204,80		**Average Value:**	1053,24	**Average Value:**	262,29

DOI: 10.15320/ICONARP.2020.145

Table 7. Annual Indoor daylighting performance of the Aziziye Mosque

September,23 Clear Day						
Illuminance (Lux)		**09.00**	**Illuminance (Lux)**	**12.00**	**Illuminance (Lux)**	**17.00**
1	617		1220		699	
2	1308		667		416	
3	2344		1744		421	
4	1587		1477		1078	
5	601		530		725	
Average Value: 2658,59			**Average Value:** 2967,14		**Average Value:** 1146,88	
December,21 Cloudy Intermediate Day						
Illuminance (Lux)		**09.00**	**Illuminance (Lux)**	**12.00**	**Illuminance (Lux)**	**15.00**
1	582		1407		814	
2	723		762		450	
3	1239		2210		1200	
4	1197		2200		859	
5	370		730		376	
Average Value: 1466,27			**Average Value:** 2920,30		**Average Value:** 1414,46	
March,21 Clear Day						
Illuminance (Lux)		**09.00**	**Illuminance (Lux)**	**12.00**	**Illuminance (Lux)**	**15.00**
1	637		1327		1800	
2	1244		633		604	
3	1655		1725		2060	
4	1534		1923		1121	
5	610		533		632	
Average Value: 2397,78			**Average Value:** 3087,16		**Average Value:** 2435.5	
June,21 Clear Day						
Illuminance (Lux)		**09.00**	**Illuminance (Lux)**	**12.00**	**Illuminance (Lux)**	**17.00**
1	697		1134		918	
2	2365		843		454	
3	1514		1817		1569	
4	1861		1785		742	
5	579		468		585	
Average Value: 2638,98			**Average Value:** 2687,03		**Average Value:** 2003,51	

The results are also evaluated on five different spots for each equinox date by DB simulation. Results and evaluations are described below. For all three mosques, illuminance levels for each point and for each month are stated in graphical expression.

DISCUSSION

Tahir and Zuhre Mosque has the best illuminance level at Point 4 with 60 lux in December 21. In September 23 the mosque has the best illuminance level at the same point with 80 lux. Point 4 has the best results 78 lux in March 21 and 160 lux in June 21. Point 5 also has good illuminance level according to other points. In December 21 Sultan Selim Mosque has the best illuminance level at Point 3 with 300 lux. Point 4 also has good illuminance level according to other points. the best illuminance level is at Point 5 with 322 lux and Point 4 also has good illuminance level in September 23. In March 21 Point 4 with 256 lux is the best result. Point 3 also has good illuminance level according to other points. In June 21 Sultan Selim Mosque has the best illuminance level at Point 4 with 900 lux. Point 3 also has good illuminance level. Aziziye Mosque has the best illuminance level at Point 3 with 1550 lux in December 2. Also have the best result with 1800 lux in March 21, with 1600 lux in June 21 and with 1530 lux in September 23 for the same point, Point 3. Point 4 in December 21 and June 21 And Point 1 in March 21 also has good illuminance level according to other points. At Point 3 and at Point 4 Sultan Selim and Aziziye Mosques have the same best illuminance levels in common on southern side. This is related to the mosques's locations where the two mosques stand to the south side. Orientation of the building to the south is as well based on Islamic religious belief.

In September 23 at Point 4 Sultan Selim and Aziziye Mosques have the same good illuminance levels in common. Also in June 21 Zuhre, Sultan Selim and Aziziye Mosques have the same good illuminance levels in common at the same point.

In March 23 at Point 3 Sultan Selim and Aziziye Mosques have the same good illuminance level in common. Relevant values and datas can be checked from the Tables 8,9,10 and 11.

Despite the fact that the area and height of the studied space in numeric values and the number of openings of Sultan Selim mosque are much more than Aziziye Mosque with reference to Table 4, the rate of Aziziye Mosque's Annual and Equinox Illuminance levels for all stated points are higher. The relevant research results also show that upper windows opening built around the dome provide daylit factor which transmits daylight in southern and central location at prayer hall in Aziziye and Sultan Selim mosques. The lack of the upper windows design in Tahir and Zuhre Mosque makes the central of prayer hall with low illuminance level. This shows the important impact of upper window openings to dome design.

DOI: 10.15320/ICONARP.2020.145

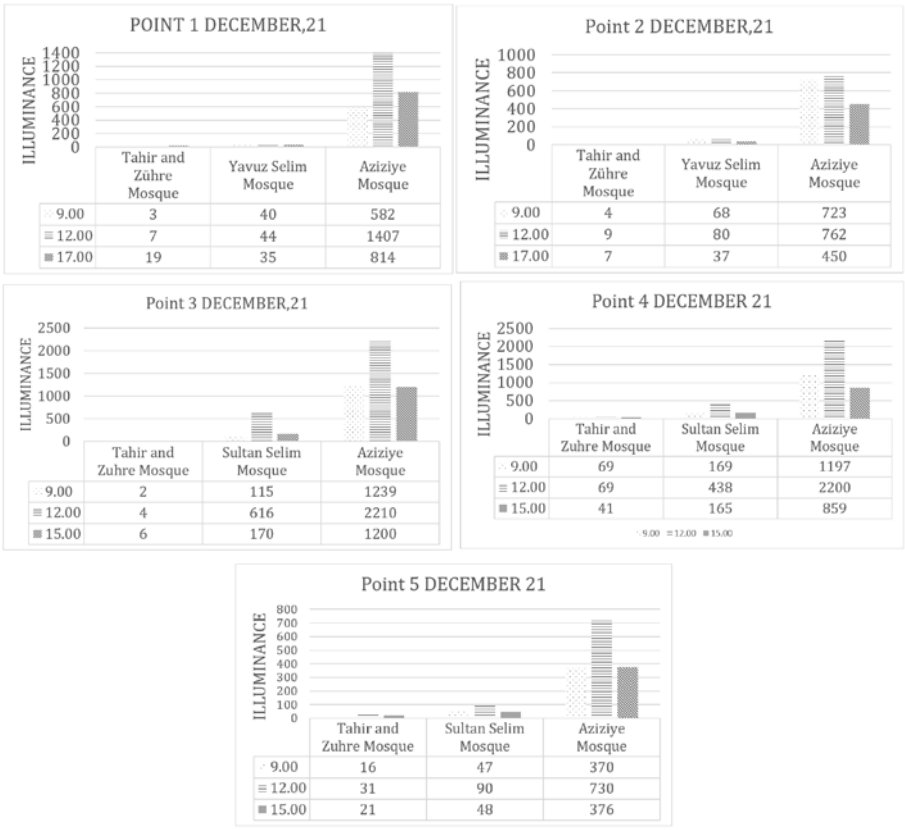


Figure 13. Illuminance levels for Points 1.2.3.4.5 (December,21)

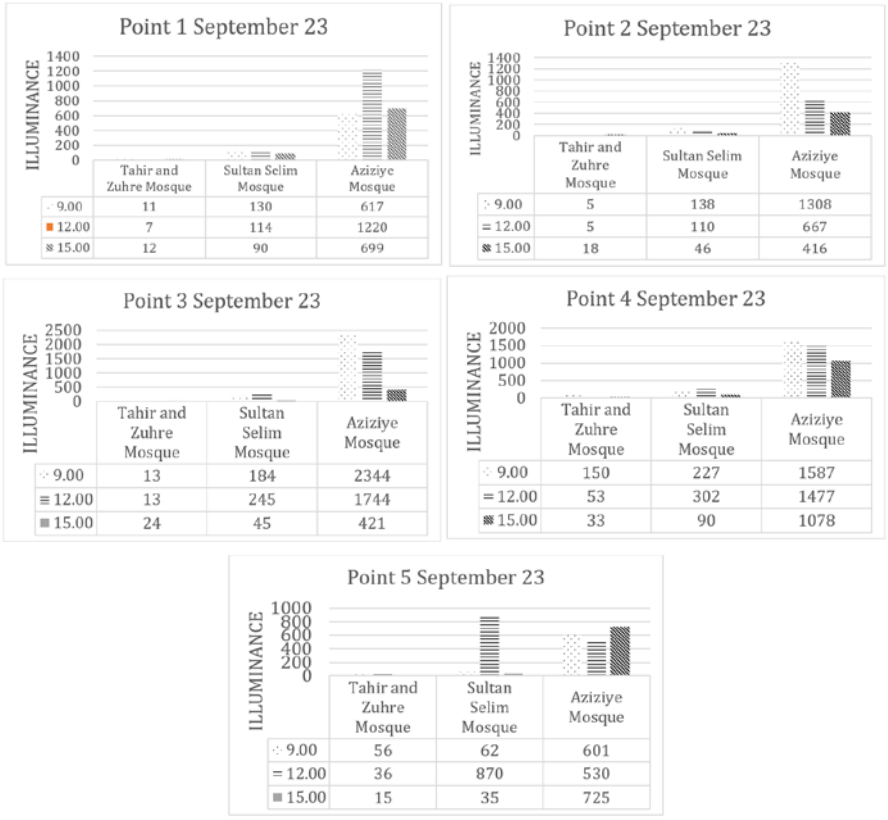
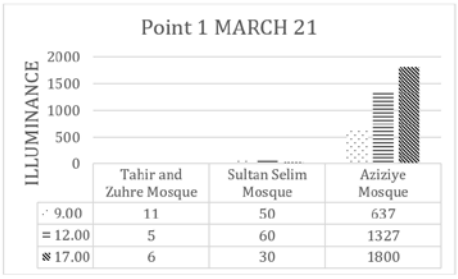
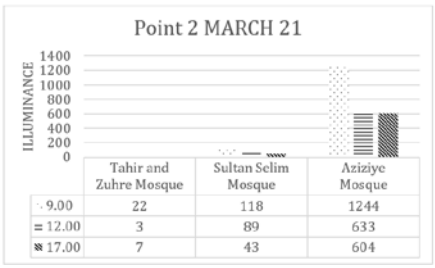
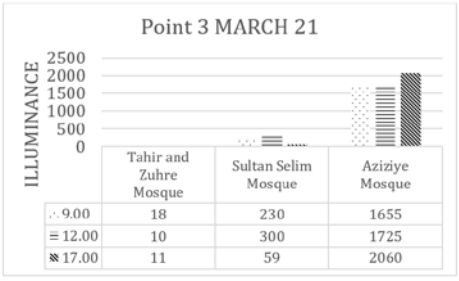
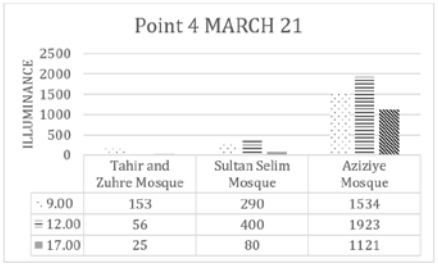


Figure 14. Illuminance levels for Points 1.2.3.4.5 (September,23)









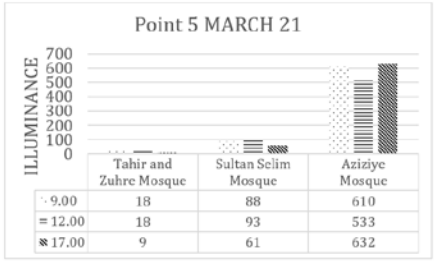
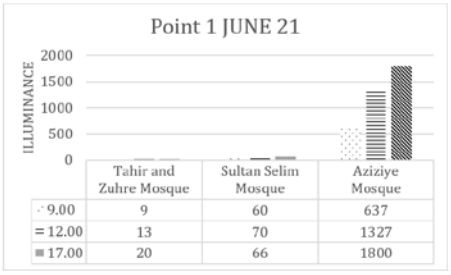
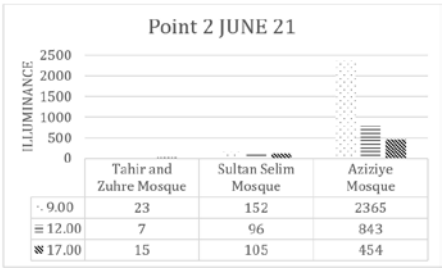
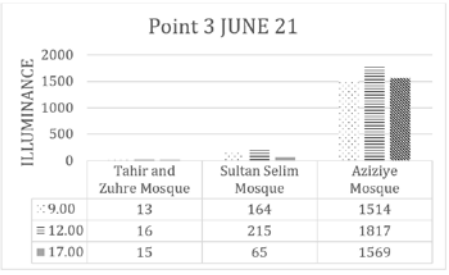
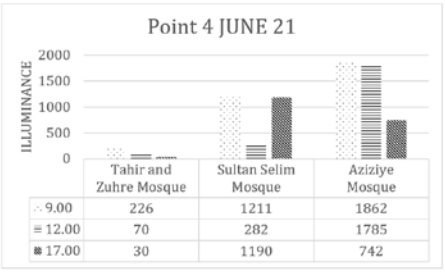


Figure 15. Illuminance levels for Points 1.2.3.4.5. (March,21)









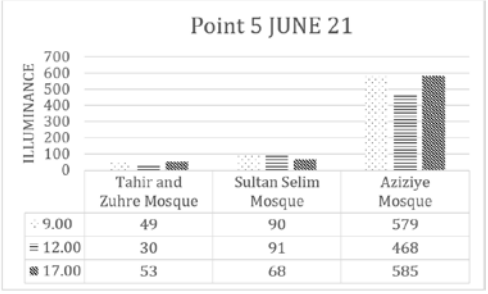


Figure 16. Illuminance levels for Points 1.2.3.4.5. (June,21)

DOI: 10.15320/ICONARP.2020.145

CONCLUSION

Daylight is used in architectural design to carry out activities in accordance with an internal space. Particularly in Islamic Architecture, daylight, where mosques were mostly related to the creation of an environment, has been used for the worshippers to fulfil their religious needs and regular visual comfort objectives. One of the most important properties of Sinan's designs was structural lightness. During and after Sinan Period Ottoman Mosque architecture continued to grab light intentionally, which yield a bright and spacious interior.

According to overall results, Sultan Selim mosque's studied space is much bigger than Aziziye mosque but its' window to wall ratio is only 6% where Aziziye Mosque's is 26.5%. When we compare the two mosques' annual daylighting values Aziziye Mosque has more illuminance level and daylight in prayer halls than Sultan Selim Mosque. The research outcomes show that upper windows opening built around the dome provide daylit factor which transmits daylight in southern and central location at prayer hall in Aziziye and Sultan Selim mosques. The lack of the window design in Tahir and Zuhre Mosque makes the central of prayer hall with low illuminance level. This shows the brightness impact of the upper window openings to specialized dome design. Best illuminance level is analysed for the southern orientation for all three mosques which is directly related to Islamic religious belief and the importance of daylight in Islamic Architecture.

This study proves the fact as the building construction techniques and design criterias of the mosques from past to present improve (within the scope of Islamic mosque architecture), the illuminance level and maximized interior reflected light also increase and become much more effective. Due to WWR values, upper window features, special dome design criterias and long span distance which provide the additional daylight in, the architectural features and brightness of the mosque are much more high-lighted. Based on long span distance with the development of the bearing system provide the good illuminance levels through the windows from the walls in Aziziye Mosque even without the upper window openings. Specially Aziziye Mosque's vast interior space plan layout, without obstruction by walls and columns, helps creating a perfect lighting performance space for worshipping.

The major design criterias and construction techniques stated in this study will give inspiration to builders to design mosques which have perfect lighting performance with sacred sense of worshipping activities with a presence of divinity inside the prayer hall. It is believed that new theoretical and technical comparisons will continue to merge for the day light use in places of worship on behalf of cultural property and sustainable environment.

ACKNOWLEDGEMENTS/NOTES

The authors have no acknowledgements or other involvements in this study.

