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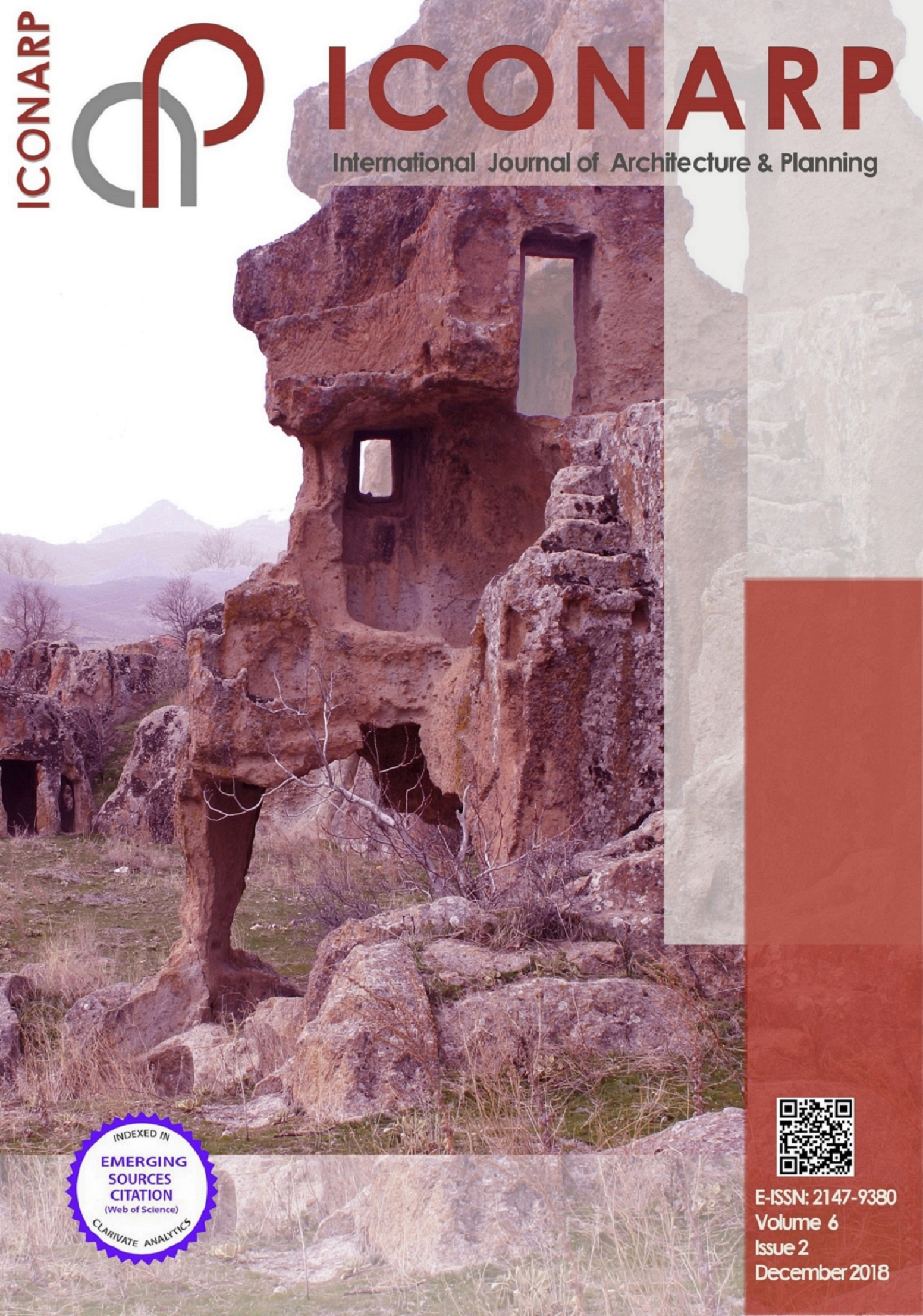
International Journal of Architecture & Planning



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

E-ISSN: 2147-9380
Volume 6
Issue 2
December 2018

International Journal of Architecture & Planning
Volume6, Issue 2, December 2018
DOI: 10.15320 / E-ISSN: 2147-9380
Online: http://iconarp.selcuk.edu.tr/iconarp

ICONARP

ICONARP is a biannual peer-refereed journal with the support of Selçuk University, under the responsibility of Konya Technical University Faculty of Architecture and Design, online published every June and December.

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ICONARP INTERNATIONAL JOURNAL OF ARCHITECTURE & PLANNING

ICONARP as an e-journal considers original articles, research briefs, book reviews and viewpoints in peer-reviewed. ICONARP is an exciting new venture occurred with experiences, theoretical approaches, critical and empirical studies in the field of architecture and urban planning.

SCOPE and AIM

The journal aims to be a platform for the studies of design, education and application and has a goal to be a bridge in between traditional/modern, east/west, local/global in the disciplines of Architecture / Planning.
Architecture and Planning, as two interconnected fields, are strongly affected by other disciplines such as fine art, urban design, philosophy, engineering, geography, economics, politics, sociology, history, psychology, geology, information technology, ecology, law, security and management. However, there are no academic journals which specifically focus on the connections of architecture and planning with other social fields. 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.

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, Index Copernicus, Tubitak Ulakbim TR Dizin, Iconda Bibliographic (The International Construction Database), ROAD (Directory of Open Access), DRJI (Directory of Research Journals Indexing), ROOTIndexing, Scientific World Index, Science Library Index, SIS (Scientific Indexing Services), J-Gate, Crossref, OpenAIRE, OCLC WorldCat, BASE (Bielefeld Academic Search Engine), Scilit, Google Scholar and D-Space (database).

EDITORIAL

ICONARP began its broadcast life as peer-reviewed faculty journal in the field of international architecture and planning and now it is the thirteenth issue.

ICONARP is continuing its growing process with this new issue.

The fourteenth issue will be published in June 2019 and we wait for your contributions with your scientific studies until April 2019.

* Cover Photo: Klistra/Konya/Turkey, Bilgehan Yılmaz Çakmak, Cover Design; Bilgehan Yılmaz Çakmak

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ICONARP
International Journal of Architecture & Planning
Received 08 Feb 2018; Accepted 07 Aug 2018
Volume 6, Issue 2, pp: 217-245/Published 28 December 2018
DOI: 10.15320/ICONARP.2018.53–E-ISSN: 2147-9380

ICONARP

Analytic Hierarchy Process (AHP) as an Assessment Approach for Architectural Design: Case Study of Architectural Design Studio

Timuçin Harputlugil*

Abstract

Architectural design is complex and can be defined as an effective decision-making activity based on problem solving. This complexity is not based on content and volume of problems, but also heterogeneity and uncertainty of information provided for assessment, subjective approaches, and a large number of the criterion for assessment. The aim of this research paper is to contribute to the researches for assessment of architectural design by providing a novel approach based on Analytic Hierarchy Process (AHP) – a Multi Criteria Decision Making (MCDM) method. The approach supports an effective comparative analysis among the alternative projects based on determined criterion. The methodology is implemented with a case study in one of the design studios of Department of Architecture of Çankaya University on final design projects of a group of students with observation, research and assessment. The data used in the assessment is collected through interviews and surveys which is analysed by the help of a software. Based on the outcomes of the AHP-based approach, it has been seen that this approach can provide numerical results that are comparable, measurable, gradable, consistent and can be reported separately for

Keywords: *Architectural education, Analytic Hierarchy Process (AHP), Assessment of architectural design*

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each assessor. However, it has also been found that the AHP-based method is suitable for evaluating only a limited number of projects. With the research, and by setting thresholds levels for evaluation, it has become clear that successful and unsuccessful projects can be separated for achievement and competence. Consequently, it has been observed that the approach has considerable potentials to be further developed to evaluate architectural projects comparatively, especially for architectural students' projects, and other architectural projects such as architectural design competitions.

INTRODUCTION

Design is the basic activity of architecture (Simon, 1969) and is based on problem solving and decision making (Davis, 2017). Simon (1969) identified design problems as sick problems since more problems are created for solution. In this context, architectural design is an iterative process based on feedbacks (Harputlugil et al., 2014) and it differs from many other design disciplines by the way it solves the problems and problems it contains. Dickson (2004) defines design and construction processes as the set of decisions required for the building process while Sebastian (2007) defines the process as analysis through synthesis.

Each architectural piece/product is unique when the program of requirements, site of the construction, stakeholders are considered. For this reason, no design is like any other and the final product is unique. Accordingly, the evaluation of the design process is complex and difficult. This involves the evaluation of architectural design for which each case is based, to choose the most appropriate one from among the other alternatives, and to rank alternative projects as well as accordingly define the pros and cons of the projects and to design them separately. Architectural design can include different criteria that can be defined according to the characteristics of each project, as well as universal evaluation criteria. Architectural design with this point of view; can be regarded as a set of possible solutions proposed for specific design problems and is aimed at achieving the desired level of design outcomes in the framework of the prescribed criteria. In this context, it is necessary to develop different methods for the evaluation of project alternatives designed for different people or groups, both in education and in professional practice.

Evaluation is an inevitable process for the product of design. The evaluation methodology is important as well as the content, context and the process. Çıkış and Çil (2009) describe evaluation process of architectural design in education as a measure of development, and point out evaluation criteria as the most

DOI: 10.15320/ICONARP.2018.53 – E-ISSN: 2147-9380

important feature of evaluation. Hickman (2007) suggests that evaluation should be able to demonstrate the strengths and weaknesses of the project as well as the development of practical skills, technical knowledge, and research competence. Williams et al. (2010) emphasizes the importance of useful feedback to evaluation.

Design studios that constitute the spine of architectural education (Nazidizaji et al., 2014) are defined by Çıkış and Çil (2009) as practical working areas where design is evaluated and vocational education is integrated with art. Kalaycı (2016) states for the comparative evaluation in the design studios, which is a process of learning and teaching activities in groups, that it is inevitable for themselves and others to compete each other, and that it is a right of the student to know the concrete, non-subjective consequences of the explanatory, reasoned, specified criteria of the evaluation. In this context, it is also expected that the scope and criteria of the evaluation method is well defined as well as its transparent.

Critical numerical (quantitative) evaluation is now widely used in architectural education, however, it is not easy to quantify the results of subjective evaluations of different groups of people with common numerical values. In this context, it is possible to come across the work carried out on behalf of the development of numerical evaluation. Hassanpour and Ani (2015) and Utaberta et al. (2013) have developed recommendations for the development of numerical evaluation systems and the creation of feedback information to promote the project as far as possible. Alagbe et al. (2015) suggest that correctness, reliability, usefulness, and consistency for evaluation must be fundamental concepts, while Crooks et al. (1996) states that an accurate assessment improves the individual development and the education system. Webster (2006) believes that evaluation should be able to determine how far the goal of the specified learning outcomes has been achieved.

Traditional evaluation methods in architecture are limited with the defining of criteria and sub-criteria for evaluation, common language development in group evaluation processes, benchmarking, and definition of success threshold levels, etc. It is believed that various decision support systems can be used to overcome with these limitations. Multi Criteria Decision Making (MCDM) Methods, the best-known decision support system (Triantaphyllou, 2000), are analytic methods (Timor, 2011) that involve many people in decision-making processes and allows for the evaluation of measurable and non-measurable factors that enable decisions to be taken in line with goals (Özcan et al., 2011) .

MCDM systems are based on the evaluation and numerical comparison of alternatives within the framework of the defined criterion. The main problems experienced in traditional architectural design evaluations may already be identified as, the relative superiority and inferiority of project alternatives relative to each other, and the absence of numerical data for comparative analysis. Considering all the previously mentioned evaluation conditions; the assessment of architectural design is prone to individual and group evaluations that are particularly subjective, with concrete criteria that cannot be assessed in the same measurement units. Since it requires accurate, reliable, consistent, and transparent evaluation methods based on feedback, it is believed that that using MCDM methods for this purpose (as an evaluation tool), that there is an enormous potential if properly implemented. In this context, and within this research, the potentials of evaluation of architectural design based on Analytic Hierarchy Process (AHP) (a MCDM Methodology used broadly) are scrutinized. Following this introduction is a literature review. The approach is narrated with details in the chapter titled material method and followed by a case study told in details in. Discussion of the outcomes of the research is followed by conclusion chapter.

LITERATURE REVIEW

Analytic Hierarchy Process (AHP), Analytic Network Process (ANP), Preference Ranking Organization Method for Enrichment Evaluations (PROMETHEE), Simple Additive Weighting (SAW), Weighted Product Method (WPM), Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), Elimination and Choice Expressing Reality (ELECTRE), dominance, max-max, max-min, are the most used MCDM methodologies and can be classified as below (Riberio et al., 2011) (Figure 1).

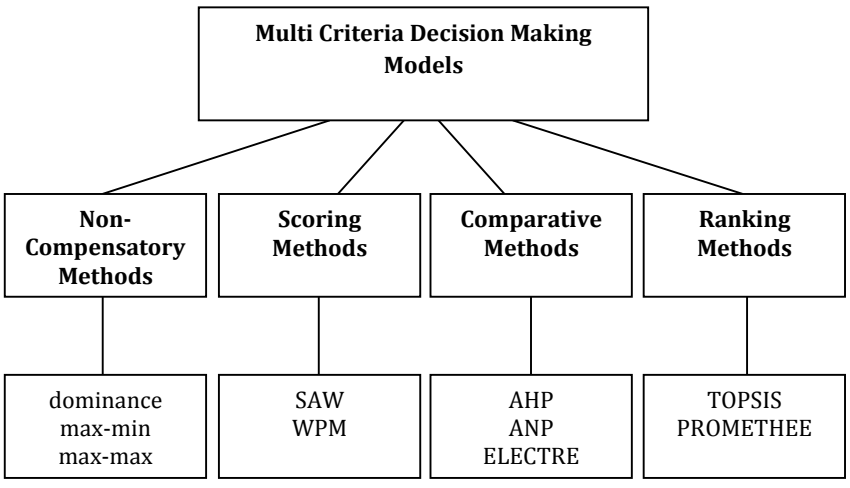

Figure 1. MCDM Taxonomy adapted from Riberio et al. (2011)

DOI: 10.15320/ICONARP.2018.53 – E-ISSN: 2147-9380

It is possible to come across research that evaluates the use of MCDM methods for different processes of building. In the study of Mela et al. (2012), different building designs were assessed with different MCDM methods in the context of different criteria, Heravi et al. (2017) have shown that they use MCDM methodologies for the optimization of sustainable industrial plant selection for petrochemical projects. Si et al. (2016) used MCDM methodologies to integrate green technologies into the building, while Mulliner et al. (2016) compared MCDM methodologies in a comparative manner for the calculation of sustainable housing costs. In addition to these, it can be seen, that different MCDM methodologies are used in other topics, such as, material (Akadiri et al., 2013) and construction method selection (Tsai et al., 2013). According to the evaluation based on 88 studies made by Espino et al. (2014) which is one of the most widely circulated publications in this context, MCDM methods in the construction sector are used for tender, construction and structure, geotechnics, materials, equipment, project management, highways, settlement planning, waste management and water management. They found that AHP is the most commonly used method of study in which 25 different methods are used.

Considering the above classification, AHP with its widespread use in MCDM applications; it can be observed that the comparative matrices are acceptable (Harputlugil et al., 2011) , the length of the evaluation periods is not long enough, the ease with which the abstract and the concrete criteria can be evaluated together, the consistency analysis can be performed, the criteria and sub-criteria hierarchy can be defined, the results are clear, understandable and straightforward, and that effective decision-making in complex situations is possible (Harputlugil et al., 2014) compared to the other methods (Timor, 2011). Considering the above-mentioned classification, AHP with its widespread use in MCDM applications emerges from other methods (Timor, 2017) with the following distinctives such as: using pairwise comparative matrixes, easiness of operation, evaluation of tangible and intangible criteria all together (Aksakal & Dağdeviren, 2015), ability for measurement of consistency, structuring hierarchy of main criteria and sub criteria, event-based easy adaptation of criterion, acceptable number of matrixes for evaluation (Harputlugil et al., 2011). Besides clear results, which are understandable and straightforward, it also makes it possible to make effective decision-making in complex situations. In addition to all these reasons, the AHP's ability to provide adaptability, widespread use (Gandhi et al., 2015) for different disciplines with different areas and purposes and the ability to present complex expert assessment analysis in a simple and

understandable manner can be listed as surplus values for the potential of architectural design evaluation (Omkarprasad & Sushil, 2006).

The widespread use of AHP in social and many engineering disciplines such as, construction and building process, is striking. On the other hand, its use for a subjective assessment of tangible and intangible criteria such as architectural design is very limited. In this respect, an AHP-based approach has been developed for the evaluation of architectural design based on these considerations.

AHP is one of the multi-criteria decision-making methods developed by Saaty (1980). The AHP has been used in many fields due to its plain and simple mathematical system based on pairwise comparison which includes tangible and intangible criterion for numerical evaluation. The AHP allows for alternatives to be evaluated in terms of decision-makers, within the framework of determined main and sub-criteria, to solve the problems that can be hierarchically structured for the specified target (Saaty, 1990). In addition to its ease of use, the ability to evaluate consistency check provides results that are close to true scores (Triantaphyllou & Mann, 1995). The AHP structures the problem in a hierarchical structure when the alternatives to be selected by the decision maker/s, criterion and sub-criterion, are listed for the specified purpose. Based on this structure, comparison matrixes are formed. The resulting matrix is transformed into the priority vector. The consistency rate is then calculated (Timor, 2011).

Questions for pairwise comparisons should be expressed clearly. Sub-criteria are arranged in order of priority relative to their values. Pairwise comparison judgments are placed in vertical and horizontal columns in the decision matrix. The evaluation scales on the table proposed for pairwise comparisons are between the numbers 1-9 where two measures are equally important, 1 is used, while numbers 3-5-7-9 represent increasing importance. Numbers 2-4-6-8 are also used for intermediate evaluations. The digits used are not used as numerical values but are used to define the significance levels of the metrics relative to each other in pairwise comparisons (Saaty, 1980; Saaty, 1990; Adamovic et al., 2008) (Table 1, Table 2).

DOI: 10.15320/ICONARP.2018.53 – E-ISSN: 2147-9380

Table 1. Definitions of pairwise comparison numerical scales (Saaty, 1980; Saaty, 1990; Adamovic et al., 2008)

Values (i_aj_b ; k_cl_d)	Explanation
1	Criteria *i and* Criteria *j* are of **equal** importance
3	Criteria *i* is **weakly** more important than Criteria *j*
5	Criteria *i* is **strongly** more important than Criteria *j*
7	Criteria *i* is **very strongly** more important than Criteria *j*
9	Criteria *i* is a**bsolutely** more important than Criteria *j*
2,4,6,8	Intermediate Values
a, b= (1,2,3, ..., n = number of criteria) c, d= (1,2,3, ..., n = number of alternatives)	

At a specified level of hierarchy, when the number of criteria is n, the number of alternatives is m; n number of matrices consists of m horizontal and vertical cells (Table 3).

Table 2. Definitions of pairwise comparison numerical scales of main and sub criterion (Adamovic et al., 2008)

i / *j*	Criteria 1	Criteria 2	Criteria 3	Criteria 4	.....	Criteria n
Criteria 1	1	i_1j_2	i_1j_3	i_1j_4	...	i_1j_n
Criteria 2	i_2j_1	1	i_2j_3	i_2j_4	...	i_2j_n
Criteria 3	i_3j_1	i_3j_2	1	i_3j_4	...	i_3j_n
Criteria 4	i_4j_1	i_4j_2	i_4j_3	1	...	i_4j_n
.....	...	...	...	...	...	...
Criteria n	i_nj_1	i_nj_2	i_nj_3	i_nj_4	...	i_nj_n=1
i_aj_b : (a=1, ..., n; b=1,...., n)= Values (Table 1)						

Table 3. Definitions of choosing alternatives based on priorities of criterion (Adamovic et al., 2008)

Criteria i (i → 1, 2, …., n)						
k / *l*	Alternative 1	Alternative 2	Alternative 3	Alternative 4	…..	Alternative m
Criteria 1	1	k_1l_2	k_1l_3	k_1l_4	…	k_1l_n
Criteria 2	k_2l_1	1	k_2l_3	k_2l_4	…	k_2l_n
Criteria 3	k_3l_1	k_3l_2	1	k_3l_4	…	k_3l_n
Criteria 4	k_4l_1	k_4l_2	k_4l_3	1	…	k_4l_n
“”	…	…	…	…	…	…
Criteria n	k_nl_1	k_nl_2	k_nl_3	k_nl_4	…	k_nl_n=1
k_cl_d : (c=1, …., m; d=1,…., m)= Values (Table 1)						

All pairwise comparison matrices basically have two features: The diagonal values in each matrix are equal to 1 and all matrix values are reciprocal (iajb = 1 / ibja ; kcld = 1/kdlc). The eigenvector w of matrix A is formulated as the formula Aw = λmax w. When the vector w is normalized, it becomes the vector of criteria priorities with respect to the goal. λmax is the largest eigenvalue of the matrix A and the corresponding eigenvector w contains only positive entries. Accordingly, the consistency is defined as CR (consistency ratio) = CI (consistency index) / RI (random index) equality. For RI (random index) random index table is used (Table 4). CI = λmax -n / n-1 must be used for the consistency ratio. If the CR value is less than 0,10 the evaluation is considered to be consistent. If the consistency ratio is greater than 0,10 pairwise comparisons should be reviewed (Saaty, 1980; Saaty, 1990; Adamovic et al., 2008; Timor, 2011).

Table 4. Random index table

Matrix size	1	2	3	4	5	6	7	8	9	10
Random Index	0	0	0,52	0,89	1,11	1,25	1,35	1,40	1,45	1,49

DOI: 10.15320/ICONARP.2018.53 – E-ISSN: 2147-9380

AHP has four axioms namely, Reciprocal Judgments, Homogeneous Elements, Synthesis and Expectations (Saaty, 1986). The reciprocal axiom is used to construct the comparison matrices. According to this axiom, the knowing of the comparison matrix defines the corresponding comparison matrix. The Homogeneous Elements axiom conveys the evaluation of the factors to be evaluated with a preferred scale. Furthermore, a criterion cannot be considered infinitely good or bad in comparison to another. The third axiom, Synthesis states that the criteria are independent of each other and states that the elements in a hierarchy do not depend on lower level elements. The last axiom, Expectation, indicates that a problem can be presented in a hierarchical structure to be evaluated, and that each criterion and alternate that affects the decision problem should be included in the hierarchy (Timor, 2011; Saaty, 1986; Kuruüzüm & Atsan, 2001). Consequently, the AHP has stages of defining the problem, ordering decision criteria, creating a hierarchical structure, forming pairwise comparison matrices, calculating the priority vectors of the matrices, and measuring the consistency along with combining weights (Saaty, 1994).

MATERIAL AND METHOD

It can be observed in the important indexes surveyed, that there are only a limited number of publications of usage of AHP in the architectural field which comparatively evaluate architectural design projects. One of the publications noted, proposes a fuzzy decision-making model for choosing the best project for a pavilion design by Palabıyık and Çolakoğlu (2012). Harputlugil et al. (2011) used AHP for design quality approach while Bitarafan et al.(2015) used the methodology for another purpose of selecting the optimal composition of architectural forms. Arroyo et al. (2015) also used AHP as one of the methodologies for resolving the problem of choice in detailed design. Nevertheless, usage of AHP for different purposes of building process such as, assessment of sustainability in buildings (Markelj et al., 2014), budget estimation (Lai et al., 2008), project management (Al-Harbi, 2001), identification of the importance of urban renewal project criteria (Lee & Chan, 2008), comparison of green building assessment tools (Ali & Al, 2009), planning risk during project planning and security risk analysis in budgetary processes (Aminbakhsh, 2013) available land for buildings (Pandav et al., 2016) and location selection (Nahid & Gholam, 2010) can also be found in the literature.

Within the scope of this study, the proposed AHP-based approach was carried out by taking four students work done in Veral & Veral + Sepkin studio, which is one of the four vertical studios of

Çankaya University Architecture Department's 2014-2015 spring term graduation projects. Within the scope of this research, evaluators (decision makers) who had participated in the AHP evaluation system are the studio tutors(academicians) who have long and qualified professional experience. In addition to running design studios in architecture schools, they have won awards in countless architectural competitions and have been jury members for several competitions. Within this context, it is believed that, their competence to evaluate architectural design projects required for this research is at high level. Assessment criteria and sub-criteria were determined by the studio tutors after transferring information to them and guiding them through assessment process. Specified criteria and sub-criteria were organized in the AHP hierarchy and the evaluation study was conducted with Expert Choice 11.5 academic version software. Expert Choice software for AHP evaluation was used based on several advantages such as; allowing non-experts to easily evaluate, intuitive graphical user interface, simultaneous automatic calculation of priorities, simultaneous consistency control and sensitivity analysis (Alessio & Ashraf, 2009). Including the preceding, graphically reporting numerical data and the process steps associated with it was also one of the reasons for using the software. Studio tutors are primarily asked to evaluate the projects based on the traditional system. The rankings of the student projects were recorded according to the numerical grades given in the evaluation made as a group with the traditional system. In the AHP-based assessment approach, the studio tutors were asked to evaluate the projects individually and the consistency check was done through the software used in the evaluation process. The resulting individual and group results were shared with the studio tutors and compared with the traditional evaluation results, the differences between both systems comprehensively analysed, and the positive and negative aspects of the AHP based approach were investigated. The implementation steps of the approach are shown in Figure 2.

DOI: 10.15320/ICONARP.2018.53 – E-ISSN: 2147-9380

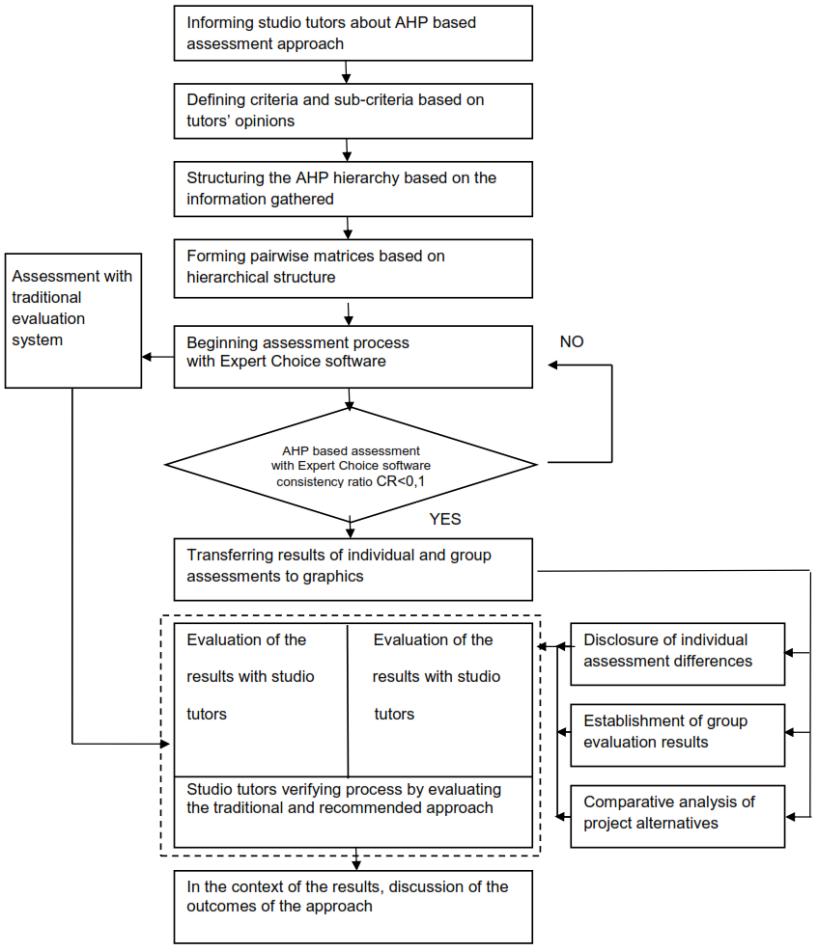

Figure 2. Implementation steps of the approach

CASE STUDY

This research aims to investigate alternatives to the traditional assessment methods in architecture. With this research the topics below are researched based on the outcomes of the case study: i) comparative evaluation of student projects, ii) definition of scholars' evaluation criteria and their priorities, iii) setting out individual and group assessment priorities of scholars, iv) determining the positive or negative sides of student projects relative to other projects, v) possibility to carry out what if analyses.

Structuring

The criterion used in the case study can be formulated based on 3 main principles.

- Based on studio tutor's opinions
- Based on building typology and site conditions
- Based on the expectations of outcomes of the design studio

A culture and congress center design was decided as topic of the design project located in the new campus area of Çankaya

University beside Ankara-Eskişehir road on 30th km. Within the scope of this design project students were evaluated based on the project submission of a 1/500 site plan, 1/200 scale architectural drawings(plans-sections-elevations), 3-dimensional perspectives and 1/200 scale physical model that they delivered for the final project. Student project submissions were randomly numbered as A1-A2-A3-A4 for objectivity of the research. All the drawings and images of each project were presented to the studio tutors individually for their evaluation (Figure 3).

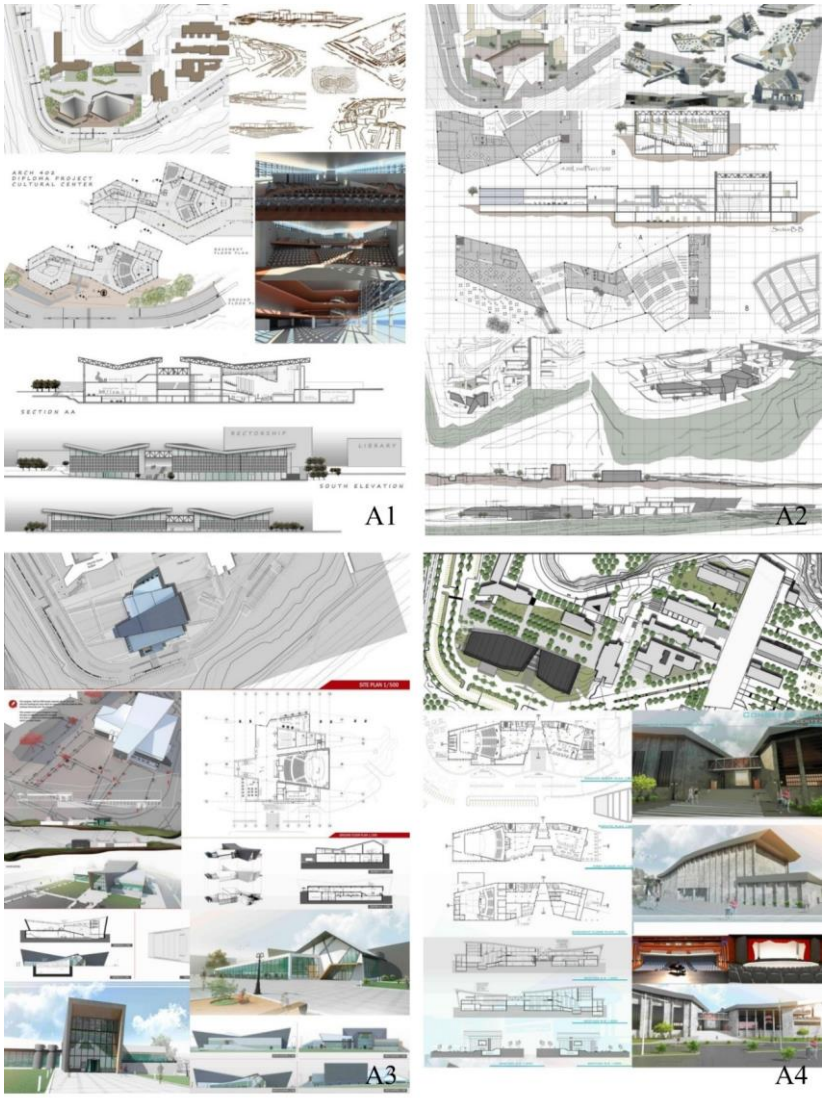

Figure 3. Student projects A1, A2, A3, A4

The main criteria of Functionality, Build Quality, Innovation and Impact, Presentation and Process and all the sub-criteria related to them are determined by the academicians. Based on the criteria and data, the structured AHP hierarchy was derived in Figure 4.