CONFLICT OF INTEREST

No conflict of interest was declared by the authors

FINANCIAL DISCLOSURE

The authors declared that this study has received no financial support.

ETHICS COMMITTEE APPROVAL

Ethics committee approval was not required for this article.

LEGAL PUBLIC/PRIVATE PERMISSIONS

In this research, the necessary permissions were obtained from the relevant participants (individuals, institutions, and organizations) during the survey and in-situ measurements.

REFERENCES

Aljofi, E. K. (2018). The Potentiality of Domes on Provision of Daylight in Mosques. *International Journal of Applied Engineering Research ISSN*, *13*(7), 5103–5112.

Antonakaki, T. (2007). Theodora Antonakaki. *6th International Space Syntax Symposium*, 057-1/057-14.

Arel, H. Ş., & Öner, M. (2017). Use Of Daylıght In Mosques: Meanıng And Practıce In Three Dıfferent Cases. *International Journal of Heritage Architecture*, *1*(3), 421–429. https://doi.org/10.2495/HA-V1-N3-421-429

Bjørn, C. *Traditional Kasbahs image*. (2011). Retrieved 13 November 2020, from https://bjornfree.com/galleries

Burney, W*., Hagiasophia Mosque*. (n.d.). Retrieved 20 November 2020, from https://traveldigg.com/the-stunning-hagia-sophia-museum-istanbul-turkey

Chepchumba, N. F. (2013). History of Daylighting: A comparative analysis across the periods. *Luminous Environment*, *14*.

Deutsche Welle *Pantheon image*. (2017). Retrieved 18 January 2020, from https://www.dw.com/enitaly-romes-pantheon-to-start-charging-entry-fee-for-touristsa-41747353

El-darwish, I. I., & Gendy, R. A. E.-. (2016). The role of fenestration in promoting daylight performance. The mosques of Alexandria since the 19th century. *Alexandria Engineering Journal*, *55*(4), 3185–3193. https://doi.org/10.1016/j.aej.2016.08.006

Eyice, S. (1991). Aziziye Camii. Içinde *TDV İslâm Ansiklopedisi*. İslâm Araştırmaları Merkezi. https://islamansiklopedisi.org.tr/aziziye-camii--konya

Greatest Paka Photography*, Alhambra Palace image*. (2012). Retrieved 20 November 2020, from https://www.flickr.com/photos/greatestpaka/7095400807/

Hareri, R., & Alama, A. (2020). Lıghtıng Desıgn In Two Mosque Typologıes In The Cıty Of Jeddah, Saudı Arabıa. *Islamic Heritage Architecture and Art III*, 125–137. https://doi.org/10.2495/IHA200111

DOI: 10.15320/ICONARP.2020.145

Hassan, A. S., & Arab, Y. (2012). Lighting Analysis of Single Pendentive Dome Mosque Design in Sarajevo and Istanbul during Summer Solstice. *The Arab World Geographer*, *15/2*, 163–179.

Horsey, R., *Ummayad Mosque image* (2019). Retrieved 22 November 2020, from www.adventure.com/tourism-syria-iraq

Kammoun, S., & Saci, A. Ben. (2016). Morpho-Lıght In The Fırst Great Mosques Of Tunısıa, The Research Of Identıty Through The Lıght's Form. *The First İnternational Conference On Mosque Architecture*, 173–190.

Küçükdağ, Y. (2009). Sultan Selim Camii ve Külliyesi. İçinde *TDV İslam Ansiklopedisi*. TDV İslâm Araştırmaları Merkezi. https://islamansiklopedisi.org.tr /sultan-selim-camii-ve-kulliyesi--konya

Lec, A., & Mohammed, S. (2015). Mosques Sinan ' s Mosques as case study The environmental implementation of natural lighting in congregational mosques Sinan ' s Mosques as case study. *1st international engineering conference on development in civil and computer engineering applications*, *December 2014*.

Lechner, N. (2001). *Heating, cooling, lighting design methods for architects*. Wiley.

Mango, C. (1986). *Byzantine Architecture*. Faber and Faber.

Mazloomi, M. (2010). Horizontal Distribution of Daylight Factor with Reference to Window Wall Ratio in Pendentive Dome Buildings in Tropics, Case of Kuala Lumpur. *World Applied Sciences Journal*, *10*(10), 1247–1254.

Phillips, D. (2004). *Daylighting, Natural Light in Architecture* (1. baskı). Architectural Press.

Philip J.H., *Eskimo, Inuit Houses image(n.d.), Lines in the Ice: Exploring the Roof of the World*. McGill-Queen's University Press. https://www.canadiangeographic.ca/article/map-curator-examines-history-arctic-exploration

Runsheng, T., Meir, I. A., & Etzion, Y. (2003). An analysis of absorbed radiation by domed and vaulted roofs as compared with flat roofs. *Energy and Buildings*, *35*, 539–548.

Shahani, M. (2018). Sheikh Lotfollah Mosque: A Story of Daylight in Sequential Spaces. *Space and Culture*, *1*, 1–18. https://doi.org/10.1177/1206331218782406

Stein, B., & Reynolds, J. (2000). *Mechanical and Electrical Equipment for Buildings* (9. baskı). Wiley.

Tørrissen, B. C. (2011). *Traditional Kasbahs*. Retrieved 22 March 2020, https://bjornfree.com/travel/galleries/

Yavaş, A. (2008). Konya Sahip Ata (Tahir ile Zühre) Mescidi Alptekin. *Atatürk Üniversitesi Güzel Sanatlar Enstitüsü Dergisi*, *20*, 161–178.

Resume

Ayşıl Coşkuner Pamuk receives her B.Arch. from Mimar Sinan University major of Architecture Department and M.Arch. from Mimar Sinan University the Institute of Science and Technology, Building Physics and Materials Department in 2018. She currently works as a researcher on building materials and building physics in İstanbul Sabahattin Zaim University, Department of Architecture. She is a PhD candidate in IZU, Department of Architecture.

İbrahim Agah Taştemir receives his bachelor's degree at Istanbul Sabahattin Zaim University, Department of Architecture in 2017.He completed his masters at Mimar Sinan Fine Arts Universit, Building Physics and Materials Department in 2020. His research interests are building physics, energy efficient building design, thermal comfort, daylight in buildings. Currently he is working as Research Assistant at Istanbul Sabahattin Zaim University, Department of Interior Architecture, he is PhD candidate at Department of Architecture.

Born in 1976, in Istanbul. Umit Arpacıoğlu receives his bachelor's degree at Mimar Sinan Fine Arts University at 2001, on the same year he began his career as a research asisstant in the Department of Architecture at MSFAU. He completed his masters and PhD thesis at the Institute of Science and Technology, Building Physics and Material Department. Since 2017, he continues his career as an associate professor doctor at MSFAU.

DOI: 10.15320/ICONARP.2020.145

Research Article

ICONARP
International Journal of Architecture and Planning
Received: 13.10.2020 Accepted: 11.12.2020
Volume 8, Special Issue/ Published: 28.12.2020
DOI: 10.15320/ICONARP.2020.146 E- ISSN:2147-380

ICONARP

‘Floating Public Space’ for Birds: Design Research and Prototype Fabrication in Haliç

Kutay Karabağ [1], Zeynep Şahbaz [2]

[1] Lecturer, Faculty of Architecture, Bilgi University, Istanbul, Turkey. (Principal contact for editorial correspondence), Email: kutaykarabag@gmail.com

[2] Graduate Student, Faculty of Architecture, Bilgi University, Istanbul, Turkey. Email: zeysahbaz@gmail.com

Abstract

Purpose

This text intends to discuss the outcome of the graduate design studio titled ‘hydrophilic structures’. Studio research is organized on two primary axis; revealing the potentials of floating spaces as an extension of public spaces on one hand, and digital design and fabrication technologies for prototyping on the other. Concepts such as floating structures, water interaction and public space may initially refer to human utilization however, non-human living organisms are critical for their decisive role on the qualities of the water and the urban environment.

Design/Methodology/Approach

Design of floating structures and water interaction had been a niche inside the traditional culture and practice of architectural design, whereas design and production skills in connection with water had historically developed mostly in the field of engineering and transportation. Floating structures and their potential for unconventional spatial experiences have recently engaged in the focus of contemporary design culture, mainly due to the increasing density and lack of public spaces on the land.

Findings

The proposal, designed through computational tools and fabricated through robotic technology, concentrates on various ways of interaction with water and acknowledge research on the spatial requirements for the birds, as the users of space.

Research Limitations/Implications

Fabrication of the floating prototype is assumed as a primary target for its observation potential enabling an original discussion of the design parameters for bird species. Limitations of the existing fabrication tools and sustainability of the practically available materials were assumed to be out of the scope of this study.

Social/Practical Implications

Design-research presented here covers principal case-studies of floating spaces, the buoyancy principles, material tests and essential variables of ecological dynamics in Haliç as a general framework.

Originality/Value

The subsequent prototype serves for a specific bird population utilizing Haliç as a part of their life cycle, rather than human utilization.

Keywords: *Floating structures, hydrophilic design, robotic fabrication, floating space, Haliç*

INTRODUCTION

All the early settlements established around Bosphorus and Haliç (Golden Horn) depend on the benefits of the water connection in terms of trade, defence and fertility (Yılmaz, 2008, p.120). Utilization of the shores of Haliç had varied beginning from the Byzantian settlement around Sarayburnu and progressed through the inner areas. In the Byzantine period, whole Haliç turned out to be a big trade harbour and commercial and residential areas formed on its shores. Historically, it is possible to observe spatial and cultural typologies, both public and private, of human utilization and interaction with water, particularly on these shores.

On the other hand, public utilization of the shores of Haliç had been impaired by particularly the industrialization of the area in the 20th century and furthermore neo-liberal urban and economic policies after 1980. While public spaces on the waterfront diminish, the urban employment of water is reduced to transportation purposes in a limited scale, which neither contributes for spatial diversification of the waterfront nor enriches the historical experience of interaction with water.

This study intends to present the outcome of the graduate design studio, titled 'hydrophilic structures', as an experimental design research on floating structures and their contribution to public utilization of the shores. Studio research aims to discuss the problems and potential of public utilization of Haliç and design a sustainable floating open space proposal which will contribute to SantralİstanbuI campus in a positive, sustainable and sensitive way. This text initially presents the research and discussion on the context, focusing on the historical and contemporary public utilization of Haliç in order to contribute to the design criteria. This is followed by research on the case-studies of floating structures. One of the proposals is presented in detail at the fourth part with references to the design criteria, process and fabrication. The text is finalized with a conclusion for critiques as well as a brief discussion on possible future research.

BACKGROUND OF CONTEXTUAL WORK

Spatial History of Haliç

Haliç, similar to the Bosphorus, is assumed to be a valley filled with water following the last ice age, and lies almost perpendicular to the Bosphorus in the northwest direction up to the point where Alibeyköy and Kağıthane Rivers meet (Yılmaz, 2008, p. 5). Thanks to its geographic formation, it provides a safe waterway of approximately 7 km in length, connected to clean waters on both sides. Besides, waters and surrounding land delivers rich fishing and agricultural potential. The early Byzantion settlement had been located around Sarayburnu area, right on the southern corner where Haliç meets with Bosphorus. As the urban form of the city expanded, Haliç had always been one of expansion axis for fishing,

DOI: 10.15320/ICONARP.2020.146

trade and waterway activities were the primary income for the city (Yılmaz, 2008, p. 10).

Particularly after 324 A.D., when the city is conquered by Romans and converted to be Constantinopolis, the city comes forward as a trade centre. The inner harbours, located on both sides of the entrance of Haliç operate the significant part of this trade, resulting in further developments on the land behind. As the waterway was enchained in the 8th century, the safety is increased, and during the 13th century the whole waterway was utilized as a large harbour composed of docks, each specialized for various goods.

The importance of Haliç and its trade potential increased further following the Ottoman conquest in mids of 15th century, leading to more docks on the southern shore and the imperial shipyard on the northern. Additional residential areas were developed on the inner parts of the waterway, such as Fener, Balat, Eyüp and Kasımpaşa, inhabited by Greek, Armenian and Jewish populations as well as Muslims. Triggered by increasing residential and commercial density, early forms of fabrication ateliers emerged around Haliç shores and Alibeyköy and Kağıthane Rivers, particularly in the 16th century.

Figure 1. Kağıthane (Photograph by Abdullah Fréres)

In the 18th century, depending on the new lifestyle of 'Tulip Period' and westernization dynamics in Ottoman Empire, interest into leisure activities increased drastically, resulting in the new construction of summer palaces, mansions, gardens and kiosk on the shores of Haliç and Kağıthane River (Yılmaz, 2008, p. 111). Such leisure activities were usually engaged with boat trips on the calm waters. In the 18th and 19th century, Haliç shores demonstrate an elegant and high-quality silhouette in terms of architecture and landscape. It is possible to assume a rich and colourful life on the waterway, generated by various sailing vehicles for transport and leisure purposes, as well as fishing activities.

Beginning with the second half of the 19th century, İstanbul became the centre of imperial industry, hosting new facilities, funded by foreign capital particularly after the Free Trade Agreement in 1838 (Köksal & Ahunbay, 2006, p. 126). For the industrialization of the Ottoman Empire, Haliç had been one of the preferred areas for a variety of advantages such as water connection, cultivable land, protection and proximity to central

urban areas. At the beginning of the 20th century, Haliç accommodates shipbuilding facilities on the northern shore, brick building on the inner parts, food and textile production facilities on the southern shore, tobacco and soap industry on the slopes (Köksal & Ahunbay, 2006, p. 131). In order to fulfil the increasing energy demand generated by the industrialization, the strategic location at the inner end of Haliç where Alibeyköy and Kağıthane Rivers meet, was selected for the first coal-based urban-scale power plant of the Empire. The location offers confident coal transportation on the south and continuous delivery of essential clean water through two creeks on the north (Aksoy & Açıkbaş & Akman, 2009). Moreover, Silahtarağa benefits for proximity with the industrial facilities around Haliç as well as primary urban areas of Pera and Historical Peninsula. Activation of Silahtarağa Power Plant in 1914 marks a significant point on the course of industrialization and westernization of the Ottoman society, bringing late but widespread distribution of the most recent form of energy to the Capital and triggering transformations on the social and economic life of people as well as urban form (Aksoy & Açıkbaş & Akman, 2009).

Some areas around Haliç were zoned for industrial functions in the early planning studies by Henri Prost in the Republican period, and modern industrial facilities, as well as small ateliers, were populated around the shores beginning in the 1940s. However, effects of continuous industrialization lead to results such as general pollution, migration and severe decrease of the water depth in Haliç. Revitalization and cleaning projects were practised beginning form end of the 1970s and more actively in the 1980s. It is possible to observe an urban, spatial and social transformation in the districts of Haliç beginning with the 1990s and particularly in 2000s. Public and private cultural and educational institutions usually refurbishing the industrial heritage are essential components of such transformation. As an example, Bilgi University was assigned for both conserving and transforming Silahtarağa Power Plant campus into a hub of education, culture and art spreading the creative energy of the 21st century throughout the city, and opened in 2007 as a public space including museum and exhibition spaces, university functions, offices, food and beverage services.

Case-studies on Floating Space

As indicated above, although Haliç shores had always been strategic and significant throughout the historical development of İstanbul, the diversity and quality of life reached its utmost level in the 18th and 19th centuries. As a safe trade harbour full of docks and market buildings, as a waterway utilized for transportation and as a leisure area spatialized by landscape areas and mansions, the urban image around Haliç shores usually involved of water-related structures such as a large variety of vessels and coastal arrangements.

A unique example of water structures in the urban image of İstanbul is sea bath, a wooden structure generating open and closed spaces above

DOI: 10.15320/ICONARP.2020.146

the water surface. Sea baths were designed to fulfil the cleaning and swimming requirements of the citizens proper with religious and ethical criteria. Depending on the record of Evliya Çelebi, it is deduced that sea baths were a component of social life before the 17th century. However, effects of westernization probably increased the popularity of sea baths particularly in non-muslim neighbourhoods, and it is known that there are two sea baths on the waters of Haliç in 1847 (Çelik, 1998).

Traditionally sea baths were built on a platform standing on wooden pillars fixed on the seabed. The platform is usually rectangular in shape, encircling a body of water in the middle like a pool and connected to the coast employing a wooden dock (Koçu, 1966). In some cases, the structure is more articulated with extensions such as diving towers. Closed spaces on the wooden platform served as changing rooms, toilet and coffee-house and mostly covered with a canvas as the ceiling (Evren, 2000). Sea baths were mostly temporary structures where the whole structure or parts of it were dismantled before winter and rebuilt before summer.

Besides sea baths as a traditional example, contemporary water structures and floating spaces are examined throughout the research process, and five substantial cases are presented briefly below.

Figure 2. Courtesy of the Recyled Islands (Photograph by the Business Insider)

Recycled Park is a floating landscape built from material recycled from the waste in water in Rotterdam. The proposal is composed of debris traps on the water to collect raw material and floating hexagonal plastic units as recycled forms of the debris. For this prototype, units function mostly as green areas and the project can be read as a 140 m2 floating extension, not only contributing the environment positively as a park, but also directly enriching the fauna for particular living organisms. Moreover, it is possible to vary the functions and increase human utilization, thanks to its modular and flexible design (Berke, 2018).

Figure 3. Floating Island (Photograph by the Rivista Italiana di Ornitologia - Research in Ornithology, 88)

Floating Island for Tern Habitat is a simple artificial floating island aiming to create more space for terns in addition to other conservation actions for announced natural conservation areas in Poland. Representing many similar examples, the project consists of a lightweight modular concrete floating base, covered with biodegradable material suitable for plantation purposes. The floating island is designed similarly with the most common sea bath typology in İstanbul, namely encircling a rectangular pool in the centre. Through this design terns, gulls, and some other bird species are expected to find more space for breeding and feeding in addition to the decreasing natural sand and gravel pits in the area (Coccon & Borella & Simeoni & Malavasi, 2018).

Figure 4. Hope on the Water (dezeen magazine 3 January 2019- Photography by Kayhan Kaygusuz)

Designed and prototyped for the 4th Istanbul Biennial by SO? Architecture and Ideas in collaboration with MEF University and Boğaziçi University, project title 'Hope on the Water', proposes a temporary floating shelter for possible urban disasters such as an earthquake. Based on solid reasoning such as the modularity and mobility advantages of floating spaces for post-disaster scenarios, the project proposes a light and foldable unit, fully equipped to serve victims as temporary accommodation. The design is composed of a light concrete pontoon as a floating platform and a foldable light steel construction forming the accommodation space. The prototype was built to float on the waters of Haliç for its tsunami-safe geography (Ravenscroft, 2019).

Figure 5. Mokoko Floating School (In Current Opinion in Environmental Sustainability - April 2015 Photograph by Riise, Jan; Adeyemi, Kunlé)

Makoko Floating School is a well-known floating structure, designed to serve for the low-income settlements in Makoko, Laos, by NLE Architects. The design is inspired by the vernacular typology of water housing

DOI: 10.15320/ICONARP.2020.146

structures while converting it to a floating structure. The floating base of the structure is composed of plastic barrels, some of which are also utilized for storing rainwater. Over this platform, lies a sizeable triangular structure, mostly built up with wooden material. Floating potential enables the educational space to announce a broader range of communities. This way, it may contribute to the resilience of some of the most vulnerable areas (Riise & Adeyemi, 2015).

METHODOLOGY

This study aims to design floating structures in order to contribute to the public spaces around Haliç. For this reason, history, qualities and problems about public spaces around the coastline were analysed. In parallel with the form and material studies based on floating spaces and fabrication potential, the above research outcome triggered various discussions and proposals. Modularity, scalability and temporality had been the leading concepts throughout these discussions. On the other hand, any spatial production without a regenerative contribution to the ecosystem in Haliç would increase the effects signified above. For this reason, designers had decided to develop spatial design ideas that can positively contribute to the conservation or regeneration of the natural life of living organisms in Haliç. In order to simplify the scale and fabrication of the solution, designers proposed a modular ecological island for a specific bird population. The design promises contribution for the current ecological balance, by being a part of the cycles of the ecosystem. This proposal is an attempt to draw attention to the ecosystem on a central location in the urban context of the city, as well as it aims rejuvenation of the existing public recreation areas through the restoration of ecological cycles. Moreover, it will contribute indirectly to the qualities of the human-based public spaces as well as some other species by means of it's contributions for the bird population.

FINDINGS OF THE STUDY

Design and prototyping of a floating space on the waters of Haliç requires en extensive and multi-disciplinary research and integrated fabrication technologies. Based on the analysis and historical research on the ecology, coastal character, and public utilization of Haliç, the graduate studio had concentrated on simple floating structures which can sustainably contribute to the ecological properties and public qualities of Haliç, while generating the minimum damage. Hence the following parameters are defined as the primary criteria of design.

Analysis of Public Spaces around Haliç

The existing public spaces on the shores of Haliç are analyzed in terms of their scale, function, continuity and capacity, identifying the following findings

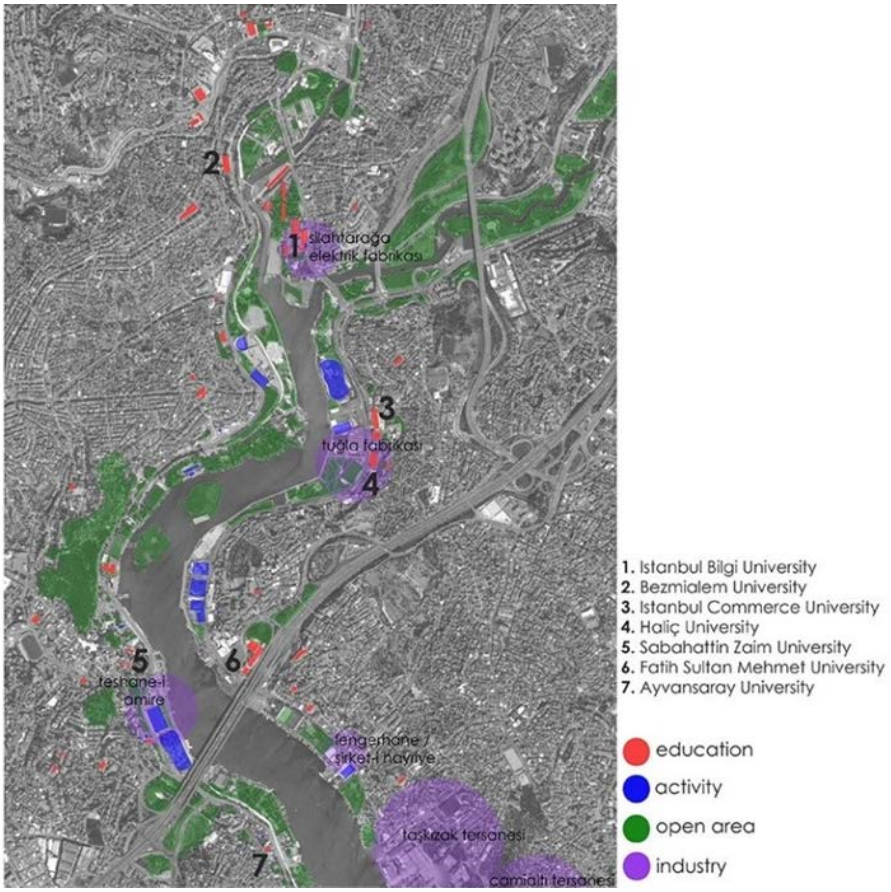


Figure 6. The ones shown in red are 7 listed university campus buildings. The activity areas shown in blue are generally the areas where sports, art and cultural activities are held. Those shown in green are where the greenery is publicly available. Finally, the regions shown in purple colors show the places used as the industrial center in the past. (Research and map composition by Zeynep Şahbaz, Behzad Jam, Shirin Housseinzadah, Mihrimah Yılmaz and Kübra Halıcı).

1.Poor utilization of coastal public spaces: There is a variety of public functions around the waterway and the coast is usually reserved for public use, but a few exceptions. However, since holistic planning is lacking, some of these areas are poorly utilized for reasons such as improper functional organizations, unsatisfactory access and inadequate transportation facilities. Moreover, some of these areas are invaded by private functions such as restaurants and retail spaces. Unfortunately, the number of these cases are rapidly increasing.

2.Disconnection of the coast from the urban fabric: A continuous and fast road runs parallel on both sides of Haliç, generating a disconnection with the commercial and residential fabric on the other side, opposing with the traditional use. The public space on the coast is defined by this road as a disconnected and non-continuous narrow band, enormously decreasing the possibility of interaction with water.

3.Disconnection of the two sides of Haliç: Although both shores possess similarities in their urban character and functions potentially supporting each other, they are not connected physically for triggering mutual interaction. Existing bridges mostly operate for vehicle traffic and lack for establishing connections between public spaces and functions of the two sides. Galata Bridge laying on the entrance of the waterway is an exception, however not satisfactory. Passenger transportation on the ferry in Haliç started from the second half of the 19th century (Akyıldız,

DOI: 10.15320/ICONARP.2020.146

2007) and still proposes the quickest and most efficient way of connection between both sides of Haliç.

4.Influence of mass urbanization on the ecosystem: As a natural formation, Haliç waterway is a complete ecosystem including living organisms other than humans. Lacking natural conservation measures, all the living organisms in this ecosystem are at risk in connection with the harmful effects of the urbanization, resulting in the degeneration of the landscape. Bahariye Islands are currently the only area suitable for natural life in the ecosystem.

Water Interaction and Floating

The design research on floating spaces has been one of the primary parameters shaping the final proposal of this study. Throughout the process, form proposals were developed to be tested for their floating capacity, initially on the computer simulations and followingly as small-scaled models in the fabrication lab. Utilizing these test workshop, a variety of materials such as wood, plastics and filament were also tested as the sub-parameters of the form. Finally, larger prototype models were produced and observed on the water for design problems in terms of interaction with Haliç water, wind and living organisms.

Figure 7. Floating Workshop Test (Photograph by the Authors).

Birds

As a result of observations and research, the presence of the bird population living along with the Haliç coast and Haliç (Bahariye) islands is of considerable importance. These two small islands mainly provide the only natural and suitable earth habitat for the living conditions of the birds, surrounded by dense urban fabric.

Most bird species have three main stages in their life cycle: breeding, wintering, and migration. The primary purpose of birds when wintering is to feed and survive. During this period, birds can disperse relatively freely, depending on the availability of food and weather conditions. On the other hand, birds are most selective in terms of location preferences in the breeding period as opposed to migration and wintering. Birds select nesting areas according to criteria such as feeding potential and security for themselves and their offsprings, in order to detect, anticipate and avoid future threats, they need to recognize the breeding grounds extensively. Therefore, the presence of a species or a group of species that

form an ecological association in a specific area during the reproductive period can be used as a clear ecological indicator (Türkiye Üreyen Kuş Atlası, 2019). In light of all this information, the biological preferences of the birds that are utilized as design input.

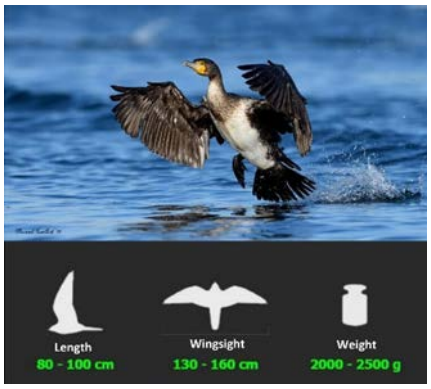


Figure 8. Great Cormorant (Photography by the trakus.org).

Bird species densely hunting, breeding and resting around Haliç are crested cormorants (tepeli karabatak), cormorants (karabatak), mallard ducks (yeşilbaş ördek), silver gulls (gümüş martı), tern (sumru) and grey heron (gri balıkçıl) (URL – 1 TRAKUS). It is observed that grey heron, mallard duck, and silver seagulls can live together, particularly around Bahariye Islands. Cormorant is a bird that is seen all year long and that reproduces in small numbers (Boyla, 2008). According to the results of IUCN, the crested cormorant bird is the least breeding and endangered bird among these bird species. Based on these facts, one of the objectives of the project is; to create an adequate breeding-resting area for the species and to contribute to the continuity of the species (KOSKS Report, 2018).

Aquatic Plants That Purify Water

During the historical development process, the estuary water became increasingly polluted by the positioning of industrial buildings on the coastal edges. In time, this situation had triggered a cleaning project, so that basically water was pumped from the Marmara Sea to Haliç while local water was ventilated by a water jet. While these measures purified the water quite a bit, Kağıthane and Alibeyköy streams were poured and cleared off the odour while increasing the salinity of the water. The estuary water is still dirty to some extent and has a bad smell leastwise. In order to contribute to the ecology of the inhabitat, design criteria for the floating space are targeted to operate in closed cycles, not producing any waste. For this reason, while the droppings of the birds are food for the plants, the plants that contribute to the cleaning of the water of the Haliç will increase the feeding potential of the birds.

Fox Tail Plant which lives mostly in freshwater, is a plant with high tolerance (URL – 2 Sutopya). Although it is an aquarium plant, it is mostly used in aquariums where water balance and pH levels are atypical. It may clean the water by reducing the bacteria and nitrate levels. Employment

DOI: 10.15320/ICONARP.2020.146

of this plant will enable cormorants to feel safe by providing a natural habitat and contribute to the estuary life by increasing the living quality of the living creatures.

If it is planted, the roots of the plant may die, and it will have a positive effect in terms of maintenance and development. According to the tests carried out in the Kağıthane region in the Istanbul Water Quality Report, the pH of this region is 6.93. This study was aimed to investigate the potentials of the Foxtail plant in the salty waters of Haliç in the context of cormorants and ecological island (URL – 3 İSKİ Report, 2019).

Materials and Production Technology

Since the graduate studio was targeting the production of the prototype in a limited time scale, design and fabrication activities should be integrated, providing a continuous test, feedback and optimization cycle. Particular features of this design, such as interaction with water and natural life requires the selection of proper materials and production technology that is significantly determinant for the accomplishment of the design targets. Although the design process had started with formal research on floating abilities, independent from the available fabrication technology and even materials, these constraints were included in the design criteria in the following design phases. The participants were required to develop their design to maturity in parallel with experiments on the material choices and fabrication opportunities available in Istanbul Bilgi University fab-lab, such as laser cutting, CNC, hot wire cutting, vacuum modelling and the robotic arm.

The modular character of the design requires a modular fabrication technology in direct connection with the digital design medium where the form is designed and tested for the floating properties and structural requirements. Secondly, the proposed form requires a certain level of plasticity for both aesthetic as well as functional reasons deduced through research on the lifecycle of cormorants. Namely, interaction with birds entails a variety of design parameters which imposes proper and appealing tectonic quality and surface properties for the birds. Moreover, the outcome prototype is required to perform some flexibility for the dynamic structural forces exerted by water and wind. At the same time, the design necessitates excellent durability against the humidity and minerals of Haliç water together with pecking of the cormorants. Finally, aquatic plants ask for suitable materials on the plantation surfaces of the design.

DESIGN RESEARCH

It is difficult to separate the process into phases since it had been a multi-disciplinary and multi-scale process with continuous feedback, however it will be abstracted here to a more systematic mode in order to clarify the variety of the work and their contribution each. The initial workshops on buoyancy principles provided the participants to experience and test the behavior of various forms and materials. Throughout the individual

proposals, similar forms were combined and unsuccessful ones were eliminated by the studio instructors.