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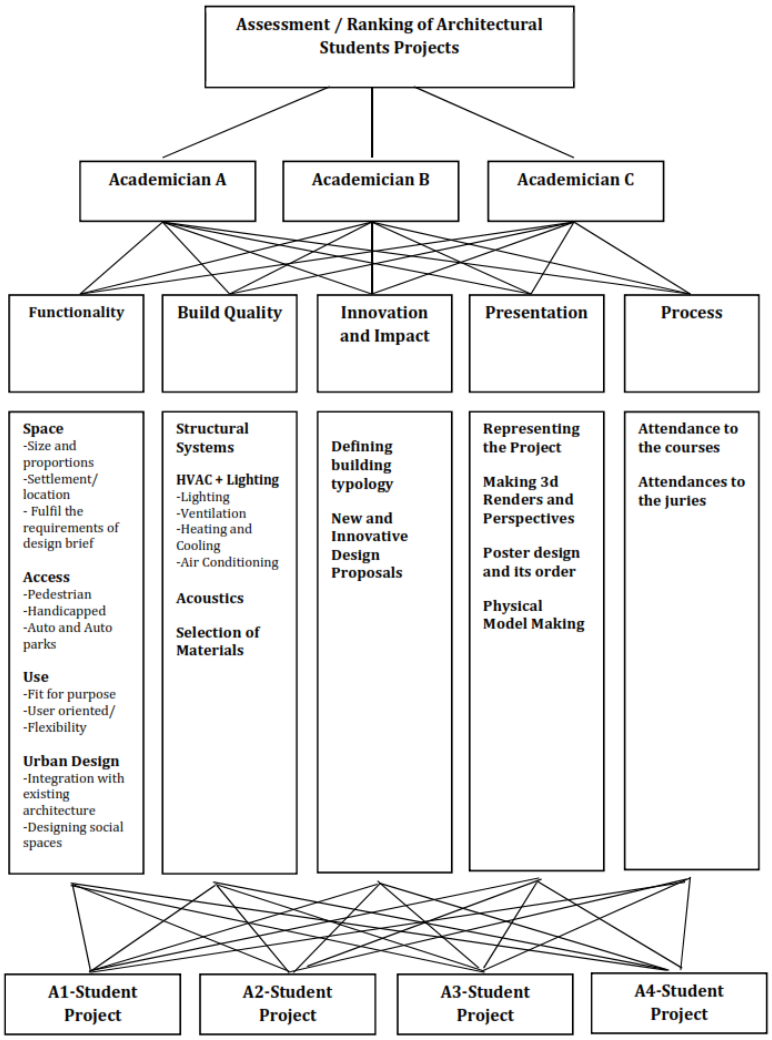


Figure 4. AHP based assessment hierarchy

Modelling

Based on how the AHP hierarchy pairwise matrices are structured, a questionnaire was made ready for the decision makers using a total of 38 pairwise comparison matrices; 1 for the main criteria, 5 for the sub-criteria, 27 for the subsets of sub-criteria, and 1 for the alternatives. The questionnaire was utilized by the decision makers individually. As part of the survey study; a sample questionnaire prepared for evaluation of the main criteria is provided in Table 5.

The questionnaire was conducted with the contribution of each decision maker and their judgments were entered in to the Expert-choice software in which priority vectors with consistency ratios were calculated.

Table 5. Questionnaire sample for AHP assessment

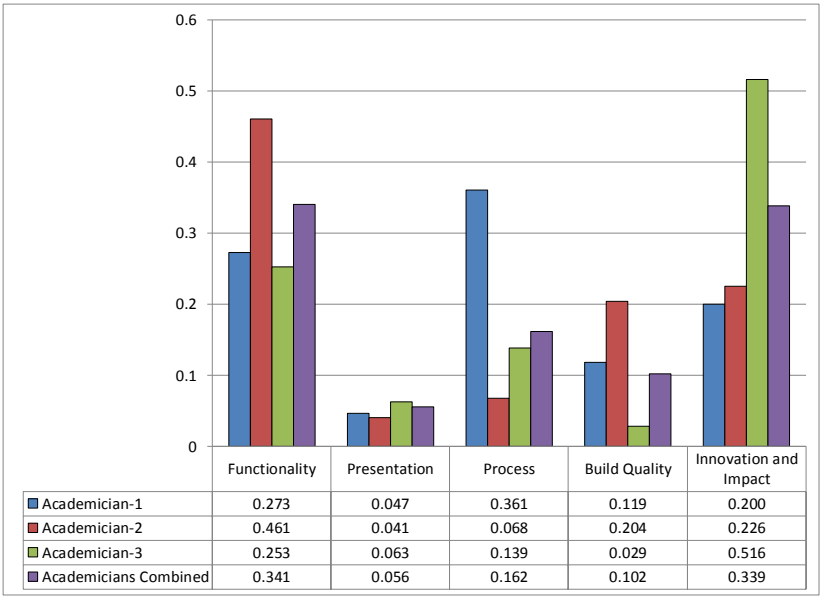
Functionality	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	**Build Quality**
Functionality	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	**Innovation and Impact**
Functionality	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	**Presentation**
Functionality	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	**Process**
Build Quality	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	**Innovation and Impact**
Build Quality	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	**Presentation**
Build Quality	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	**Process**
Innovation and Impact	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	**Presentation**
Innovation and Impact	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	**Process**
Presentation	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	**Process**

Findings

Studio tutors were asked to review the projects individually according to the main and sub-criteria with expert-choice (11.5 academic version) software. With the software used, based on their individual and group evaluations of the academic group, priorities of criterion can be ranked according to the most widely disagreed or the closest agreed. Throughout the evaluation process, the academicians were simply identified as Academician-1, Academician-2 and Academician-3 to maintain the objectivity of the research.

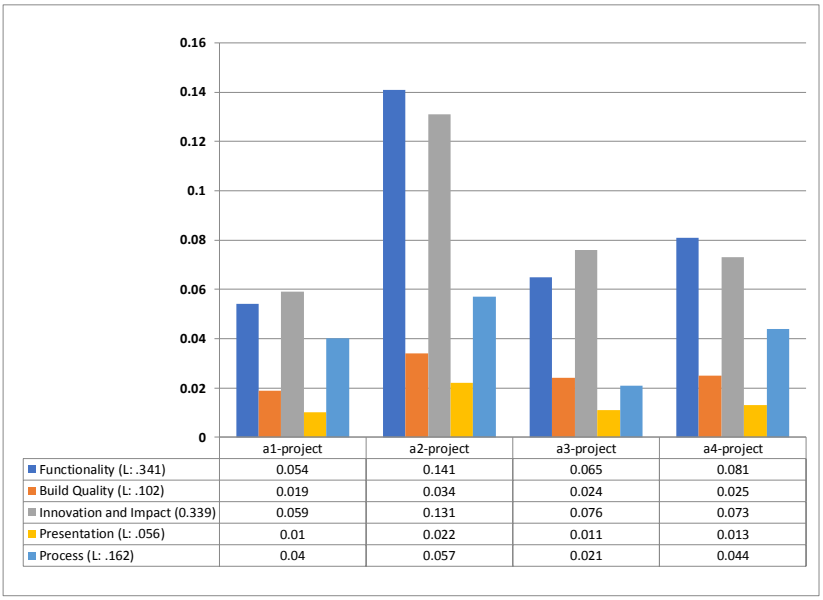
In the first stage, based on the main criteria, individual and combined priorities of three scholars were evaluated and graphically represented (figure 5). As indicated in Figure 5, according to evaluation of scholars, the degree of priority of the main criteria are shown as follows: Functionality (%34,1) Innovation and Impact (%33,9), Process (%16,2), Build Quality (%10,2), Presentation (%0,56). The most important main criterion is the Functionality, while the Presentation is considered the least important. The total consistency rate was recorded as 0,04 and the results were deemed to be consistent since they were below 0,1.

DOI: 10.15320/ICONARP.2018.53 – E-ISSN: 2147-9380



	Functionality	Presentation	Process	Build Quality	Innovation and Impact
Academician-1	0.273	0.047	0.361	0.119	0.200
Academician-2	0.461	0.041	0.068	0.204	0.226
Academician-3	0.253	0.063	0.139	0.029	0.516
Academicians Combined	0.341	0.056	0.162	0.102	0.339

Figure 5. Priorities of academics for main criterion



	a1-project	a2-project	a3-project	a4-project
Functionality (L: .341)	0.054	0.141	0.065	0.081
Build Quality (L: .102)	0.019	0.034	0.024	0.025
Innovation and Impact (0.339)	0.059	0.131	0.076	0.073
Presentation (L: .056)	0.01	0.022	0.011	0.013
Process (L: .162)	0.04	0.057	0.021	0.044

Figure 6. Distribution of priorities of main criterion of academicians for project alternatives

The most important main criterion for the academician-1 was the Process, Functionality for the academician-2, and Innovation and Impact for the academician-3. According to the combined priorities of the scholars; it is seen that different percentages are obtained for the main criteria, Innovation and Impact, and Process, while the priority ratios for the main criterion for Presentation are close to each other (Figure 5). Figure 6 shows these percentages distributed to the student projects.

The percentages of the priorities of sub-criteria as well as the main criteria are shown in Figure 7. According to the combined evaluation of academicians; New and Innovative Design Proposals (27,5%) Use (13,2%) and Space (12,8%) are the most noticeable sub-criterion (Figure 7). When the individual approaches of academicians are investigated, Attendance to Juries of Process, User Oriented Use and Fit for Purpose of Space appear to have distinct priority values.

Attendance to Juries, Fit for Purpose and the User Oriented appear to be the sub-criterion that the academicians have the most differences from the group combined priorities compared to the individual ones. Sub-criteria of New and Innovative Design Proposals is clearly above the group mean priority of the other sub-criteria (Figure 7).

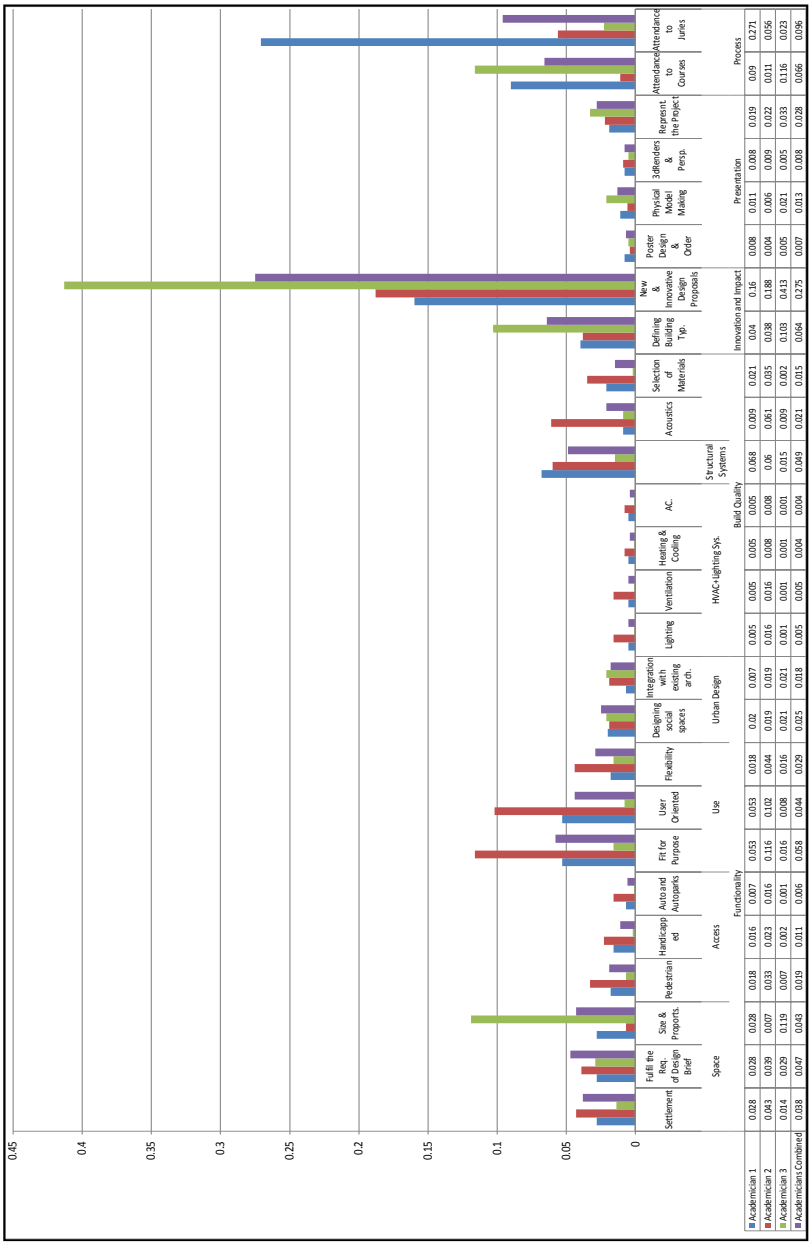
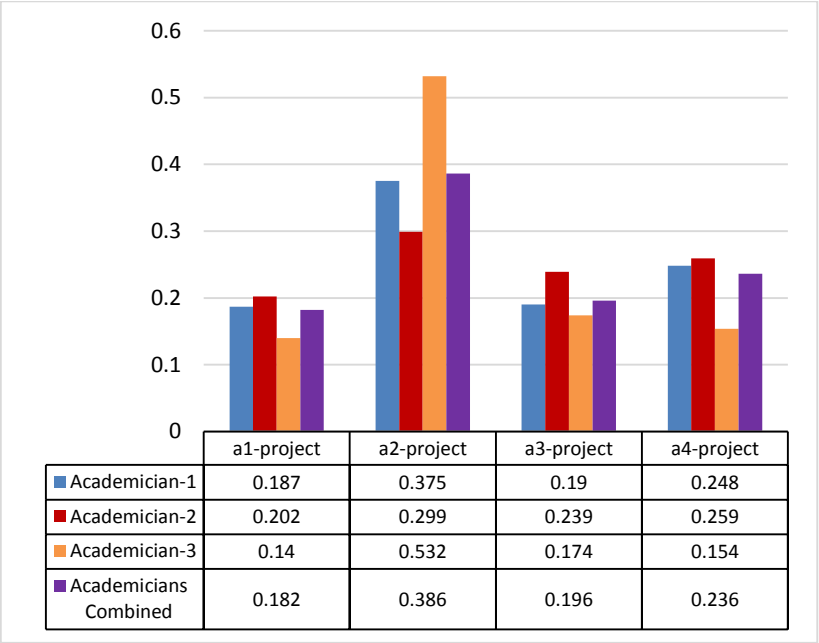


Figure 7. Priorities of academicians for main and sub criterion

DOI: 10.15320/ICONARP.2018.53 – E-ISSN: 2147-9380

When the project alternatives were evaluated, considering the priority ratios in relation to the above mentioned main and sub criterion, the A-2 student project was found to be more successful than the other projects according to the priority order of the determined criteria (Figure 7). According to the evaluations of the academicians, the student projects are listed as A-2 (%38,6), A-4 (%23,6), A-3 (%19,6) and A-1 (%18,2) respectively (Figure 8). When individual assessments of all 3 academicians are analysed, it is seen that all the academicians with different priorities are putting forward the A-2 project compared to the others.



	a1-project	a2-project	a3-project	a4-project
Academician-1	0.187	0.375	0.19	0.248
Academician-2	0.202	0.299	0.239	0.259
Academician-3	0.14	0.532	0.174	0.154
Academicians Combined	0.182	0.386	0.196	0.236

Figure 8. Priorities of academicians for students' projects

The priority table for each sub-criterion based on evaluation of student projects, is given in Figure 9. Based on sub-criteria assessments, it is observed that project proposals are limited with design of HVAC + Lighting systems, whereas, higher priority percentages of the sub-criterion of functionality reveals clear issues in the process of designing the projects.

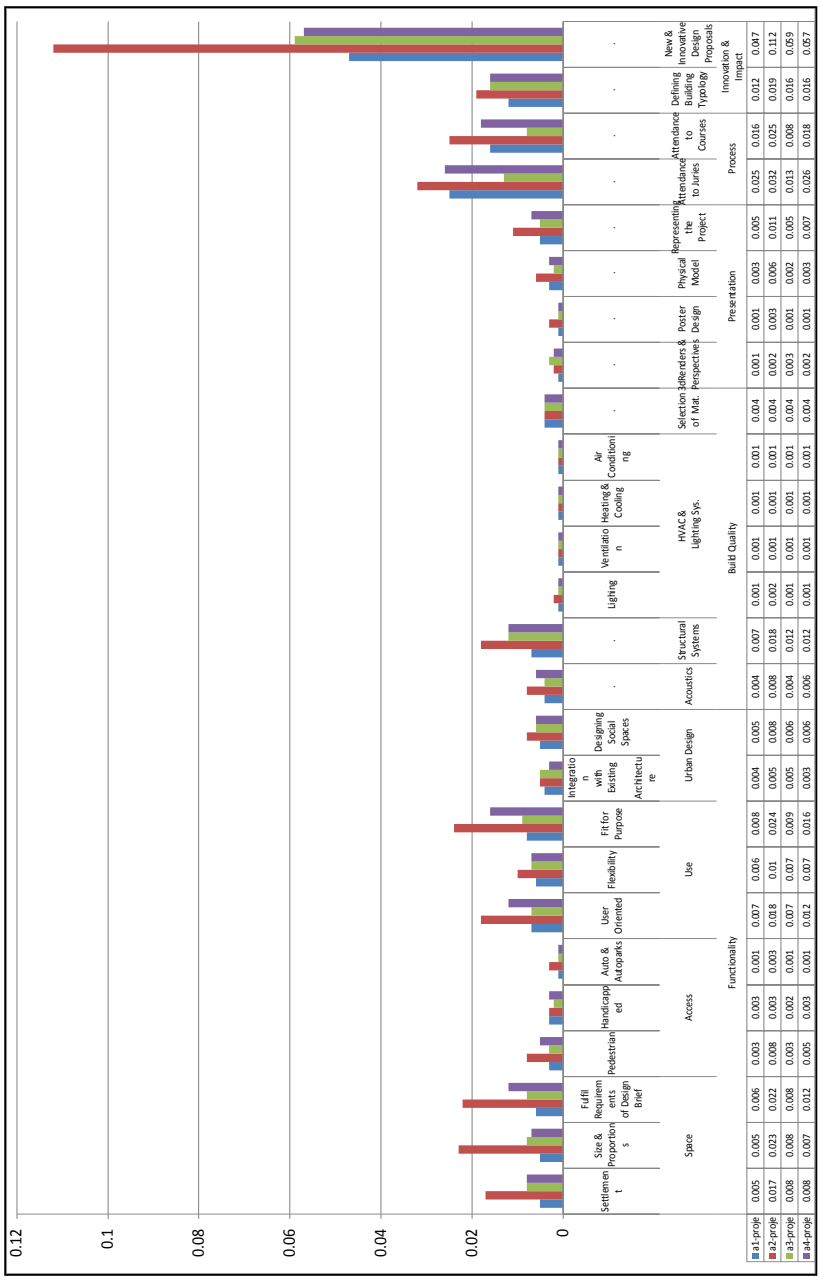
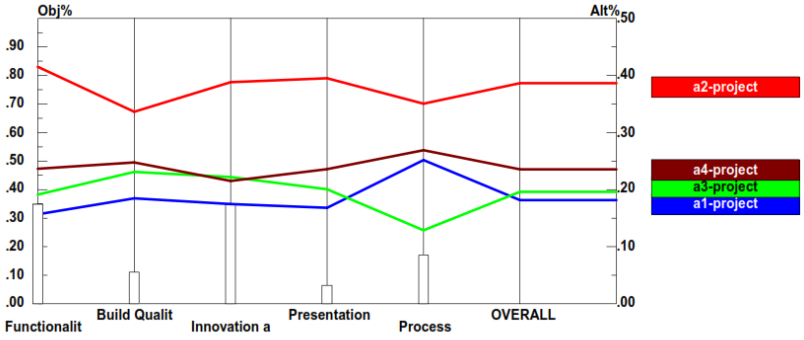


Figure 9. Assessment of students projects based on sub-criterion

Based on the proposed AHP-based approach, comparative analyses of alternative projects with respect to defined criteria and sub-criteria can be evaluated in detail individually and as a group (Figure 9). Student project A2 lead other projects based on evaluations results of many of the sub-criterion. In addition, the project seemed to also lead in the sub criterion of Functionality such as, Fulfil Requirements of Design Brief, Fit for Purpose, User Oriented, Space Size and Proportions. The A2 project stood above other projects with a big difference on the sub-criteria of New and Innovative Design. In addition to this, according to the evaluations of the academicians, the decision thresholds of the project alternatives were determined in the context of the main criteria (Figure 10). Project A2 was deemed superior to other projects in

DOI: 10.15320/ICONARP.2018.53 – E-ISSN: 2147-9380

terms of all main criteria. A4 project ranked second after A2 project, lead other projects based on main criteria except New and Innovative Design (Figure 10).



Functionalit	Functionality
Build Qualit	Build Quality
Innovation a	Innovation and Impact
Presentation	Presentation
Process	Process

Figure 10. Threshold analysis of students projects based on main criterion

Priority percentages of main criterion of the projects were compared based on defined threshold levels. With the software used, what if scenarios were applied to follow the change in the priorities in selecting projects based on different threshold levels (Figure 11).

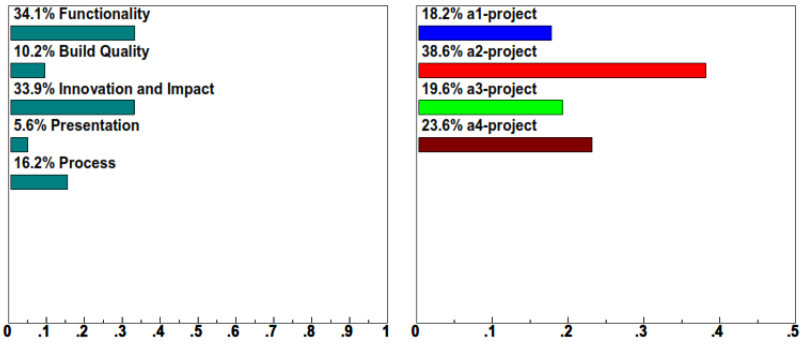


Figure 11. Assessment of students projects based on main criterion

When desirable, the change in the ranking of the projects for different priority and status were examined by changing the weight ratios of the main criteria within the total (Figure 11). This approach can also make a one-to-one comparative analysis of alternative projects within the context of the main criteria according to participants' priorities. With the help of the software, alternative projects were evaluated against each other on five main criteria. Sample graphics of direct comparative evaluation of projects based on the main criterion are shown in Figure 12, Figure 13, Figure 14.

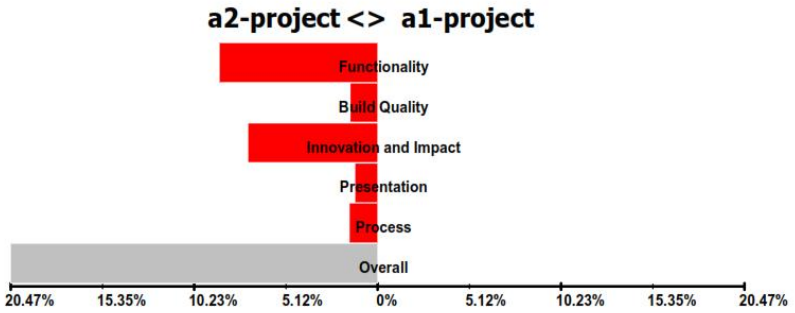


Figure 12. Comparison of student projects A2 vs A1 based on main criterion

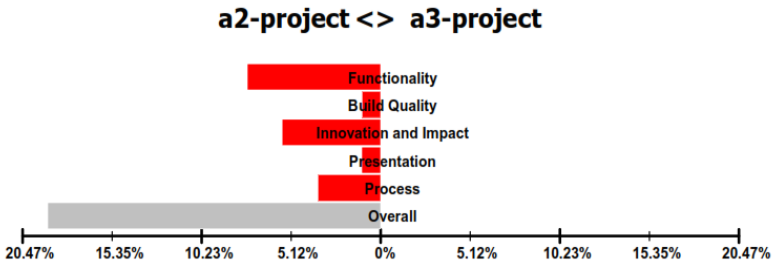


Figure 13. Comparison of student projects A2 vs A3 based on main criterion

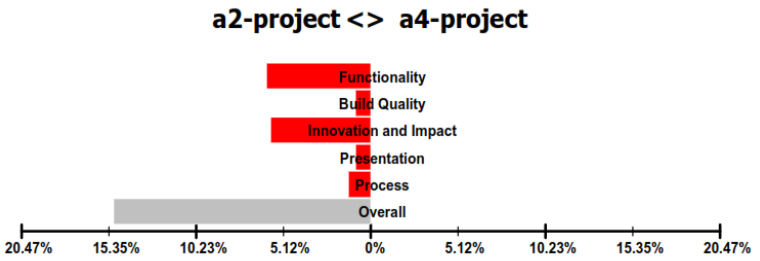


Figure 14. Comparison of student projects A2 vs A4 based on main criterion

DISCUSSION

Outcomes Of The Case Study

The proposed AHP-based approach allows for modification or redefinition of criteria and sub-criteria for each project, offering comparative individual and group evaluation of project alternatives. The case study results reveal that participants' criteria priorities vary each other, however, the approach can identify these differences and reveal the threshold levels of change. This plays an important role in bringing about differences in evaluating the architectural projects where subjective evaluation is often made.

It is evident that the proposed AHP-based approach overlaps with the results of the traditional assessment. The results of the student project rankings in the traditional system are very similar to the student project rankings with the AHP-based approach.

DOI: 10.15320/ICONARP.2018.53 – E-ISSN: 2147-9380

Competence levels, incomplete knowledge and underdeveloped abilities of the students assessed by the approach can be identified and consequently, concrete data can be presented for development of training/education strategies. Threshold levels can be quantified by sensitivity analysis. Accordingly, student projects that fall below the thresholds level, which can be defined as competence level, may possibly be deemed inadequate.

Besides its positive features, this approach, does not provide sufficient data for selection of alternatives based on criterion such as lighting, energy use, ventilation, heating, cooling and air conditioning which are rarely identified or included in the initial stages of design. In the development process of the projects, it was determined that these aspects were not studied or emphasized and therefore the approach could not produce distinctive information in these aspects of design.

Feedback from The Contributing Academics and Arguments

Based on the results obtained, participating academicians were asked their opinions about the outcomes of the applied approach. The results of the evaluation were reported as accurate, reliable and consistent. It should be acknowledged that this evaluation process differs from the existing/traditional one, and that the results were successful in terms of evaluating a limited number of student projects expressing individual and group considerations, but the evaluation process is likely to be tedious as the number of projects to be evaluated increases. It was particularly appreciated that, whether individual or group assessments, this approach can evaluate projects comparatively and can reveal both their positive and negative aspects. Obtaining the what if analyses was also found to be positive.

Regarding evaluation of the projects: determining the distinctions based on comparative evaluation and ranking the projects was found more valuable than the numerical based percentage evaluation results. It should be noted that there may be some margin of error with respect to the mathematical system in the total evaluation, so it may be useful to review some benchmarking results after the evaluation. It has been found beneficial for academicians to set their own evaluation priorities and to compare them with other academicians. In addition, validating the project results comparatively and concretely is also found to be useful in providing empirical support for the rankings.

In addition to the results of the project ranking success, overlap with the evaluation of the traditional system; numerical evaluation, comparative analysis and successful findings of the

study, the proposed approach has been found to be innovative. The proposed method presents a high potential to be adaptive to the architectural design studio evaluation system.

Discussion

This study investigated the use of the AHP-based approach in student architectural project evaluations. Problems in the traditional evaluation system such as, not being able to clearly define the evaluation criteria, importance of the criterion relatively to each other for final decision, and to reach a common decision in the group evaluation process can be eliminated with this proposed approach. The ability of this approach to be used for individual and group evaluation, to redefine criteria and sub-criteria for each different project work, to report results easily with the support of the software and the ability to make comparative evaluations of participants both common and different judgments on projects can be determined as outstanding advantages of the approach.

In the traditional methods of architectural evaluation, it is essential that assessors make assessments in terms of priorities and benchmarks that they deem applicable to the whole of the project design process. The outputs of the individual evaluation results are terms such as, good, bad, successful, unsuccessful or resulting grades based on certain numerical values. In group evaluations such as jury systems, it is not easy for each evaluation to obtain a common result. The competencies of jury members for expressing their priorities to the other jury members and the project designer during the evaluation process are also questions of debate. The most important outputs expected from an evaluation system are: to identify the strengths and weaknesses of the projects, determining the positive and negative aspects of the project comparatively with the other projects, to provide concrete, accountable, numerically comparable and consistent results. While traditional methods can be limited in this respect, the proposed AHP-based approach emerges as an evaluation approach that can cover the aforementioned outputs and provide the broadest possible feedback. Contribution to these discussions were made by comparing the results of the evaluation using the traditional system to the evaluation with the AHP-based approach. It is evident that ranking of the projects in both systems are the very similar, however information from analysis that the AHP-based approach provided from the reporting and evaluation process yielded useful feedback. The added value of this approach can be quantified as: i)adaptability, ii)the ability to add or remove more evaluators, iii) the ease of sub clustering among the

DOI: 10.15320/ICONARP.2018.53 – E-ISSN: 2147-9380

evaluators, iv)ability to restructure the assessment hierarchy based on project typology and evaluators determination.

While the proposed approach successfully assesses a limited number of projects, as the number of projects increases, it may be necessary for the evaluators to spend more time and energy, which will inevitably become tedious and mentally taxing. In this context, the AHP-based approach allows limited number of projects to be evaluated simultaneously. If the number of projects to be evaluated is high, it is likely that a singular/separated evaluation of each project will be a more accurate approach depending on the upper and lower threshold levels that can be defined by the evaluators. Evaluation based on these threshold levels for each project can also be visually reported with graphics. Evaluation taking into account of sensitivity analysis is also possible with the software used in this study or with other software that can be used for AHP evaluation. In addition to all this, what if analysis can also be extended to cover all criteria and sub-criteria.

Considering the limited knowledge of mathematics and AHP of the participants, it is deemed useful to integrate and adapt the existing or different software of AHP for assessment processes. It is recommended to transfer numerical values to evaluation analyses with graphical comparison tables for clear reporting of the results. The AHP-based approach will allow these expectations to be met, including the accuracy, reliability, consistency and transparency that any valid assessment requires.

Since they have been educated in the traditional assessment processes and are accustomed to being evaluated and to evaluate with traditional systems for years; the architectural academic community may not easily adopt this approach and replace it with current assessment systems in the short term. It should also be noted that those who wish to apply this approach may have to go through preliminary education and training due to the mathematical base and systems used.

It may be considered that the evaluation of AHP in the linear direction may cause problems in the architectural evaluation process since architectural design is not regarded as a simple sum of values that can be evaluated in a linear direction with equal proportion. Considering this, the AHP-based approach should be used for evaluation and ranking, based on criteria, to establish project superiority and incompleteness compared to other alternatives, rather than using priority percentages for comparison. With this study, it is evident that the projects ranked

with this approach (comparative analysis-based) can provide more descriptive results than those ranked in the traditional system which is based on numerical values.

CONCLUSION

One observation is that the applied AHP-based approach overlaps with the evaluation results of the traditional system based on ranking project alternatives according to their success. In this sense it was supported with case the study that this approach is suitable for ranking project alternatives and facilitates both individual and group evaluations and can present the results quickly and reliably which was also confirmed by academicians participating in the evaluation process. Moreover, the approach has also been found to be successful in areas in which traditional assessment systems are limited such as establishing clear definition of criteria and sub-criteria through the evaluation process, evaluation of alternative projects accordingly, determination of priorities of evaluation criteria, comparative analysis and consistency control.

The implementation of this approach also allows for evaluating project alternatives as pass or fail/successful or unsuccessful based on the threshold levels determined by tutors. Additionally, it is clear that the approach has potential to be developed not only for evaluation in architectural education but also for architectural project competitions. Moreover, the approach can be adapted to be used as a checklist for checking compliances with the standards determined by the regulated outcomes. Although not implemented within this case study, numerical or percentage threshold levels can be assigned to the evaluation criteria requirements of the projects to establish competency levels. In all these processes, comparative analysis of the projects can be done in terms of all defined criteria and sub-criteria. In addition, with the software used in this approach, it is possible to transfer outputs of what if analyses with graphics to compare the advantages/disadvantages of project alternatives.

This approach identifies the underlying fundamental dynamics of the participants in the group decision making process and presents useful analyses to establish a consensus. Beyond this, the approach has potential to be used to identify projects that fall below the threshold levels set, to identify missing fundamentals in the education of students, and to generate feedback for the education system. In addition to the many benefits of the proposed AHP-based approach for architectural education, there is also the negative issue of an increased length of evaluation time that may arise as the number of students assessed increases, and

DOI: 10.15320/ICONARP.2018.53 – E-ISSN: 2147-9380

the tediousness of the task. Based on all these findings, however, it is concluded that the AHP-based approach has a high potential for both increased competence and development for evaluating architectural projects, along with their alternatives, especially within architectural design education and architectural design competitions.