Figure 9. Relationship Structure and Water (Photograph by the Designers).

Figure 10. Form Development (Photograph by the Designers).

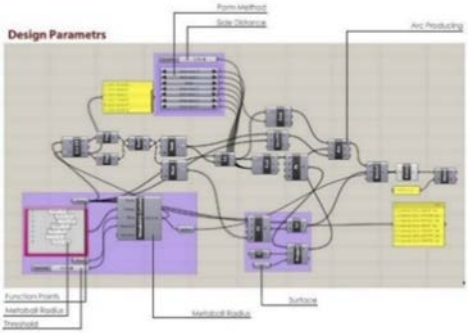


Figure 11. Function & Development (Design by the Designers).

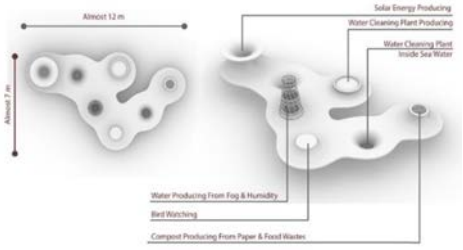


Figure 12. Design Parameters (Design by the Designers).

For the following stage, participant groups were asked to model their floating designs for testing, optimizing and elaborating in the digital medium. In this stage, two separate digital tools were utilized for buoyancy and wind performance of the models. For testing the floating performance of the forms, an algorithm on the Grasshopper platform, developed by Oğulcan Üneşi was employed. Although the proposal discussed in this paper is comparatively a flat surface structure which is naturally floatable with the correct material, the duality of the pool and tower parts demonstrated imbalanced configurations on the tests.

DOI: 10.15320/ICONARP.2020.146

Additionally, wind performance of the designs was tested through Archidynamics software, proving no problems.

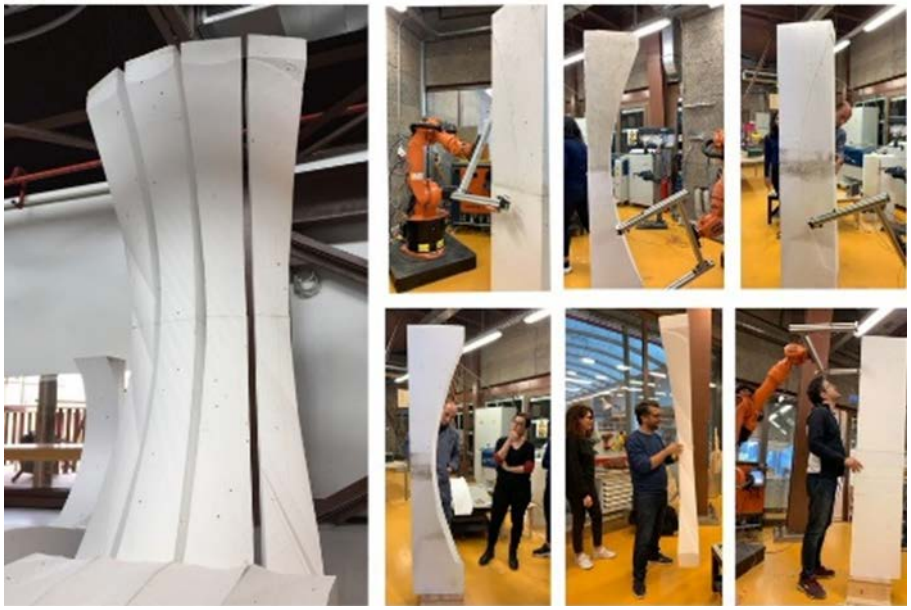


Figure 13. Scaled Test I (Photograph by the Designers).

Figure 14. Scaled Test II (Photograph by the Designers).

Following this stage, participants were asked to develop their designs in terms of spatial properties, functions and connection with the coast, utilizing the experience they accumulated through the initial workshops. In parallel, they were required to develop the fabrication techniques together with the material choices, which included modularity as a constraining parameter in the design process. The early version of the proposal, examined here, was a 7x12 m. free-form shape serving for more complex functions such as photovoltaic cells and compost production as well as human utilization.

As the fabrication constraints were included in the problem, the designers of the proposal offered a parametric design system for a

circular base and two modes of extensions, into the water surface and the opposite direction. Through dividing the circular structure into triangular slice units, the whole system turned out to be a modular floating structure which can be parametrically designed for various functions and dimensions to be fabricated employing the same design logic. A group of these modules were optimized digitally for KUKA robotic arm utilizing wire cutter head and fabricated in scale from foam material as a floating prototype.

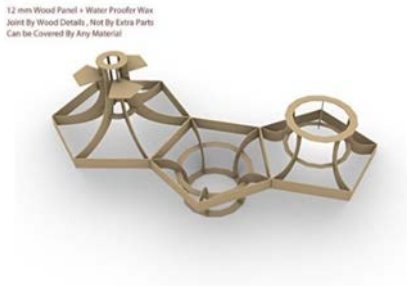


Figure 15. Designed Structure (Design by the Designers).

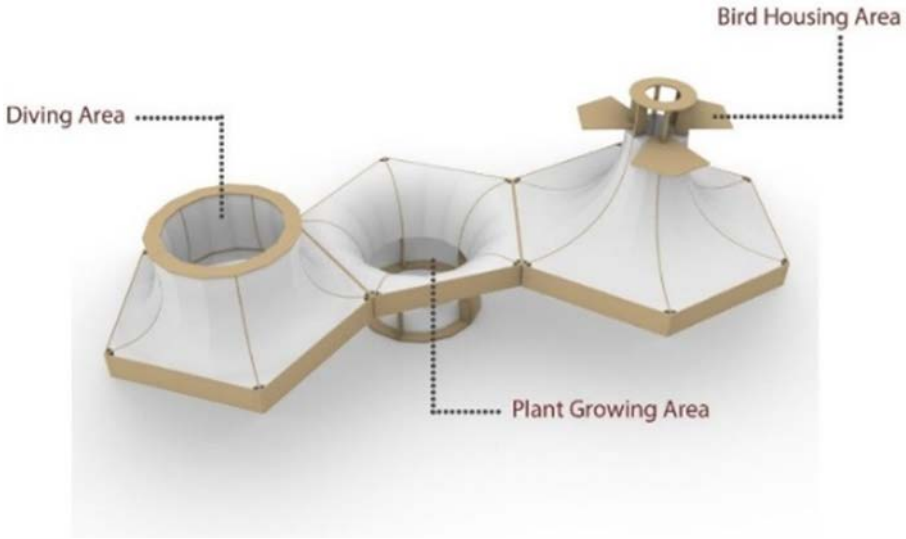


Figure 16. Structure (Design by the Designers).

Figure 17. Form Dimensions (Design by the Designers).

DOI: 10.15320/ICONARP.2020.146

Based on the real-life tests on the water and jury critiques, the design proposal was optimized further and simplified for incorporating with the fabrication technology and budget. The most significant simplification had been avoiding the human use and limiting the users of the proposal with birds. Hence the dimensions and structural performance requirements of the prototype were decreased drastically. Secondly, the circle based curvilinear form of units were converted into pentagon and hexagon bases for simplifying fabrication difficulty and time.

The final proposal is composed of 3 parts; diving area and bird platforms established by concave forms of the preliminary design and the plant growing area as the convex version in the middle. The reservoir (plant growing area) of the hydrophilic structure was designed to grow edible plants by species in Haliç and to perch / breed cormorant birds at risk.

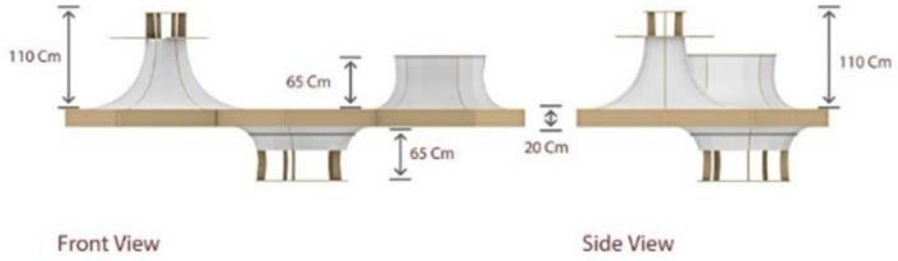


Figure 18. Section Views (Design by the Designers).

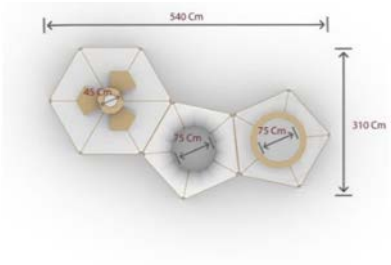


Figure 19. Section (Design by the Designers).

The structure of the system is composed of 2 mm thick wood panels, cut in slice profile shapes on CNC. These slice profiles are connected with a horizontal circular hoop on its end and a vertical pentagon/hexagon base, forming a sound backbone structure. Wooden platforms integrated into the crested structures attract cormorant birds and provide space for nesting.

Figure 20. Paste, Isonem MS Polymer, Isonem Super Component
Coating materials have been tested on foams. Photos taken in material testing (Photograph by the Authors).

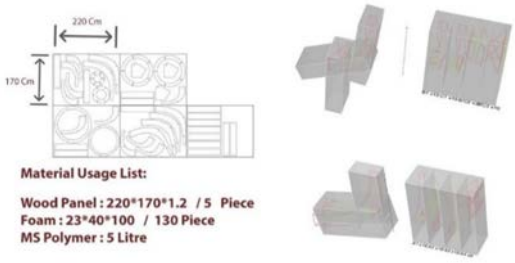


Figure 21. Material Usage Reducing (Design by the Designers).

The body of each unit is composed of slices and filled with Styrofoam material, for its lightweight and buoyant properties as well as workability with wire-cutter and robot arm. In order to increase durability and waterproof quality of the modules, Isonem MS Polymer coating is proposed for the foam surfaces, particularly for its performance in a variety of real-life tests, performance with Styrofoam and its glossy surface. On the other hand, this coating is not considered to be suitable for ecological conditions hence not in conformity with the general design approach of the project. However, this criterion is ignored for the prototype design only, for economic and time-based considerations.
For the real prototype, 130 grains of styrofoam 23-40-100 cm in size, 220-170-1.2 cm in size wooden plate, 5 litres of Isonem MS Polymer, paste and silicone were used. In robotic cutting, the faulty parts were covered with mastic and cold silicone.

CONCLUSIONS AND RECOMMENDATIONS

Haliç first harbour, once recreation area and later the industrial quarter of İstanbul, had also established its ecosystem, which has been reduced mostly to Bahariye Islands and limited natural areas on the banks, as a result of dense urbanization with the 21st century, in parallel with the decrease of public utilization of the shores. An alternative way of generating public spaces again lies on contributing to the ecological life cycles of living organisms in Haliç habitat, hence increase the ecological quality and diversity of the natural areas. Through this way, both sides can be connected ecologically and quality of the public experience will be developed indispensable of the location of the public space.
Additionally, the utilization of computational design tools and contemporary fabrication technology usually recalls for human use. However, it must be possible to utilize the same tools to contribute directly to non-human living organisms and indirectly to the public life of human beings. The project discussed in the text prefers, rather than supporting ecology in extreme conditions or marketing the concept of ecology, to support and develop the natural life and create awareness for the problems of diminishing habitat in Haliç.

DOI: 10.15320/ICONARP.2020.146

Figure 22. 1/5 Scale & 1/1 Scale (Photograph by the Authors).

This project proposes an experimental floating structure, designed to research the parameters and fabrication process. Therefore, the determination of production style and design language along with technological constraints are exemplary in order to reach a mature level in both design and use of information tools in the following years.

This study concentrates on the life cycles of cormorant species which is in danger of extinction. The research needs to be elaborated for plant and underwater life and holds the potential for adaptation for a variety of parameters based on other species as well as cormorant.

The design is modular and reproducible for a variety of parameters. Furthermore, thanks to its modular structure, it is possible to adopt the floating islands for other functions and even human use as well, so that it may further contribute for the public spaces in the context of raising awareness and attracting attention.

ACKNOWLEDGEMENTS/NOTES

Initially, we need to acknowledge the studio instructors Fulya Özsel Akipek and Abdurrahman Tuğrul Yazar, who contributed to each and every phase of the process as much as the authors of this text, if not more. In parallel, Shirin Housseinzadah, Behzad Jam, Mihrimah Yılmaz and Kübra Halıcı has to be primarily referred as studio participants and designers of the ecological island project.

Authors also wish to thank studio participants Deniz Karabekiroğlu, Kübra Koyuncu and Oğulcan Üneşi who contributed to the research phase. Furthermore, workshop instructor Tania Feldzer, lecturer Stefano Pugliese and simulation software developer İlker Karadağ are acknowledged for their significant contributions. We would also thank to Bilgi University fab-lab technician Rahman for fabrication process.

Finally, we would like to Prof. Dr. Zuhal Ulusoy, Dean of the Faculty of Architecture and Prof. Dr. Şebnem Yalınay Çinici Head of Department of Architecture for their academic and moral support.

FINANCIAL DISCLOSURE

The authors declared that this study has received no financial support. However, Istanbul Bilgi University contributed financially to the production of the structure during the design process.

ETHICS COMMITTEE APPROVAL

Ethics committee approval was not required for this article.

LEGAL PUBLIC/PRIVATE PERMISSIONS

In this research, the necessary permissions were obtained from the relevant participants (individuals, institutions, and organizations) during the in-depth interviews.

REFERENCES

Adey, W. H. & Loveland, K. (2007). *Dynamic Aquaria: Building and restoring living ecosystems*. Londra, UK: Academic.

Aksoy, A. & Açıkbaş, F. & Akman, A. (2007). *Silahtarağa Elektrik Santrali'nin Hikayesi 1910-2004.* İstanbul Bilgi Üniversitesi.

Akyıldız, A. (2007). *Haliç'te Seyrüsefer Haliç Vapurları Şirketi*. Türkiye İş Bankası Kültür Yayınları.

Berke, J. (2018). A New 'Floating Park' Made Out of Recycled Plastic Waste Has Popped Up In The Netherlands. *Business Insider*.

Boyla, K. A., Arslan, M., editors (2008). *İstanbul'un Kuşları: 2000-2007*, İstanbul, Turkey. İstanbul Kuş Gözlem Topluluğu. (in Turkish).

Boyla, K. A. (2019). *Türkiye Üreyen Kuş Atlası-WWF Rapor.* İstanbul, editor: Per, E.& Yavuz, K. E., Türkiye Doğal Hayatı Koruma Vakfı.

Coccon, F., Borella, S., Simeoni, N., & Malavasi, S. (2018). Floating rafts as breeding habitats for the Common tern, Sterna hirundo, Colonization patterns, abundance and reproductive success in Venice Lagoon. *Rivista Italiana Di Ornitologia*, 88(1), 23-32.

Çelik, Z. (1998). *19. Yüzyılda Osmanlı Başkenti; Değişen İstanbul.* Türkiye Ekonomik ve Toplumsal Tarih Vakfı-Numune Matbaacılık.

De Jong, T. M., & Drake, B. G. (1981). Seasonal patterns of plant and soil water potential on an irregularly-flooded tidal marsh. *Aquatic Botany*, Volume 11, 1-9.

Evren, B. (2000). *İstanbul'un Deniz Hamamları ve Plajları.* Seçkin İstanbul Kitaplığı. İnkılap Yayınevi, İstanbul.

Güngör, N. (1996). *Seyyahların Kaleminden Şehr-i Şirin İstanbul.* İstanbul: Milliyet Yayınları.

Koçu, R. E. (1966). Darphane, *İstanbul Ansiklopedisi.* 8. Cilt, Koçu Yayınları. İstanbul.

Köksal, T. G. & Ahunbay, Z. (2010). İstanbul'daki Endüstri Mirası İçin Koruma ve Yeniden Kullanım Önerileri. *İtüdergisi*/a, 5(2).

DOI: 10.15320/ICONARP.2020.146

Masters, D. G., & Norman, H. C. (2016). Genetic and Environmental Management of Halophytes for Improved Livestock Production. *In Halophytes for Food Security in Dry Lands,* Academic Press, 243-257.

Ravenscroft, T. (2019). SO? Builds prototype floating house for post-earthquake Istanbul. *Dezeen.* access address: *https://www.dezeen.com/2019/01/03/so-prototype-floating-house-earthquake-istanbul/*

Riise, J., Adeyemi, K. (2015). Case study: Makoko floating school. *Current Opinion in Environmental Sustainability*,Volume 13, 58-60, April.

Tutel, E. (2000). *Haliç: dünden bugüne yedi tepenin koynunda uyuyan büyülü cennet.* Dünya Yayıncılık.

Yılmaz, G. I. (2008). *Haliç Kıyı Şeridinde Sanayileşme ile Ortaya Çıkan Kentsel Dönüşüm,* Rölöve Restorasyon Doktora Tezi, Yıldız Teknik Üniversitesi Fen Bilimleri Enstitüsü, İstanbul.

URL – 1 TRAKUS Türkiye'nin Anonim Kuşları. Gray Heron Habitats. https://www.trakus.org/kods_bird/uye/?fsx=2fsdl17@d&tur=Gri%20bal%FDk%E7%FDl

URL – 2 Sutopya. Fox Tail Plant/ Ceratophyllum Demersum. https://sutopya.com/tag/tilki-kuyrugu/

URL – 3 İSKİ Report. (2019, September 13). Water Quality Report 2019. Istanbul Water and Sewerage Administration. https://www.iski.gov.tr/web/assets/SayfalarDocs/sukalite/WATERQUALITY_MAY2019.pdf.pdf

Resume

Kutay Karabağ currently works at the Dept. of Architecture, Istanbul Bilgi University. Kutay does research in Architectural Conservation and Restoration, Adaptive Reuse, Industrial Heritage, History and Theory of Computational Design. His most recent publication is 'Bir Endüstri Mirası Olarak Antalya Dokuma Fabrikası'.

Zeynep Şahbaz graduated from Istanbul Bilgi University, Dept. of Architecture in 2018. During this period, participated in various contributions at the intersection of architecture and sociology. Currently she is a graduate student in Dept. of Architecture History, Theory and Criticism. She is interested in public design and issues of city-power.

Research Article

ICONARP
International Journal of Architecture and Planning
Received: 13.10.2020 Accepted: 08.12.2020
Volume 8, Special Issue/ Published: 28.12.2020
DOI: 10.15320/ICONARP.2020.147 E- ISSN:2147-380

ICONARP

"Inherited Gentrification": Changing Profiles of Gentrifiers via Inheritance, The Case of Bozcaada

Duygu Okumuş[1]

[1] Lecturer, Faculty of Architecture and Design, Bursa Technical University, Bursa, Turkey. Email: duygu.okumus@btu.edu.tr

Abstract

Purpose

Rural areas have been through structural changes. The reorganisation of the rural economy from agriculture to services, in addition to improvements in transportation and infrastructures, migration patterns have started to reverse in some regions and hence to change the social composition of those regions' rural areas. These changes and their implications have been largely debated in the rural gentrification literature, mainly by re-presenting cases from the Anglo-Saxon world. This paper contributes to the rural gentrification literature by presenting an empirical study on a socio-cultural and demographic change that, together with a local economic shift, is taking place in a location other than the Global North.

Design/Methodology/Approach

A qualitative case study examining the changes on the socio-spatial structure of a small Turkish island, Bozcaada, is presented through the following principal indicators of countryside gentrification: the change in the socio-economic composition of its citizens; the emphasis on cultural or national heritage and aesthetics; the emergence of new institutions leading to the closure of older ones; the diversification of products and services; and the change in properties' value.

Findings

The first-generation newcomers were in line with the typical gentrifier's profile of rural gentrification studies. Differently, the second-generation newcomers have shown diversity in terms of both motivation and socio-economic class. This study argues that the second-generation newcomers took part naturally in the gentrification process not because they inherited their parents' properties, but also they play an important role in the significant socio-economic and cultural changes that are still taking place on the island.

Research Limitations/Implications

The fact that the research is based on a single case study is a limitation for its generalisation. However, the case examined provides a basis for future work that may validate its findings in different contexts.

Originality/Value

This paper contributes to the rural gentrification literature by introducing a new type of gentrification process, the 'inherited gentrification' with the identification of the second-generation gentrifiers of the island, who are the direct descendants of the first gentrifiers.

Keywords: *Gentrification, tourism development, rural transformation, gentrifiers*

INTRODUCTION

Rural areas have been through structural changes which were reflected in the economy, social structure and demography, and the composition of the community and rural land. These structural changes in Turkey had commenced in 1980s. In early years of 1980s Turkey embraced neo-liberal economic policies. This initiated a series of significant transformations in its agricultural economy (Aydın, 2002) mostly felt by small-scale farmers (Köymen & Öztürkcan, 1999). These transformations of the rural economy were intensified in the early 2000s and resulted in the rapid de-ruralisation of the population in most regions of Turkey, as small-scale farmers became unable to sustain their livelihood through agricultural production (Keyder & Yenal, 2011). The local population in the countryside sought new income sources other than agriculture: many started to commute to city centres or industrial zones in their vicinity, while other left their villages and migrated to cities (Tekeli, 2008). The local communities of rural areas, especially those in coastal regions with distinctive historical, cultural, and natural qualities, such as the Aegean and the Mediterranean, took the opportunity to diversify into the tourism sector. In addition to the shift in local economy, substantial changes started to occur in the local social structure and in the landscape, as commonly observed in rural gentrification studies (Başaran Uysal & Sakarya, 2018; Hall, 2006; Phillips, 2009; Phillips & Smith, 2018). The rural areas mainly located along the coast and in close proximity to big cities have already been used for secondary housing and recreation purposes for a long time (Akgün et al., 2011). One of those areas is Bozcaada, a small island in the North of the Aegean Sea that has experienced a change from viniculture to tourism (Okumus, 2018).

This paper follows from a research investigating the socio-economic and cultural transitions in Bozcaada that stemmed from this change, and focuses on the change in the social fabric of the island by examining, through qualitative research, the changes in the demographics, in the socio-cultural environment and on the built environment taking place on the island. The data consist of semi-structured and in-depth interviews with island's residents and representatives of local and regional governmental bodies.

This paper contributes to the rural gentrification literature by introducing the concept of 'inherited gentrification', discussed from a generational perspective. The concept of inherited gentrification represents the transfer of the gentrification phenomenon to a new generation via inheritance. Nonetheless, it does not refer to a simple transfer of ownership of gentrified assets and a reproduction of the process of gentrification by the next generation. It refers to an ongoing and constantly changing process of transformation that, alongside the socio-economic and cultural changes, occurs on the island and in the wider society.

DOI: 10.15320/ICONARP.2020.147

DIFFERENT APPROACHES TO GENTRIFICATION

There are two main schools of thought that explain the causes of gentrification: the productivist/supply-side and the post-productivist/consumption-side approaches. The productivist/supply-side approach is centred upon the economic structures of gentrification and claims that the notion of gentrification should be investigated through the productive investment of capital, which relates to the "rent-gap" theory of Smith (1979).

Although the production-side approach to gentrification theories has been widely explored in the urban context, it has been relatively little used in rural studies. Phillips (1993) drew an analogy between post-productivism and rural gentrification theories. The notion of the post-productivist countryside in rural studies relates to the devalorisation of land and buildings with respect to agricultural production and its uneven revalorisation with respect to more consumption-oriented capital networks. Therefore, rural gentrification can be seen as "*one form of the revalorisation of resources and spaces which have become seen as unproductive or marginal to agrarian capital*"(Phillips, 2005, p.479). Conversions of barns and other rural buildings into residential, retail or leisure facilities are the most visible example of post-productivist approach to rural gentrification and of the process of devaluation and revaluation.

Darling (2005) suggested that the cycle of devaluation and revaluation is also applicable to national parks, which have a bespoke set of legislative restrictions; she named this unique case of gentrification "*wilderness gentrification*". She suggested that the wilderness character of the area led to a devaluation of the region due to the special land-ownership patterns and conservative regulations of the state. This "*peculiar condition*" of the Adirondack State Park has conditioned an "*underutilisation of ground rent*" and underpinned the preservation of the landscape, which became very desirable to tourists and subsequently stimulated capital investment in the area (Darling, 2005).

Productivist/supply-side and post-productivist approaches to gentrification are criticised for lacking a historical and cultural approach (Zukin, 1990). In contrast, consumption/demand-side approaches emphasise the movement of people rather than capitals. Consumption approaches also aim to identify the typology and motivation of gentrifiers and are usually based on empirical, place-based research. Consumption-side approach research therefore focuses on socio-cultural changes in the countryside, consumer preferences and middle-class concepts of rurality (Butler, 2007; Ley, 1987; Skeggs, 2004; D P Smith & Phillips, 2001).

Studies adopting consumption-side approaches have been predominantly covered under various titles such as counterurbanisation, rural in-migration, rural population change, rural mobility and so on, exploring social changes in the countryside rather than rural gentrification. However, Stockdale (2010) claims that those

studies failed to make explicit conceptual linkages, which the concept of rural gentrification did, and summarises rural gentrification as "*counterurbanisation which leads to displacement*".

Glass's (1964) conceptualisation of gentrification highlighting middle-class in-migration and working-class displacement has been applied to several rural studies, especially British ones. In the rural context, middle-class ex-urbanites migrate to rural areas and displace working-class locals and their rural way of life by outbidding them in the housing market, dominating local and social organisations as well as the market sector (Cloke et al., 1995; Guimond & Simard, 2010; Phillips, 1993, 2002, 2005; Scott et al., 2011; Shucksmith, 2012; Sutherland, 2012). However, debates over the definition of "middle-class" have a critical importance when defining gentrifiers in gentrification studies. Although income is the primary parameter in use to describe the socio-economic and socio-cultural structure of a particular population, it is very important to support it with other parameters such as employment, education level and occupation, as a person can be poor in economic capital but rich in cultural capital, which makes them a 'good' gentrifier (Stockdale, 2010).

In addition to problematic definitions of the contemporary middle classes and working classes, Hamnett (2009) also criticises class colonisation and displacement perspectives of rural gentrification for disregarding the general decline of the working class and increasing the volumes and sub-fractions of the middle class at a national level. He stated that: *"If we are to see gentrification as a class-based process, it is important to address the questions of where the expanded middle-class has gone, and what the connections are between gentrification, social class change and displacement"* (Hamnett, 2009, p.476).

Gentrification is widely accepted as a process which is diverse and varies in its outcomes. However, Davidson and Lees (2005) give some "*evidence*[s] *of change*" that are linked to each other: reinvestment of capital, social upgrading of the locale, landscape change, and displacement of low-income groups. Reinvestment of capital through purchase and refurbishment of existing housing stock leads to changes in the landscape, while social upgrading of the locale through migration of the middle class leads to displacement of low-income groups. Even though this conceptualisation breaks down the concept of gentrification into four main "changes", it does not necessarily imply an order amongst them.

Gentrification in The Countryside

This complex urban phenomenon of gentrification emerges in the countryside with similar principal indicators (Guimond & Simard, 2010): a change in the socio-economic composition of its citizens; an emphasis on cultural or national heritage and aesthetics; the emergence of new institutions leading to the closure of older ones; the diversification of products and services; and the change in properties' value.

DOI: 10.15320/ICONARP.2020.147

Guimond and Simard (2010) claim that, unlike its urban counterpart, rural gentrification does not necessarily lead to the displacement of locals and lower-income groups due to the possibility of new build development in rural places. However, Murdoch and Marsden (1994) state that once higher income groups move into rural settlements, they resist to any further development in the area, which subsequently leads to an increase in housing prices and the inevitable displacement of lower-income groups.

According to Phillips (1993), there are two principal problems with applying urban phenomena to the countryside. Both the transformation of the built environment and the characteristics and motivations of gentrifiers take place differently in each context. Although there is "*evidence of change*", as Guimond and Simard (2010) suggested, "*rural areas themselves may be sufficiently differentiated to render the idea of an overarching, homogeneous 'rural gentrification' suspect*" (Darling, 2005, p.1015). Thus, it is inevitable that there will be geographical differences produced by different agents (Phillips, 2005; Scott et al., 2011). It is a "*multi-faceted process*" (Stockdale, 2010) that evolves through different stages and subsequently generates different outcomes, according to geography, time and agents.

Since rural gentrification has been defined through a socio-cultural change in the countryside, especially by consumption-side theories, it has been discussed under a diverse range of topics related to the influx of population towards rural areas. Counterurbanisation as a "*migration movement*" (Mitchell, 2004) is the most popular concept that correlates with the rural gentrification concept. For example, Sutherland (2012) described rural gentrification as a counterurbanisation with displacement of the low-income groups by adding the social-class dimension into the migration debate. Therefore, counterurbanisation studies take a significant space in the rural gentrification literature.

As in rural gentrification, defining such a complex "*socio-spatial structure*" runs the risk of narrowing and limiting diversity (Halfacree, 2001; Mitchell, 2004). By avoiding the conceptualization of counterurbanisation, Gkartzios (2013) presents three "*interrelated elements of differentiation*" in counterurbanisation "*stories*":[1] *locality, motivation,* and *social group.* These elements can also be used in the context of rural gentrification.

[1] Gkartzios uses "*counterurbanization stories*" instead of typologies in order to emphasise the unique patterns of each case.

Land-use Planning, Housing Policies and Gentrification

Rural gentrification from a planning perspective has been mostly examined through issues of housing supply, housing affordability, and the subsequent displacement of locals. Planning regulations that restrict the supply of new housing and further development in the countryside can act as a "*gentrification agent*" (Gkartzios & Scott, 2012; Scott et al., 2011). For example, in the UK, the dual pressure of a restrictive housing supply and the effect of rural in-migration has resulted in an acute affordability issue for local communities, which eventually leads to the

issue of displacement (Best & Shucksmith, 2006; Gallent & Tewdwr-Jones, 2007; Shucksmith, 2012; Stockdale et al., 2000). Gkartzios and Scott (2012), however, showed that in countries where rural planning regulations (if they exist) or house-building processes in the countryside are more flexible, rural in-migration/counterurbanisation is less likely to generate the displacement of locals.

On the other side, Cloke (1983) claims that pressured rural areas with restrictive policies attract the gentrification process and prevent the building of dwellings for local needs. In her study in the Adirondack region, USA, Darling (2005) stated that the material production of nature, such as the national park and preservation areas, by the state management of local landscape, creates the conditions for gentrification to take place. Moreover, as it promotes more interest towards the area through alternative tourist activities, it underpins not only the displacement of locals but also the exclusion of newcomers who came to the area with employment-led motivations, due to the increased number of second homes and holiday homes where housing stock was already limited. For example, in the Webb area of Adirondack, the shortage of year-round rentals due to the high demand for weekly rentals has forced workers to double or triple up with other workers to avoid long commuting journeys every day (Darling, 2005).

Gentrification from within

Sutherland (2012) has described the gentrification process in non-commercial farming in the UK, arguing that "*while gentrification can occur 'without' through in-migration and displacement of existing farmers, it can also come from 'within' through reorientation of commercial farmers*"(p.574), and introduced the concept of "*gentrification from within*", referring to "*social upgrading*" through "*agricultural gentrification*" that occurs at farm (rather than neighbourhood) level, achieved through the influx of wealth generated from non-farming activity. Having agricultural land as a productive resource alongside housing and other farm building is the major feature of agricultural gentrification that makes it possible for farmers to "self-gentrify", increasing their social status without relocation. In her research on the Scottish countryside, Stockdale (2010) also identified the particular importance of diversified farmers, especially those with commercial activities that drew on rural resources. This self-employment through diversification in the countryside is related to the "production of rurality", particularly through tourism or retailing.