SYMBOLS

λmax :Eigen Value of AHP Decision Matrix
A :Decision Matrix
AHP :Analytic Hierarchy Process
CI :Consistency Index
CR :Consistency Ratio
RI :Random Consistency Index
w : Eigen Vector

Acknowledgment
I would like to thank the following scholars: Inst. Oktay Veral, Inst. Yurdanur Sepkin and Inst. Aysel Veral who contributed to the execution of this work and for their interest and support. I would also like to thank the students of Çankaya University Architecture Department who graduated in the 2014-2015 academic year whose projects were used for this study. And finally, I would like to thank Prof. Dr. Y. İlker Topçu for his suggestions and contributions towards finalizing this research.

REFERENCES

Adamović, P., Maja, C.D., Nahod, M. (2008). Expert Choice Model For Choosing Appropriate Trenchless Method For Pipe Laying. Journal of Expert Choice, p. 1-12.

Akadiri, P.O., Olomolaiye P.O., Chinyio E.A. (2013). Multi-Criteria Evaluation Model For The Selection Of Sustainable Materials For Building Projects. Automation in Construction, 30, p. 113-125.

Aksakal, E., Dagdeviren, M., (2015). Talent Management Based Personnel Assignment Model And Solution Proposal. Journal of the Faculty of Engineering and Architecture of Gazi University, 30(2), p. 249-262.

Alagbe, O. A., Oluwatayo, A. A., Aderonmu, P. A., & Alalade, G. M. (2015). Difference in Grading Parameters in Architectural Schools And its Impact On the Competency Rating of Future Professionals. Frontiers of Architectural Research, 4(3), p. 230-236.

Alessio, I., Ashraf, L. (2009). Analytic Hierarchy Process and Expert Choice: Benefits and Limitations. OR Insight, 22(4), p. 201–220.

Al-Harbi, K.M.A.S. (2001). Application Of The AHP in Project Management. International Journal Of Project Management, 19(1), p. 19-27.

Ali, H.H., Al Nsairat, S.F. (2009). Developing a Green Building Assessment Tool For Developing Countries–Case of Jordan. Building and Environment, 44(5), p. 1053-1064.

Aminbakhsh, S., Gündüz, M., Sönmez, R., (2013). Safety Risk Assessment Using Analytic Hierarchy Process (AHP) During Planning and Budgeting Construction Projects. Journal of Safety Research, 46, p. 99-105.

Arroyo, P., Tommelein, I. D., & Ballard, G. (2014). Comparing AHP and CBA as decision methods to resolve the choosing problem in detailed design. Journal of construction engineering and management, 141(1), 04014063.

Bitarafan, M., Hosseini, S. B., Abazarlou, S., Mahmoudzadeh, A. (2015). Selecting the optimal composition of architectural forms from the perspective of civil defense using AHP and IHWP methods, Architectural Engineering and Design Management, 11:2, 137-148,

Çıkış, Ş., Çil, E. (2009). Problematization Of Assessment İn The Architectural Design Education: First Year As A Case Study. In Procedia - Social and Behavioral Sciences, Volume 1, Issue 1, p. 2103-2110.

Crooks, T. J., Kane, M. T., Cohen, A. S. (1996). Threats to the Valid Use of Assessments. Assessment in Education: Principles. Policy & Practice, 3(3), p.265-286.

Davis, D. (1997). Design As A Process The Project Development Process. Annual Conference, Milwaukee, Wisconsin.

Dickson, M. (2004). *Achieving Quality In Building Design By Intention, Designing Better Buildings*. Spon Press, London, UK.

Gandhi, S., Mangla, S.K., Kumar, P., Kumar, D. (2016). A Combined Approach Using Ahp And Dematel For Evaluating Success Factors in Implementation Of Green Supply Chain Management in Indian Manufacturing Industries. International Journal of Logistics Research and Applications, 19(6), p. 537-561.

Harputlugil T., Gültekin, A.T., Prins, M., Topcu, Y.I., (2014). Architectural Design Quality Assessment Based On Analytic Hierarchy Process: A Case Study. METU Journal of the Faculty of Architecture, 31(2), p.139-161.

Harputlugil, T., Prins, M., Gultekin, A.T., Topçu, İ. (2011). Conceptual Framework For Potential Implementations Of Multi Criteria Decision Making (MCDM) Methods For Design Quality Assessment. CIB International Conference of Management and Innovation for Sustainable Build Environment, Amsterdam, The Netherlands.

Hassanpour, B., Ani, A. I. C., (2015). Transparent Assessment Model In Architecture Design Studio: Eastern Mediterranean University As Case Study. Open House International , 40:2, p.37-43.

Heravi, G., Fathi, M., Faeghi, S. (2017). Multi-Criteria Group Decision-Making Method For Optimal Selection Of Sustainable İndustrial Building Options Focused On

DOI: 10.15320/ICONARP.2018.53 – E-ISSN: 2147-9380

Petrochemical Projects. Journal of Cleaner Production, 142, p. 2999-3013.

Hickman, R. (2007). Whippet-Fancying and Other Vices: Re-Evaluating Assessment in Art and Design. The Problem of Assessment in Art and Design. Chicago: Intellect, p.77-88.

Jato-Espino, D., Castillo-Lopez, E., Rodriguez-Hernandez J., Canteras-Jordana J.C. (2014). A Review Of Application Of Multi-Criteria Decision Making Methods in Construction. Automation in Construction, 45, p. 151-162.

Kalaycı, P. D. (2016). *Etkileşimden Bütünleşmeye- Bir mimari Tasarım Stüdyosu Pratiğinin Anatomisi*, Nobel Yayıncılık, Ankara, Türkiye.

Kuruüzüm, A., & Atsan, N. (2001). Analitik Hiyerarşi Yöntemi Ve İşletmecilik Alanındaki Uygulamaları. Akdeniz University Faculty of Economics & Administrative Sciences Faculty Journal, 1(1), p. 83-105.

Lai, Y.T., Wang, W.C., Wang, H.H. (2008). AHP-And Simulation-Based Budget Determination Procedure For Public Building Construction Projects", Automation in Construction, 17(5), p. 623-632.

Lee, G.K., Chan, E.H. (2008). The Analytic Hierarchy Process (AHP) Approach For Assesment of Urban Renewal Proposals. Social Indicators Research, 89(1), p. 155-168.

Markelj, J., Kitek Kuzman, M., Grošelj, P., Zbašnik-Senegačnik, M. (2014). A Simplified Method For Evaluating Building Sustainability in The Early Design Phase for Architects. Sustainability, 6(12), p. 8775-8795.

Mela, K., Tiainen, T., Heinisuo, M. (2012). Comparative Study Of Multiple Criteria Decision Making Methods For Building Design. Advanced Engineering Informatics, 26(4), p. 716-726.

Mulliner, E., Malys, N., Maliene, V. (2016). Comparative Analysis Of MCDM Methods For The Assessment Of Sustainable Housing Affordability. Omega, 59, p.146-156.

Nahid, M., Gholam, R.A. (2010). Railway Station Site Selection Using Analytical Hierarchy Process And Data Envelopment Analysis. Computers & Industrial Engineering, 59(1), p. 107-114.

Nazidizaji, S., Tomé, A., Regateiro, F. (2014). Search For Design Intelligence: A Field Study On The Role Of Emotional İntelligence In Architectural Design Studios. In Frontiers of Architectural Research, Volume 3, Issue 4, p.413-423.

Omkarprasad, S.V., Sushil, K. (2006). Analytic Hierarchy Process: An Overview of Applications. European Journal of Operational Research, 169 (1), p. 1–29.

Özcan, T., Çelebi, N., Esnaf, Ş., (2011). Comparative Analysis of Multi-Criteria Decision Making Methodologies and Implementation of a Warehouse Location Selection Problem. Expert Systems with Applications, 38(8), p. 9773-9779.

Palabiyik, S., Colakoglu, B. (2012). Mimari Tasarim Surecinde Son Urunun Degerlendirilmesi: Bir Bulanik Karar Verme Modeli. Megaron Architecture, 7(3), p.191-207.

Pandav, C., Sachin, K.C., Kiran, M.J, Basanta, M.S., Prabin, K. (2016). Application of an Analytic Hierarchy Process (AHP) in the GIS Interface For Suitable Fire Site Selection: A Case Study from Kathmandu Metropolitan City, Nepal. Socio-Economic Planning Sciences, 53, p. 60-71.

Ribeiro, R. A., Moreira, A. M., Van, den Broek P., Pimentel, A. (2011). Hybrid Assessment Method For Software Engineering Decisions. Decision Support Systems, 51(1), p. 208-219.

Saaty, T.L. (1980). *The Analytic Hierarchy Process*, McGraw-Hill International, New York, U.S.A.

Saaty, T. L. (1986). Axiomatic Foundation Of The Analytic Hierarchy Process. Management Science, 32(7), p. 841-855.

Saaty, T.L. (1990). *The Analytic Hierarchy Process*, RWS Publications, Pittsburgh, U.S.A.

Saaty, T. L. (1994). Highlights and Critical Points in The Theory And Application Of The Analytic Hierarchy Process. European Journal of Operational Research, 74(3), p. 426-447.

Sebastian, R. (2007). *Managing Collaborative Design*. Eburon, Delft, The Netherlands.

Si, J., Marjanovic-Halburd, L., Nasiri, F., Bell, S. (2016). Assessment Of Building-Integrated Green Technologies: A Review And Case Study On Applications Of Multi-Criteria Decision Making (MCDM) Method. Sustainable Cities and Society, 27, p.106-115.

Simon, H. A. (1969). *The Sciences of the Artificial*. M.I.T. Press, Cambridge, U.S.A.

Timor, M. (2011). *Analitik Hiyerarşi Prosesi*. Türkmen Kitabevi, Türkiye.

Triantaphyllou, E. (2000). *Multi Criteria Decision Making Methods: A Comparative Study*. Kluwer Academic Publisher, London, UK.

Triantaphyllou, E., Mann, S.H. (1995). Using The Analytic Hierarchy Process For Decision Making in Engineering Applications: Some Challenges. International Journal of Industrial Engineering: Applications and Practices, 2(1), p. 35-44.

Tsai, W.H., Lin, S.J., Lee, Y.F., Chang, Y.C., Hsu, J.L. (2013). Construction Method Selection For Green Building Projects To Improve Environmental Sustainability By Using An MCDM Approach. Journal of Environmental Planning and Management, 56(10), p. 1487-1510.

Utaberta, N., Hassanpour, B., Bahar, M. A., & Ani, A. I. C. (2013). A Comprehensive Learning Of Architecture Education: Understanding Critique Session As Learning Process And Criteria-Based Assessment in The Architecture Design Studio. Procedia-Social and Behavioral Sciences, 102, p. 21-32.

Webster, H. (2006). Power, Freedom and Resistance: Excavating the Design Jury. Journal of Art and Design Education, vol.25, no.3, p. 286-296.

DOI: 10.15320/ICONARP.2018.53 – E-ISSN: 2147-9380

Williams, A., Ostwald M., Askland H.H. (2010). Assessing Creativity in the Context of Architectural Design Education. Proceedings DRS2010, Montreal, Canada.

Resume

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Research Article

ICONARP
International Journal of Architecture & Planning
Received 08 Oct 2018; Accepted 14 Nov 2018
Volume 6, Issue 2, pp: 246-273/Published 28 December 2018
DOI: 10.15320/ICONARP.2018.54–E-ISSN: 2147-9380

ICONARP

Opportunities of Geometric Documentation of Historic Buildings with Terrestrial Laser Scanner, Examples from Aksaray/Turkey

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Abstract

Detailed and accurate measurements can be done by using laser scanning technology compared to conventional methods in documentation of cultural heritage. Accuracy of measured data directly affects the protection of historical buildings and decision-making process. By processing laser scanning data, multipurpose 3d models can be obtained and all work and results can be shared via internet. Moreover, a detailed analysis of the building can be made with this data and it can be transferred to all related engineering and archeological fields. Despite the advantages of this technology, it has not been used widely yet in production of architectural projects. High cost of equipment and data processing software have been seen as main obstacles for widespread using of this technology. As well as, lack of integration of this topic into architectural education and less number of researcher studying in this field restrict the use of laser scanner. In this paper, evaluations were made in order to define the possibilities by using laser scanner technologies in process of restoration projects of which number is getting increased in last decades in Turkey. Positive and negative aspects of technology observed in survey process were given

Keywords: Geometric documentation, terrestrial laser scanner (TLS), architectural preservation, restoration project

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with a case study, a small traditional house in province of Aksaray and surroundings.

INTRODUCTION

The importance of cultural heritage documentation has been recognized by the time and today there is an increasing demand for documentation of cultural heritage. This demand has prompted international organizations for creating a guideline to describe the standards for documentation. They underline the importance of cultural heritage documentation for the purposes of identification, conservation, management, assessment, interpretation, archiving, publication and research. Important ones include the International Council on Monuments and Sites, ICOMOS (2005) and UNESCO, including the Venice Charter, The International Charter for the Conservation and Restoration of Monuments and Sites, 1964 (Amans et. al., 2013; Yilmaz et. al., 2007; Parias, 2009).

Even the international organizations, charters and declarations emphasize the importance of documentation, not all of them specifically defines the geometric documentation. Despite the attention of these organizations, there are still cultural sites without sufficient documentation. According to LeBlanc *et al.,* 2005, only a third of the eight hundred sites on the World Heritage List are adequately documented in terms of geometric documentation (Amans et. al., 2013).

Through the remarkable technological advances in last years, the collection of the metric data for geometric documentation of a monument is facilitated. So several techniques are being used for geometric data acquisition today. Among these techniques terrestrial laser scanning has become very popular considering its advantages. Since its results also can be combined with photogrammetry, it produces metric documents and data for monuments which is a good contribution for monitoring, conservation and documentation of the monuments.

This paper suggest a way of documentation by using 3D laser scanning technology and describes the steps carried out for geometric documentation of a project, a Vernacular house in Aksaray, Turkey. The field work and geometric documentation process are described in detail with practical difficulties. The final result is evaluated for the performance of terrestrial laser scanning for geometric documentation of cultural heritage projects, the importance of it for the quality of the projects and its usefulness in this process.

DOI: 10.15320/ICONARP.2018.54 – E-ISSN: 2147-9380

GEOMETRIC DOCUMENTATION OF CULTURAL HERITAGE

Documentation is a complex process including stages of data acquisition, interpretation, and production. It is the first and the most important step before starting any conservation project. As short definition, documentation is the recording of the existent state and surroundings of the building by reports, drawings and photographs (Yilmaz et. al., 2007).
Heritage documentation is defined by CIPA RecorDiM in 2007 as:

"Heritage Documentation is a continuous process enabling the monitoring, maintenance and understanding needed for conservation by the supply of appropriate and timely information. Documentation is both the product and action of meeting the information needs of heritage management. It makes available a range of tangible and intangible resources, such as metric, narrative, thematic and societal records of cultural heritage" (Santana Quintero et. al., 2008).

As a part of general heritage documentation, apart from the others (architectural, historical, bibliographic documentation etc.), geometric documentation aims to record the present of monuments, as they have been shaped in the course of time (Stathopoulou et. al., 2010). It includes a series of measurements such as vector drawings, raster images, 3D visualizations etc. and metric data acquisition. It mainly aims to define the shape, size and the position of the object in 3D space (Sofocleous, 2006). The geometric documentation of a monument may be defined as (UNECCO, 1972).

- The action of acquiring, processing, presenting and recording the necessary data for the determination of the position and the actual existing form, shape and size of a monument in the three dimensional space at a particular given moment in time.
- The geometric documentation records the present of the monuments, as this has been shaped in the course of time and is the necessary background for the studies of their past, as well as the studies for their future.

The products of geometric documentation have usually metric properties with a series of data, usually at large scales, which fully document the geometric and other properties of the monument in 2D (horizontal and vertical) and in 3D. These produced 3D models can be combined with photogrammetric procedures, such as the production of orthophotos, cross-sections, top and elevation plans, represent the complexity of the monuments in standard metric documents (Stathopoulou et. al., 2010). However the most important properties of these products are their scale and accuracy. They should be carefully defined before any work since

the scale of the product implies the level of detail (Sofocleous, 2006; Georgopoulos, 2004]).

Geometric Documentation Techniques for Cultural Heritage

A general challenge in heritage documentation is try to get information with an unsuitable technique. This challenge depends on mainly two reasons; lack of knowledge of available techniques and demand of conservator to use the techniques that he can use alone. If there is not enough knowledge about any technique, it is not preferred to use it even it is the suitable one. Moreover, it is observed that conservators mostly prefer the technique they know well and they can work more alone. Whereas, here, the first step should be understanding the limits of documentation and the utilities of metric technique which helps to balance the information needs of projects with appropriate methods, before starting to documentation (Santana Quintero et. al., 2008).

The main techniques for digitization and geometric documentation of historic buildings and sites can be classified mainly in four categories regarding their methodology. These are:

- *Empirical techniques, direct method or hand measurements,*
- *Standard topographic techniques,*
- *Close Range Photogrammetry,*
- *Terrestrial laser scanning* (Lysandrou and Agapiou, 2010; Arias et. al., 2005; Andrews et. al., 2013).

Summary Table of Metric Survey Techniques				
Technique	**Product**		**Application**	**Constraints in use**
Direct Method	2-D	Key detail records, explanatory diagrams.	Structural notes, architectural definitions, excavation records.	Selection of information based on subjective domain knowledge.
Topography	3-D	CAD frames, point data.	Topographic mapping, plans and sections. Precise control network measurement.	Date organization is need by code. Layer or GIS protocol, trained operators
Close Range Photogramme try	3-D	Photo-maps, CAD Drawings, anti-disaster reports.	Architectural Façade Drawings, Ortho-photos, stereo pairs, surface models.	Calibrated Camera, optimized image capture, object area control, processing
Terrestrial Laser Scanner	3-D	Point Clouds, Surface Modes.	Building Models and Drawings	Point Density must be matched to required information outcome.

Figure 1. Summary of metric survey techniques (Andrews et. al., 2013).

Direct method or empirical technique is mainly based on the m easurement of reference points on structure, so accuracy of drawings depends on complexity and shape of the object. It is still widely used owing to its low cost and no need for any special expenses for equipment, software etc. Besides this technique is more preferred for 2D drawing and can be used very effectively where the site is accessible, not too large and easy to overlook

DOI: 10.15320/ICONARP.2018.54 – E-ISSN: 2147-9380

(Boehler et. al., 2002). Topographic measurement is a process of measuring reference points of the structure with total station and it can be performed with high accuracy. 3D point cluster can be obtained by this technique for drawing of structures. However topography cannot provide high density point clusters in a short time. Furthermore, when it is needed to get high resolution data for complex structures like archeological area or ruins, only topographic measurement is inadequate. For complex structures it is needed detailed and reliable 3D models which can be provided by photogrammetry through image-based modeling and Terrestrial Laser Scanning (Salonia et.al, 2009). As a low cost technique, photogrammetry is used with topographic support for documentation purpose in different scales for architectural projects, especially in survey of building façades. Another technique laser scanning technology provides great opportunity for presentation and visualization of cultural heritage with high accuracy in addition to measurement.

Terrestrial Laser Scanning for Geometric Documentation

Terrestrial laser scanners have become widely investigated instruments among architectural and archaeological surveying applications in last years. Basically, a laser scanner collects a large range of data representing three-dimensional coordinates and called “point cloud” data. The point cloud is a collection of X, Y, Z coordinates in a common coordinate system that defines to the viewer an understanding of the spatial distribution of an object. They may also include additional information, such as return intensity or color values. In order to abstract geometry, shape, measurements and texture of an object. These large amounts of data must be processed in appropriate software which helps to handle huge amount of data and to combine the image and scanned data (Amans et. al., 2013).

Main reason for terrestrial laser scanning technique to become widely used is its data acquisition process. It allows to collect a great amount of data with accuracy supporting reconstruction and repair activities withal analysis of structures. While it is easily possible to detect complex geometries and details in practices requiring sensitive and high accuracy and deep study in constructive techniques, it is difficult to achieve these results with traditional methods (Vacca et.al., 2012). Using of laser scanner with photogrammetry and topography together directly affect the final accuracy of documentation process and results in positive way (Meyer et. al. 2007). It can be compared sensitiveness and using area of these main four techniques in Figure 1.

The survey of an architectural building, besides its complexity, is an act of getting knowledge aiming to understand all details in

order to get analysis of whole building (Docci and Maestri, 2010). Here the laser scanning technology helps to this analysis by containing data about whole structure in terms of the shape and conservation and restoration of the structure (Lourenço et. al., 2010; De Matías et.al., 2013).

As known, geometric survey is fundamental stage of restoration process (Salonia et.al., 2007). Before any intervention, the restorer needs to get deep and complete knowledge of the cultural property such as measurement, shape and cultural values (Genovese, 2005). It contains different sort of data and is essential to have "*accurate knowledge-based model"* of the building which includes collected data related to building material, character, decays, interventions and restoration works in the past and information from archival studies about the structure (Canciani, 2013). Laser scanning technology helps to complete geometric and material data of the structure so it contributes to protect authenticity of historic structure by transferring this data significant for restoration (Versaci and Cardaci, 2011). Acquired data, can also be categorized and managed using with GIS which allows us not only to have a "clever" catalogue also to get a useful tool enabling to compare the building's situation at different stages and times; such as before and after restoration, the evolution of the interventions, damages caused by a disaster, etc. (Andrés and Pozuelo, 2009; Oreni, 2006). It should be considered that intervention decisions based on true knowledge acquired by laser scanner directly affect the quality of restoration activities.

Challenges of Laser Scanning

Even though laser scanning technology replaced some of traditional methods in heritage documentation, sometimes its capabilities are over-rated. Here it is important to consider limitations and capabilities of laser scanning. There are some points to be considered in processing workflow of laser scanning.

Experience in data acquiring is very essential for a successful field survey. In many cases, it is almost impossible to get a complete cover of the structure because of some unachievable parts and conditions. For required level of detail, the parameters should set up very carefully considering the complexity of the structure. When the structure is complex, it is more difficult to get sufficient overlap for data registration. Besides, target distributions on the structure surface and to arrange their visibility are essentially important for overlap. Here also choice of scanner positions, to set right angles and parameters become significant for a successful data acquiring.

DOI: 10.15320/ICONARP.2018.54 – E-ISSN: 2147-9380

In data registration step in which all scans are put into a single coordinate system is an important step since the accuracy is achieved in this stage. For a satisfied registration, targets should be in high resolution means it requires a lot of field time. Besides time, it's quite difficult to manage high resolution data that sometimes can cause hard and software problems. So registration phase should be considered as crucial part of the modelling process. Similarly, after registration of data, cleaning of point clouds should be done carefully. In this step, it is possible to lose the information about the closest point neighbors which is necessary for surface model.

In this study, difficulties and advantages of using laser scanning technology during documentation projects were evaluated with a case study in Turkey, besides discussion for the advantages of laser scanner for future works and studies were discussed.

CASE STUDY

Turkey is a reach country in point of cultural heritage in different size and character. These architectural heritage have different character, building materials constructions techniques and deformation reasons in different regions of country. Aksaray is a significant city with its vernacular architecture and interesting landscape (Figure 2, Figure 3). Its traditional houses are generally two-storey masonry buildings and they have different size of spaces and impressive façade designs. In addition, a large number of carved early Christian settlements and churches/chapels take place in some valleys around the city Large number of restoration projects are prepared by architects, are approved by conservation board and are applied by private companies or other institutions in each year. These projects are generally prepared with traditional methods (total station and sometimes direct methods). At the end, it is possible to see some accuracy problems and observe non-overlapping between some drawings and the building.

Figure 2. Location of Aksaray.

Figure 3. Some building typology and architectural heritage in Guzelyurt/Aksaray

In this study, a middle-scale historical building was chosen from Aksaray, a city close to Cappadocia Region for exemplifying laser scanning use in Turkey for documentation of architectural heritage. In decision process of case study, it was considered that the example should be in dense urban fabric and had different dimensions of spaces with different light amount (Figure4). Thus, it was encountered to find some solutions for different problems during the scanning process. This building was registered as a cultural heritage of Aksaray and it was an aim to re-use it with a new function.

Methodology

Data accuracy and measurement work have been shown in Figure 5 as methodology of case study. As a first step, topographic survey was carried out in local coordinate system, then several scans were performed around and inside of the building. After scanning and data acquisition, post-processing procedure was followed, and laser scanning data was referenced with topography in office. Afterward, some architectural elements, plans sections, elevations and ortho-images were prepared and were exported to CAD for drawing. 3D model of historical building could be produced in two-different steps for different aim and result: One method is that mesh model could be produced from point cloud and then this mesh model could be texturized with images. As second way, 3D model could be obtained with parametric solid elements. All documents could be stored in a database for current and future use and this data could be managed with GIS applications.

Figure 4. Pictures of the house facades

DOI: 10.15320/ICONARP.2018.54 – E-ISSN: 2147-9380

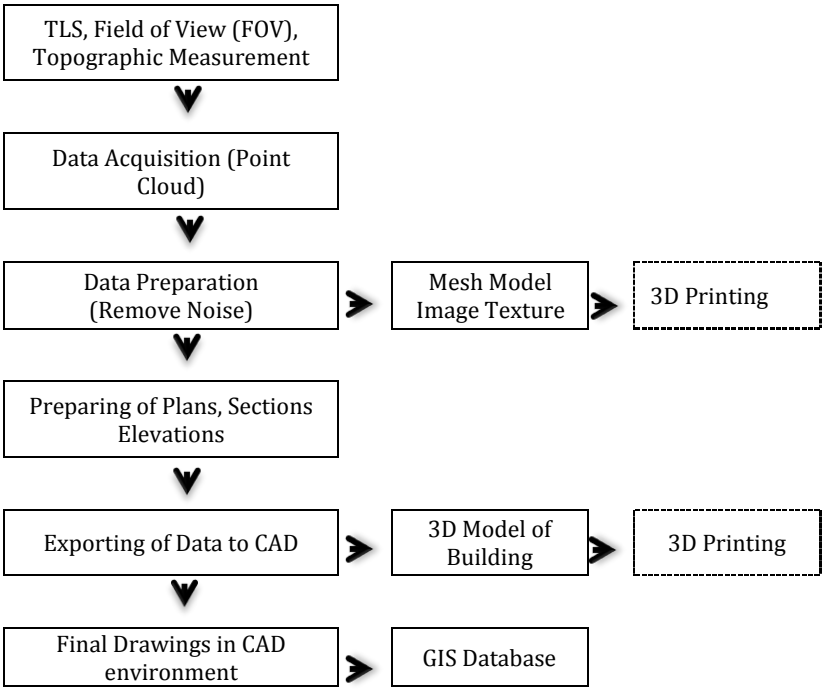

Figure 5. Methodology of case study.

Equipment and software

The scanning of the building was accomplished by using terrestrial laser scanner *Leica Scan Station 2*. It is a pulse-based time of flight scanner with a maximum range of 300 m. Its nominal accuracy is 6 mm at 50 m and can record up to 50,000 points/sec. The field of view of the scanner is 360° x 270°. It includes a digital video camera of low resolution. Its physical dimensions are 265 mm x 370 mm x 510 mm and it weighs 18.50 kg. It comes with the proprietary software *Cyclone* for processing data (Leica, 2013).

Reflectorless Leica total station was used for topography measurements and for targets which were used as reference points for registration of different scans. Nikon D90 with 24 mm fixed lens was used for taking picture of historical building. Topographic data was adjusted with MicroSurvey StarNet. Cyclone 8.0 was used as main software for data processing, registration of different scans, cleaning of unnecessary data. Cyclone 8.0 was also used for creating and exporting ortho-images. Thanks to Leica CloudWorx plugin, point cloud was able to open in AutoCad. In order to prepare and draw sections, plans and elevations in AutoCad.

Scan Data Collection

A sketch of the building was prepared to organize workflow of study. Laser scanner positions and topographic network locations were planned on this sketch. Traverse stations were fixed with nails, measured and registered on sketch to easily recognize for next time study.

In order to enable indirect target-to-target registration (Van Genechten, 2006), black and white targets were located on suitable walls that can be registered and visible from more than one scan location. Totally 30 targets were fixed inside and outside walls of the building and around the buildings facades. Although, reflective and HDS targets could be used in laser scanner applications, A5 size black and white targets were used in this study. Since targets can be automatically recognized in point model, they were used to accelerate alignment procedure and allowed the alignment among data acquired from different rooms. Due to the small doors it was impossible to obtain a high percentage of overlapping. Historic house space sizes are different from each other and distances from scanner to object are different as well. These differences, as expected, affected point cloud density however an equal scanning resolution was set. Redundancy of data allowed in any case to have 1 point per centimeter in the final model. And a lot of picture was taken for documentation of the building and 3D model texturing.

Scanning of the house was performed from 13 different scan positions. Average scan time for each station was 25 minute then additional a few minutes was spent for taking photo for texture mapping of scan data with internal camera and totally 12 hours was spent for 13 laser scanning stations and topographic measurement. During taking photo, even the light of the environment is important for quality of pictures, dark spaces, transparent surface or some part from scanning area from where light directly comes to laser scanner made big problem for homogenous exposure texturing. The big challenge with photography especially for panorama pictures was that different light conditions around the scanner caused over exposure or dark texturing on some parts of point cloud. In order to deal with this problem, users would measure lighting conditions for every scans and determine exposure settings for good average results (Figure 6).

DOI: 10.15320/ICONARP.2018.54 – E-ISSN: 2147-9380

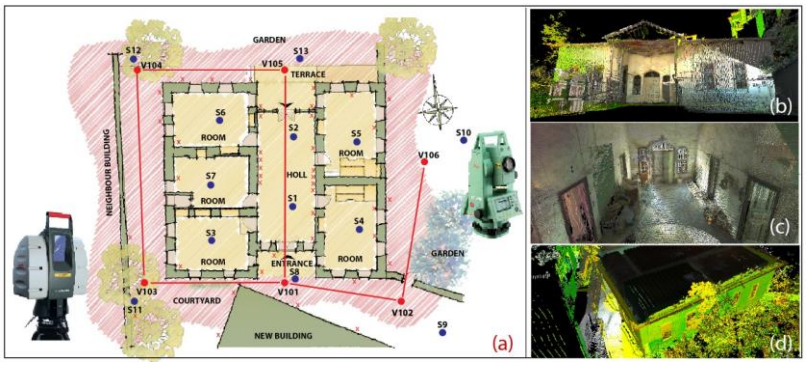

Figure 6. (a): Topographic network of fieldwork **(b):** Point cloud view of south façade. **(c):** Point Cloud view from inside of building. **(d):** Perspective view of the house.

Distance between laser scanner and surfaces of the building directly effects the resolution of point cloud data besides, the rays coming from laser scanner and surface of the object have influence on the quality of point cloud as well. If this angle becomes so acute, resolution problems and noisy parts can be observed. Due to narrow space between the historical building and its neighboring building, some noisy area was observed in point cloud of west façades of the building. On account of these problems, it is needed to get support from direct methods to complete survey in less than 1 m scanning distances.

Data Processing

This step includes the works held in the office after scanning. As a first step, topographic data was downloaded from total station and was processed in MicroSurvey StarNet software to adjust the traverse coordinated. Scan data was downloaded from scanner via FileZilla open software.

All scanning data and topographic coordinates were transferred in Cyclone. Registration, which is the process of integration of different scans into a single coordinate system was made in Cyclone point cloud software. This integration is obtained by constrains which are pairs of common points (tie-points) between two scan or overlapping point clouds that exist in two different scan data (Loannides, 2010). In this case study, different scans were registered in a single coordinate system thanks to the target coordinates. This was considered the most suitable method of registration in order to minimize the errors (Andrews et. al., 2013). Since some target points were not distinguished efficiently, considering the registration results, some target points were excluded from registrations. Generally it is important to get error of registration value less than 1cm. In this case study, after careful registration, 0.004 m was obtained as registration value. After registration, 100.446.404 number of point in total was acquired. The size of the scanning files (imp files) reached 110 MB.