Gentrification Studies in Turkey

Turkey has started to experience gentrification processes later than the global north, roughly in the 80's and the gentrification literature in Turkish context started to be published in the 2000's. Majority of the gentrification studies in Turkey examine the phenomenon through urban cases in major metropolitan areas such as İstanbul and Ankara

DOI: 10.15320/ICONARP.2020.147

(Behar & İslam, 2006; Enlil, 2000; Ergun, 2004; Güzey, 2009; İslam, 2005; Şen, 2011; Uzun, 2003). Rural gentrification studies, however, has just started to be debated in Turkey. Currently available studies (Başaran Uysal & Sakarya, 2018; Dinçer & Dinçer, 2005; İslam, 2005; Kural, 2016) focus on the coastal part of Aegean countryside mainly dominated by tourism investments and second houses since 1980's. As in Western counterparts, disinvestment-reinvestment cycle, change in social structure and rural landscape, and the process of displacement are also represented by empirical rural gentrification studies in Turkish context (Başaran Uysal & Sakarya, 2018; Kural, 2016; Tezcan, 2010).

METHODOLOGY

This paper follows from a research which explored the socio-economic and cultural transitions on Bozcaada through a qualitative study. Bozcaada is one of the two island districts of the province of Çanakkale, the other being Gökçeada. Although these two islands present quite a similar cultural-historical background, during the last three decades they have shown rather different development processes. Bozcaada, being more accessible from the mainland, has attracted more visitors and, in the late 1990s and early 2000s, diversified into tourism, which led to a demographic change in the social fabric (Okumus, 2018). Differently, Gökçeda has not yet experienced a substantial change in the local economic and social structure. Bozcaada was therefore chosen for this study to examine the socio-economic and cultural transitions within the context of rural gentrification.

A set of primary and secondary data collection methods based on qualitative research was followed throughout the research. Primary data was collected by undertaking two-phase fieldwork, while secondary data, including demographic and economic statistics, archive review, and review of local news, was collected continuously over the research period between 2014 and 2017.

The fieldwork on the case study area was planned to be conducted in two phases of primary data collection, one during the peak tourism season (March-April 2016) and one during the off-season (May-June 2015) with the objective of capturing seasonal differences. During the fieldwork, a total of 39 in-depth and semi-structured interviews were conducted with local residents and representatives of local and regional governmental bodies. Four different groups of residents were identified for the interviews, based on their residential status on the island. For example, "ISD" stands for the islanders who had lived on the island for many generations, "LX" stands for the locals who moved to the island after the departure of the Rums[2] and "NC1" and "NC2" stand for the newcomers who moved to the island in the last two decades.

[2] The members of this group is referred as "localXs" throughout this research to distinguish them.

THE CASE OF BOZCAADA

Bozcaada is a small Turkish island located in the north of the Aegean Sea, four miles away from mainland Turkey and connected to it via a

regular ferry service. This small island presents excellent examples of socio-economic and cultural changes that are seen in contemporary rural areas. The island's local economy was based on viniculture for centuries until the last couple of decades. During the last decade, Bozcaada became one of the most prominent domestic tourist destinations for the residents of Turkey. Although viniculture is still one of the characteristics of the island, it is only carried out by a number of boutique local wineries on the island. The local economy of the island is now predominantly based on tourism. Almost every household on the island is directly or indirectly involved in tourism.

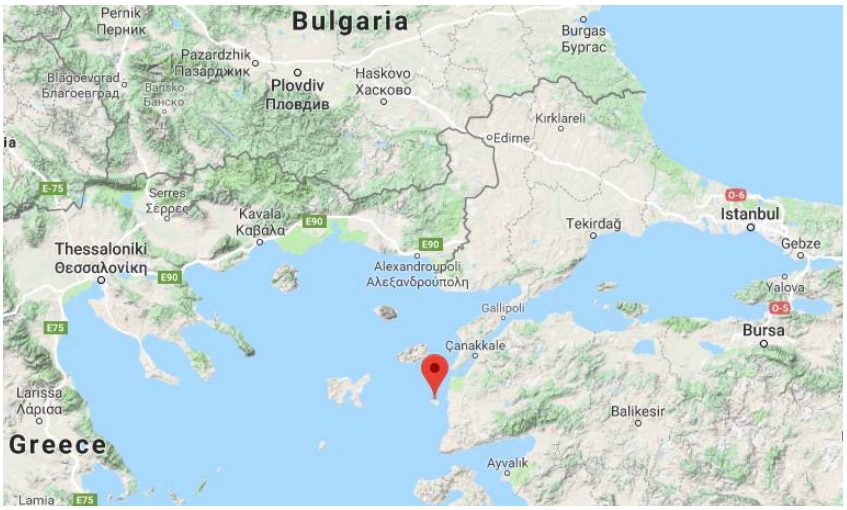


Figure 1. Location map of Bozcaada (Google Maps, n.d.) The island located in the north of the Aegean Sea, four miles away from the mainland

Demographics

As Figure 2 shows that the gradual decrease of Bozcaada's population due to the departure of the Rums ended in the 1980s, and turned into a steady increase with minor fluctuations between 2000 and 2010. The increase after the 1980s corresponds to the arrival of agricultural workers from the surrounding areas on the mainland, who used to work in grape harvesting and the winemaking industry, as a result of the gap in the local community and the local economy created by the departure of the Rums.

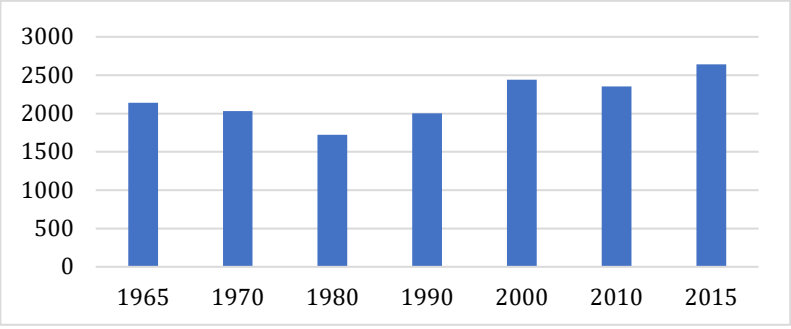


Figure 2: Population change on Bozcaada since 1965. A gradual decrease of Bozcaada's population due to the departure of the Rums ended in the 1980s.

The small fluctuation in the population of Bozcaada between 2000 and 2010 coincides with the period in which tourism was becoming the main economic activity on Bozcaada. As stated during the interviews

DOI: 10.15320/ICONARP.2020.147

with the local residents, there were families who were keen to move from the island but not able to afford to do so. Local tourism development and the increasing popularity of the island in these years helped those families to sell their property for higher prices than they expected and finance their out-migration. Since the properties that sold in this period were mainly used as holiday/second homes, we see a small decrease in the registered population on Bozcaada. After this early period of tourism on the island, the trend of population increase on Bozcaada continued.

In-migration

One of the most commonly used indications of gentrification and counterurbanisation movements is the migration pattern. However, to be able to make a more accurate critique of migration patterns on Bozcaada, detailed migration statistics showing the origins of the migrants in certain time periods are needed. Unfortunately, this data is only available at regional and provincial level. Nevertheless, Table 1 shows the proportional population change on Bozcaada between 1990 and 2014 according to the birthplace of the residents. This proves that the proportion of the local population who were born on the island has been decreasing since 1990. It is important to note that, in Table 1, "Canakkale" includes the population who were born either on Bozcaada or anywhere within the borders of Canakkale province, including the population who moved to the island from the surrounding rural areas after the departure of the Rums.

Table 1. Distribution of Bozcaada's population according to birthplace (adapted from TUIK, 2015)

Birthplace (%)	***1990***	***2000***	***2010***	***2014***
Canakkale	69	61	66	58
Istanbul	3	7	8	11
Balikesir	2	3	3	3
Bursa	1	1	1	2
Abroad	1	2	2	2
Total population	1903	2427	2324	2773

The notable point of Table 1 is that it shows possible counterurbanisation movements on Bozcaada. Table 1 only shows those provinces that are the birthplaces of at least 2% of the current population on the island.[3] The three cities of Bursa, Balikesir and Istanbul are the closest metropolitan cities to Bozcaada. The proportion of Bozcaada residents who were born in metropolitan areas has been increasing gradually every decade. Nevertheless, this figure may not clearly show the increase of in-migrants in the local population, as it also shows a steady increase of the population who were born in Canakkale province. The percentage of local residents who were born in Istanbul has increased from 3% to 11% since 1990. However, during the

[3] Taking into account Turkey's internal migration patterns, Bozcaada has a community with a population that was born in over 60 different provinces, as do many towns. For the sake of readability, only those provinces that are the birthplaces of more than 2% of the population in 2014 are shown in Table 1.

same period, the number of residents born in Canakkale dropped from 69% in 1990 to 58% in 2014. This represents a clear indication of a gradual increase of Istanbulians on Bozcaada; however, it should be recognised that this deduction is based on the data, which cannot give an absolute portrayal of the local community on Bozcaada. Therefore, the interviews and observations undertaken during the fieldwork were of great importance in identifying the social component of the current local community.

Newcomers

In rural gentrification literature, active agents of gentrification are usually middle-class or upper-class ex-urbanite newcomers who are usually in search of "*a retreat from the pressures of the modern world*"(Smith & Phillips, 2001, p.464). On Bozcaada, the profiles of the newcomers correspond to this mainstream profile of rural gentrifiers in terms of being ex-urbanites escaping from the distressing "big city life". However, not all the newcomers are from the relatively wealthier upper or middle classes. Some of the newcomers are young families who cannot afford a property with their savings yet, but they inherited or took over their parents' properties, which were once in use as summer houses. One of these second-generation newcomers turned their properties into B&B accommodation and started running it themselves while trying to continue their jobs in part-time positions:

> *"He [the husband] teaches at the university. It was very appropriate for us as he is pretty much free in summer and we have got a little child; we always wanted her to grow up in such a natural environment. We are free in summer and already have a property here from his parents, so why not put it into good use ... We were able to come here as we already have a property [from his parents]. Otherwise it would be impossible as we don't have such money to buy a property here." (NC2-A)*
>
> *"We settled permanently here last year. I studied advertising at university, my wife as well. We were working in different companies as advertising managers. However, we decided that we don't want to work in constant pressure in this economic system. And also, Istanbul has its own problems like traffic jams, population increases, earthquake risks etc. ... Therefore, we wanted to escape from Istanbul, but didn't think of Bozcaada at first. Then we thought that we already had a house which we used as a summer house for years, let's go to Bozcaada and try and see what we can do there. So we came here and have been living here for a year." (NC2-D)*

Since the newcomers tended to be regular visitors to the island before moving in, they are usually familiar with the local social environment.

DOI: 10.15320/ICONARP.2020.147

Therefore, integration into the local community may not be an issue. During the fieldwork, none of the interviewees explicitly reported any challenges to integration with the rest of the community. Although two interviewees below explained that their integration period with the community was smooth, they also emphasised that there is a "*superior–subordinate relation*" based on the length of time lived on the island, as in the military ranking system.

> *"There is no owner of the island, no indigenousness here if you look back [in history]. Being an islander is something everybody here can earn. But there is also this 'you came later, hold on' … like in the military." (NC2-C)*
>
> *"Usually the first wave (of newcomers) does not like the second wave, just like older generations do not like younger generations. It is in human nature." (NC1-A)*

Apart from the integration of newcomers, in-migration of more affluent groups is generally viewed as a threat to local communities, due to the fact that in many cases it results in the displacement of local community members. However, a change in the local social fabric, usually through in-migration of more affluent and well-educated groups, may also have positive outcomes. One of the main "benefits" is the catalysis effect of newcomers on the development of local tourism on Bozcaada (Okumus, 2018). Besides, based on the interviews undertaken on Bozcaada, the newcomers brought "*quality*" and "*awareness*" to the everyday practices of the local community. The interviewees below explained their opinions of how the newcomers helped with local tourism and the social development of the island.

> *"Sometimes they [the newcomers] love and watch out for the island more than us. Because they can see what we don't see. For example, I was born and bred here, never got off the island. But they come well-educated, they help us a lot." (ISL-A)*
>
> *"Before the Istanbulians came, the situation in the schools was not very good. Because parents were not getting involved. They were even hardly going to parent–teacher meetings. Then young families came here with children. They sent their children to the local school and got involved in the school board etc. so the quality has increased since then." (NC1-E)*
>
> *"Some people [from the newcomers] give free classes for children here. Some give photography, another gives English, another gives ceramic courses." (ISL-E)*

In addition to free classes for the local children, the newcomers initiated something else that happened to be a very important contribution to the local socio-cultural life: the local online newspaper "www.bozcaadahaber.net" and the local monthly journal *Mendirek*. The online newspaper was founded in 2014 with the assistance of two

newcomers who worked as journalists and provides daily news about the island. The same group started to publish a local journal with the motivation of creating an archive of the island. However, both of them are currently prepared by an editorial board that includes members from the three social groups of the local community: the newcomers, the localXs and the islanders. The online newspaper and the journal also work as important tools to make connections with the outside world as well as creating a platform for discussion and participation on the island.

Housing market

The most visible change in the island's built environment during the last two decades was inevitably the housing market, with ever-increasing prices for any kind of property. Increased demand for property on the island brought extreme benefit for the landowners of Bozcaada, but also seriously affected the younger generations of the local community and the civil servants who were appointed to the island.

Rising property prices

It is a basic principle that if the housing supply cannot meet the housing demand, property prices will increase. This is what has been happening on Bozcaada in the last two decades. Bozcaada has become more and more popular since the late 1990s as a tourist destination and a "getaway" for urbanites. This increasing popularity inevitably caused an increase in demand and in the price of properties on the island. According to online searches and field observations in 2015, the average property was on sale for approximately £1,860 (6,661 TL) per square metre on Bozcaada. This figure is almost double the average price of £946 per square metre in Istanbul, which is the most expensive city in the country and holds second place in the world for the highest increase in property prices in 2015 (Satterlee, 2015).

Inevitably, there are many reasons for rising property prices, such as the increase in demand as well as the shortage of supply in the local housing stock on Bozcaada. Being a tourist destination played the biggest role in the increase in housing demand. However, being subject to strict conservation regulations also limits the number of possible actions to meet the demand within the existing built environment, and consequently causes the price increases. A real estate agent interviewed on Bozcaada gave an example of this ever-increasing value in the local property market and how "*everybody wins*" since the 1990s in the local real estate market on Bozcaada.

> *"... there was a piece of land at that time [the early 1990s], since then it has changed hands seven times and the price increased at every sale; each seller made a profit out of it." (local real estate agent)*

These highly inflated property prices have both negative and positive outcomes for the local community. On the one hand, they provide

DOI: 10.15320/ICONARP.2020.147

enormous financial support for the residents who own a property to rent out, since rents also increase. On the other hand, members of the community who do not own a property struggle to find accommodation. Even if the price were not an issue, finding an available place may be a challenge due to second homes and short-term holiday rentals on the island.

Second homes and short-term rentals

During the high season of local tourism, which covers around three months of the summer, the population of the island goes up to 10,000 on average. Given that the total number of beds on the island is 3000 and the local population is around 2500, the remaining 4500 people, more than half of the summer population, are holidaymakers who do not stay in formal hotels or guesthouses but in short-term rentals or their own holiday houses. For example, on the AirBnB website, there were 74 properties being advertised for short rentals on Bozcaada as of November 2016. Although it should be noted that some of those advertisements are people who rent out their spare rooms, short-term rentals seem to be the most visible cause of the lack of affordable housing on the island. This issue was even raised by the mayor during the interview.