Point cloud contains all data obtained by laser scanner. It is necessary to clean some part of point cloud not directly related to the structure. In this case study, also some part of point cloud were not related to the historical house so they were cleaned and

the total number of points was reduced to 97.578.840. Sometimes it is very difficult manage all point cloud so data reduction can be preferred for easier management of the model. However, a global point cloud reduction is not recommended before complete back up all data, since it entails information lost (Lerones et. al., 2010). Noise reduction is generally random and unfortunately accompanied by a loss of detail. Noise typically increases in overlapping areas (Rühter et.al, 2011).

Preparation of Plans, Sections and Elevations

After the registration, all scan data became in common coordinate system and this coordinate system can be transformed to local ones according to final results of section, elevation and plan layouts. This transaction was done by utilizing UCS (user coordinate system) in Cyclone software. Reference tree points which would recognize XYZ directions were used for transforming coordinate system in Cyclone for preparation of measured drawings of Aksaray House (Figure 7).

In Turkey, number of the section depend on object complexity but generally two sections (one cross and one longitudinal) are main requirement for restoration projects When restoration projects are prepared with point cloud model, different plans and sections with different locations can be obtained as needed. It is possible to manage the thickness of slices in order to recognize all of the plan end section details. In this case study slice thickness for plan layouts are 0.01m and the main section elevation is 1.5 m according to ground level of historical building. Ground cover detail and ceiling projection can be drawn colored point cloud with changing view direction of plan section. In this study, slices were exported to CAD software as DXF format and views of ground covers and lining of ceilings were exported to AutoCad as TIFF format ortho-image. Similarly, some temporary coordinate systems parallel to building façades were prepared for elevations. Unnecessary point clouds for facades drawings were hidden. Orthographic views were obtained and were exported to AutoCad as TIFF orthographic images (Figure 7, Figure 8).

DOI: 10.15320/ICONARP.2018.54 – E-ISSN: 2147-9380

Figure 7. Horizontal section of plan for drawing of plan layout.

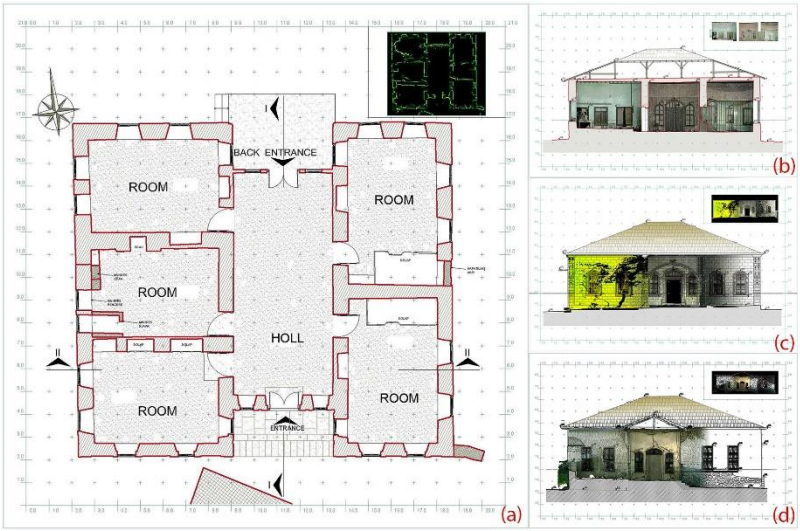

Figure 8. (a) Plan of building with exported points from Cyclone as dxf to Autocad. **(b)** One Section of Building. **(c)** South elevation drawing with ortho-images. **(d)** North elevation drawing with ortho-images.

All ortho-images exported from Cyclone contain georeferences data thanks to some collateral files (TWF, TFW extensions). When these images are imported into AutoCad, thanks to some special tools, these images can be taken places according to coordinate system coming from Cyclone.

3d documentation is getting common in Turkey documentation main study field. Archeological areas and architectural ruins are a good works for 3d documentation techniques. Especially TSL is effective solutions for survey projects in Turkey (Figure 9,10,11).

Figure 9. A Mass stone building main façade ortho-image from pointcloud in Guzelyurt/Aksaray

Figure 10. Aksaray Kılıçaslan Hammam, in city center. After excavation 3D documentation

Figure 11. Documentation of completely ruined semi caved traditional Guzelyurt/Aksaray

Modelling

Far from their physical locations, buildings can be visualized, perceived and understood thanks to digital 3D modeling (Balzani et.al., 2012). With the advent of digital modern techniques for 3D acquisition, it has become possible to drape images on the point clouds of objects. Producing of 3D models based on geometric data in architectural surveys has led to develop different data collecting and sharing methods in cultural heritage studies. Generally parametric 3d models are used for expression of some ideas using with some measurements from point cloud (Figure. 12). This models don't need to convert point cloud to the mesh models. There are principally two main reasons to convert point cloud data to mesh models. First, mesh models can be used in different graphic software for different aim and they can be easily

DOI: 10.15320/ICONARP.2018.54 – E-ISSN: 2147-9380

published via internet. For the second, mesh models are generally used in 3D printing technology (Stnik et.al., 2010). Scanned objects replicas can be reproduced with different materials and different scales thanks to 3D printing. There are some difficulties to share high-resolution 3D models generated by point cloud via internet. However, some softwares provide suitable solutions to share high-resolution 3D models without losing visual characteristics (Valanis et.al., 2010). 3D textured models are generally used for giving information about the object (as in multimedia museums, exhibitions) and sharing or dissemination of information and using as a data for professional studies (Tucci et.al, 2012). Two survey methods, laser scanner and photogrammetry are very effective 3D reconstruction techniques but recently, low cost techniques also allow the fully automatically three-dimensional reconstruction of objects from images, giving back a dense point cloud and a surfaced mesh model (Fassi et.al., 2013). The image-based approach is generally considered a low-cost method (in particular for Terrestrial applications) (Romondino et.al., 2012).

Figure 12. 3D Cad model of houses base on point cloud data.

These 3D results can be used for many purposes, such as archaeological analyses, digital preservation and conservations, computer aid restoration, virtual reality or computer graphic applications (Rizzi et.al, 2011). 3D models can be integrated with multi discipliner studies (Cappellini and Campi, 2011). Calibrated and orientated high-resolution digital images provide scan and image data. This data can be automatically or semi-automatically processed to generate product such as textured triangulated surfaces or ortho-photos with depth information (Koska and Kremen, 2011; Neubauer et.al., 2005). 3D models with exhaustive graphic-communications makes them easy to understand and they show objects with fundamental and irreplaceable value (Lamatina and Lanfranchi, 2013).

Any laser scanner usually comes with specific software for data acquisition and processing. The capabilities of these software vary but generally they can process acquired data (filtering, cleaning, alignment ect.). Also 3D mesh models can be obtained by other specific programs for mesh modeling (Rapidform, VRmesh). Additionally different open-source software offers alternative free solutions for users (Callieri et.al, 2011).

In this case study, only façades of historical building were modelled. Point cloud was exported from Cyclone as PLY extension and opened with open software MeshLab for triangulation process. These kinds of projects require powerful computers with fast processors and graphic cards. Otherwise great amount of time could be lost for that process. Point cloud data could be segmented and 3d modeling of object could be made part by part (Fassi et.al, 2011). Cleaning of unnecessary point cloud data and size of triangulation can be managed with MeshLab software. After creating mesh model, it is generally necessary to fill some holes, to repair some part of the model and to make some model optimization. After texturizing mesh with photos, 3d model of object can be used for any desired purposes (Figure 13). In recent years, TLS has shown great versatility for also 3D printing. The data of TLS gives possibility to print 3D models for different purposes with diverse materials. These printed models can be either small objects or complex buildings or sites (Figure 14).

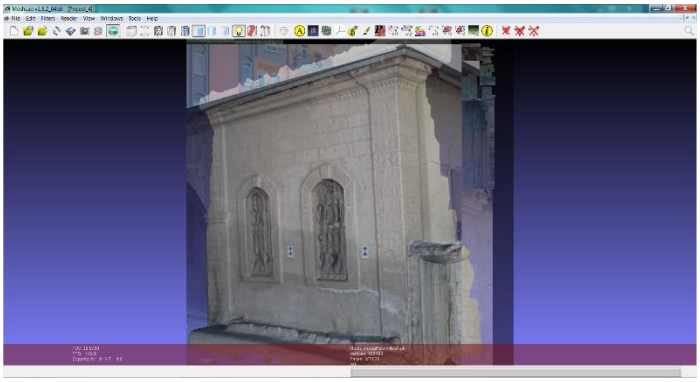

Figure 13. Texturized part of 3D model of building with images for obtained photorealistic model.

DOI: 10.15320/ICONARP.2018.54 – E-ISSN: 2147-9380

Figure 14. 3D Printed images of building for different purposes.

Virtual Panoramic Tour

Technological developments in recent years have remarkably increased the diversity of metric data collection methods. With the help of advancements in computer industry, three dimensional visualizations of the monuments have been facilitated in a virtual world. The collection of data for 3D models of historical monuments is simplified by dense point clouds created by terrestrial laser scanners.

Virtual Reality (VR) is a development of the artificial (man-made) based computer technology that can be controlled by the user using the mouse. VR interactive key points lies in the hands of the user controls the enjoyment of photos by moving the mouse or by pressing the keyboard (Prabawati and Triyuliana, 2006; Famukhit et.al., 2013).

In the last years virtual reality tours have been created for both simple and more complex monuments. This ability has greatly contributed to the thorough study of the monuments, as well as to the creation of virtual visits (Sofocleous, 2006).

Virtual models are fundamental media tool which allow users to interact with 3D models in a virtual environment. In last decades, virtual tour applications prepared with panoramic images have been started to be applied in cultural heritage field for documentation, preservation, reconstruction, decision support and cultural heritage promotion. Especially in field of archeology, virtual models enrich interactivity and visualization (Pavlidis et.al., 2007) This makes them to become powerful tools for visualization and 3D reconstruction of archeological sites and finds (Bruno et.al., 2010) as well as sustainable tourism and cultural heritage management (Lettelier, 1999). Increasing number of visitors have negative effect on cultural heritage when it is thought to protect cultural heritage. In contrast, tourists and

tourism companies, even the countries, would like to promote their cultural heritage for more visit. Virtual tours may be seen as a kind of solution for this concern since they give the possibility to visitor to have visiting experience. With the possibility of displaying 3D models of cultural heritage, one can able to visualize, zoom and make walkthrough of these models by rotating. To promote the cultural heritage is not the only contribution of VR to cultural heritage field. Beside documentation and recording, it also helps to give information about lost heritage, to support education process at architectural schools, to present tradition and culture throughout the cultural heritage, to develop learning experiences with expert and non-expert stakeholders (Reffat and Nofal, 2013). Another advantages of virtual panoramic tours could be for conservators. In some cases, it can become very difficult to see the cultural heritage for several reasons like safety or distance. At the same time, since they are also decision makers for cultural heritage, it can be useful to have such a kind of system especially shared on a database or web-site for decision makers (Figure 15).

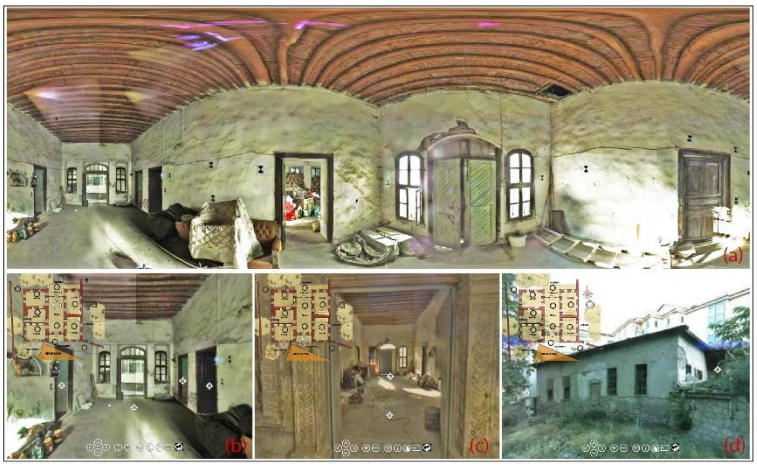

Figure 15. Different screens from panoramic tour of house.

It could be said that over the last twenty years, special recording tools like photography, architectural stereo-photogrammetry, 3D modelling and 3D laser scanning techniques only or integration of these techniques can be used in the field of cultural heritage. A simple but efficient option for the visualization of a complex objects is the virtual tour using panorama photography (Kersten and Lindstaedt, 2012). In this study a panoramic tour was prepared with the photos from laser scanner. For colorizing the point cloud of the Leica Scan Station 2 panorama photographs were taken from each scan station using a nodal point adapter for the camera on the tripod of the laser scanner. This images can be exported from Cyclone as JPG extension. The software PTGui automatically generated a spherical panorama with 640 x 480 pixel for each camera station. These panorama images were converted into a set of six cube and simultaneously generated one

DOI: 10.15320/ICONARP.2018.54 – E-ISSN: 2147-9380

interactive virtual tour for all available panorama images with Pano2VR.Hotspots, overview maps, photographs, text, music, videos and many more custom actions can be integrated with this software.

DISCUSSIONS

With experience of this case study, it can be said that laser scanner has been used in surveys, due to its high speed data collection and processing, high density and accuracy of measured points, advantage of time of analysis; its contribution helps to increase the productivity (Mamede et.al. 2012). This dense data is successful to recognize the shape of architectural objects and its anomalies as distortions, asymmetry, and out of plumb of building structure (Haddad, 2011). Not only for time processing and analysis, but also for the richness of detail, once this system is able to capture topographic information in inaccessible places such as ceilings and irregular galleries, in the case of monuments, or even in places difficult to visualize, in case of the sculptures and / or works of art (Rühter et.al, 2012). Data capture without any physical access to a structure is of a special interest in the case of historical buildings due to the peculiarities of their construction and location. Detection of material degradation on historical buildings using traditional methods manual mapping, or "naked eye" analysis performed by an expert, is laborious and time consuming procedures (Armesto-González et. al., 2010). 3D modelling and ortho-image support to give different initiative for documentation of cultural heritage. Possibility of sharing 3D models via internet provides data management and dissemination of information about cultural heritage. Thanks to sharing data, 3d models and internet access aid to close gap between the data supplier and data users (Lourenço et.al., 2010).

Speed of laser scanning applications predictably depends on device working principle but in any case these systems are faster than traditional measurements techniques. Also, scanning time for each position depends on the preferred scan resolutions. Opportunity of convenience and speed of laser scanning applications can easily be observed especially when the shape of the object is complex.

While topographic measurement and direct measurement techniques help to measure specific points of buildings in detail, laser scanner acquires data related to whole of the objects and gives possibility to store data. This is an important advantage when compared with conventional techniques. In this way, a lot of data like materials and structural deformations can be stored in digital environment.

Direct integration of laser scanning technologies with CAD software also facilities architectural drawings. Ability to manage point cloud in CAD software thanks to special tools, all architectural layouts can be directly prepared in CAD softwares, is among other advantages of these techniques.

Laser scanner and post processing software's costs are expensive and it is another difficulty to get the technology because of the cost except hiring from private companies. However, it may be seen another problem increasing project cost to employee technical staff for managing the data. Although, laser scanning technology is expensive, in long term period and with taking into account of its accuracy, to use this technology gives advantage to users.

Use of laser scanning technology has become more widespread almost in all area related to cultural heritage and engineering applications requiring high accuracy spatial data. In spite of this prevalence, use of laser scanning technology has been still limited in restoration projects in Turkey despite Turkey is a rich country with its cultural heritage. Even though there are many disciplines strongly need this technology related to architectural field and may carry out a large number of applications, the use of this technology by expert and private companies has been still low in Turkey. The main reasons for this low utilization using rate can be defined as: *lack of integration into architectural education, difficulties to get technology and deficiencies in the legal arrangements for use of laser scanning data in architectural documentation process.*

It could be mentioned that there are limited number of expert academic staff, courses and equipment related to laser scanner technologies, only in a few universities of Turkey. For this reason, this topic is almost not included in bachelor degree level; however it could be a research field for a master and doctoral study or may take place in some research projects in a limited number of universities. These kinds of studies are generally carried out with providing supervisors and equipment from departments of geomatics engineering. Hence, the use of the software and instrument can be mostly learned only through personal effort and work experience. As secondary, financial aspect is another restriction about this technology. Laser scanning hardware and software products used in applications to be seen as expensive, requirement of employing qualified staff are thought as factors increasing the cost of the project. For these reasons, private companies do not intend to invest in this technology so much and they prefer to use their best known techniques on their project, considering the costs. Thirdly, there is not any binding legislation for the projects intended for using laser scanning or

DOI: 10.15320/ICONARP.2018.54 – E-ISSN: 2147-9380

photogrammetric data in Turkey. It is specified only in a few number of official tenders as prerequisite to use laser scanning data. Any special measurement method is not defined as a prerequisite for the remaining tenders and bidders choose their measurement techniques for preparation of the project.

RESULTS

It is clear that use of this technology provide a significant contribution to conservation practices in Turkey. This technique rather than just a measurement method contains an extensive research on historical buildings. It is observed that data which are very difficult to acquire with conventional methods, can be obtained by laser scanner in a short time with high accuracy. Thanks to 3D models, great number of data can be shared via internet. Because of the fact that laser scanner technology provides some facilities to extract sections and elevations from point cloud, it gains advance to conservation projects. While there are some difficulties in narrow spaces, in general, good results were observed in the end of case study. Especially, it can be said that laser scanning technology is effective as non-destructive method for archeological areas and all buildings.

In order to get common use of laser scanning technology in restoration projects in Turkey, it has been concluded that adequate training should be given in universities, workshops should be organized by relevant organizations, and especially, this technology should be taken place in architectural education. It is also observed that, to hire laser scanner seems as an alternative solution to get this technology for avoiding high cost of equipment and software in Turkey. Use of laser scanner or photogrammetry should become prerequisite for preparation of conservation projects, and for current restoration projects and some arrangements should be done in legislations. Although, at the beginning, investment is so high for private companies or institutions, when price-performance comparison did laser scanner technology is very effective method in long term period.

REFERENCES

Amans, O. C., Beiping, W., Ziggah, Y. Y., & Daniel, A. O. (2013). The need for 3d laser scanning documentation for select Nigeria cultural heritage sites. *European Scientific Journal, ESJ*, *9*(24).

Andrés, M. A. N., & Pozuelo, F. B. (2009). Evolution of the architectural and heritage representation. *Landscape and Urban planning*, *91*(2), 105-112.

Andrews, D., Bedford, J., Blake, B., Bryan, P., & Cromwell, T. (2013). *Measured and drawn: techniques and practice for the metric survey of historic buildings*. English heritage.

Arias, P., Herraez, J., Lorenzo, H., & Ordonez, C. (2005). Control of structural problems in cultural heritage monuments using close-range photogrammetry and computer methods. *Computers & structures*, *83*(21-22), 1754-1766.

Armesto-González, J., Riveiro-Rodríguez, B., González-Aguilera, D., & Rivas-Brea, M. T. (2010). Terrestrial laser scanning intensity data applied to damage detection for historical buildings. *Journal of Archaeological Science*, *37*(12), 3037-3047.

Balzani, M., Bughi, C., Ferrari, F., Rossato, L., & Tursi, A. (2012, October). Alberti's Box: The Cultural Multimedia Project on the Architectures of Leon Battista Alberti. In *Euro-Mediterranean Conference* (pp. 66-75). Springer, Berlin, Heidelberg.

Boehler, W., Heinz, G., & Marbs, A. (2002). The potential of non-contact close range laser scanners for cultural heritage recording. *International archives of photogrammetry remote sensing and spatial information sciences*, *34*(5/C7), 430-436.

Bruno, F., Bruno, S., De Sensi, G., Luchi, M. L., Mancuso, S., & Muzzupappa, M. (2010). From 3D reconstruction to virtual reality: A complete methodology for digital archaeological exhibition. *Journal of Cultural Heritage*, *11*(1), 42-49.

Callieri, M., Cignoni, P., Dellepiane, M., Ranzuglia, G., & Scopigno, R. (2011). Processing a complex architectural sampling with meshlab: the case of piazza della signoria. *Proceedings of 3D-ARCH*, *4*.

Canciani, M., Falcolini, C., Saccone, M., & Spadafora, G. (2013). From point clouds to architectural models: algorithms for shape reconstruction. *ISPRS Archives*, *5*, W1.

Cappellini, V., & Campi, M. (2011, September). 3d survey of the San Carlo Theatre in Naples. In *ISPRS Trento Workshop,(2011)* (Vol. 95).

De Matías, J., Berenguer, F., Cortés, J. P., De Sanjosé, J. J., & Atkinson, A. (2013). Laser Scanning for the geometric study of the Alcántara Bridge and Coria Cathedral. *ISPRS-International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, *1*(1), 51-56.

Docci, M., & Maestri, D. (1994). *Manuale di rilevamento architettonico e urbano*. Roma: Laterza.

Famukhit, M. L., Yulianto, L., & Maryono, B. E. P. (2013). Interactive application development policy object 3D virtual tour history Pacitan District based multimedia. *IJACSA)*

DOI: 10.15320/ICONARP.2018.54 – E-ISSN: 2147-9380

International Journal of Advanced Computer Science and Applications, *4*(3).

Fassi, F., Achille, C., Gaudio, F., & Fregonese, L. (2011). Integrated strategies for the modeling of very large, complex architecture. *Proceedings of the International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Trento, Italy*, 2-4.

Fassi, F., Fregonese, L., Ackermann, S., & De Troia, V. (2013). Comparison between laser scanning and automated 3d modelling techniques to reconstruct complex and extensive cultural heritage areas. *International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, *5*, W1.

Genovese, R. A. (2005). Architectural, archaeological and environmental restoration planning methodology: historic researches and techniques of survey aiming to conservation. In *CIPA 2005 XX international symposium, Torino, Italy*.

Georgopoulos, A., & Ioannidis, C. (2004, May). Photogrammetric and surveying methods for the geometric recording of archaeological monuments. In *FIG Working Week* (pp. 22-27).

Haddad, N. A. (2011). From ground surveying to 3D laser scanner: A review of techniques used for spatial documentation of historic sites. *Journal of King Saud University-Engineering Sciences*, *23*(2), 109-118.

http://cipa.icomos.org/fileadmin/template/doc/PRAGUE/147.pdf (accessed, July 2013).

Kersten, T. P., & Lindstaedt, M. (2012, October). Virtual architectural 3d model of the imperial cathedral (kaiserdom) of königslutter, germany through terrestrial laser scanning. In *Euro-Mediterranean Conference* (pp. 201-210). Springer, Berlin, Heidelberg.

Koska, B., & Kremen, T. (2013). The combination of laser scanning and structure from motion technology for creation of accurate exterior and interior orthophotos of St. Nicholas Baroque church. *Int. Arch. Photogramm. Remote Sens. Spat. Inf. Sci*, *40*, 133-138.

La Mantia, M., & Lanfranchi, F. (2013, February). The reverse modelling realized by digital scans and fotomodellazione: based on post-processing compared several noteworthy episodes contained in the basilical complex of San Lorenzo fuori le Mura in Rome. In *ISPRS Trento Workshop,(2011)* (Vol. 152).

Leica ScanStation 2 technical sheet, available from: http://hds.leica-ecosystems.com/downloads123/hds/hd

s/ScanStation/brochures/LeicaScanStation%202_brochure_en.pdf (accessed: July 2013)

Lerones, P. M., Fernández, J. L., Gil, Á. M., Gómez-García-Bermejo, J., & Casanova, E. Z. (2010). A practical approach to making accurate 3D layouts of interesting cultural heritage sites through digital models. *Journal of Cultural Heritage*, *11*(1), 1-9.

Lettelier, R. (1999). Virtual reality... A new tool for sustainable tourism and cultural heritage sites management: Paper presented at CIPA XVII International Symposium Web, Olinda, Brazil.

Loannides, M., Fellner, D., Georgopoulos, A., & Hadjimitsis, D. (2010). Geometric Documentation Of Historical Churches in Cyprus Using Laser Scanner., In *Proceedings of EuroMed2010 3rd International Conference Dedicated on Digital Heritage*.

Lourenço, P. B., Peña, F., & Amado, M. (2010). A document management system for the conservation of cultural heritage buildings. *International Journal of Architectural Heritage*, *5*(1), 101-121.

Lourenço, P. B., Peña, F., & Amado, M. (2010). A document management system for the conservation of cultural heritage buildings. *International Journal of Architectural Heritage*, *5*(1), 101-121.

Lysandrou, V., & Agapiou, A. (2010). Comparison of documentation techniques for the restoration and rehabilitation of cultural heritage monuments: the example of Pyrgos "Troulli" medieval tower in Cyprus. In *3rd Int. Conf. dedicated on Digital Heritage, Archaeolingua, Limassol, Cyprus* (pp. 21-26).

Mamede, C.G., Silva, B.Q., Schuler, C.A.B. (2012). Laser scanner in works of art and historical monuments monitoring, 8th FIG Regional Conference Surveying Towards Sustainable Development, Uruguay

Meyer, É., Grussenmeyer, P., Perrin, J. P., Durand, A., & Drap, P. (2007). A web information system for the management and the dissemination of Cultural Heritage data. *Journal of Cultural Heritage*, *8*(4), 396-411.

Neubauer, W., Doneus, M., Studnicka, N., & Riegl, J. (2005, September). Combined high resolution laser scanning and photogrammetrical documentation of the pyramids at Giza. In *CIPA XX International Symposium* (pp. 470-475).

Oreni, D., Fassi, F., Brumana, R., Prandi, F., & Tuncer, H. (2006). Laser Canning supports architectural mappings and historical urban view analysis. In *XI International CIPA Symposium*.

DOI: 10.15320/ICONARP.2018.54 – E-ISSN: 2147-9380

Patias, P. (2009). Cultural Heritage Documentation. International Summer School 'Digital recording and 3D Modeling', Aghios Nikolaos, Crete, Greece, 24–29 April.

Pavlidis, G., Koutsoudis, A., Arnaoutoglou, F., Tsioukas, V., & Chamzas, C. (2007). Methods for 3D digitization of cultural heritage. *Journal of cultural heritage*, *8*(1), 93-98.

Prabawati, T. A., & Triyuliana, A. H. (2006). Multimedia: Making It Work edisi 6. *Yogyakarta: Penerbit ANDI*.

R. Sitnik, P. Bolewicki, J. Rutkiewicz, J. Michonski, M. Karaszewski, J. Lenar, K. Mularczyk, W. Zaluski. (2010). Project "revitalization and digitization of the seventeenth century palace complex and garden in Wilanow – phase III" task "3d digitalization of selected exhibits collection"EuroMed2010 International Conference.

Reffat, R. M., & Nofal, E. M. (2013). Effective communication with cultural heritage using virtual technologies. *International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, *5*, W2.

Remondino, F., Del Pizzo, S., Kersten, T. P., & Troisi, S. (2012, October). Low-cost and open-source solutions for automated image orientation–A critical overview. In *Euro-Mediterranean Conference* (pp. 40-54). Springer, Berlin, Heidelberg.

Rizzi, A., Baratti, G., Jimenez, B., Girardi, S., & Remondino, F. (2011). 3D recording for 2D delivering–The employment of 3D models for studies and analyses. *Int. Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences*, *38*, 5.

Rüther, H., Held, C., Bhurtha, R., Schröder, R., & Wessels, S. (2011). Challenges in heritage documentation with terrestrial laser scanning. In *Proceedings of the 1st AfricaGEO Conference, Capetown, South Africa* (Vol. 30).

Rüther, H., Held, C., Bhurtha, R., Schroeder, R., & Wessels, S. (2012). From point cloud to textured model, the zamani laser scanning pipeline in heritage documentation. *South African Journal of Geomatics*, *1*(1), 44-59.

Salonia, P., Bellucci, V., Scolastico, S., Marcolongo, M., & Leti Messina, T. (2007, October). 3D survey technologies for reconstruction, analysis and diagnosis in the conservation process of cultural heritage. In *Proceedings of CIPA*.

Salonia, P., Scolastico, S., Pozzi, A., Marcolongo, A., & Messina, T. L. (2009). Multi-scale cultural heritage survey: Quick digital photogrammetric systems. *Journal of Cultural Heritage*, *10*, e59-e64.

Santana Quintero, M., Blake, B., Eppich, R., & Ouimet, C. (2008, January). Heritage documentation for conservation: partnership in learning. In *The Spirit of Place*. ICOMOS.

Sofocleous, E., Ioannides, M., & Ioannidis, C. (2006). The geometric documentation of the asinou church in cyprus. In *Proceedings of the 7th International Symposium on Virtual Reality, Archaeology and Cultural Heritage, Lefkosia Cyprus*.

Stathopoulou, E. K., Lerma, J. L., & Georgopoulos, A. (2010). Geometric documentation of the almoina door of the cathedral of Valencia. In *Proceedings of EuroMed2010 3rd International Conference Dedicated on Digital Heritage*.

Tucci, G., Cini, D., & Nobile, A. (2012). A Defined Process to Digitally Reproduce in 3 D a Wide Set of Archaeological Artifacts for Virtual Investigation and Display. *Journal of earth science and engineering*, *2*(2), 118-131.

U.N.E.S.C.O. (1972). *Photogrammetry applied to the survey of HistoricMonuments, of Sites and to Archaeology,* UNESCO editions.

Vacca, G., Deidda, M., Dessi, A., & Marras, M. (2012). Laser scanner survey to cultural heritage conservation and restoration. *International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, *39*(B5), 589-594.

Valanis, A., Fournaros, S., & Georgopoulos, A. (2010). Photogrammetric texture mapping of complex objects. In *Proceedings of Eur-oMed2010 3rd International Conference dedicated on Digital Heritage*.

Van Genechten, B. (2008). Theory and practice on Terrestrial Laser Scanning: Training material based on practical applications.

Versaci, A., & Cardaci, A. (2011). Web-sharing for a cultural heritage computer database of Central Sicilian monuments. CIPA, ISPRS syposium, Prague, available from:

Yilmaz, H. M., Yakar, M., Gulec, S. A., & Dulgerler, O. N. (2007). Importance of digital close-range photogrammetry in documentation of cultural heritage. *Journal of Cultural Heritage*, *8*(4), 428-433.

Resume

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DOI: 10.15320/ICONARP.2018.54 – E-ISSN: 2147-9380

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DOI: 10.15320/ICONARP.2018.54 – E-ISSN: 2147-9380

Research Article

ICONARP
International Journal of Architecture & Planning
Received 07 Nov 2018; Accepted 04 Dec 2018
Volume 6, Issue 2, pp: 274- 303/Published 28 December 2018
DOI: 10.15320/ICONARP.2018.55–E-ISSN: 2147-9380

ICONARP

Conservations and Rehabilitation in Historical Urban Centres: Halit and Gaziosmanpaşa 22nd Streets, Tokat, Turkey

Emine Saka Akın*

Abstract

Historical and traditional urban fabrics located at historical urban centres carry on with their existence as slum areas of cities due to economic, physical and functional aging. In Turkey, efforts to conserve historical and traditional urban fabrics and to solve their problems have increased in recent years. These efforts are mostly supported by local governments, and are exemplified by such implementations as urban renewal projects, and street and façade rehabilitations. However, these implementations are carried out to a large extent on a singular basis, lacking in multi-dimensional, holistic approach. Nevertheless, conservation and problems of historical environments have multiple spatial, cultural, social, and economic dimensions. This article addresses conservation and its problems, together with their spatial, socio-economic, cultural, and legal dimensions, by the example of the rehabilitation project undertaken on Halit and Gaziosmanpaşa 22nd streets located in the historical urban centre of Tokat, and introduces solutions to conservation with respect to strategies developed specifically for this area.

Keywords: *Conservation, restoration, rehabilitation, historic building, Tokat*

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In conclusion a general evaluation of the success of the case study with its background and applicability of this concept to Turkish housing, which is used by middle-class has been discussed.

INTRODUCTION

Historical urban centres contained in continuously growing and developing cities always have to confront changing current problems. These changes present themselves to us over time as social, cultural, spatial, and economic challenges. For this reason, the concept of conservation may be summarized as "managing the change" (Şahin Güçhan, 2014). Making decisions about and managing the implementation of conservation interventions carried out in cities that undergo change is an important and dynamic issue. Cities have transported themselves up to the present by retaining layers of their accumulations. These accumulations, alongside the local architecture, geographic elements, cultures, traditions, and life styles, make up their identities. Where the relationship between these components gets damaged, that place loses its identity. And where the identity of a place gets lots, people living there also lose their sense of belonging to that place, which in turn may also damage the identity of the affected person (Schulz, 1980). For this reason, all types of conservation decisions which would prevent the loss of and carry the identity of a place to the future are of great importance.

When conservation is carried out at the scale of a single building, in general one faces the problems of physical, functional, and economic aging. But, given that each building only becomes meaningful within the city and the context where it is located, when the concept of conservation is viewed at the urban scale, one is confronted with very different set of problems. This is so because historical cities differ in their local identity values, spatial characteristics, and functional identities, at national and international levels (Özcan, 2009). The decisions to be made for the implementation of conservation must be formulated around the principle of public good, based on particular socio-spatial and economic infrastructure differences of historical cities. This formulation is important in terms of the process of transforming "the space into a unique place", and conservation/development and integration with urban life of local identity values, urban memory, and image (Gospodini, 2002; Gospodini, 2004; Özcan, 2009). These decisions which would carry the unique urban fabric and local identity values of cities to the future must be made in a continuous manner (Güvenç, 1974). Given that at the present time the conservation of cultural heritage has become multi-dimensional and the significance of historical areas located in

DOI: 10.15320/ICONARP.2018.55 – E-ISSN: 2147-9380

urban centres has increased, such concepts as "area management" have come to the fore in order to attain continuous, effective conservation (Ayrancı and Gülersoy, 2009). Area management is also of significance as it also incorporates long term developmental objectives of cities. This kind of approach in particular takes into consideration whether or not the current conservation of historical centres meets the development requirements of tomorrow (Brüggemann and Schwarzkopf, 2001).

In recent years, real estate oriented, large scale urban projects, infrastructure investments, and efforts to invigorate urban economies have once more engendered significant change in the physical landscape of historical cities (Aksoy et al., 2012). Historical buildings may have been rehabilitated or reclaimed by adopting them to new uses, but as long as the city becomes commodified, economic expectations become the dominant factors determining urban form and identity (Enlil, 2000). The fact that traditional settlement fabrics are phenomena that, aside from their physical features, are also defined by their socio-cultural characteristics, is overlooked. One needs to remember that the meaning of these spaces is integral of life that goes on within (Koca, 2015). For this reason, a sustainable conservation approach should be developed which would not only identify the physical and natural infrastructures of areas to be conserved, but also their socio-cultural infrastructures (Çahantimur, 2008). When conservation of traditional settlement fabrics is not undertaken in this way, the ties to the past would be broken and not carried to the future. Today's environmental challenges of rapid urbanization in the steadily developing and changing world, and social and functional transformations have rendered significant the conservation of historical environments together with the people living within as much as the conservation of their unique identities (Enlil, 1992). Especially in the historical urban centres, the use of houses beyond the commercial and working hours would largely contribute to enliven the city at all hours. The 24 hours use by residents generates higher demand in historical centres, and it increases the number and varieties of uses. While some urban centres strive for a physical conservation and maintenance, others try to preserve the original population. In short, it is clear that in order to sustain the identity, character, and urban location of an area, one is required to sustain its societal, functional, and economic relations as well (Tiesdell at al., 1996).

In the city of Tokat, which constitutes the study area of this article, urbanization and the transformation of living conditions push residential and social areas out of the urban centre into new

settlement areas. As such, it is indispensable to increase the perceptibility of historical urban centres, which have entered into an evacuation process, and to augment their conditions of comfort. Local governments, associations, and citizens have to assume the important task of finding solutions to problems including economic, spatial, social and political issues by prioritizing the concept of lasting and sustainable space. Also setting as a target this area to be reused, the Governorate of Tokat has put on its agenda its rehabilitation project, had the projects prepared, and initiated the implementation process as of 2017 (Figure 1).

Figure 1. Restoration works just started in Halit Street *(by the author)*

The street rehabilitation project carried out on Halit and Gaziosmanpaşa 22nd streets, which harbours both residential and commercial functions inside Tokat's historical urban centre, was realized in three stages. In the first stage, in order to identify the area and to develop an understanding of its unique urban fabric, the spatial and historical infrastructure was laid down by compiling all physical data with the methods of literature review, questionnaires, interviews, and documentation. In the second stage, strategies were developed on the basis of analysis of all data and identification of existing problems, and in the third stage, planning decisions were made on the basis of assessment of all data obtained. The economic, cultural, social, and spatial analyses, as well as proposals for solution made in this project, which was conducted with a contemporary and sustainable conservation approach, will contribute to other conservation efforts in urban areas.

PROJECT AREA

The city of Tokat, where the project area is located, is situated in the Central Black Sea Region (Figure 2). Within the provincial borders of the city, the history of which goes back to 3000 BC, are located many ancient cities such as Sebastapolis, Comano,

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Maşathöyük, and Horoztepe. The current urban centre was founded inside the Castle during the Roman Period. During the Danismend reign, the city started to grow toward the southern foothills of the Castle. Urban growth continued also in the Anatolian Seljuk, Ilkhanid, and Ottoman periods. Tokat maintained its existence as a small city after the founding of the Republic, but was subject to urbanization drives in the last 15 years.

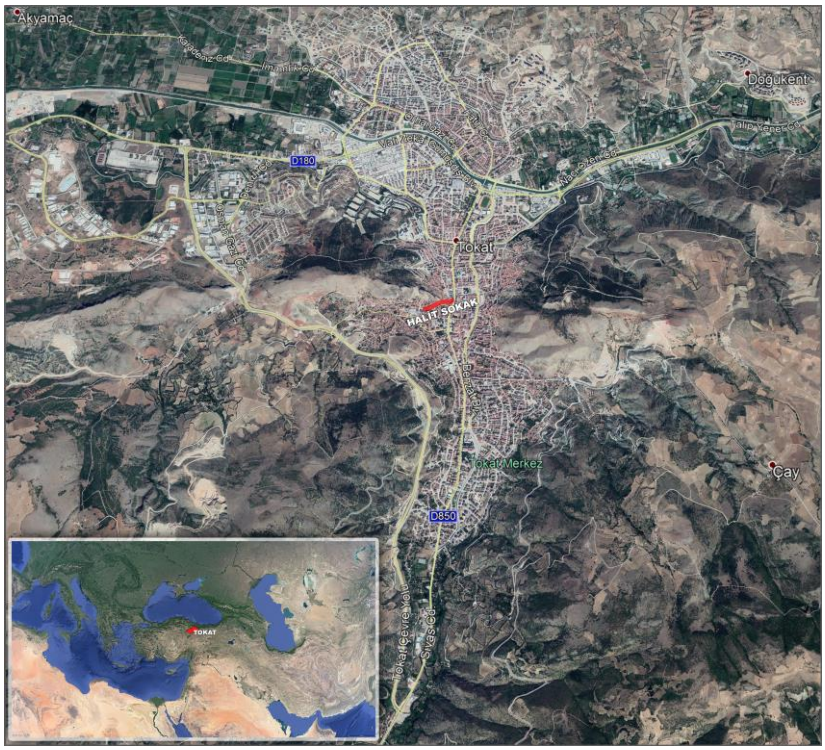

Figure 2. Satellite view of Tokat *(http://www.netkayit.com/turkiye-haritasi.php?uydudan=Tokat)*

The project area is located at Halit and Gaziosmanpaşa 22nd streets on the southern foothills of Castle of Tokat, in Kabe-i Mescid and Camii Kebir neighborhoods. Situated within the urban protection zone, these two streets are continuation of each other on the same axis, and connect the new urban centre of the city (Gaziosmanpaşa Boulevard) to the old urban centre (Sulu Street), (Figure 3). Sulu Street and its surroundings, which constitute the historical commercial centre of the city of Tokat, have retained commercial vitality up to the 1980s as one of the oldest commercial centres of the city. There are many monumental works on Sulu Street dating back to Danismend, Anatolian Seljuk, Ilkhanid, and Ottoman periods. However, as a result of the urbanization activities flourishing after the 1980s, the monumental and traditional urban fabric of Sulu Street has become derelict and transformed into a slum area. Even though restoration works have taken place on some monumental buildings in the historical urban centre (Sulu Street) in recent years, given that this area is distant to and disconnected from the

main new transportation artery of the city, this could not integrate the area fully to the city. For this reason, the project area is in an important location as it is situated on an axis which would accomplish this integration. Halit Street, also known as Yahudiler Street among the populace, is a residential area containing traditional houses (Figure 4). Gaziosmanpaşa 22nd Street, on the other hand, has more commercial activities. Even though there are many streets in the city which connect Gaziosmanpaşa Boulevard with Sulu Street, both streets in the project area differ from the rest as they represent a small model of the city, displaying traditional and monumental architectural buildings.

Figure 3. Sulu Street *(by the author)*

Figure 4. The project area and its surroundings *(Archtech Mimarlık Ltd. archive)*

Since there were no written documents on either street, information about them was gathered through interviews made with elderly persons. These interviews revealed that Halit Street featured a church and a synagogue which did not survive up today. People aged 60 and above stated that they remembered the church, and had heard about the synagogue from their elders. Today, apartment buildings stand on the sites of these buildings. During the interview, Bozyel, a resident aged 65, explained that the traditional houses in the area were the homes of non-Muslims, that the immigrants from Salonika who came to Tokat had

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purchased them when they were vacated during the implementation of the exchange agreement made with Greece, and that even his grandfather was an immigrant who had purchased the house they had been living in following the exchange (Interview, 2015).

PROJECT AREA FABRIC

There are 64 buildings facing the two streets, including 40 traditional buildings out of which 9 are registered, 17 new buildings, 6 monumental buildings, and 1 mosque (Figure 5, 6, 7, 8). The municipality has conducted maintenance work during the early 2000s on the outer facades of traditional buildings facing Halit Street, which were not part of a project.

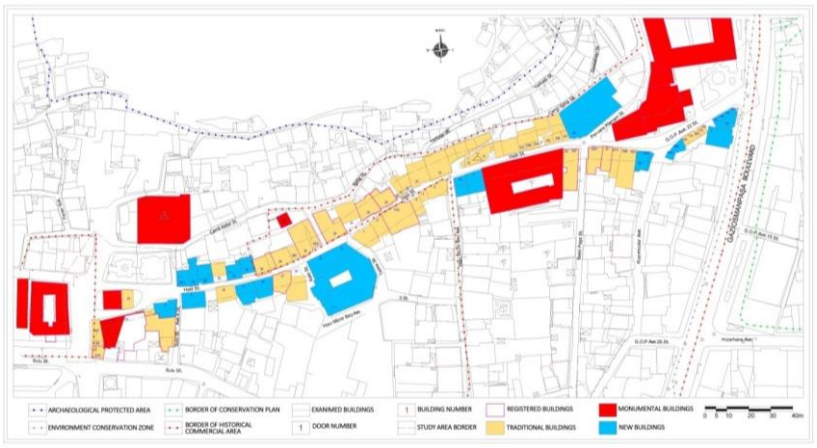

Figure 5. Buildings in the project area *(Archtech Mimarlık Ltd. archive)*

Figure 6. Aerial photo of the project area *(Archtech Mimarlık Ltd. archive)*

Figure 7. Views of project area connected with Gaziosmanpasa Boulevard *(by the author)*

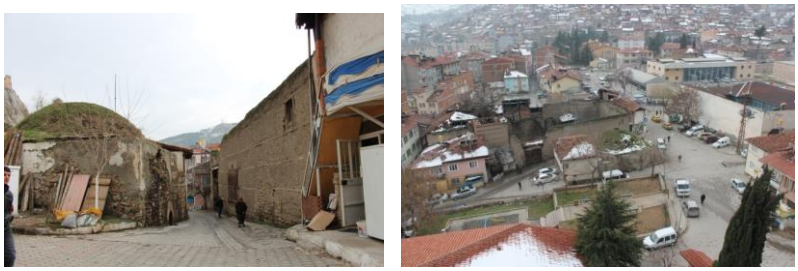

Figure 8. Views of project area connected with Sulu Street *(by the author)*

Settlement Fabric and Street-Garden-Building Relations

Buildings line both streets that connect Gaziosmanpaşa Boulevard with Sulu Sokak with an average elevation of 5.5 %. Houses situated on the street, the sharpest elevation of which is 8,5 % and the width of which varies between 4 to 7,5 meters, in an organic order consistent with the features of the land and its ownership.

The frontal facades of the buildings face the street and demark the borders of the street. All buildings on the street are attached and situated next to each other in a row. The attached rows are broken only when giving passage to roads. 3 buildings have gardens in front, and 6 buildings have gardens at the side and at the back facades. With the exception of those with front gardens, the entrance to the buildings is accessed from the street. There are also reinforced concrete buildings in between the traditional buildings (Figure 9, 10, 11, 12, 13).

Figure 9. Views from the project area *(by the author)*

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Figure 10. The survey of north silhouettes *(Archtech Mimarlık Ltd. archive)*

Figure 11. The restoration of north silhouettes *(Archtech Mimarlık Ltd. archive)*

Figure 12. The survey south silhouettes *(Archtech Mimarlık Ltd. archive)*

Figure 13. The restoration south silhouettes *(Archtech Mimarlık Ltd. archive)*

Traditional Houses

The traditional houses on Halit and Gaziosmanpaşa 22nd streets which have survived up until now with little alterations in the city centre represent the characteristics of traditional housing of Tokat and Central Anatolian Region. While their construction dates are not known, in consideration of the natural disasters Tokat has gone through, their construction materials can be dated back to the 19th century (Akın and Özen, 2010).

There are 24 traditional houses, out of which 9 are registered, facing the street. The ground floors of these traditional houses are service areas containing hearth, oven, and workshop. Upper floors are reserved as living spaces. These traditional houses usually have floor plans with inner and outer anterooms which are the spaces that provide passage to outdoors and the street (Akın and Özen, 2010). 8 of the traditional houses have mezzanine floors between the ground floor and the upper floor. These mezzanine floors, which also exist in many other traditional houses in Tokat, were built for residing during wintertime, and have low ceilings for easy heating.

Projections constitute the most prominent and characteristic elements of street façades and they vary a great deal. Projections of all houses, usually supported by arches, called *"eli böğründe"*, are built uniformly. Almost all of the traditional houses have one storey above the ground floor, and only one has two storeys above the ground floor. The outer facades are plastered with white sweet lime plaster, and their windows are proportioned by a ratio of ½ and have wooden frames. The area has 13 ground floor+one storey, 8 ground floor+mezanzine floor+one storey, and 1 ground floor+2 storey houses (Figures 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25).

Figure 14. The traditional house at block 133, lot 109 *(by the author)*

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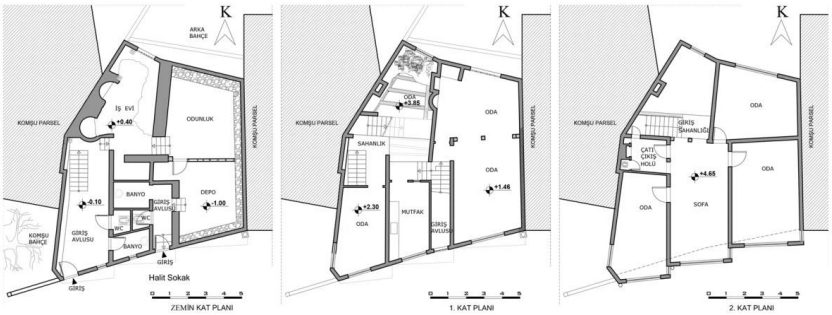

Figure 15. The survey plan of the traditional house at block 133, lot 109 *(Sivas Kültür Varlıklarını Koruma Kurulu archive)*

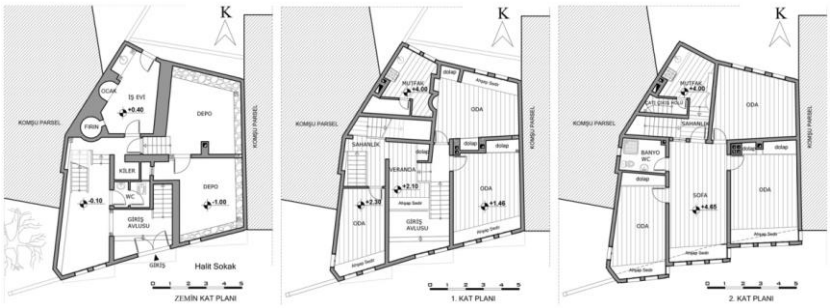

Figure 16. The restoration plan of the traditional house at block 133, lot 109 *(Sivas Kültür Varlıklarını Koruma Kurulu archive)*

Figure 17. The survey and restoration façades of the traditional house at block 133, lot 109 *(Sivas Kültür Varlıklarını Koruma Kurulu archive)*

Figure 18. The traditional house at block 135, lot 23 *(Archtech Mimarlık Ltd. archive)*

Figure 19. The survey plan of the traditional house at block 135, lot 23 *(Yaprak Mimarlık Office archive)*

Figure 20. The restoration plan of the traditional house at block 135, lot 23 *(Yaprak Mimarlık Office archive)*

Figure 21. The survey and restoration façades of the traditional house at block 135, lot 23 *(Yaprak Mimarlık Office archive)*

Figure 22. The traditional house at block 135, lot 75 *(Archtech Mimarlık Ltd. archive)*

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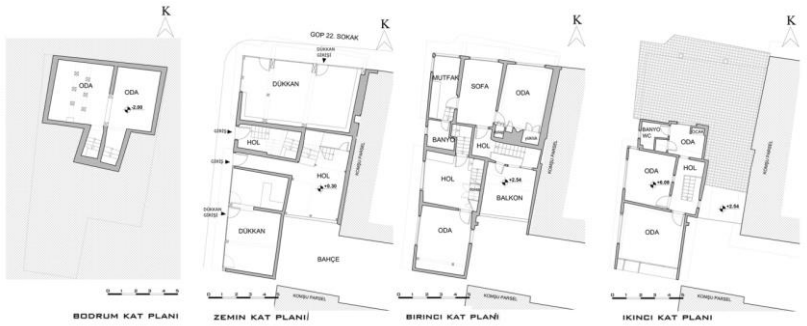

Figure 23. The survey plan of the traditional house at block 135, lot 75 *(Yaprak Mimarlık Office archive)*

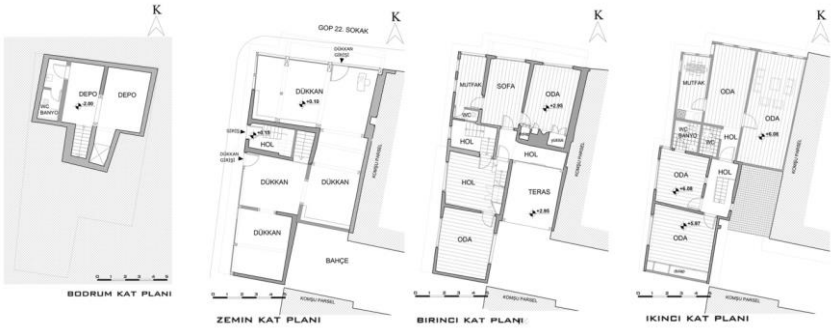

Figure 24. The restoration plan of the traditional house at block 135, lot 75 *(Yaprak Mimarlık Office archive)*

Figure 25. The survey and restoration façades of the traditional house at block 135, lot 75 *(Yaprak Mimarlık Office archive)*

Indoor elements and decorations have the characteristics seen in Traditional Houses of Tokat. While these houses look very plain and modest from outside, their indoor decorative elements are quite ostentatious, and they feature hearths, wooden ornamentations, light fixtures, ornamented ceilings, and built-in closets (Akın and Hanoğlu, 2013) (Figures 26, 27, 28).

Figure 26. Views of interior space of the traditional house at block 241, lot 1 *(by the author)*

Figure 27. A view of interior space of the traditional house at block 242, lot 9 *(by the author)*

Figure 28. A view of interior space of the traditional house at block 242, lot 2 *(by the author)*

The construction materials of these houses include rubble stone, wood, brick, and mud brick. Their construction technique consists

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of building on top of a continual stone foundation a wooden structure which is filled with brick and mud filling for walls. The inner surfaces of walls are plastered with sweet lime, and their outer surfaces are plastered with mud or sweet lime. Cupboards, stairways, ceilings, and floor coverings, except for the ground floor, are wooden. Since the ground floors are mostly service areas, their floors consist of rolled earth, stone, or brick materials.

Monumental Buildings

Taşhan (Voyvoda); located at the intersection of Gaziosmanpaşa Boulevard and Gaziosmanpaşa 22nd streets, Taşhan *(Stone Inn)*, an Ottoman period commercial building, was built between 1626-1632 (Mercan et al., 2003) (Figure 29).

Figure 29. Taşhan *(by the author)*

Pervane Bathhouse; built as a double bathhouse, today this bathhouse is under the ownership of General Directorate of Foundations, and is in good condition and in operation. It was built in 1275 during the Anatolian Seljuk Period (Önge, 1995). The ground floor of the bathhouse, which is located on Gaziosmanpşa 22nd Street, is 2.00 meters below the current street level (Figure 30).

Figure 30. Pervane Bathhouse *(Archtech Mimarlık Ltd. archive)*

Yazmacılar (Gazi Emir, Gazioğlu) Inn; this two storey inn with an inner courtyard has a quadratic plan, and its construction date is unknown. Located on Gaziosmanpaşa 22nd Street, it used to be private property, but went into the ownership of the Regional Directorate of Foundations. Today, its restoration work is complete (Figure 31).

Figure 31. Yazmacılar Inn *(by the author)*

Ulu Mosque; **l**ocated in Cami-i Kebir neighbourhood to the North of Halit Street, the inscription on the eastern entrance of the mosque shows the date of 1678, but this is the date of its renovation. In reality, it was built during the Seljuk period, but was damaged because of fire, earthquake, etc., and was rebuilt during the Ottoman period, based on its original foundations (Erdemir, 1986) (Figure 32).

Figure 32. Ulu Mosque *(by the author)*

Katırcılar Inn; there is no definite information about the construction date of this dilapidated building of an inn, of which the northern façade is on Halit Street (Figure 33).

Figure 33. Katırcılar Inn *(Archtech Mimarlık Ltd. archive)*

Sık Dişini Helâsı; the construction date of this building located on Halit Street is unknown. It is a single space, domed building, with unoriginal additions inside. Since it was used as toilets for a while, the populace calls it by this name. The small round windows on the dome indicate that it must have been a section of a bathhouse. The higher ground elevation of the building was lowered during the excavations conducted in 2017 to its entry elevation, and the

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house attached to its eastern façade was knocked down (Figure 34).

Figure 34. Sık Dişini Helası *(Archtech Mimarlık Ltd. archive)*

ANALYSIS OF PROJECT AREA

Based on literature review, technical measurements, observations, research, meetings, questionnaires, and interviews about the area, a dataset was gathered regarding the 64 buildings and the streets. All buildings in the project area have been analysed in terms of registration, properties, ownership, site plans, use, and construction techniques.

Spatial Analysis

Urbanism:

Located in the city centre, urbanization drives and rent pressures exert fairly strong impact on the project area and the surrounding historical centre. This causes traditional buildings located inside the urban protection zone, which are not registered as yet, to be demolished and new buildings to be erected on their spots which do not fit into the urban fabric of the area. As commercial venues abandon the historical urban centre, this causes further pressure on traditional commercial activities. Evacuated traditional houses and diminishing commercial activities have caused this area to turn into a slum and shanty area.

Physical and Functional Aging:

Interventions made to buildings over time and reasons emanating from physical conditions have caused historical buildings to age. For this reason, buildings which have not been maintained for a long time have serious structural damages (Figure 35). Buildings with structural damage and adjacent to the road are also of concern for life safety. Physical comfort conditions of buildings which have not been maintained are also not in good shape.

Figure 35. The structural damages *(by the author)*

As a result of changing living conditions over time, these traditional houses also face the problem of functional aging. Given the size of contemporary nuclear family, these traditional houses are too large, which results in evacuations, sales, or renting by their owners. Some home owners habitually divide their houses with unoriginal additions and live there with a number of other families (Figure 36).

Figure 36. Unnecessary wall attachment *(by the author)*

6 out of 24 of the houses built with traditional techniques were empty and 5 were used partially. New shopping malls built in the city result in functional aging of traditional commercial venues located in the area. While structural conditions of traditional buildings, where commercial activities take place are in good shape, they cause visual pollution within the street fabric.

Problems with Infrastructure:
Both streets display visual and physical deterioration caused by road and infrastructure works.

Access/Transportation:
The project area acts as a bridge between the historical urban centre and the new city centre, and is therefore in an advantageous location in terms of accessibility. Nowadays, traffic continues to flow on both directions on Halit and Gaziosmanpaşa 22nd streets. The street going in between the traditional houses is not even, as its width varies between 4 and 7.5 meters. For this

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reason, the street has no sidewalks, and no pedestrian and disabled safety. Additionally, passing vehicles cause buildings adjacent to the street to tremble and damage their structures.

Socio-Economic and Cultural Analysis

All places acquire their characters over time that reflect current and past actions and shared values of society, as well as their unique soul, culture, and history. Traditional settlements also reflect the soul of society in concrete terms. This concrete fabric, developed by layering of accumulations over the years, evinces the traces of the past, and is unique (Conzen, 1960; Conzen, 2004; Koca, 2015). For this reason, conservation projects in historic urban centres carried out of this context are not expected to be successful.

In order to conduct socio-economic and cultural analyses in the project area, questionnaires, interviews, and meetings were conducted. On both streets, where approximately 200 persons live, questionnaires were implemented by random sampling to three groups, made of those who were engaged in commercial activities, those who lived in traditional houses, and those who lived in new housing. Questions regarding socio-economic and cultural situation of persons living in the area, and their problems and expectations regarding the street were asked. In addition, two meetings were organized during the project preparation stage with the inhabitants in the area and the authorized public administration in order to evaluate the project process.

Persons living in both the traditional and new houses consisted of illiterates by 3 %, and graduates of primary school by 50 %, middle school by 15 %, high school by 20 %, and university by 12 %. 95 % of women were housewives. Of men, 60 % were retirees, 10 % government employees, and the rest were working at minimum wage or in temporary jobs. The level of income of these families was middle and lower middle income, and households consisted of 2 to 5 persons. 50 % of residential and commercial buildings were rented. Out of those who were engaged in commercial activities, 21 % were graduates of primary school, 5 % middle school, 38 % high school, and 36 % university. Their level of income was middle and upper middle income.

According to the results of questionnaires, as the buildings in the project area are in a process of being evacuated due to spatial problems, usually the traditional houses were either rented out or sold to families with low levels of income and education who have migrated from rural areas. There are also refugee groups living in traditional houses with low rents. For these reasons, the socio-

economic and cultural structure of the area has changed considerably.

The reasons for living in these houses were stated as economical by 72.73 %, proximity to work/school by 22.73 %, and the house being the ancestral home by 4.55 % (The answer stating economical reason was statistically significant, chi^2=16.46, p<0.05). The reasons for engaging in commercial activities in this area were stated as customer loyalty by 68 %, proximity to the centre as 21.05 %, and time spent by 5.26 % (The answer stating customer loyalty was statistically significant, chi^2=14.63, p<0.05).

Some of the statistical analysis results of the questionnaire conducted in the area regarding the streets are provided in Table 1.

Table 1. The results of questionnaire analysis

Questions	Yes %	No %	Undecided %	Significance level (Those who answer "yes")
Satisfied with life on the street	78.05	12.20	9.7	chi^2=36.93, p< 0.05
Neighborhood relationships are friendly and sincere	75.61	12.20	12.20	chi^2=32.98, p<0.05
Feels belonging to the street	70.73	12.20	17.07	chi^2=25.95, p<0.05
Must be a craft on the street	92.68	4.88	2.44	chi^2=65.02, p<0.05
Restaurant should be opened on the street	73.17	26.83	-	chi^2=8.80, p<0.05
Must be resting places on the street	90.24	9.76	-	chi^2=26.56, p<0.05
Should the area be open for tourism?	% 85.37	% 7.32	% 7.32	chi^2=49.95, p<0.05
Should the area be cultural street	% 92.68	% 7.32	-	chi^2=29.88, p<0.05

The largest problem facing the project area, having been subject to in and outmigration due to changing living conditions and dereliction, is neglect and poverty. Local governments have important tasks to assume in order to overcome these problems. Since overcoming these problems necessitates large budgets, single institutions will not be able to tackle them. Therefore, a joint effort of all public institutions will be the starting point to overcome these problems. As a first step, the Provincial Directorate of National Education should offer courses on small handicrafts, music, folklore, and education geared especially toward women and the youth living in the area.

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Legal Condition

As it is the case in the rest of the world, also in Turkey, the management process of cultural endowments is usually realized within the state organization. Started in the Ottoman times, this organization has also continued in the Republican period. The most comprehensive regulation in Turkey that sets out the rules for all types of research, conservation and management of cultural and natural endowments is the Conservation of Cultural and Natural Endowments Law no 2863 passed in 1983, and today's regulations are all based on this law. The actors in the public administration for cultural endowments include Ministry of Culture and Tourism, General Directorate of Foundations, General Directorate of National Palaces, and Ministry of National Defence at the central government level, and municipalities and provincial special administrations at the local level (Aksoy et al, 2012).

In Tokat, decisions regarding specification of the protection area and building conditions were first taken in 1984, and 181 real properties were registered as cultural endowments in the same year. Up until now, registered and unregistered traditional houses in Tokat have been subject to an understanding of conservation at a single building scale. Nevertheless, conservation strategies are needed which would ensure that these buildings would be converted to more liveable spaces and would be integrated to the city. With regard to the conservation of these products, these strategies need to be specified, even though there is a legal framework in Turkey, but its implementation has many dimensions. For this reason, area/management plans, which would include long term conservation strategies, need to be prepared for Tokat in the shortest time possible in order to carry this heritage to the future.

Spatial, legal, socio-economic, and cultural problems witnessed in the project area in recent years have brought about multi-faceted challenges in the area. The leading problem is with regard to multi-owner title deeds of buildings which are legally transferred by inheritance. There are also problems with owners not wishing registration of their unregistered houses, or owners who try to unregister their registered houses. Carrying out restoration work in traditional homes occupied by low-income people, half of whom are tenant, is especially very difficult. Even though there are incentives granted by the State for restorations, they remain insufficient. Out of the 24 qualified traditional houses, including 9 registered ones, in the project area, only 4 have had undergone restoration, which is due to the low level of income of inhabitants.

ASSESSMENT AND CONSERVATION DECISIONS

Since the project area does not have more attractive power than other streets, despite its traditional urban fabric and importance in history, a decision was made to convert this area into a centre of attraction. For this purpose, assessments were made at the urban scale in communication and cooperation with the users of the area and the authorized public administration to ensure that conservation work would be guided in an integrated and sustainable manner. All analyses regarding increasing spatial, socio-economic, cultural, infrastructural, and accessibility qualities, as well as user demands, which would bring about solutions to the fundamental problems of the project area, were assessed in terms of "strengths/ weaknesses" and "opportunities/threats" of the project area (Table 2).

Table 2. Strengths, Weaknesses, Opportunities, and Threats

STRENGTHS	**WEAKNESSES**
Location of streets in historic urban core	Squalidness of traditional houses
Location of streets in urban centre (accessibility)	Squalidness of the street giving rise to a safety problem
Traditional, unique urban street fabric	Location of area within a shanty town area
Existence of monumental buildings	Poverty and low level of living quality
Existence of an economic structure brought about by history, art, and culture	The shifting of commercial area to the new settlement region of the city
Existence of traditional production together with historic commercial areas	Traffic and parking problems
Retaining local culture	Insufficiency of social facilities
	The area not being recognized by visitors coming from outside the province
	Lack of holistic approach /holistic conservation
OPPORTUNITIES	**THREATS**
The street being the gate opening to the historical centre of the city	Rent pressure
The existence of an inn, the restoration of which was recently completed	Financial problems
The support and significance assigned by current central and local governments to conservation work	Problems with expropriation
	New buildings spoiling the silhouette
	Lack of precautions against fire
	Substandard building stock
	Evacuating inhabitants and trades people
	Lack of regulatory plans such as tourism plans, visitor management plans,
	Wrongful restorations

These analyses which were made in the rehabilitation project that has the objective of making both streets a gate and centre of attraction between the new axis of the city and the historical urban centre, were helpful in setting out the conservation strategies. The conservation strategies of the street rehabilitation project were set as follows:

- Making sure that street rehabilitation is integrated to the city by a thorough analysis of historical background of the city, its

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cultural heritage, spatial development, socio-economic and cultural infrastructure, and contemporary life styles
- Conservation of the accumulation of the historic urban fabric, traditional houses, and monumental buildings located in an important area of the historic urban core
- Contributing to increasing living/environmental qualities
- Strengthening the physical and functional ties between buildings by evaluating all buildings on the street as a whole
- Creating social areas in order to instigate a sense of belonging
- Generating consciousness of conservation of the historic environment
- Integrating the area, which is located in the commercial centre, to the local economy
- Ensuring health and safety conditions
- Ensuring unity and continuity in pedestrian and vehicular transportation between the project area and the rest of city and its environs in terms of function and spatial arrangements, etc.
- Ensuring physical, functional, social, and economic development of the area
- Evaluating each area by their unique qualities
- Ensuring intervention to unexpected situations even during the implementation phase by providing feedback.