> *"There is a serious housing problem. Also, there is big demand. So even though you found a house, its rent is very high. Because people make very serious income through tourism in summer, they do not want to rent out their houses in winter. They make the same money in ten days that they can make if they rent out the house all year round." (Mayor)*

The mayor mentioned that the local community rent out their spare properties in summer. However, another point made by another interviewee focused on the second home owners who have bought a property on the island to use occasionally. Due to the fact that property prices on the island are very inflated, only the wealthy can afford to buy a house to use for a limited time and keep it locked up for the rest of the year. The interviewee suggested that these houses, which are unused for the majority of the year, contributed to the shortage of housing on Bozcaada.

> *"If somebody pays 500K TL for a house to use only a month in a year, it means that that person does not need money. So he [or she] does not give his [or her] house to another person to rent. He [or she] comes and stay a month here and keeps it locked up for 11 months." (ISL-D)*

Lack of affordable housing

As the housing demand on Bozcaada exceeds the supply, the prices and rents of the existing houses increase enormously. This situation has an

immense effect, particularly on the people who come to the island to work. The civil servants who are appointed to work on the island, such as doctors and teachers, have difficulty in finding affordable places to live all year round. As mentioned earlier in the mayor's quotation, the local homeowners prefer to rent out their houses in summer for a short period. Therefore, they either keep them vacant for the rest of the year, or rent them out from October to May only. Two interviewees who are teachers in the local school shared their experiences of finding accommodation when they first moved to the island:

> *"They said that, 'If you stay all the year round you [will] hamper our tourism income,' so they asked me to evacuate the house before May. Because they rent the house as a pension in summer." (OFF-B)*
>
> *"... if you wanted to stay for the whole year, they were asking for 1000 TL at that time [nine years previously]. My salary was around 1800 TL at that time, so I had to pay the rent with more than half of my salary." (OFF-C)*

There are 48 lodgement houses on the island in total. Twenty of them are reserved for the local municipality and another 20 are reserved for governorship officials. The remaining eight lodgement housing units are allocated for the civil servants in education and health. However, this number is lower than what is needed. Some of the single civil servants had to share their flats with others. In particular, new arrivals are the ones who suffer the most from the lack of affordable housing, which subsequently pushes them to ask to be appointed elsewhere. This situation has also effects on maintaining good public services on the island.

> *"Rents are so high. Civil servants who have been appointed here do not want to stay here, because there is not enough lodgement for everyone. A teacher who is paid between 2000 and 3000 TL has to pay a rent around 1500 TL." (NC2-D)*

Lack of affordable housing on Bozcaada is not a problem only for the new residents who recently came to the island for work purposes, but also for the locals who do not own a property on the island. In particular, the young adults of the local community are in the group who are most affected by these high rents and property prices. The younger generations who want to move out from their family house may not be able to do so under these conditions. One of the interviewees below gave an example of his friend's experience as well as his own. Another interviewee was also highly critical of the landowner's behaviour and also the conditions that he has to live in while paying such a high rent:

> *"Rent here is so expensive. Thankfully we have a house from my grandparents, so we all live there. One of my friends had to wait two years to get married because they couldn't find a house to move into. In the end, they*

DOI: 10.15320/ICONARP.2020.147

got married and continued to live with his parents." (ISL-G)

"Many people ask for a year's rent in advance. And also, if the roof is leaking etc., they don't repair it. They expect the tenant to pay for it. It is ridiculous! I am living in a 42m² flat and paying 1000 TL for that … but there is no other option." (LX-F)

Another issue that was raised during the interviews was the accommodation problem for seasonal tourism labourers due to the lack of affordable housing on the island. As the number of tourists on the island rapidly increases during summer, the demand for services and labour such as housekeepers, waiters/waitresses and cooks also goes up. Due to the high rents on Bozcaada, the employers struggle to find accommodation for their seasonal employees. Many employers rent a house for a short time and accommodate their employees there in bunk beds. However, the conditions of these houses are not always favoured by the employees, and subsequently affect their performance or are conducive to their early departure. During the interviews, this situation was also raised as an obstacle to providing quality tourism services.

"Accommodation for personnel is problematic. There are 15 people working here only [a restaurant]. But we rent a house for them only. A two-bedroom house for ten people. There is another room behind the restaurant for the family [the cook's family]. Our standards are a bit better than others." (LX-B)

"If you want a certain type of tourist, you need to provide that kind of service. They call for proper chefs and service assistance, but they put them all in one room. Of course, they don't want to work in such conditions. They either ask for more money or leave the next day." (NC2-D)

Conservation

In 1982, the entire island of Bozcaada was designated as a conservation site for the first time. With this decision, the settlement area of the island was designated as an urban conservation area, the historical monuments and necropolises were designated as archaeological conservation sites, and the rest of the island was protected as a natural conservation site. The fact that Bozcaada as a whole was designated as a conservation area before the development pressure of tourism helped to protect the historical and cultural heritage of the island, which now became the primary component of the island's identity in promoting the local tourism sector. However, this is not always perceived as a positive feature by some interviewees in the local community due to very strict restrictions and complicated regulations to follow, while others believed that the same strict regulations were the "*saviour*" of the island against the increasing pressure of development.

Because the traditional layout and architecture of the town centre is under conservation, possibilities for spatial development in the town centre are very limited. One of the interviewees shared how these limitations prevent major investors and entrepreneurs from investing on the island and help to protect it from the development pressure of the tourism sector. Another interviewee emphasised the importance of conservation for tourism by giving an example of another island, Avşa, which is not considered to be a tourist destination any more.

> *"If you come here and say, 'Find me a 200m² place' [footprint], I will pay whatever you want,' you cannot get anything. There is no such place. So those big businessmen don't come here to invest." (LX-B)*
>
> *"Avşa was a wonderful island in my university years back in the 1960s, just like Bozcaada before the 2000s. With untouched nature, very quiet beaches and B&Bs, inexpensive and good wine … but it has never been declared a conservation site like here. So, they couldn't control the development. All the vineyards were gone, tall buildings by the coast, beaches became polluted as well. Now you wouldn't even hear the name of the island as a tourism destination anymore." (NC1-A)*

Although the title of conservation area helped both to protect the heritage and to promote a unique identity for tourism, living in a conservation site comes with its benefits and costs for the local residents of Bozcaada. On the one hand, the value of their properties has gone up more than they would expect due to the rising popularity of the island as a tourism destination, which created such a high demand. On the other hand, renovating their properties or making small repairs costs significant time and money due to the bureaucracy. In conservation sites, any building or modification application must go through several different levels of administrative bodies from the local municipality to the regional conservation council to obtain approval. An interviewee explained how this gruelling process puts some buyers off, as well as leaving the local residents reluctant to renovate their properties:

> *"They discover older foundations during excavation and think that those are ancient remnants … of course they stop everything and call the council of monuments and inform them … then people get dispirited and don't want to buy a house and renovate it." (ISL-E)*

Planning and conservation regulations are able to act as a "gentrification agent" by restricting new spatial development (Gkartzios & Scott, 2012). The limitations on the existing built environment also play the role of the gentrification agent due to the tedious processes of obtaining approval. It was suggested by an interviewee that having to deal with time-consuming and costly bureaucratic works of renovation or rebuilding on Bozcaada allows only the wealthy to buy a property on the

DOI: 10.15320/ICONARP.2020.147

island. It is possible that this leads to indirect displacement of lower-income groups by excluding them from the local property market. It also consolidates the change in the socio-cultural structure on Bozcaada.

> *"Bureaucracy runs so slowly. If you want to take this stone and put it there you need to go to so many different offices and contact so many different people ... So only wealthy people can buy a property here, or people who can access important people and bypass bureaucracy." (ISL-E)*

DISCUSSION

Inherited Gentrification and Second-Generation Gentrifiers

The finding of this research supported Hamnett's assertion (2003) that gentrification is a process of change which is complex and constantly evolving. The earlier classic pattern of rural gentrification on Bozcaada evolved to be an "*'other' process of rural gentrification*"(Higley, 2008) . This presents itself with the changing typology of newcomers. In the early phase of Bozcaada's gentrification, the newcomers were mainly middle-aged and middle-class urbanites who moved to the island with rural idyll motivations. However, in the current phase, the characteristics of the newcomers have become diversified in terms of both motivations and socio-economic class. First, the second-generation newcomers are not wealthier than the long-term residents of the island due to increased economic status with local tourism development. Secondly, the motivations of second-generation newcomers moving to the island was not only based on lifestyle desires and rural or small-town idyll, but also on expectations of financial gains, again due to the growing local tourism.

Another point proving that the case of Bozcaada presents an "*'other' process of rural gentrification*" (Higley, 2008)is the integration of newcomers with long-term residents. The second generation of newcomers are more integrated with the different sections of the local community, in contrast to the "classic" rural newcomer typology. The second-generation newcomers are not only integrated with the local community through business connections, but also through strong socio-cultural connections; they show a strong sense of loyalty to the island and the local culture and community.

One of the main aspects of the gentrification concept is its class dimension, since it is often defined in the earlier productivist literature as the displacement of the working classes by the middle classes (Bijker et al., 2012; D P Smith & Phillips, 2001; Stockdale, 2006). The parameters that are used to define the middle class or portions of it have a critical importance in identifying the potential gentrifiers. Taking income as the sole parameter may not reflect the real picture of today's complex social class structure of populations (Hamnett, 2009; Phillips, 2009; Stockdale, 2010). As Stockdale (2010) suggests, one can be poor in economic capital but rich in cultural capital, which would make one a

ICONARP – Volume 8, Special Issue / Published: 28.12.2020

good gentrifier. In addition, an increase or decrease in the size of a particular social class in a given locality may not always manifest an event of displacement, as it may be a reflection of national or global trends in social class change (Hamnett, 2009). For example, the first generation of newcomers on Bozcaada were mainly middle-class, middle-aged ex-urbanites, who closely fitted the typical profile of rural gentrifiers (Cloke et al., 1995; Little, 1987; Urry, 1995). Regarding the later newcomers on Bozcaada, it is harder to determine to which socio-economic class they belong. This can be explained by the contemporary complex class structure (Phillips, 2009). Besides, the popularity of Bozcaada among domestic tourism destinations and increasing employment opportunities in the service sector certainly had an effect on the change in the newcomers' profile on Bozcaada. This supports Hamnett's (2003) assertion, showing that the gentrification of Bozcaada is still an ongoing process evolving alongside the overall transition of the island.

The most significant finding of this research was the identification of the second-generation gentrifiers of Bozcaada who are the direct descendants of the first gentrifiers. This particular section of current newcomers on Bozcaada are not as wealthy as the other newcomers or their parents. In fact, they may not be able to move into the local community if they have not inherited their parents'/grandparents' properties due to a highly inflated housing market. Although they do not hold economic capital, as Stockdale (2010) suggested they are still part of the gentrifying population of Bozcaada due to their cultural capital, which differentiates them from the other sections of the local community.

Another characteristic of the second-generation newcomers on Bozcaada is that they do not just "consume" the place, as usually described in the literature on rural in-migration and gentrification (Argent et al., 2014; Cloke et al., 1995; Halfacree & Boyle, 1998; Woods, 2005). On the contrary, they are well-integrated into the local economy, directly contributing to local social and cultural life, and helping to keep services such as schools running. This raises the question of whether the second-generation newcomers can be identified as gentrifiers of Bozcaada.

This paper argues that the second-generation newcomers naturally took part in the process of gentrification when they inherited their properties, since they play an important role in the significant socio-economic and cultural changes that are still taking place on the island. However, they created a different kind of gentrification from their parents. This paper calls this new concept "inherited gentrification". It may simply be understood as another method of gentrification that is passed down to the next generation via ownership of assets. It is, however, continuously evolving, with the inclusion of new actors in the ongoing process who characteristically differ from the former ones.

DOI: 10.15320/ICONARP.2020.147

Displacement of Locals or Exclusion of Newcomers

The rural gentrification literature suggests that due to increased demand for property, rising prices and rents lead to the displacement of a local population (Cloke et al., 1995; Darling, 2005; Davidson & Lees, 2005; Phillips, 1993; Stockdale, 2006). However, what is seen in the case of Bozcaada can be explained as "*exclusion of newcomers*" (Darling, 2005) from the property market rather than the displacement of the locals. Tourism on Bozcaada has played a critical role in generating this situation. Firstly, the nature of local tourism on Bozcaada, which started with room rentals in owners' own houses (levels of house ownership are high on Bozcaada), prevented the possible displacement of locals to some extent through their inclusion in the distribution of tourism profits from the beginning.

Secondly, because tourism became highly rewarding for the local landowners, available properties on the island are marketed as short rentals during the tourism high season, and finding affordable year-round rentals becomes almost impossible. Under these circumstances, newcomers who moved to the island with job-led motivations, such as civil servants, are the most excluded group in the local property market. Darling (2005) stated in her study of the Adirondack region of the USA that this shortage of year-round rentals pushed workers to double or triple up with other workers. This is the case on Bozcaada for the seasonal tourism labourers, who tend to be young and single. However, some civil servants, such as schoolteachers and medical officials who moved to the island with their families, choose to leave the island by asking to be appointed to somewhere else due to the high rents and expenses on the island. This causes a high circulation of civil servants that may affect the stability and the quality of the services provided, commonly criticised during the interviews.

Guimond and Simard (2010) argued that unlike urban gentrification, rural gentrification does not necessarily result in the displacement of local populations, as rural areas tend to give people the opportunity to spread out and around the original settlement. On the other hand, restrictive planning regulations, such as in areas under natural or cultural protection, can act as an agent of gentrification and subsequently result in the lack of affordable housing to the detriment of local populations (Best & Shucksmith, 2006; Gallent & Tewdwr-Jones, 2007; Gkartzios & Scott, 2012). In the case of Bozcaada, the fact that the island as a whole is a conservation area is seen as the main actor in the issue of affordable housing. The strict conservation regulations and the bureaucratic hassles play an important role in the exclusion of lower-income groups in the local housing market. However, what is intentionally or unintentionally ignored by the local community and administration is the high commercial value of short-term rentals thanks to tourism. Thus, it is argued that tourism is the main agent of indirect displacement or "exclusion of newcomers" on Bozcaada.

CONCLUSION

The phenomenon of gentrification as the transformation of an urban neighbourhood through the gradual arrival of middle-class or well-to-do residents, who eventually replace poorer and working-class residents, has been widely accepted as a process that is diverse and varies in outcome (Glass, 1964; Lees, 2000). This made it impossible for researchers to apply fixed criteria and a single definition to gentrification processes around the world (Davidson & Lees, 2005; Guimond & Simard, 2010). Therefore, Davidson and Lees (2005) introduced "*the core elements of gentrification*": the reinvestment of capital; the social upgrading of locales by in-migration of high-income groups; landscape change; and the direct or indirect displacement of low-income groups. Bozcaada has been displaying the core elements of gentrification through the process of rural social change and the structural local economic changes that have been taking place over the last couple of decades (Okumus, 2018).

This paper reports on the changes in the social fabric of Bozcaada with a focus on the demographics, the socio-cultural environment, and the built environment. The emigration of the Rums due to political issues in the 1970s initiated a substantial change in the local community of Bozcaada. The gap in the local population was filled by the in-migration of Turks, who used to work as seasonal agricultural workers on the island. The changes continued with the in-migration of urbanites in the 1990s.