Appropriate conservation interventions were done in accordance with these strategies by assessing socio-economic, cultural, and spatial structures in the area. As a priority for increasing the spatial quality, restitution and restoration projects for all buildings on the street were prepared geared toward renovation of their façades.

In the rehabilitation project prepared for sustenance and integration of the area with the city, three target groups were selected in this order: inhabitants of the street, city dwellers, and visitors. One key objective of the project was to conserve the traditional housing settlement to be used 24 hours. For this purpose, when the activities were being planned, empty traditional houses not used by the inhabitants of the street were identified and were given appropriate functions, also in line with the results of the questionnaires. New functions were planned to allow for the socio-cultural continuity, and consequently, new social activity areas were created. The creation of environments in which traditionalized cultures can be exercised and cultural activities can be organized will ensure that the area is used more frequently in Tokat's cultural life. For example, promotional day festivities can be organized for traditional events (such as bathhouse parties, henna nights for brides), preparation of

traditional foods (such as grape molasses, tomato paste, cured grape leaves), or traditional handicrafts (such as Tokat's hand-printed cloths). People getting lonelier in a steadily globalizing world appears to be a social problem. From this point of view, such organizations would make possible for the people to gather and get socialized, and engender a sense of belonging and loyalty to place and space in persons. Higher quality, more liveable spaces would increase the number of qualified users in this area. In the project area, which would start to be used more intensively, along with the traditional living culture generated, people's consciousness would be increased about conservation of the historical environment.

For this purpose, an unused, registered traditional house with ground floor+2 storeys was identified for holding courses on by gone handicrafts, music, etc., as part of the social activities to be undertaken on the street (Figure 37). The front and side facades of this traditional house with an L shaped plan, located at block 242, lot 1, seemed to be damage-free, but there were collapsed areas at the back façade and inside. This large traditional house, situated at the corner of a four-road intersection, features many properties of Tokat's traditional houses. In consideration of its accessible location within the area and its size, it was assigned the function where cultural activities would be conducted.

Figure 37. A view of the traditional house at block 242, lot 1 *(by the author)*

In consideration of tourism activities for groups of visitors in the city and the street, a boutique hotel was proposed within the traditional urban fabric. For this function, an empty, registered traditional house was selected, which was the largest house with the largest garden on the street (Figure 38). Structurally this house, located at 243 block, lot 5, is not in good condition. It has a floor plan arranged around an inner anteroom. Despite some of the later additions, this floor plan is original. In consideration of the size of the building, the number of rooms, and the existence of

DOI: 10.15320/ICONARP.2018.55 – E-ISSN: 2147-9380

a backyard, it was considered to be suitable for the function of a boutique hotel.

Figure 38. A view of the traditional house at block 243, lot 5 *(by the author)*

The traditional house, located at block 242, lot 9, was selected as a venue where Tokat's local food would be served to all users, and which would also be used for small organizations (Figure 39). The front and side façades of this traditional house with ground floor+mezzanine+1 storey are adjacent to the street and the building thus has an L shaped floor plan. The entryway is from the front façade and it opens into a hallway. This hallway, the ceiling of which is covered with the floor planks of the first floor, opens directly into the garden. The surrounding anteroom on the L-shaped upper floor is open to outdoors, and thus the building has a floor plan with an outer anteroom. This type of floor plan having an outer anteroom, where passage between rooms is made possible in the open, was also encountered in the Yağcıoğlu Mansion in Tokat. In consideration of the size of this traditional house and the existence of a workshop, fountain, kebab range, and oven in its large garden, the ground floor was assigned the function of a restaurant, and the upper floor to be used for social organizations and meetings.

Figure 39. A view of the traditional house at block 242, lot 9 *(by the author)*

Small cafés and shops selling small souvenirs were also envisaged. Empty buildings with physical properties appropriate to these functions were selected. Existing commercial buildings were used with the same functions.

These streets contain three inns, a bathhouse, and two mosques which can actively be used. Located at the intersection of Gaziosmanpaşa Boulevard and the Gaziosmanpaşa 22nd streets, Taşhan is still in use today. Located on Gaziosmanpaşa 22nd Street, Yazmacılar Han, the restoration of which has been completed, was considered for use by workshops and shops where courses for the vanishing hand-printing of cloths would take place. Tokat has a great bathing culture, and the Pervane Hamam in the project area is expected to keep on with this tradition. Katırcılar Han in the area was proposed to be restored as a social facility with both open and closed spaces following its immediate expropriation. In addition, Ulu Camii will have programs ensuring that larger crowds have access to the street.

The integration of buildings with the street was realized with landscaping and planting arrangements appropriate to the functions assigned in accordance with the needs of the inhabitants of the street and the city. Resting and sitting areas were erected in order to facilitate socialization, and in consideration of the length and elevation of the street (Figure 40). Since the traffic flow on both streets has been creating problems for buildings and pedestrians, vehicular traffic was removed from the area, allowing access to the street only for emergencies. Roads and car parks parallel to these streets at south and north will have capacity to solve the traffic problem. In addition, in the landscaping project, a walkway and signs for the disabled, and a playground for children were realized. Projects and arrangements were done in order to solve the disorder created by electric and phone posts, advertisement boards, infrastructure lines, and the like. All additions which would cause visual pollution were removed from the façades of shops in the commercial area, and instead, nameplates and showcases suiting the traditional urban fabric were proposed. In order to ensure that the area is visible, usable and safe at night time, a lighting project was done. The materials used in outdoor spaces throughout the street were selected to complement each other, so that the street would be perceived as a unified place.

DOI: 10.15320/ICONARP.2018.55 – E-ISSN: 2147-9380

Figure 40. An elderly resting on the street *(by the author)*

CONCLUSION

The capitalist system contradicts with values based on esthetical, environmental, and qualitative criteria in fast growing cities and in cities where land and ownership are abused. Also Larkham (1996) notes that this contradiction is a large problem unsolvable theoretically in terms of qualities and scale, as there is not one single theory about how to manage conservation and implementation in historical buildings and urban landscapes, which has many dimensions. For this reason, in recent years it has been widely accepted that instead of the limiting meaning of the concept of "protection areas", one should adopt certain policies that deal with settlements as a socio-cultural and spatial whole inclusive of their layers, and approach them with the concept of "historical urban landscaping". These policies necessitate considering what is historical and what is modern jointly, and acknowledging the relationships between local identity, spatial quality, economic well-being, and social harmony. As such, controls over financial resources and decision making processes should also evolve into partnership, consultation, and cooperation between the state and the actors of the market and civil society (Dinçer, 2013). The conservation action, which means managing change in cities, as living organisms, should be at the same time flexible and in tune with changing times.

We observe that generally conservation projects in Turkey are not handled in a multi-dimensional way, and the tendency of making visitor-oriented physical interventions by creating museums or boutique hotels detached from their context is quite common. In a small city like Tokat, where there is a traditional housing stock with more than 140 registered houses and as many unregistered ones, it is not feasible to convert all of them into boutique hotels or museums from the perspective of sustainable conservation. Nevertheless, given the fact that visitors wishing to get to know different cultures and learn about other people's lives would like

to see and experience that culture in its physical environment, it is important that traditional way of living survives in these areas.

The strategic decisions made in the street rehabilitation project have focused on conservation as something more than physical improvement. In this respect, a SWOT analysis was carried out concerning the holistic conservation of the traditional urban fabric. In addition to this analysis, priorities and conservation strategies were identified based on questionnaires, interviews, and meetings. The important issues in restoring the unique identity of both streets were physical repairs, landscaping arrangements, identifying traditional life styles, revealing the cultural way of life, and the assigned new functions. In a holistic conservation approach, through which the street sustains its commercial activities and residential living inside the urban centre together with monumental buildings, the project does not transform these streets into a museum but makes them streets having a life not detached from its past. For Tokat, a city with a very rich historical and cultural heritage, this project will serve as a precedent for the preparation of area/management plans for conservation and implementation in other historical areas of the city.

ACKNOWLEDGEMENT

*This research was developed from the "Halit and Gaziosmanpaşa 22nd streets feasibility project" that was undertaken by Tokat Teknopark Archtech Architecture Restoration Consulting Limited Company. This project was made to Tokat Provincial Directorate of Culture and Tourism with the support of OKA (*Middle Blacksea Development Agency). *The restoration, restitution and restoration drawings of the area which constitutes the subject of article have been drawn by Asst. Prof. Dr. Emine Saka Akın, Asst. Prof. Dr. Aygün Kalınbayrak Ercan and Res. Asst. Elif Yaprak Başaran.*

REFERENCES

Akın, E. S. and Özen, H. (2010). Tokat Geleneksel Evlerinin Beyhamam ve Bey Sokak Örneğinde İncelenmesi, *The Black Sea Journal of Social Science* (2) 167-182.

Akın, E. S. and Hanoğlu, C. (2013). Tokat Geleneksel Konut Mimarisi'nde İç Mekân Alçı Süslemeleri, *Vakıflar Dergisi* (40) 163-184.

Aksoy, A., Enlil, Z., Ünsal, D., Pulhan, G., Dinçer, İ., Gülersoy, N. Z., Ahunbay, Z. and Köksal, G. (2012). *Kültürel Miras Yönetimi*, T.C. Anadolu Üniversitesi Yayını, I. Baskı, Web-Ofset, Eskişehir.

Ayrancı, İ. and Gülersoy, N. Z. (2009). Bay Tarihi Çevrede Koruma: Yaklaşımlar, Uygulamalar, *Dosya-14, TMMOB Mimarlar Odası Ankara Şubesi Yayını, Ankara, 73-79.*

DOI: 10.15320/ICONARP.2018.55 – E-ISSN: 2147-9380

Brüggemann, S. and Schwarzkopf, C. (2001). Erfurt, Germany, *Management of Historic Centres,* ed. R. Pickard, Spon Press Taylor and Francis, London; 113-132.

Conzen, M. R. G. (1960). *Alnwick, Northumberland: A Study in Town Plan Analysis,* Institute of British Geographers, London.

Conzen, M. R. G. (2004). *Thinking About Urban Form – Papers on Urban Morphology: 1932-1998*, Peter Lang, Bern.

Çahantimur, A. (2008). Sürdürülebilir Kentsel Gelişmeye Sosyokültürel Bir Yaklaşım: Bursa Örneği, *İTÜ Dergisi* 7 (2) 3-13.

Dinçer, İ. (2013). Kentleri Dönüştürürken Korumayı ve Yenilemeyi Birlikte Düşünmek: "Tarihi Kentsel Peyzaj" Kavramının Sunduğu Olanaklar, *ICONARP*1 (1) 22-40.

Enlil, Z. (1992). Tarihi Bir Çevreyi Yaşatmak: Paris ve Bologna'da Bütüncül Koruma Yaklaşımları, *YTÜ Mimarlık Fakültesi Yayını*, Mf Şbp 92.039/02, 199-204.

Enlil, Z. (2000). Yeniden İşlevlendirme ve Soylulaştırma: Bir Sınıfsal Proje Olarak Eski Kent Merkezlerinin ve Tarihi Konut Dokusunun Yeniden Ele Geçirilmesi, *Domus*, No:8, 46-49.

Erdemir, Y. (1986). *Tokat Yöresindeki Ahşap Camilerin Kültürümüzdeki Yeri*, *Türk Tarihinde ve Kültüründe Tokat Sempozyumu, Temmuz*, Gelişim Matbaası, Bildiriler Kitabı, Ankara, 295-312.

Gospodini, A. (2002). European Cities in Competition and the New '*Uses*' of Urban Design, *Journal of Urban Design*, 7(1) 59-73.

Gospodini, A. (2004). Urban morphology and place identity in European cities: built heritage and innovative design, *Journal of Urban Design,* 9(2) 225-48..

Güvenç, B. (1974). *İnsan ve Kültür*, İkinci Baskı, Remzi Kitabevi, İstanbul.

Interview 2015. A resident in Halit Street.

Koca, F. (2015). *Türkiye'de Geleneksel Yerleşim Örüntülerinin Özgün Karakter ve Kültürel Mirasını Koruma Anlayışına Ontolojik Bir Yaklaşım*, Planlama 2015; 25 (1):32–43.

Larkham, P. J. (1996). *Conservation and the City, by Routledge*, London and New York.

Mercan, M. and Ulu, M. E. (2003). *Tokat Kitabeleri* , Türk Hava Kurumu Basımevi İşletmeciliği, Ankara.

Online Satellite Photo [http://www.netkayit.com/turkiye-haritasi.php?uydudan=Tokat] Retrieved on (12.04.2015).

Önge, M. Y. (1995). *Anadolu'da XII-XIII. Yüzyıl Türk Hamamla*rı, Vakıflar Genel Müdürlüğü Yayınları, Ankara.

Özcan, K. (2009). Sürdürülebilir Kentsel Korumanın Olabilirliği Üzerine Bir Yaklaşım Önerisi: Konya Tarihi Kent Merkezi Örneği, *METU.JFA*.2009.2.1, 1-18.

Schulz, C. N. (1980). *Genius Loci-Towards a Phenomenology of Architecture*, Academy Edition, London.

Şahin Güçhan, N. (2014). Tartışma I- Koruma Yaklaşımları ve Uygulamaları İçinde Sivil Mimarlık, Korumada Sivil Mimarlık Çalıştay Notları, VEKAM, Ankara, s. 105.

Tiesdell, S., Oc, T. and Healt, T. (1996). *Housing-Led Revitalization*, Historic Urban Quarters, Reprinted 1998, Printed in Great Britain by MPG Books, London, s. 97-129.

Resume

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DOI: 10.15320/ICONARP.2018.55 – E-ISSN: 2147-9380

Research Article

ICONARP
International Journal of Architecture & Planning
Received 12 Nov 2018; Accepted 14 Dec 2018
Volume 6, Issue 2, pp: 304-332/Published 31 December 2018
DOI: 10.15320/ICONARP.2018.56–E-ISSN: 2147-9380

ICONARP

Analyzing Fringe Belt Phenomenon in The Historico – Geographical Structure of Milan, Italy

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Ayse Sema Kubat**

Abstract

The object of this paper is to identify the specific land use patterns in relation to a general framework of the fringe belts formation and modification through the urban expansion of Milan, a city with solid Italian planning tradition, by defining strong characteristics and land use transformations through comparative map analysis in a consistent timeline period.

Adapting the study of fringe belts, as signatures of the pulsations of urban growth, and a reflection of urban space needs beyond those of the residential and retail sectors, is pertinent as it contributes to understand each phase of city alteration and urban growth and relate them to economic and political forces linked to the contemporary development of metropolitan areas. Applied adequately, fringe belt studies have been taken in different parts of Europe, but few have been done in Italy. This research, as a comparative study of superposition data approach, has aimed to verify the true development pattern of a city with dynamic typo-morphological transitions, with powerful industrial and service sector shifts recently, strictly reflecting on the shaping of the overall urbanized territory.

A general study of the urban evolution has been undertaken and development of the municipality has been observed with a focus on

Keywords: *urban development, urban fringe belt, land use transformation, urban morphology, urban planning*

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defining land use maps, and obtaining a comparative data analyzes by overlapping and tracking land use transformations and expounding fringe belt modifications through different expansion periods of the urban territory. In the contemporary city, fringe belts can play crucial role as vast green open spaces for recreation and leisure, natural boundaries from harmful industrial surroundings, as well as ecological corridors and mediums for natural systems maintenance and natural remedy to improve the quality of life and provide healthier environments for the overall urban systems.
Adapting the study of fringe belts in a regulated conceptual framework, and referring them into the historico-geographical structure of the urban development could lead up to adequate planning and urban design strategies that aim to improve the quality of life in contemporary urban landscapes.

INTRODUCTION

The fringe-belt concept, first formulated in Germany fifty years ago, has its origins in the recognition by Louis of the long-term significance of physical limitations on urban growth. Herbert Louis first recognized fringe belts in his study of Berlin in 1936. Fringe belts could be assumed as spacious zones that formed at urban fringe during the hiatus in urban growth. That hiatus was in most cases reasoned by either a physical termination on urban growth, notably by a city wall or a topographical barrier, or by a legislative or economic delay to urban growth, most commonly predicated in a prolonged slump in residential construction. When the urban area resumed its outward spread, the fringe belt constantly became embedded as the growing residential area extended outward into the area beyond it. Relying on Louis's ideas, developed further by Conzen in Britain in the post-war period, it became the foundation for a morphological theory of urban growth and change. Discovering the existence and formation of fringe belts within cities has become a great challenge that urban morphologists tend to scope in their studies. The fringe-belt concept provides a frame of reference for depicting, explaining, and comparing the physical structure and historical development of urban landscapes (Conzen. 2001). In his study of the town of Alnwick, M.R.G. Conzen defined the fringe belt as "a belt-like zone originating from the temporarily stationary or slowly advancing fringe of a town and composed of a characteristic mixture of land use units initially seeking peripheral location" (Conzen, 1969, p. 58). Institutions like hospitals, universities, parks, cemeteries, jails, military barracks or large houses isolated on large plots are typical of the type of land uses that would locate at the urban fringe during periods of slow urban growth. When the urban growth resumes, the hiatus leaves a permanent mark and the fringe belt becomes embedded in the urban area. At its most basic, urban

DOI: 10.15320/ICONARP.2018.56 – E-ISSN: 2147-9380

fringe-belt theory was based on the uneven nature of urban growth over time in response to business cycles and the prediction that these oscillations produce an alternation of land-use belts in the outward growth of the urban built-up area of markedly different character (Whitehand, 1987). For scholars, fringe belts are signatures of the pulsations of urban growth, and a reflection of urban space needs beyond those of the residential and retail sectors. For planners, they merit recognition for their cultural and natural attributes and beg the question whether they should be regulated given their broad social value. And for designers, they present opportunities to design and redesign at lower densities, to design in more mixed environments, and face the challenge of retaining their inherent character (Conzen, 2009). There are three fringe belt types which have been classified according to their emergence times, distances from the city center and relations with the fixation lines: inner, middle and outer fringe belts. The oldest fringe formation is the inner fringe belt which has been formed around the historical core and the city wall as a fixation line (Whitehand, 1967). The inner fringe belt is an extramural continuous green belt includes agricultural areas and urban parks around the old city walls, which act as a fixation line for further urban expansion (Hazar Kubat 2015, 2016, Kubat, 2018). The inner and middle fringe belts were associated with city walls as fixation lines which acted as barriers to the physical growth of the city (Gu, 2010), which is usually observed within the historico-geographical expansion of medieval structure settlements. Fringe areas emerge spontaneously. Like their formation, their continuity is also about the operations of physical, socio-economic and cultural powers. This interaction shows that the fringe belt concept has a potential in the process of urban planning. Additionally, using fringe belt concept as a tool of planning is predicting to be helpful in integrated urban design and land development management (Whitehand & Morton, 2004). Urban periphery and urban fringe belt are two concepts that could be confused with each other because fringe belts are the areas which used to locate at the periphery, then embedded within the city as a result of the city growth. Fringe belts can be defined as the former urban peripheries which later embedded within the city. Open spaces, industrial areas, institutional areas, low density housing areas and recreational areas are examples of fringe belts. For open spaces, public parks, markets, cemeteries and vacant plots; for industrial areas, transportation utilities, warehouses, factories and quarries; for institutional areas, religious centers, monasteries, barracks, campuses, hospitals and wastewater treatment plants; for low density housing areas, villas, rural settlements; for recreational areas, sport areas, riding schools and

golf courses can be given as examples of fringe belt areas (Hazar & Kubat, 2015).

As a result of the rise in population and increasing demand for new development plots, and in spite of recent planning policies that scope these areas to green belt planning regulations, fringe belts have been acting as appetizing new development areas. Market garden lands, which open up to be development areas, are example for this case. Historical and unique characteristics of the fringe areas and historical identity of the city have been destroyed in this process called fringe belt *alienation* (Hazar & Kubat, 2015). If fringe belts continue to be used by their formation purpose, they become permanent, thus *consolidation* processes within the land use properties emerge. If a fringe belt does not locate at the periphery but the inside of the built environment, transformation pressure increases as a result of the city growth, thus transitions occur in the current character of the fringe area. Although their characters modify, sprawl or narrow, they continue to be separated from their surroundings (Whitehand, 1967). Fringe-belt *translation* occurs when a transfer of a lands use unit form an older fringe belt to a more recent one without change of site is evident (Conzen, 1960). In fringe belt *modification* process, area does not lose its fringe character, however, its land use changes. While the city grows, the location of the fringe belt plots in the city also changes. Relative change increases if the plot is older because the inner fringe belt plots which used to locate at the periphery of the city become at the periphery of CBD. As a result of the CBD pressure, some of the inner fringe belt plots start to alienate (e.g. new residential developments, densification and urban renewal projects). Fringe belts can be restructured and modified as a result of radical and large scale transitions in the city. New residential developments and CBD pressure are few of the reasons for this modification (Conzen, 2009). The acquisition of fringe belt sites by land uses of different character (e.g. multi-story office blocks and apartment buildings) and planning of park/open areas as new development sites are few of the reasons of fringe belt alienation. Unfortunately, a systematic strategy and integrated policy framework for the management of change are missing which may prevent the continuity of fringe belt areas (Gu, 2010).

The following paper attempts to discover the specific land use patterns in relation to fringe belts formation and transformation through the urban expansion of Milan, defining strong characteristics and land use modifications in the process of urban expansion and relate a general framework of the topic to the city. In order to define fringe belts in the city, a revision of the subject and a comparative map analysis has been conducted. Milan's

DOI: 10.15320/ICONARP.2018.56 – E-ISSN: 2147-9380

urban growth and development has been observed by overlapping city maps from different periods of urban growth, accordingly to the imperatives of the Conzen studies and his supporters. Thematic maps have been prepared through land use analysis, the superposition of historical and contemporary maps, orthophotographs, photographs and personal observations in the field.

The study concentrates on the modification of land utilization in a consistent timeline reference, based on their features of low density and institutional use. This research aims to result in identification of fringe belts formation and transformation in Milan, and highlight their present existence as part of the overall urban texture.

METHODOLOGY

In order to define fringe belts in the city, a revision of the subject and a comparative map analysis was conducted. Milan's urban growth and development was observed by overlapping city maps from different periods of urban growth, accordingly to the imperatives of the work of Conzen and Whitehand, the transformation and alienation process in the city of Milan was investigated. Data collection and analysis of these data were used as a base method in this research. The study concentrates among several land use patterns that are linked to the fringe belt land utilization (according to Conzen studies): cemeteries, military areas, college grounds, hospitals, industrial areas, marketplaces, sports and recreation areas, vast squares, parks and gardens, low density villa estates, airport areas and low density residential areas with agricultural character, known as "cascinas" (Figure 1). Not far from the city center, example of rural life dating to eighteenth century could be found - urban farmsteads, originally called "Cascina" in Italian consisted of residential farmhouse made up of series of individual dwellings and vast areas of gardens and courtyards, used to occupy the rural periphery of the city, so identified as low density residential areas with agricultural character within the map analyses. Many of the original Cascina structures, once abandoned, were completely destroyed, thus their land was integrated to the contemporary developments of the city, whereas some underwent extensive renovation and today act as historical social centers, completely surrounded by modern constructions (Cascina Cuccagna in Porta Romana, for instance). However, some cascinas maintained their original functions as urban agricultural lands and take place mostly in the periphery of the dense urbanization sites, recently.

In addition, urban land use character that exceptionally specified in the case of Milan was distinguished: former fair grounds that used to take place in the outskirts and lately integrated within the city, transforming into commerce areas due to capitalism market forces and carry the features of business centers after the 40s of the previous century arose rapidly. Although being enveloped and adopted within residential districts, subsequently, these grounds tend to preserve strong distinguishing architectural and typo-morphological nature, recently, that highly differentiate them from their surrounding environments (indicated as "*Fiera & Business District*" in the 1937, 1964 and 2018 map analyses). For instance, *Republica district*, *Porta Nuova* and *City Life* are related examples of that type of urban developments that lately show consolidation properties as central business district in the recent urban structure of Milan, but after all differ from their enclosing residential districts.

The research methodology concerns a comparative study of various city plans corresponding to significant urban transformation periods, starting from 1840 until 2018. A consistent overlapping of maps resulted in urban growth pattern and land use transformation analyzes that relate to the formation and modification of the fringe belts of the city. The following consecutive map overlapping have been taken into consideration:

· *New Plan of the City of Milan, corresponding to 1840*
· *Milan Master Plan, 1877*
· *Milan Master Plan, 1904*
· *Milan Master Plan, 1937*
· *Milan Master Plan, 1964*
· *Milan satellite view, 2018*

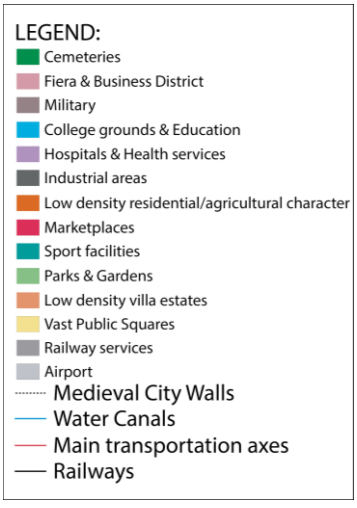

Figure 1. Indication of land use patterns in the following map analyzes *(prepared by the authors)*

DOI: 10.15320/ICONARP.2018.56 – E-ISSN: 2147-9380

Data collection is consisted of supply of historical and current plans from relevant databases, visual documents and old photographs, comparison of historic maps with consecutive plans and documents. Land use analysis was conducted to understand land utilization manners and their transformation, due to economic either political forces.

HISTORICAL LAYOUT, URBAN FORM AND DEVELOPMENT OF MILAN

"The historic development of Milan and the making of the city is rather complicated, due to an amount of different phases and stratifications, from ancient times to the current days: there is a Roman Milan, a Middle age Milan, a Renaissance Milan, a Spanish Milan, a XIX century city (Beruto's plan) and a great recent development, what generally occur in all European cities, and in Italy in particular" (V. Cutini, 2018). *Mediolanum* (the Roman name of Milan) was established in 222 BC, as a "roman castrum" that became a part of the state of the Caesars. Its location on the junction of strategic axes defined its preliminary destiny to expand and gain status quo an important exchange center. The first "castrum walls", which surrounded a square of about 600 meters of side, were replaced, during the imperial age by new walls 3.5 Km long of irregular geometrical shape (GeDeA, 1995). Under the Constantine's rule, the city expanded beyond its primary medieval walls and spread along secondary perimeter walls, containing several public and cultural facilities within its core (theaters, temples and basilicas). Once completely destroyed, the walls were reconstructed again in 1176 and six urban gates were defined to control the permeability and frame the "indoor" and "outdoor" of the city. At the same time the "Naviglio Grande" (vast water canal) construction under the Azzone Visconti rule has already started, which aimed to create a net of water roads with great defense hydraulics system around the urban wall. In 1330, Visconti gained the title "Dominus Generalis" and Milan became the capital of the state. The walls were reinforced and the construction of the Castle (Figure 2) was initiated (1368), the church of Saint Tecla was demolished to allow the establishment of the Duomo Cathedral (1386) – the most emblematic signature of the city, well known recently (Figure 3). In the period of 13th-16th century, Milan showed strong character of a medieval city with a powerful separation of urban-rural land pattern. The primary castle wall, outlined the basic formation of the core urban specimen, acting as a fixation line, it fostered the embodiment of the ring shaped secondary city wall that acted as a main defense structure.

In the period of 17th – 19th century, Milan steadily gained a rise in its population due to socio-economic factors that attracted merchants and crafts men who laid the fundamentals of the future economic development of Milan as an industrial center. As a result, the inner city agricultural land was transformed into residential areas, where only 'citizens' had the opportunity to inhabit. However, a definite preservation of the city core within

Figure 2. Sforzesco Castle *(Alessandrofoto)*

Figure 3. Duomo di Milano (*Giacomo Brogi)*

the castle walls was observed, which hosted the main administrative facilities related to the city console. The processes of land utilization did not show a rapid transformation until 19th century. Industrialization and mechanization of the economic power acted as a catalyst for further city expansion and continuous population growth.

DOI: 10.15320/ICONARP.2018.56 – E-ISSN: 2147-9380

The city of Milan is a good instance to explain the context of European and Italian modernity. In the 19th century Milan experienced a period of greatness; the city became an important pole of the Enlightenment. In the 1796 Napoleon Bonaparte expelled the Austrians, the city was ruled by the French and became the capital of the Cisalpine Republic, until the 1799. Among the main urban-neoclassical works, it was the conversion of the Castle walls that had a big importance in the urban context of Milan. The old city walls were destroyed and replaced by panoramic walks of the forecasted "Foro Buonaparte" - semi-concentric rings that surround piazza Castello (the Castle square), and private houses were transformed to refined monuments.

After the Napoleone fall, the plan wasn't carried out, thus only after the Austrian Restauration (1814-1859), new transformations started with the rebuilding of many streets and new axes, privileged by location and morphology, where new districts were born, identified today by large number of neoclassical buildings. In this sense, fundamental changes were made in the area of "Porta Orientale" (today "Porta Venezia") - the "Corso Venezia" axis (Figure 4) was a privileged work as it was the main connection line to Vienna, Austria. The transformation of the urban texture contributed to the design of the first public garden within the city: "*Giardini di Porta Venezia"* (The Gardens of Porta Venezia (Fig.6 (1)).

The competition (1861-1862) to adjust Piazza del Duomo with the Vittorio Emanuele Gallery (1865-1878), won by Mengoni, set up the style of the iconic monumental urban place. Nevertheless, the emerging transportation problem led to the implementation of a railway system - both the Milano Centrale (Figure 5) and Porta Genova railway stations' construction started in 1864. In the end

Figure 4. Corso Venezia, Illustration (*online archive*)

of 19th century, Milan underwent a new period of industrialization and progress with the bourgeoisie. This social class created new districts characterized by a new style: the liberty.

Figure 5. Stazione Centrale, Milan Central Station *(online archive)*

FRINGE BELT FORMATION AND TRANSFORMATION IN MILAN

The unification of Italy (1870) and industrialization period of the 19th century let to expansive population and urban growth, which related to the expansion of the city borders and transformation in its land use character, and a decline of the agricultural lands. Despite the decadence of the wall function, the vigorous temper of the medieval city wall acquired its role as a ring-shaped fixation line that outlined the further urban expansion.

Expansion of Milan in The end of 19th Century. The Beruto Plan (1884-1889):

The city of Milan expanded vastly and transformed as a result from The Beruto Plan (Figure 6) – the first masterplan, especially contributing to the transformation of the city center, at that time still enclosed within the Spanish walls (1549-1560), which resembled as a place to represent the ideas of emerging Milanese bourgeoisie. Compared to the Napoleonic plan (1807), Cesare Beruto – main architect and chief engineer of the city, used "cautious and modest plan" techniques to express an international vision of the predicted expansion of the city. The new masterplan aimed to regulate the urban development and structure the growth beyond the Spanish walls, which experienced a complete demolishing processes (except in some limited partitions). The first signs for the urban growth were indicated by high integration and immersion of educational plots (ex: Universita Catolica (Fig.6 - 2), Universita degli studi di Milano (Fig.6 - 3)), religious temples (ex: Basilica di San Lorenzo (Fig.6 - 4)) and cultural grounds

DOI: 10.15320/ICONARP.2018.56 – E-ISSN: 2147-9380

(theaters and other institutions), which were situated in the internal perimeter of the castle (Spanish) walls, embedded within the newly establishing residential areas, diffusing the borders of the primary fixation line (the castle walls), by that time would be analyzed as primary fringe belt areas. However, the vast urbanization and population growth, let to the translation of high density residential areas that surrounded the historical core, thus fully integrated those grounds into the texture of the residential districts. Despite the decadence of the wall function, the vigorous temper of the medieval city wall acquired its role as a ring-shaped fixation that outlined the further urban expansion. In addition, the plan concentrated on the multiplication of main transportation axes that connected the historic city core with the outlying districts, thus required for the implementation of an inner ring road pedestrian walkway, similar to the Vienna ring road saturated with parks, gardens, services and facilities, which mostly took place along the footprint of the once existing wall. Nevertheless, several key urban facilities for the further expansion of the city were founded: the first railway stations (Stazione Centrale (Fig.6 (A) and Porta Genova Fig.6 (B)), the monumental cemetery Cimitero Monumentale (Fig.6 (C)) and San Vittore (Fig.6 (D)) prison were established. The vast increase of inhabitants marked the begining of significant tranformation within the city fabric in the last two decades of the 19th century, becoming the second largest city in Italy in terms of population. The structure that ordered the urban fabric was represented by the street grid (city blocks initially about 200 metres in the first version of the plan from 1884, were halved to “real estate size” with the approved version of 1889), which consolidated the forma urbis inherited from history, comprising radial roadways converging towards the city centre and concentric ring roads (Galuzzi & Vitillo, 2017). The most evident portion of the Beruto plan concentrated on a “donut” like expansion, which varied in depth, between the Spanish walls and a new outer ring road that aimed to unite the few already developed areas beyond the walls. Another fundamental part of the Manifesto was the elongation of a north-west transportation artery that was generated by the extended area of the Castle and the newly designed Parco Sempione park (Fig.6 (E)), passing through Piazza del Duomo and the Galleria (Fig.6 (F)), it directed to the south-east to create a continuous axis, which required the demolishing of a limited portion of the urban fabric and renovation of few to reorganize a new urban system in the historical district. The transformation of the city center led to a process of decrease in the population and pulverization of its poorest parts. Moreover, 70s brought a slow process of redevelopment in the office sector and formation of CBD (new buildings for banks, insurance companies, large

national enterprises and trade), which involved the incorporation of new urban segments within the center of the city.

The unification of the state brought about a dynamic economic uplift, which called for wider local and regional mobility and initialized the construction of bounding network with north-west Europe. Milan relied on the development of good public transportation, and implementation of local and international railway system, which gave the importance of the city as a major national rail center for passengers and freight. "In an ever-increasing fashion, railways became the backbone of the transport system, progressively marginalising the network of waterways that up until the middle of the nineteenth Century had complemented the system of transporting goods by land" (Galuzzi & Vitillo, 2017).

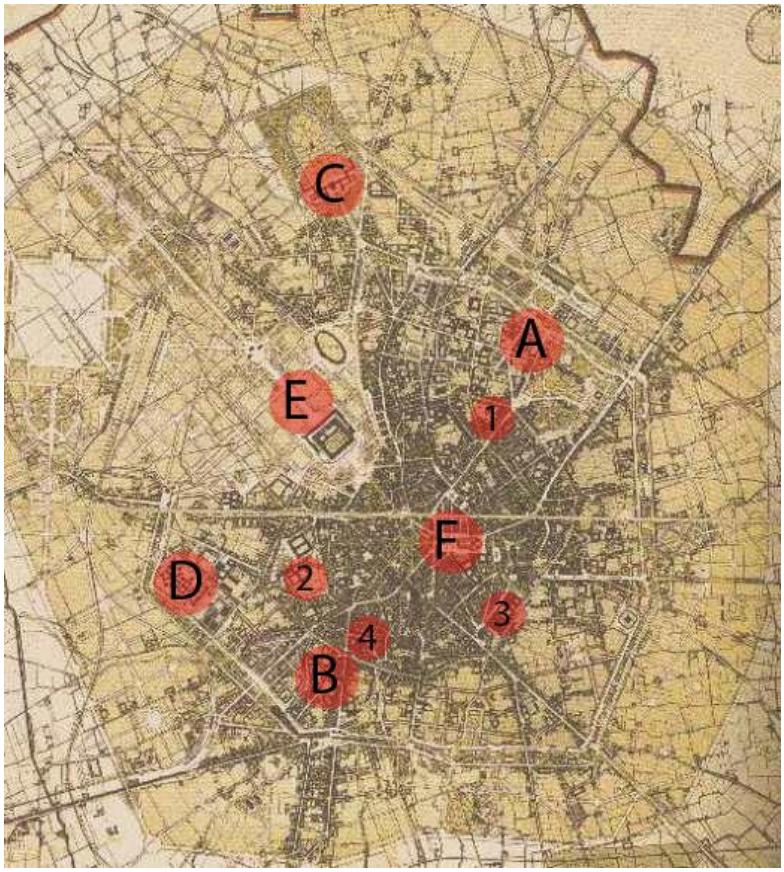

Figure 6. Beruto Masterplan 1884-1889. We can see the body of the existing city (darker within the Spanish walls), and the ring of the zone of extension (the circle clearer outside the walls, with the new roads *(prepared by the authors)*

Transformation of Milan from Late 19th until 21st Century:
The initial map analyses aims to indicate a primary morphological growth pattern of the city, by comparing its urban formation in the period 1840-1877 – just before the realization of the Beruto's Plan (1884-1889). The following analytical approach intends to study the consecutive development patterns of Milan by comping its expansion tendency after the approval and application of the Beruto's masterplan and overlap land use data analyses from succeeding years (1904, 1937, 1964, 2018).

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"The new plan of the city of Milan, corresponding to 1840" (Figure 7) defined several fundamental transportation axes that linked the historic city core with broader peripheries. There is a steady process of urbanization of the surrounding the city wall structure territories. Inner agricultural land has been transformed to low density residential areas that particularly preserve their agricultural characteristics ("cascinas"). The agricultural land has been translated only around the city boundaries, and the allocation of public services as hospitals and marketplaces prognosticated the forthcoming expansion process of Milan.

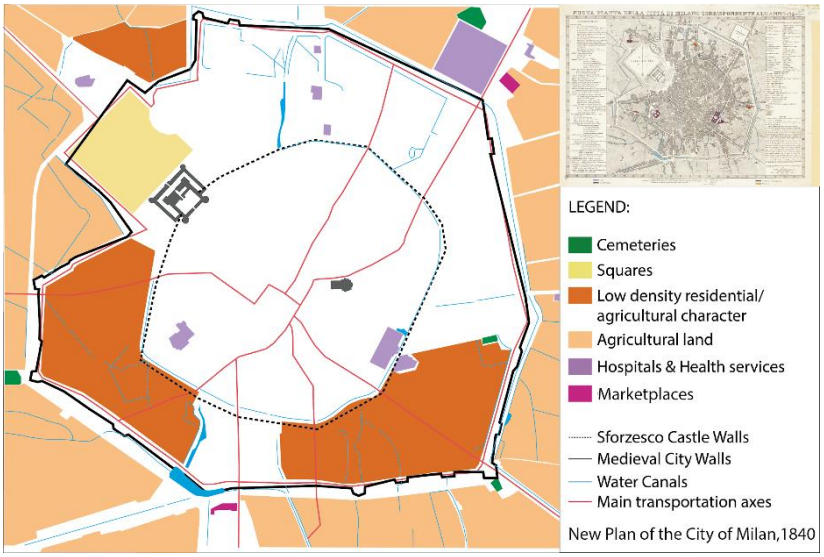

Figure 7. Graphical representation of land use, 1840; Top-right corner: Milan map, 1840 *(prepared by the authors; Milan map: online archive)*

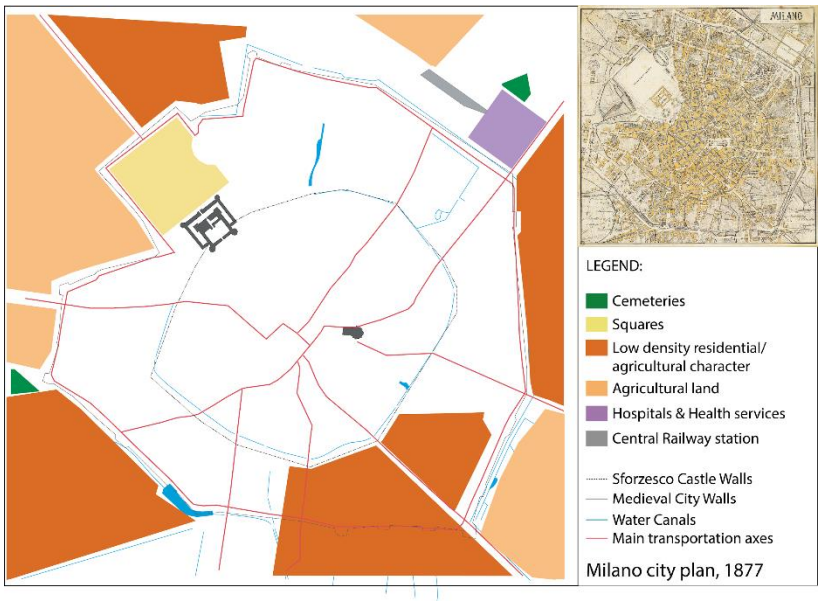

Figure 8. Graphical representation of land use, 1877; Top-right corner: Milan map, 1877 *(prepared by the authors; Milan map: online archive)*

Milan Master plan, 1877 (Figure 8) - the second half of the 19th century has been characterized by industrialization and mechanization of the work forces that resulted in a vast population growth and urbanization processes in Milan. The old city walls have been established as inner transportation rings that lost their "border" properties and a vast transformation to high

dense residential areas has been initiated. Moreover, the city lost its agricultural land in the periphery, and converted to low dense residential areas. Dynamic urbanization led to the modification of natural water sources into urban canals, or direct restraint interventions. The initiated construction of the Central Station and integration of railway services encouraged faster land utilization in the Northern part of the city.

Milan Master Plan, 1904 (Figure 9), defined new land use patterns within the urbanized territories that aimed to provide the city with higher hygiene and better living quality. The implementation of green areas within the residential parts has been a definite new strategy for a continuously increasing urbanization and economic power of Milan and Lombardy region. The completion of several new regional railway stations and extension of the railway system has showed the need for better transportation connection within and outside of the city. The integration of residential lands within the urban fabric resulted in further loss of agricultural territories.

Figure 9. Graphical representation of land use, 1904; Top-right corner: Milan map, 1904 *(prepared by the authors; Milan map: online archive)*

Milan Master Plan, 1937 (Figure 10), defined a clear North-East urban expansion of the city. Broader land utilization led up to the formation of new high density habitations that required broader service distribution around the peripheral territories, such as sports fields and educational grounds. The allocation of market places and fair grounds aimed to disperse the economic power within various parts of the city. A wider transportation network that connected the city core with surrounding industrial areas has been implemented.

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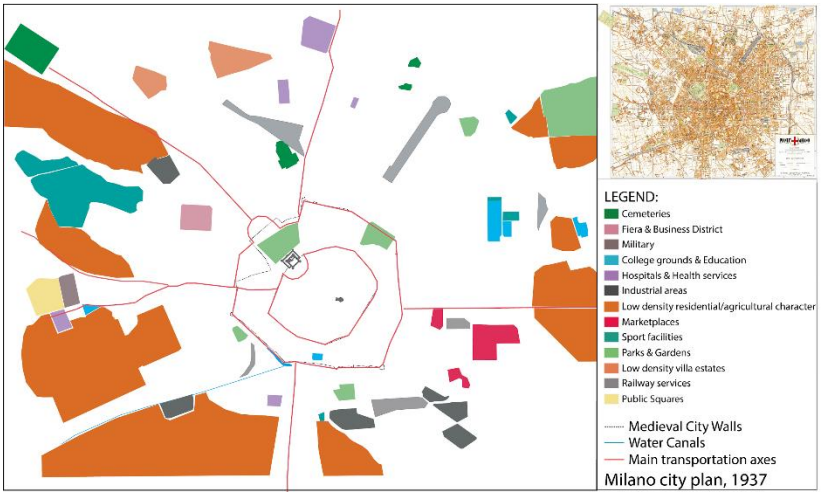

Figure 10. Graphical representation of land use, 1937; Top-right corner: Milan map, 1937 *(prepared by the authors; Milan map: online archive)*

Milan Master Plan, 1964 (Figure 11), defined new administrative border of the city that linked with upcoming satellite settlements on a Municipal level. The wide spread *cascina* settlements around the periphery of the city turned to small agriculture- production lands that contributed in low dense residential habitations. There is a strong translation of the industrial sector to service branch that assigned a new economic structure within the city borders. Industrial areas have been allocated and concentrated mainly on the surrounding Northern satellite cities of Milan, and largely engaged with textile and manufacturing. A strong differentiation of the Southern land utilization was visible, where mainly agricultural forces were embodied.

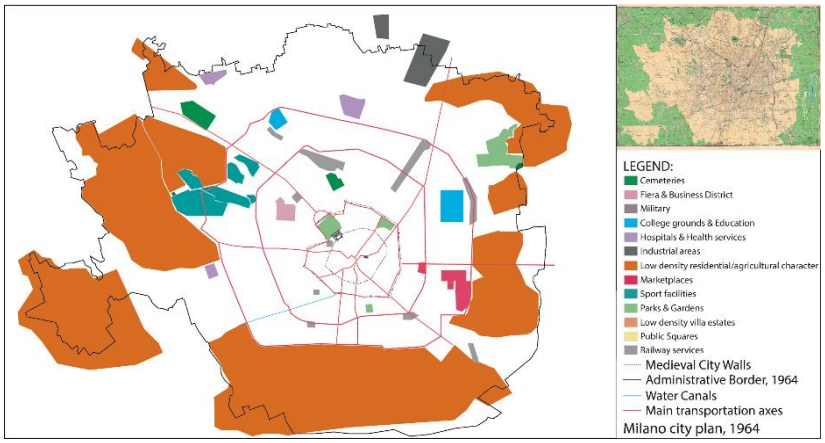

Figure 11. Graphical representation of land use, 1964; Top-right corner: Milan map, 1964 *(prepared by the authors; Milan map: online archive)*

Milan satellite view, 2018 (Figure 12), indicates the recent land use distribution within the Municipality of Milan that linked to strong transportation network to the North where the spatial extension is clearly directed. There is a strong collision between North (urban) and South (rural) that present different dominant characters of industrialization and mobility network (Bergamo and Malpensa airports) of the North-west, and low density rural areas that tend to show agricultural features to the South. The Northern expansion of the city is related to the attempt for good

network connection with Northern European countries such as Switzerland, Austria and Germany. As usually concerned, the growth of the city currently is based upon socio-economic and political strategies of the urban planning principles of the city council since the beginning of 20th century.

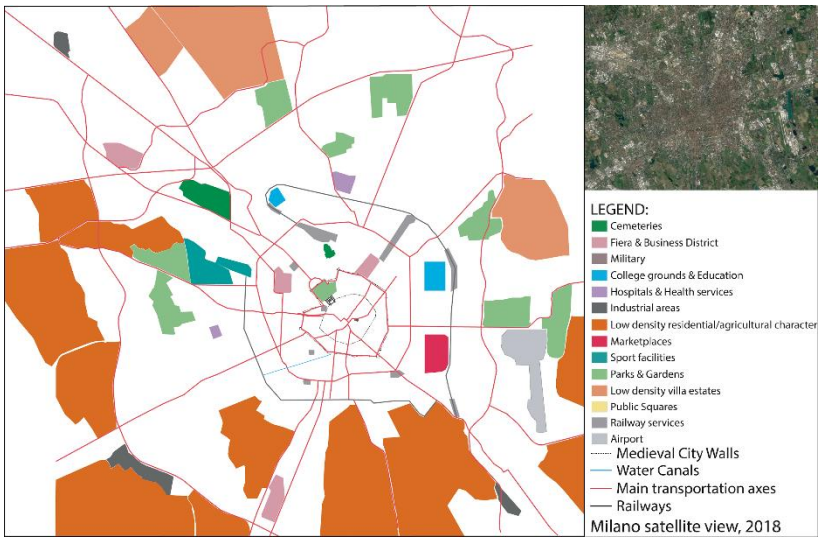

Figure 12. Graphical representation of land use, 2018; Top-right corner: Milan satelite view, 2018 *(prepared by the authors; Milan map: Google Earth)*

THE IDENTIFICATION OF MILAN'S FRINGE BELTS

Consistent land use indicating maps follow a comparative analysis of land utilization changes and fringe belt modifications within defined morphological periods in order to outline a general framework of the fringe belts of Milan. Land use map overlapping represents a consecutive map overlapping of land -use indicator schemes in successive time-lapse count that resulted in graphical representation of lands use transformations, defining five morphological periods and several fringe belt processes during city's expansion (Figure 13).

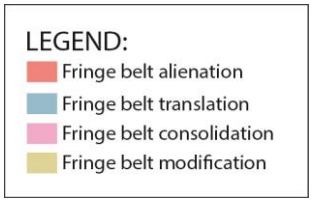

Figure 13. Indication of land use transformations from the consecutive map overlapping analyzes in Fig. 15, 17, 19, 21, 23 *(prepared by the authors)*

The First Morphological Period: 1840-1877:

1840-1877 Fringe Belt-Land Use Maps Overlapping (Figure 14) resulted in defining the castle wall as a primary fixation line and the city-gate wall as the secondary fixation line, characterizing the land utilization beyond with low density residential areas with agricultural features, agricultural lands, hospitals, cemeteries and a vast public square attached to the main administrative unit of the city. In the period, a loss of agricultural lands and their transformation to mainly low density residential areas yet with

DOI: 10.15320/ICONARP.2018.56 – E-ISSN: 2147-9380

strong agricultural characters ("cascinas") resulted in fringe belt alienation (Figure 15).

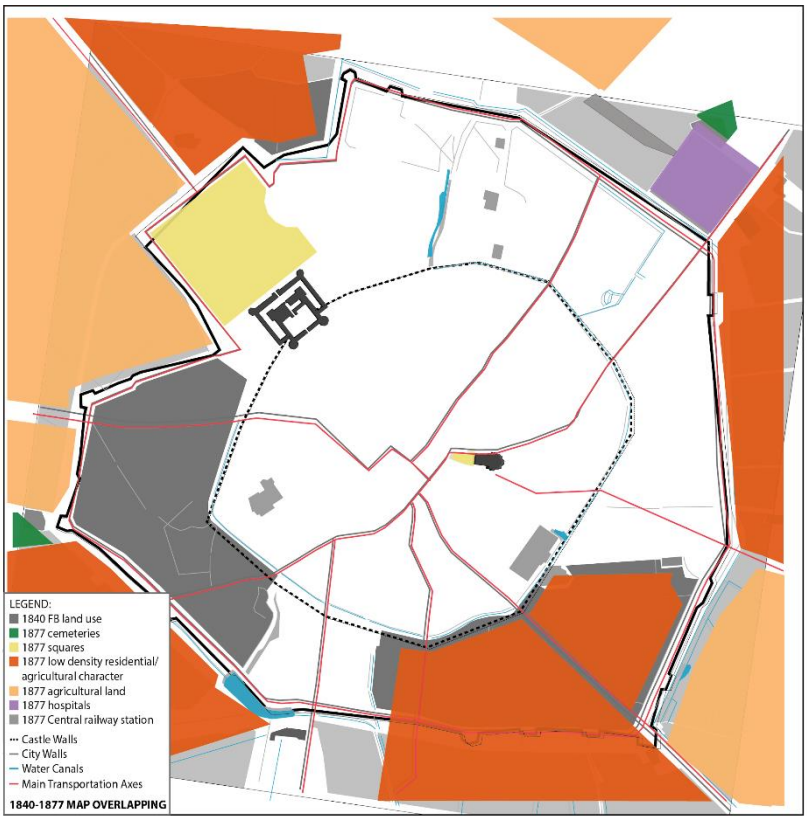

Figure 14. Graphical representation, indicating land use.Map overlapping: 1840-1877 *(prepared by the authors)*

Figure 15. Graphical representation indicating land use transformation as a result from the 1840-1877 map overlapping *(prepared by the authors)*

The second morphological period: 1877-1904:

1877-1904 Fringe Belt Land Use Overlapping (Figure 16) declared the preservation of a constant character of primary (castle wall) and secondary (gate wall) fixation lines, and a land utilization pattern characterized by low density residential areas with supporting agricultural characters, expanding agricultural lands, definition of new parks and gardens, hospitals and cemeteries, maintenance of a public square with administrative feature. Land use modifications are observed in the translation of low density to higher density residential districts. Fringe belt alienation is defined by the loss of agricultural lands and their transformation to low density residential areas. Fringe belt consolidation process is tracked with the implementation of railway services and the formation of the Milan Central station district. Fringe belt translation within new green areas and parks is observed (Figure 17).

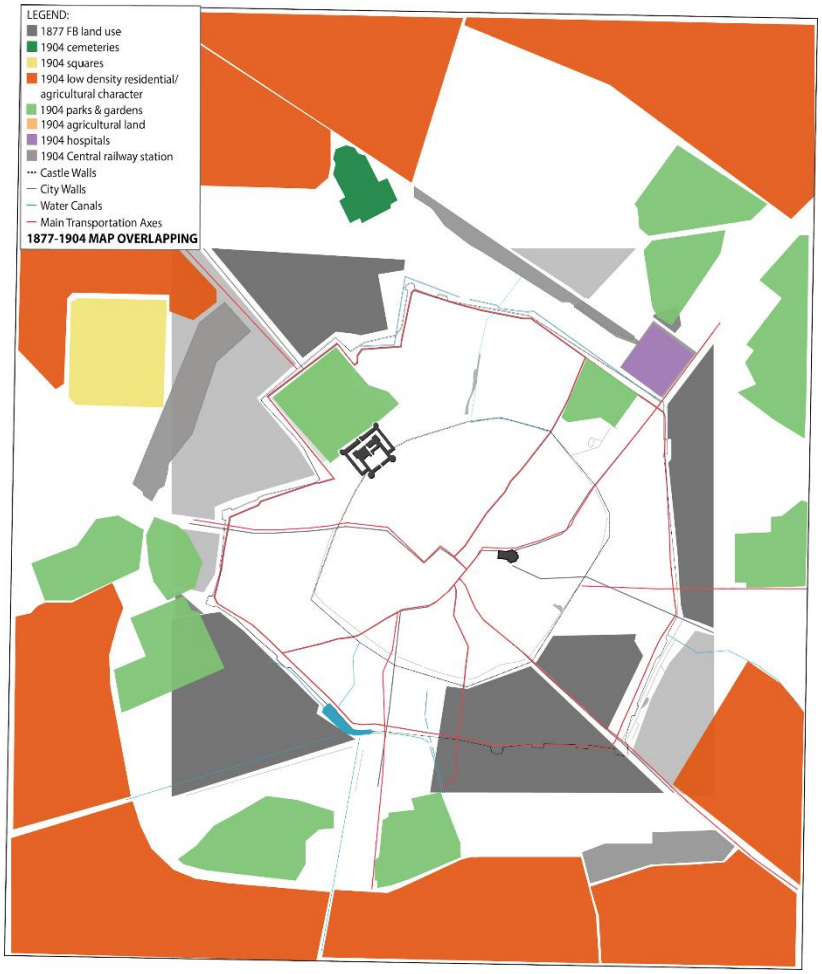

Figure 16. Graphical representation, indicating land use. Map overlapping: 1877-1904 *(prepared by the authors)*

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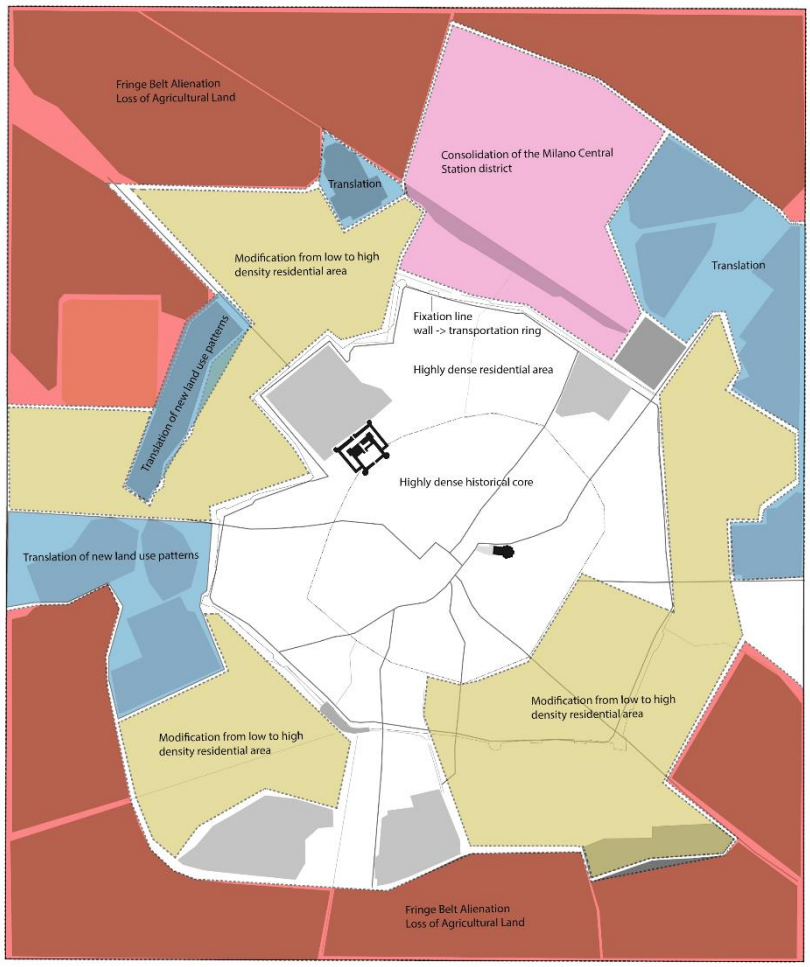

Figure 17. Graphical representation indicating land use transformation as a result from the 1877-1904 map overlapping *(prepared by the authors)*

The Third Morphological Period: 1904-1937:

1904-1937 Fringe Belt Land Use Overlapping (Figure 18) resulted in the affirmation of the primary fixation line (the city wall), but defined new secondary fixation line, formed by the newly established transportation/railway ring. Land utilization characterized with low density residential districts, agricultural lands, hospitals, cemeteries, parks and recreational areas with sports features, military areas, industrial areas, marketplaces, college grounds and low density villa estates. Land use modification from low to high density residential areas as well as fringe belt alienation in the loss of agricultural lands is noticed. Consolidation of the Southern low density residential areas and Southeast Marketplaces is marked. Strong fringe belt translation processes in the fair district and business areas are defined (Figure 19).

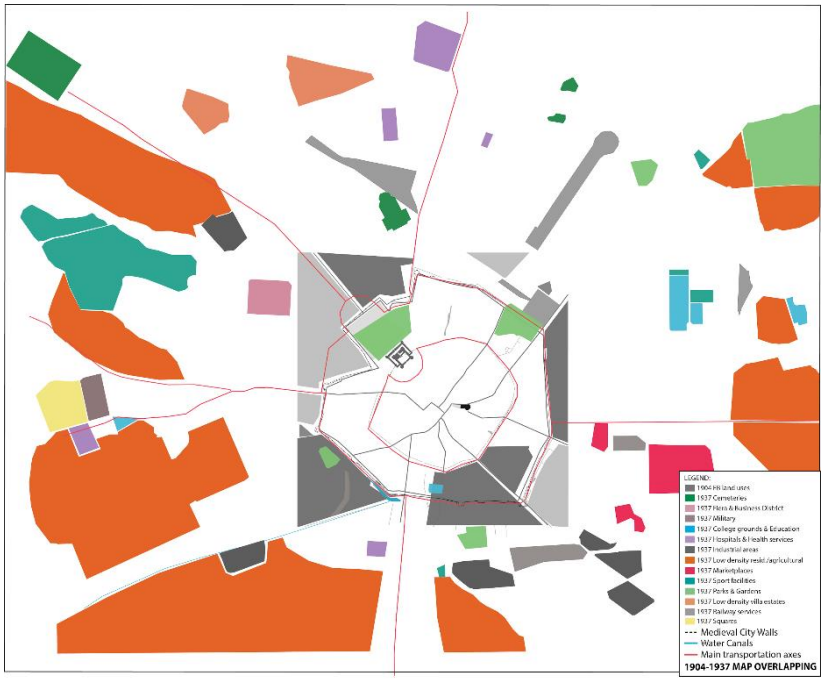

Figure 18. Graphical representation, indicating land use.Map overlapping: 1904-1937 *(prepared by the authors)*

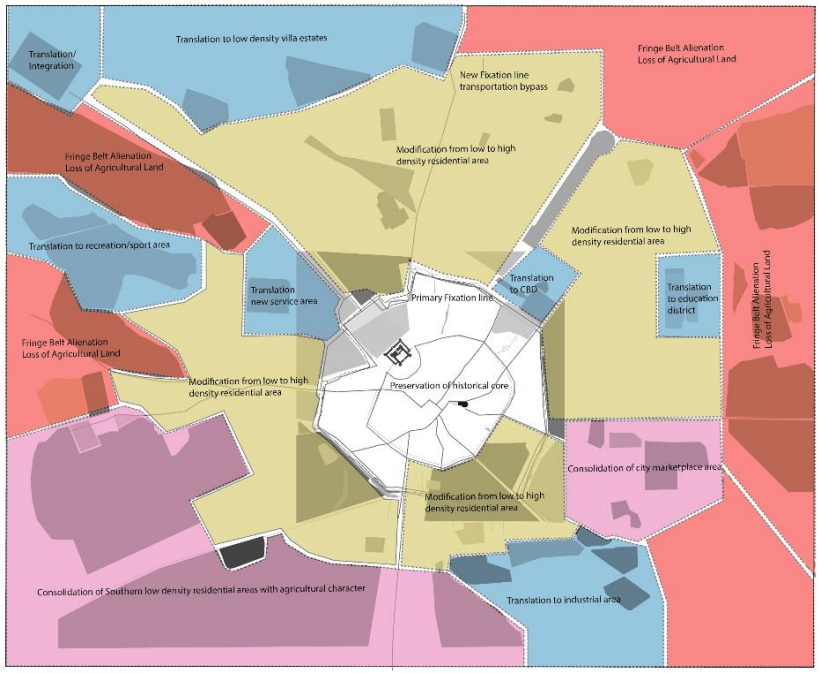

Figure 19. Graphical representation indicating land use transformation as a result from the 1904-1937 map overlapping *(prepared by the authors)*

The Fourth Morphological Period: 1937-1964:

1937-1964 Fringe Belt Land Use Overlapping (Figure 20) defined vast expansion and new primary fixation line - the transportation/railway ring and a secondary fixation line - a new administrative boundary of the great city of Milan. Land utilization pattern preserved constant features. Land use modifications are mainly concerned from low density to high density residential areas, alienation is consisted of loss of agricultural lands that are transformed into low density residential areas. Fringe belt consolidation is observed within the educational district *Citta studi* of Milan, some recreation and sports areas. Fringe belt

DOI: 10.15320/ICONARP.2018.56 – E-ISSN: 2147-9380

translation in the Northern industrial part of the city could be observed (Figure 21).

Figure 20. Graphical representation, indicating land use.Map overlapping: 1937-1964 *(prepared by the authors)*

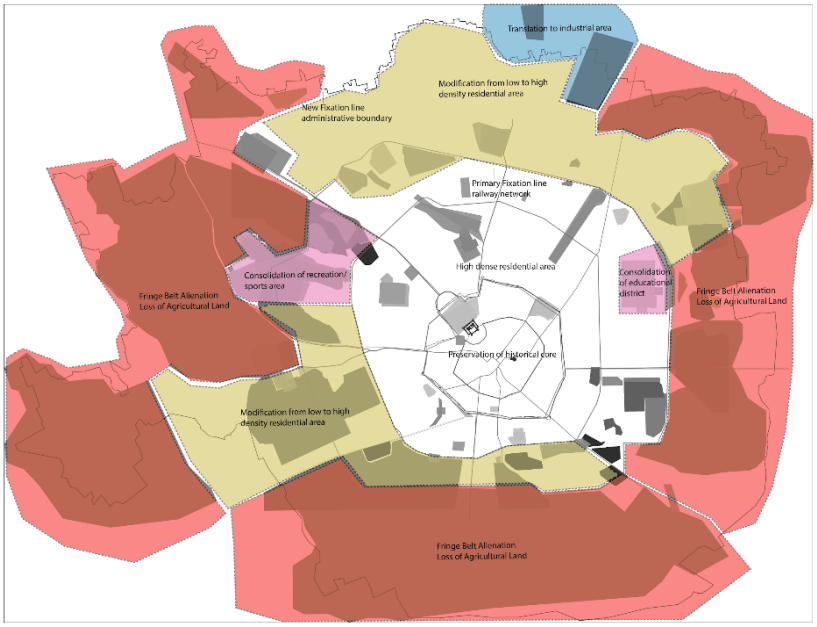

Figure 21. Graphical representation indicating land use transformation as a result from the 1937-1964 map overlapping *(prepared by the authors)*

The Fifth Morphological Period: 1964-2018:

1964-2018 Fringe Belt Land Use Overlapping (Figure 22) defined consolidation features of the primary (railway ring) and secondary (administrative boundary) fixation lines. Land utilization is concerned with low density residential areas that preserve agricultural characters ("cascinas"), agricultural lands, hospitals, cemeteries, parks and gardens, recreation, sports and military areas, a strong stratification of industrial areas and marketplaces, emerging college grounds and low density villa estates. Land use modification resulted in low-mid to high density

residential districts. Alienation in loss of agricultural lands and their transformation to urban settlements is observed. Fringe belt consolidation of the Northern industrial area and Northern commerce&business district is distinguished. Fringe belt translation of the Southern fair district, North-west industrial area and villa estates is noticed (Figure 23).