According to the literature, one of the features of the rural gentrification phenomenon is the profile of the in-migrating population, particularly in terms of social class and motivations. The common picture drawn in the Western literature points out the displacement of the lower-income groups by the well-educated higher and middle-income groups with counter-urbanization and rural idyll motivations (Bijker et al., 2012; Cloke et al., 1995; Little, 1987; Phillips, 1993; D P Smith & Phillips, 2001; Stockdale, 2006; Urry, 1995). However, on Bozcaada there are two distinct groups of newcomers: the first-generation and the second-generation newcomers. The first-generation newcomers were mainly middle-class, middle-aged ex-urbanites, who fitted well within the typical profile of rural gentrifiers described in the literature (Cloke et al., 1995; Little, 1987; Phillips, 1993; Urry, 1995). The second-generation newcomers are not wealthier than the long-term residents of the island, who increased their economic status through local tourism development. Besides, they claim that they could move to the island only thanks to the existing properties of their parents, who were first-generation newcomers.

The two generations of newcomers also differ from each other with regard to their main motivation for moving to Bozcaada. The first-generation consists mainly of middle-aged, affluent ex-urbanites who moved to the island in search of a place to retire to, with the desire of a quiet, peaceful countryside living, as widely pictured in the literature

DOI: 10.15320/ICONARP.2020.147

(Halfacree, 1993; Hines, 2010; Darren P. Smith, 2002). Although the *"escape from urban ills"*, such as traffic and pollution is the common motivation for both waves of newcomers, the second-generation tends to consist of much younger families whose motivation was also to get away from the stressful working environment typical of cities and start their own business in a more relaxed environment (Bijker et al., 2012; Haartsen & Stockdale, 2018).

This paper contributes to the rural gentrification literature by introducing the concept of 'inherited gentrification', discussed from a generational perspective. The concept of inherited gentrification represents the transfer of the gentrification phenomenon to a new generation via inheritance. Nonetheless, it does not refer to a simple transfer of ownership of gentrified assets and a reproduction of the process of gentrification by the next generation. It refers to an ongoing and constantly changing process of transformation that, alongside the socio-economic and cultural changes, occurs on the island and in the wider society. Acknowledging this aspect of the process of rural gentrification is of particular importance for the development of policies, strategies, and implementation tools to manage and mitigate the effects of structural transitions in the countryside.

ACKNOWLEDGEMENTS

This article is originated from the author's PhD thesis "Rethinking Rural Transitions: The Case of Bozcaada, Turkey', supervised by Dr. Suzanne Speak and Dr. Jane Midgley at University of Newcastle.

CONFLICT OF INTEREST

No conflict of interest was declared by the authors.

FINANCIAL DISCLOSURE

The authors declared that this study has received no financial support.

ETHICS COMMITTEE APPROVAL

Ethics committee approval was not required for this article.

LEGAL PUBLIC/PRIVATE PERMISSIONS

In this research, the necessary permissions were obtained from the relevant participants (individuals, institutions and organizations) during the survey, in-depth interview, focus group interview, observation or experiment.

REFERENCES

Akgün, A. A., Baycan-Levent, T., Nijkamp, P., & Poot, J. (2011). Roles of Local and Newcomer Entrepreneurs in Rural Development: A Comparative Meta-analytic Study. *Regional Studies*, *45*(9), 1207–1223. https://doi.org/10.1080/00343401003792500

Argent, N., Tonts, M., & Stockdale, A. (2014). Rural Migration, Agrarian

Change, and Institutional Dynamics: Perspectives from the Majority World. *Population, Space and Place*, *20*(4), 299–302. https://doi.org/10.1002/psp.1827

Aydın, Z. (2002). The New Right, Structural Adjustment And Turkish Agriculture, Rural Responses And Survival Strategies. *European Journal of Development Research*, *14*(2), 183–208. https://doi.org/10.1080/714000427

Başaran Uysal, A., & Sakarya, I. (2018). Rural Gentrification in the North Aegean Countryside (Turkey). *ICONARP, International Journal of Architecture & Planning*, *6*(1), 99–125. https://doi.org/10.15320

Behar, D., & İslam, T. (2006). *İstanbul'da Soylulastırma: Eski Kentin Yeni Sahipleri*. Bilgi University Publications.

Best, P., & Shucksmith, M. (2006). *Homes for Rural Communities: Report of the Joseph Rowntree Foundation Rural Housing Policy Forum.* Joseph Rowntree Foundation.

Bijker, R. A., Haartsen, T., & Strijker, D. (2012). Migration to less-popular rural areas in the Netherlands: Exploring the motivations. *Journal of Rural Studies*, *28*(4), 490–498. https://doi.org/10.1016/j.jrurstud.2012.07.003

Butler, T. (2007). Re-urbanizing London Docklands: Gentrification, suburbanization and new urbanizim? *International Journal of Urban and Regional Research*, *31*(4), 759–781.

Cloke, P. (1983). *An Introduction to Rural Settlement Planning*. Methuen.

Cloke, P., Phillips, M., & Thrift, N. (1995). The new middle classes and the social constructs of rural living. In T. Butler & M. Savage (Eds.). *Social Change and the Middle Classes* (pp. 220–238). UCL Press.

Darling, E. (2005). The city in the country: Wilderness gentrification and the rent gap. *Environment and Plannning A*, *37*, 1015–1032.

Davidson, M., & Lees, L. (2005). New-build "gentrification" and London's riverside renaissance. *Environment and Planning A*, *37*(7), 1165–1190. http://www.envplan.com/abstract.cgi?id=a3739

Dinçer, Y., & Dinçer, İ. (2005). Historical Heritage, Conservation, Restoration in Small Towns and Question of Rural Gentrification in Turkey. *ICOMOS 15th General Assembly and Scientific Symposium*, 621–627.

Enlil, Z. (2000). Yeniden İslevlendirme ve Soylulastırma: Bir Sınıfsal Proje Olarak Eski Kent Merkezlerinin ve Tarihi Konut Dokusunun Yeniden Ele Geçirilmesi. *Domus*, *8*, 46–49.

Ergun, N. (2004). Gentrification in Istanbul. *Cities*, *21*(5), 391–405. https://doi.org/https://doi.org/10.1016/j.cities.2004.07.004

Gallent, N., & Tewdwr-Jones, M. (2007). *Decent Homes For All*. Routledge.

Google Maps, (n.d.). [Bozcaada, Turkey].Retrieved December 4, 2020, from https://www.google.com.tr/maps/place/Bozcaada.

Gkartzios, M. (2013). "Leaving Athens": Narratives of counterurbanisation in times of crisis. *Journal of Rural Studies*, *32*, 158–167. https://doi.org/10.1016/j.jrurstud.2013.06.003

DOI: 10.15320/ICONARP.2020.147

Gkartzios, M., & Scott, M. (2012). Gentrifying the Rural? Planning and Market Processes in Rural Ireland. *International Planning Studies*, *17*(3), 253–276. https://doi.org/10.1080/13563475.2012.696476

Glass, R. (1964). *London: Aspects of change*. MacGabbon & Kee.

Guimond, L., & Simard, M. (2010). Gentrification and neo-rural populations in the Québec countryside: Representations of various actors. *Journal of Rural Studies*, *26*(4), 449–464. https://doi.org/10.1016/j.jrurstud.2010.06.002

Güzey, Ö. (2009). Urban regeneration and increased competitive power: Ankara in an era of globalization. *Cities*, *26*(1), 27–37. https://doi.org/https://doi.org/10.1016/j.cities.2008.11.006

Haartsen, T., & Stockdale, A. (2018). S/elective belonging: how rural newcomer families with children become stayers. *Population, Space and Place*, *24*(4). https://doi.org/10.1002/psp.2137

Halfacree, K. (1993). Locality and social representation: space, discourse and alternative definitions of the rural. *Journal of Rural Studies*, *9*(1), 23–37.

Halfacree, K. (2001). Constructing the object: Taxonomic practices, "counterurbanisation" and positioning marginal rural settlement. *International Journal of Population Geography*, *7*(6), 395–411. https://doi.org/10.1002/ijpg.238

Halfacree, K., & Boyle, P. (1998). Migration, rurality and the post-productivist countryside. In P. Boyle & K. Halfacree (Eds.), *Migration into rural areas: Theories and issues* (pp. 1–20). Wiley.

Hall, P. (2006). Urban exodus hits town and country. *Regeneration & Renewal*, 18. http://search.proquest.com/docview/230676159?accountid=12753

Hamnett, C. (2003). Gentrification and the middle-class remaking of inner London, 1961-2001. *Urban Studies*, *40*, 2401–2426.

Hamnett, C. (2009). The new Mikado? Tom Slater, gentrification and displacement. *City*, *13*(4), 476–482. https://doi.org/10.1080/13604810903298672

Higley, R. C. (2008). *"Other" Processes of Rural Gentrification and Counter-Urban Migration: Vol. PhD*. University of Brighton.

Hines, J. D. (2010). Rural gentrification as permanent tourism: the creation of theNew'West Archipelago as postindustrial cultural space. *Environment and Planning D: Society and Space*, *28*, 509–525.

İslam, T. (2005). Outside the Core: Gentrification in Istanbul. In R. Atkinson & G. Bridge (Eds.), *Gentrification in a Global Context: The New Urban Colonialism*. Routledge.

Keyder, C., & Yenal, Z. (2011). Agrarian Change under Globalization: Markets and Insecurity in Turkish Agriculture. *Journal of Agrarian Change*, *11*(1), 60–86.

Köymen, O., & Öztürkcan, M. (1999). Türkiye'de Toprak Dağılımı Üstüne Bazı Notlar [Notes on the Land Distribution in Turkey]. In O. Baydar (Ed.), *75 Yılda Köylerden Şehirlere [From Villages to Cities in 75 Years]*

(pp. 75–96). Tarih Vakfi.

Kural, M. S. (2016). Lost (and Gained) in Transition: The Contradictions of Gentrification in Alaçatı, Turkey. *Society & Academia*, 70.

Lees, L. (2000). A reappraisal of gentrification: Towards a "geography of gentrification." *Progress in Human Geography*, *24*(3), 389–408.

Ley, D. (1987). Reply: The Rent Gap Revisited. *Annals of the Association of American Geographers*, *77*(3), 465–468. https://doi.org/10.2307/2563280

Little, J. (1987). Rural gentrification and the influence of local level planning. In P. Cloke (Ed.), *Rural Planning: Policy into action?* (pp. 185–199). Harper and Row.

Mitchell, C. J. A. (2004). Making sense of counterurbanization. *Journal of Rural Studies*, *20*(1), 15–34. https://doi.org/10.1016/s0743-0167(03)00031-7

Murdoch, J., & Marsden, T. (1994). *Reconstituting Rurality: Class, Community and Power in the Development Process*. UCL Press.

Okumus, D. (2018). *Rethinking Rural Transitions: The Case of Bozcaada, Turkey*. Newcastle University.

Phillips, M. (1993). Rural gentrification and the processes of class colonisation. *Journal of Rural Studies*, *9*(2), 123–140. https://doi.org/http://dx.doi.org/10.1016/0743-0167(93)90026-G

Phillips, M. (2002). The Production, Symbolization and Socialization of Gentrification: Impressions from Two Berkshire Villages. *Transactions of the Institute of British Geographers*, *27*(3), 282–308. https://doi.org/10.2307/3804485

Phillips, M. (2005). Differential productions of rural gentrification: Illustrations from North and South Norfolk. *Geoforum*, *36*(4), 477–494. https://doi.org/10.1016/j.geoforum.2004.08.001

Phillips, M. (2009). Gentrification, Rural. *International Encyclopedia of Human Geography*, 368–375.

Phillips, M., & Smith, D. P. (2018). Comparative approaches to gentrification: Lessons from the rural. *Dialogues in Human Geography*, *8*(1), 3–25. https://doi.org/10.1177/2043820617752009

Satterlee, S. (2015). *Istanbul property: The majestic city wooing foreign investors* (12.07.2016). the Telegraph. http://www.telegraph.co.uk/finance/property/expat-property/12025196/Istanbul-property-the-majestic-city-wooing-foreign-investors.html

Scott, M., Smith, D. P., Shucksmith, M., Gallent, N., Halfacree, K., Kilpatrick, S., Johns, S., Vitartas, P., Homisan, M., & Cherrett, T. (2011). Interface. *Planning Theory & Practice*, *12*(4), 593–635. https://doi.org/10.1080/14649357.2011.626304

Şen, B. (2011). Kentsel mekânda üçlü ittifak: sanayisizleşme, soylulaştırma, yeni orta sınıf. *İÜ Siyasal Bilgiler Fakültesi Dergisi*, *44*, 1–21.

Shucksmith, M. (2012). Class, Power and Inequality in Rural Areas:

DOI: 10.15320/ICONARP.2020.147

Beyond Social Exclusion? *Sociologia Ruralis*, *52*(4), 377–397. https://doi.org/10.1111/j.1467-9523.2012.00570.x

Skeggs, B. (2004). *Class, Self, Culture*. Routledge.

Smith, D P, & Phillips, D. A. (2001). Socio-cultural representations of greentrified Pennine rurality. *Journal of Rural Studies*, *17*(4), 457–469. https://doi.org/http://dx.doi.org/10.1016/S0743-0167(01)00014-6

Smith, Darren P. (2002). Rural gatekeepers and 'greentrified' pennine rurality: Opening and closing the access gates? *Social & Cultural Geography*, *3*(4), 447–463. https://doi.org/10.1080/14649365.2002.9709634

Smith, N. (1979). Gentrification and capital: practice and ideology in Society Hill. *Antipode*, *11*, 24–35.

Stockdale, A. (2006). The role of a "retirement transition" in the repopulation of rural areas. *Population, Space and Place*, *12*(1), 1–13. https://doi.org/10.1002/psp.380

Stockdale, A. (2010). The diverse geographies of rural gentrification in Scotland. *Journal of Rural Studies*, *26*(1), 31–40. https://doi.org/10.1016/j.jrurstud.2009.04.001

Stockdale, A., Findlay, A., & Short, D. (2000). The repopulation of rural Scotland: opportunity and threat. *Journal of Rural Studies*, *16*(2), 243–257. https://doi.org/http://dx.doi.org/10.1016/S0743-0167(99)00045-5

Sutherland, L. A. (2012). Return of the gentleman farmer?: Conceptualising gentrification in UK agriculture. *Journal of Rural Studies*, *28*(4), 568–576. https://doi.org/10.1016/j.jrurstud.2012.05.001

Tekeli, I. (2008). *Türkiye'de Bölgesel Eşitsizlik Ve Bölge Planlama Yazıları [Articles on Regional Disparities and Planning in Turkey]* (Vol. 2). Tarih Vakfi.

Tezcan, A. M. (2010). *Rethinking Transformation with Tourism: The Case of İzmir-Alaçatı* [Middle East Technical University]. https://doi.org/10.1558/jsrnc.v4il.24

TUIK. (2015). *Databases* (01.08.2015). Turkish Statistical Institute. http://www.turkstat.gov.tr/

Urry, J. (1995). A middle-class countryside. In T. Butler (Ed.), *Social Change and the Middle Classes* (pp. 205–219). UCL Press.

Uzun, C. N. (2003). The impact of urban renewal and gentrification on urban fabric: three cases in Turkey. *Tijdschrift Voor Economische En Sociale Geografie*, *94*(3), 363–375. https://doi.org/10.1111/1467-9663.00263

Woods, M. (2005). *Rural Geography: Processes, Responses and Experiences in Rural Restructuring*. SAGE.

Zukin, S. (1990). Socio-Spatial Prototypes of a New Organization of Consumption: The Role of Real Cultural Capital. *Sociology*, *24*(1), 37–56. https://doi.org/10.1177/0038038590024001005

Resume

Duygu Okumuş currently works as a lecturer in Department of City and Regional Planning at Bursa Technical University. She received her MSc. and PhD. in planning from University of Newcastle, UK. Her research interest includes socio-economic and cultural transitions in rural areas, particularly gentrification processes.

DOI: 10.15320/ICONARP.2020.147