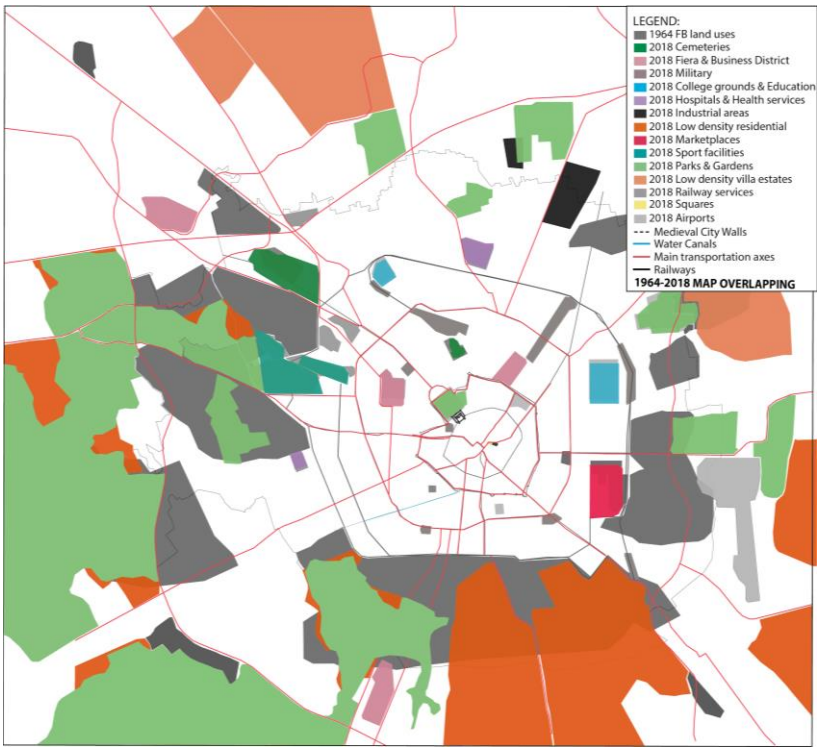

Figure 22. Graphical representation, indicating land use.Map overlapping: 1964-2018 *(prepared by the authors)*

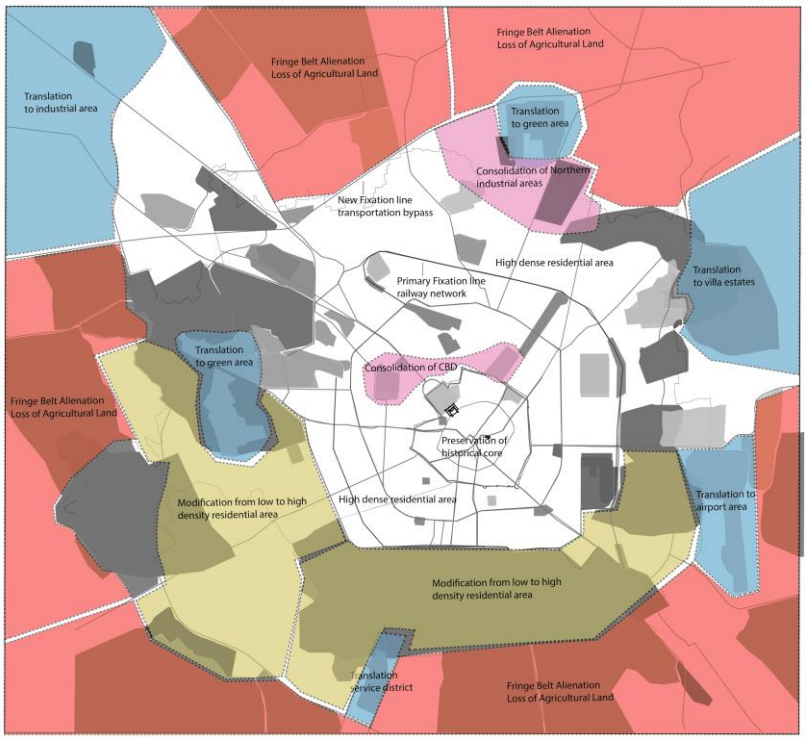

Figure 23. Graphical representation indicating land use transformation as a result from the 1964-2018 map overlapping *(prepared by the authors)*

DOI: 10.15320/ICONARP.2018.56 – E-ISSN: 2147-9380

FURTHER ASSUMPTIONS

Recently, a strong differentiation between the Northern and Southern urbanization gradient is evident (Figure 24): the highly dense urbanized North direction to Northern satellite settlements aims stronger linkages with industrial areas and Northern European countries, resulting in densification of economic bonds. In addition, constant expansion to the North attempts good mobility and service network with the industrial satellite settlement of the Greater Municipality of Lombardy. In comparison, a lower density urbanization to the South and maintenance of the Southern agricultural land is observed.

Figure 24. Satellite night view, indicating a strong North direction of urbanization gradient in Milan *(NASA)*

CONCLUSION

The methodological research resulted in general perspective of fringe belts identification and delineation in Milan and defined urban elements with strong morphological characteristics within the city structure: the old castle walls of the historical city, playing the role of powerful fixation lines acted as control lines of dynamic land use transformations that resulted from strong industrialization and economic forces and led to great urban territory growth and boundary expansion of the contemporary metropolitan area (The Great Municipality of Milan).

As a result, the city of Milan derived the formation of three types of fringe belts (Figure 25). The Inner fringe belt (IFB), closest to the primary fixation line (the secondary city walls (II.)), recently, consists of former fair grounds, cemeteries, college grounds (Citta Studi), marketplaces, city parks and gardens. The Middle fringe belt (MFB) is characterized by low density residential areas, villa estates, sports and green recreational areas, Linate Airport, which

is the closest to the city, hospital grounds and health service areas, and the Outer fringe belt (OFB) comprises low density residential areas with agricultural characters ("cascinas"), villa estates, industrial zones, municipal parks with natural forestry and satellite settlements (Great Municipality of Milan).

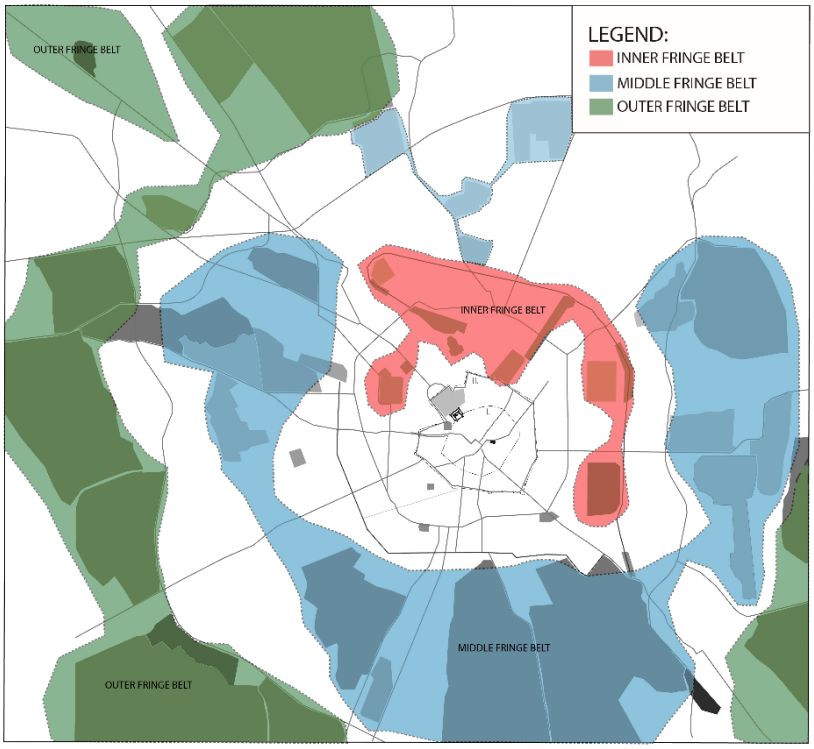

Figure 25. Graphical representation, indicating recent fringe belt formation *(prepared by the authors)*

Milan's fringe belts composition as part of the texture of the built environment tends to show integrative properties to the overall urban system. In spite of being different in their consistency and scale proportions, compared to the tightly built-up residential and commercial areas, the fringe belt characteristic land uses adapt to the natural morphological expansion of a city with dynamic historical background. The inner fringe belt has undergone tremendous modifications, because of strategic economic considerations, and recently has strong consolidation properties defining mainly important university grounds and distinguishing commerce (business) district, concerning continuous developments, resulting from the technological evolution and formation of a strong service industrial sector in Lombardy region that have powerful economic and political importance for the whole country.

In addition, a discussion on the positive contribution of the natural outer green fringe belts areas in Milan is introduced. The outer natural green areas, as remainders of the fringe belts modifications, are important and necessary to better the quality of urban life as they provide ecological habitat to maintain the

DOI: 10.15320/ICONARP.2018.56 – E-ISSN: 2147-9380

natural systems in otherwise dense built-up concrete environment. In this sense, the Middle and Outer fringe belt of Milan tend to rinse their borders in particular areas and leisure and natural sports grounds play crucial role for the rehabilitation of the social life and the proper operation of the whole urban organism. For instance, West and South-West green areas preserve not only the original ecosystem characteristics on regional scale, but also comprise strong recreational properties and medium for deferred authorship design, as a device for the articulation of public forces in the landscape shaping (Figure 26). The *Boscoincita*, literally translated "the forest in the city", the *Aldo Aniasi, Parco della Cave* and *Romano Bianco* parks to the West, are not only part of important ecosystem corridors, but also generate the sense of social belonging and responsibility among the authorities for the preservation of the ecological heritage and induce participation in land treatment and urban agriculture.

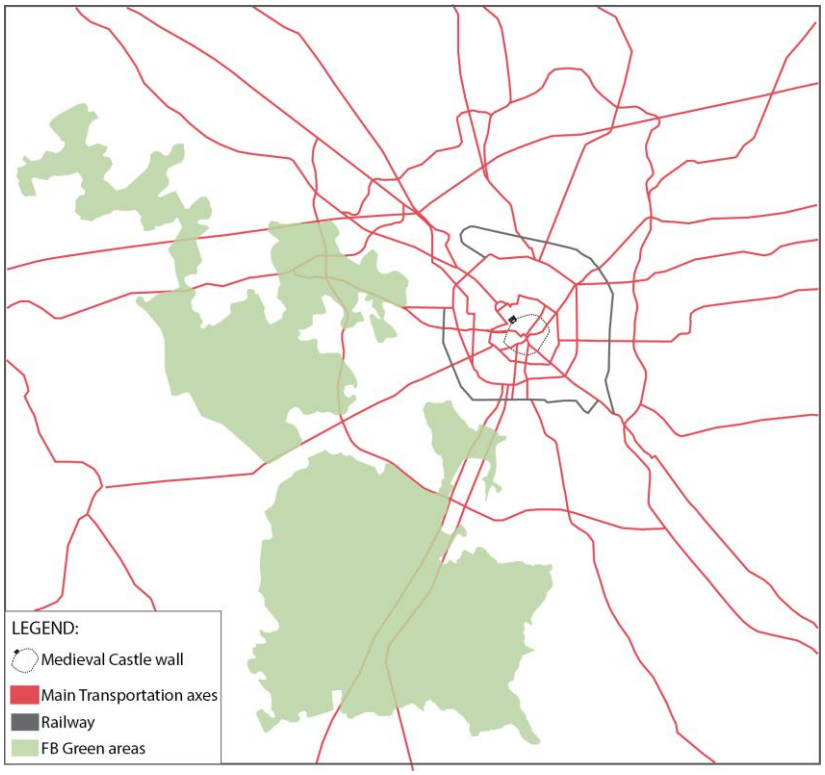

Figure 26. Graphical representation, indicating recent fringe belt formation *(prepared by the authors)*

Beyond their recreational features, fringe belt zones could also show fundamental properties for food supply for the communities. *Parco Agricolo Sud Milano* in the South-West, for instance, plays the role of an integrated urban farming medium and a buffer zone between surrounding urban system (in this case the city of Pavia). In this regard, fringe belts are important for the clear framing and differentiation of one urban structure from another. Being present in limited quantity, the green areas to the North-West are natural filtration zones that protect against the harmful influences of the surrounding industrial realms, but tend to be insufficient for the

formation of an overall connected green belt system that envelopes the city and contributes to the creation of integrated urban ecological corridor, thus improve the life habitat of the community and natural systems.

Whereas the initial fringe belt formation of Milan has been linked to industrialization and vast urbanization that resulted in city expansion, the recent urban development is related to dynamic economic forces and translation of powerful service sector that aims to respond to the socio-economic and technological needs of the contemporary society. Milan's transformation to financial center of Northern Italy and vast development of the Northern urban land in the last two decades sacrifices natural green grounds in the aim of implementation of strong infrastructural and economic bonds with Northern Europe.

Recognition of the characteristics of fringe belts and their framing considering existing fixation lines into a regulated conceptual matter within the city, can both contribute to urban landscape management and urban planning policies with environmental consciousness when it comes to preservation of original morphological characteristics of the city, and adequately adapt new inevitable urban developments under current socio-economic circumstances. Moreover, they could benefit the touristic potential of Milan, thus shift from well-known shopping to increasing cultural and leisure attitude towards its visitors.

REFERENCES

Albergoni, G. (2006). "I Mestieri delle Lettere tra Istituzini e Mercato. Vivere e Scrivere a Milano Prima Meta dell'Ottocento", Milano: Franco Angeli.

Bigatti, G. (2000). "La citta operose. Milano nell'ottocento", Milano: Franco Angeli.

Boriani, M., Rossari, A., Rozzi, R. (1993). "La Milano del Piano Beruto (1884 – 1889). Società, urbanistica e architettura nella seconda metà dell'800", Milano: Guerini e Associati.

Carozzi, C. (1993). "La crescita urbana dall'Unità ad oggi, in Storia illustrata di Milano", vol. 7.

Christine, P. (2009). "Inventing Futurism: The Art and Politics of Artificial Optimism", Princeton University Press.

Conzen, M. R. G. (1969). Alnwick, Northumberland: a study in town-plan analysis Institute of British Geographers Publication 27, 2nd edn (Institute of British Geographers, London).

Conzen, M.R.G (2004), "Thinking about urban form. Papers on urban morphology, 1932-1998", Bern: Peter Lang AG

DOI: 10.15320/ICONARP.2018.56 – E-ISSN: 2147-9380

Conzen, M. P. (2009). "How cities internalize their former urban ringes: a cross-cultural comparison", *Urban Morphology*13, 29-54

Costa, S.A.P., Machado,K. (2017). "A study of fringe belts in Belo Horizonte, Brazilia contribution to developments in urban morphology". In G.Strappa (Ed.), *Observations on Urban Growth,* pp.17. Milan: Franco Angeli.

Cutini, V., Farese, D., Rabino, G. (2018). "Milan: The Configuration of Metropolis", In R. Papa, R. Fistola, C. Gargiulo (Ed.), *Smart Planning: Sustainability and Mobility in the Age of Change,* pp.343-357. Springer International Publishing AG, part of Springer Nature 2018

Finetti, G. (2002). "Costruzione di una città", Milano: Ulrico Hoepli Editore.

Galuzzi, P. and Vitollo, P. (2017). "Milan and the Unification of Italy", *"Itineraries through Milan's architecture: Modern architecture as a description of a city"*, Fondazione dell'ordine degli Architetti, Planificatori, Paesaggisti e Conservatori della provincial di Milano.

GeDeA,, de Agostini (1995). Guida Grande enciclopedia De Agostini . Novara: Istituto Geografico De Agostini.

Gu, K. (2010). "Exploring the fringe belt concept in Auckland: An urban morphological idea and planning practice". *New Zealand Geographer 66*, 44- 60.

Hazar, D. Kubat, A.S. (2005). "Fringe belts in the process of urban planning and design: Comparative analyses of Istanbul and Barcelona", *ITU A,Z issue Vol 12*, No 1,53-65.

Hazar, D., Kubat, A.S. (2015). "The fringe belt development process of Istanbul", *23rd International Seminar on Urban Form (ISUF)* 2015 , Conference proceedings, 423-436, Nanjing, China.

Kubat, A.S., Hazar, D. (2018). İstanbul'un Çeper Kuşak Gelişim Süreci, Local ISUF Congress on Urban Morphology, İstanbul Technical University, İstanbul, Turkey. (proceedings forthcoming)

Kubat A.S. (2018). "Exploring The Fringe Belt Phenomenon In TheCase Of Istanbul", *CyNUM 2018*, Cyprus Network of Urban Morphology, Plenary Session (invited speech), Cyprus.

Lammers, D. G. O., Roders, A. R., & van Wesemael, P. J. V. (2017). "Post-industrial Eindhoven and its radial fringe-belt: a morphology of contemporary urban growth". In G. Strappa (Ed.), *Observations on Urban Growth,* pp. 15-50. Milan: Franco Angeli.

Louis, H. (1936). "Die geographische Gliederung von Gross-Berlin", in *Louis, H.* and Panzer, W. (eds) *Länderkundliche*

Forschung: *Festschrift* zur *Vollendung* des *sechzigsten Lebensjahres Norbert Krebs 146-71,* Engelhorn, Stuttgart.

Ünlü, T. (2018). "Urban Growth of Turkish cities", inObservations on Urban Growth, ed: Giuseppe Strappa, Dep. of Architecture and Design, (Diap) sapienza University, Rome, 173-189.

Venuti, G. C. (1986). *Un secolo di urbanistica a Milano*.Milano: Clup Press.

URL-1 http://www.stagniweb.it

URL-2 http://geoportale.comune.milano.it

URL-3 http://www.pim.mi.it/pgtonline/

Whitehand, J.W.R. (1987). "The changing face of cities: a study of development cycles and urban growth". Blackwell, Oxford.

Whitehand, J. W. R. and Morton, N. J. (2003). "Fringe belts and the recycling of urban land: an academic concept and planning practice", *Environment and Planning B: Planning and Design* 30, 819-39.

Whitehand, J.W.R. and Morton, N.J. (2004). "Urban morphologyand planning: the case of fringe belts", *Cities 21*, 275-89.

Whitehand, J. W. R. and Gu, K. (2017). "Urban fringe belts: evidence from China", *Environment and Planning B: Urban Analytics and City Science* 44, 80-99.

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DOI: 10.15320/ICONARP.2018.56 – E-ISSN: 2147-9380

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Research Article

ICONARP
International Journal of Architecture & Planning
Received 10 Jul 2018; Accepted 06 Aug 2018
Volume 6, Issue 2, pp: 333-357/Published 28 December 2018
DOI: 10.15320/ICONARP.2018.57–E-ISSN: 2147-9380

ICONARP

Neighborhood from Cul-De-Sac to Gated Community in Turkish Urban Culture: The "Fina"

Havva Alkan Bala*

Abstract

In this study, the closed neighborhood was discussed in gated communities and in cul-de-sacs by focusing on public and private concepts, rights and regulations in Turkish urban culture. The study aims to enlighten old concepts such as "close neighborhood," "gated community," and "cul-de-sac" with a new approach in order to understand whether planned and modern gated communities contain the same aspects of traditional Turkish cul-de-sacs – part of the "fina" concept. According to tradition and culture, the concept of fina is a kind of usage of public space as if it were private. In the modern age, gated communities have created new life styles, spaces and boundaries with their advantages and disadvantages all over the world. The gated community may be called an "architecture of fear," namely fear of the neighbors, fear of theft, fear of the one living outside the gates. On the other hand, cul-de-sacs are derived from friendships and family relations – namely, being friend**s** with relatives, neighbors and nature. Gated communities and cul-de-sacs are both created by making public space – belonging to all citizens – into private/semi-private space belonging to only a special community. A comparative method is used between gated communities and cul-de-sacs in order to understand whether the legalization of using public space in private ways creates benefits to

Keywords: *Gated community, fina, cul-de-sac, neighborhood, anatolian cities*

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society as a whole or not. The result expected from this study is not only to determine the similarities and differences pertaining to cul-de-sacs and gated communities but also to reveal the positive values generated or existing in these two living areas and provide feedback with the potential of reflecting each other.

INTRODUCTION

The study compares gated communities and cul-de-sacs with new perceptions focusing on the usage of "public space as if it were private/semi-private." in Turkish urban culture. It defines the "gated community" as a different kind of cul-de-sac, and vice versa – an idea that is very uncommon in the literature on gated communities. To define modern gated communities as spatially the same as closed traditional cul-de-sac settlements may be both original and risky. The risk comes from the many differences between traditional cul-de-sacs and modern gated communities, such as: main reason(s) for privatizing public space, usage of technology, socio-economic inputs, neighborhood / friend /family relations, cultural values and general life styles. However, when we make an in-depth analysis of the two free from prejudice, we may see some common or even the same characteristics.

Cul-de-sacs and gated communities are created by changing public space that belongs to all citizens into private/semi-private space belonging to special groups only. Both cul-de-sacs and gated communities may be called "closed neighborhoods." In order to understand the aim of this study, first, the concepts of the closed neighborhood, the cul-de-sac and the gated community should be defined, but to define these concepts may not be enough, since culture creates changes in the usage and meaning of space. The gated community was developed due to contextual reasons in Canada, the United States and Europe. In Turkey, similar gated communities have been copied and created without questioning their roots. Similarly, the Turkish "*çıkmaz sokak*" (literally, "street without an exit") is not the same as a cul-de-sac. Terms such as gated community and cul-de-sac are used in English, but not referring to a North American or European spatial culture but referring to a Turkish spatial urban culture.

METHODOLOGY

The comparative method between gated communities and cul-de-sacs case studies in Konya consists of analysis by observation and interview. The comparative method between gated community and cul-de-sac is used to find out whether legalization of the privatization of public space creates benefits for the whole picture or not. Case studies in Konya for cul-de-sac and gated community

DOI: 10.15320/ICONARP.2018.57 – E-ISSN: 2147-9380

are analyzed by observation and interview. Konya, located in central Anatolia, is of great importance as regards culture, economy, history and space. This study focuses on two typical examples of "Pervasız" cul-de-sac and "Beyzade" gated community in Konya as a case study .

Assumption and Scope of The Study

As previously mentioned, "gated community" is defined as a different kind of cul-de-sac, and vice versa in this study. This claim is based on two assumptions. The first is that access to traditional cul-de-sacs and modern gated communities in Anatolia is the same: one-sided access using public space as if it were private/semi-private (Figure 1).

Figure 1. One-sided access to traditional cul-de-sacs and modern gated communities in Anatolia *(drawn by author,2018).*

The second assumption of the study is that, in both cul-de-sacs and gated communities, human relationships between relatives, friends and especially neighbors are very relevant in the decision-making process of where to live. Despite the fact that modern life has changed the perception of neighborhood relationships in Turkish society in general, human relationships between relatives, friends and neighbors in smaller Anatolian cities can still be found as compared to larger Turkish cities in Europe and North America.

BASIC CONCEPTS: "USING PUBLIC SPACE AS IF IT WERE PRIVATE/SEMI-PRIVATE" IN A CLOSED-NEIGHBORHOOD

What is a closed-neighborhood and why does it come about? According to Webster (2002), Ladman (2002, 2004) and Fabiyi (2004), the main reasons of a closed neighborhood are to control local crime and increase their social standing. Olusevi (2006) claims that closed neighborhoods, becoming part of the city

circulation pattern, make some citizens' lives easy, but put others in a difficult situation by preventing emergency access.

"Using Public Space As If It Were Private/Semi-Private" in a closed-neighborhood is an issue of urban interface in the city. On the horizontal axis, urban interfaces are voids that remain between buildings and concern building/mass and their composition, and on the vertical axis, they are places of interaction and transition that are composed of the sum total of architectural façades and located at the intersection of architectural products and urban space. Interfaces establish visual and functional connections as outer surfaces of urban spaces on the one hand and walls of built-up environment reflected from the interior to the exterior on the other in the context of nature-city, private-public, interior-exterior, positive (mass/solid)-negative (void) and urbanization-architecture (Bala 2003). The statement "Using Public Space as if It Were Private/Semi-Private" is worth discussing because closed neighborhoods make public rights as community rights.

Streets are a major part of urban space and they are the most integrated part of the residential area that provides a different usage (Rykwert 1982). According to Newman (1972), a public space refers to an area or place that is open and accessible to all citizens, regardless of gender, race, ethnicity, age or socio-economic level. Before discussing closed neighborhoods further, it may be useful to mention the perception of public-private terminology in Turkish culture. The concepts of and the relationship between "public" and "private" in Europe and North America are different from those in Turkey, both historically and today. According to Islamic law, an owner's property is sacred. People could use common rights, as is their own property without doing damaging to it (Çelik 1996; Çevik and Özen 1995; Yerasimos 1996). During the Ottoman period in Turkey, there was an indistinct and permeable relationship between public and private. That is, the hierarchy between public and private was supported by semi-public and semi-private spaces in Turkish urban culture. The boundaries between public and private territory in the modern city have been defined by cartographic techniques. In modern cities today, boundaries of public space are very strict, well-defined, but very "thin." However, in pre-modern Turkey, boundaries between public and private spaces were "thick. "In such transitional zones, "private" diffuses **into** the territorial area of "public" (Figure 2).

DOI: 10.15320/ICONARP.2018.57 – E-ISSN: 2147-9380

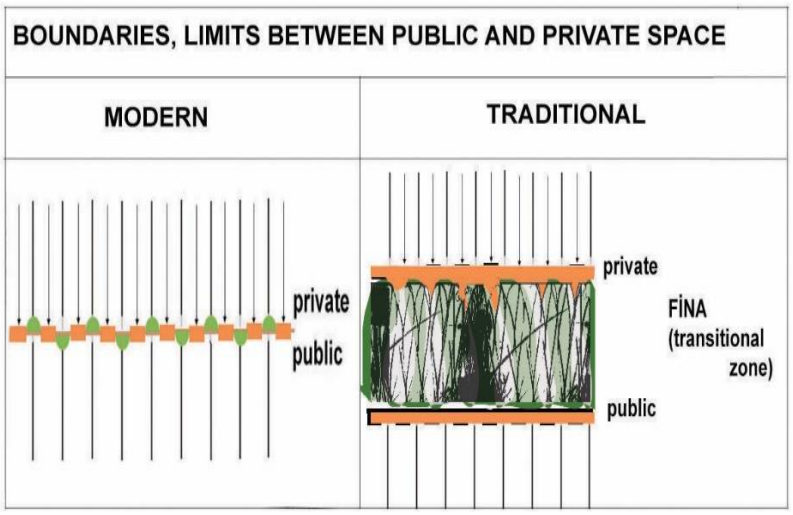

Figure 2. The concept of boundaries between public and private space in the traditional and modern city*(drawn by author,2018).*

This is a territorial space perception that turns public space into a private/semi-private space. In contrast to Western perception, such a situation is seen as positive. In Ottoman city culture, private rights had a strong power on public boundaries. These transitional zones between public space and private space were valuable for daily city life in the traditional Ottoman city street (Yerasimos 1996). During the Ottoman period in Turkey, there was a tendency to promote private space as overlapping, violating public space in the city. Güner (2010), referring to Uğur Tanyeli, says that public space which "belongs to everyone" in Western culture is equivalent to public space which "belongs to anyone" in the Ottoman period. Thus, "Using Public Space as if It Were Private/Semi-Private" creates an extra positive value, so it was legal during that period. The boundaries between private and public space were composed of transitional zones of semi-private and semi-public areas. In Islamic cities, this concept of a boundary separating private and public property from each other is called "fina". The term fina is used in place of border, which means progressive transfer from one unit to another. Fina is an Arabic term that is also synonymous with the term "Harim," which refers to an invisible space about 1 to 1.5 meter wide alongside all exterior walls of a building that is not attached to other walls, and primarily alongside streets and access paths. It extends vertically alongside the walls of a building. The owner or tenant of a building has certain rights and responsibilities associated with its fina. The owner has the right to use it for temporary purposes, provided that such use will not disturb the environment and others, and the tenant has the responsibility to keep his part of the fina always clean and safe from any obstructions. Habitable space in a fina exists vertically in the form of balconies, enclosed bay windows, and rooms bridging the public-right-of-way (called Sabat) (Hakim 2007, 2010) (Figure 3).

Figure 3. Left: Photograph of street with a "fina." Right: Sketch of street with dark areas and solid lines indicating elements allowed within the "fina" *(Bala,2010).*

Güner (2010), referring to Tanyeli (2005), all kinds of public spaces in the Ottoman city – including streets and mosque squares – were a kind of reserve spaces to make them private. For centuries there was no attempt formally and informally to prevent "Using Public Space as if It Were Private/Semi-Private," because the person who extended his plot to the street never thought that he had stolen public property or violated any public right. When we are talking about a culture that does not need to define the public space, no one would be worried about infringing upon the rights of the public. In this culture, privatization of public space belongs to anyone who creates extra values without disturbing other people, nature and the built-up environment.

Comparison of Cul-De-Sacs and Gated Communities with Respect to Property Rights

A "çıkmaz sokak" in Turkish (literally, "street without an exit") is neither a cul-de-sac nor a dead-end street (Balamir 1994). Components of cities are arranged in such a way that they reflect their relevant cultures (Hillier and Hanson 1984). Cul-de-sacs in traditional Turkish cities also represent Turkish as well as Islamic city culture. Medieval Cities in Europe had dead-end streets, similar to the ones in Turkey. However, the usage and the approach to cul-de-sacs were completely different in each case (Bala and Nafa 2008, Bala and Yodaş 2008, Bala et al. 2009, Bala 2010).

The cul-de-sac is defined in architecture and urban design literature as "the street pattern open only in one side and connected to other larger streets" (Sözen & Tanyeli 1992; Keleş 1999; Southworth & Ben-Joseph 2004; and Cozens & Hillier 2008). Cul-de-sac as a word has a negative semantic connotation in Europe and North America. In English, "dead-end street," "blind alley," and "blind path" are all used, as well as cul-de-sac, to imply

DOI: 10.15320/ICONARP.2018.57 – E-ISSN: 2147-9380

dead, numb, lazy, sluggish, lethargic, shiftless, or indolent behavior "going nowhere." This approach may come from the general idea that cul-de-sacs have come to symbolize problems of suburbia – an isolated, insular enclave, set in a formless sprawl of similar enclaves, separated socially and physically from the larger world, and dependent upon the automobile for its survival. Cul-de-sacs seen in medieval cities (Morris 1979; Mumford 1989; Moughtin 1992) do not have the same peculiarities with the dead-end streets of Ottoman and Islamic cities. Traditional Turkish cities were organic and free, not geometric and in rhythmic order (Aru 1998; Kubat et al., 2001, Kubat ve Topçu 2009). Traditional Turkish cities are typically composed of a network with a large number of cul-de-sacs and winding and narrow roads in human scale just like a tree system (Grünebaum 1946; Lapidus 1967; Hassan 1972; Acar 1975; Saoud 2002; Abu-Lughod 1987 & Hakim 2007; Bala ve Nafa 2008; Bala and Yoldaş 2008). According to Berktay (1996), in this hierarchical tree system, the main road was just large enoug to allow for the passing of horses. Islamic cities are not designed so that someone can pass from one point to another, one quarter to another as one wishes. There is a soft, gradual and hierarchical transition from the most public spaces – like a mosque, bazaar, square, large street or garden gate – to the most private space**s** like a garden and house. According to Yerasimos (1996), the status of the dead-end street is a wonderful example in terms of the priority of the rights of **a** natural person. Every resident is **a** partner to the property, which starts from the entrance of a dead-end street and ends at the threshold of his house (Yerasimos 1996, Bala and Nafa 2008, ,Bala and Yodaş 2008, Bala et al. 2009, Bala 2010). Grünebaum (1946) has wondered why Muslim cities have given up using "the advantage of a straight line as the best route from one point to another" and instead preferred narrow streets that end abruptly. However, as will be discussed, it is not so much a case of "giving up" but a case of such a convenience never being a priority in the creation of street layouts (Grunebaum 1961; Hannah 1985; Stein 1974), (Hassan 1972; Saoud (2002); Lapidus (1973); Acar (1975), Petherbridge (1984); Hakim (2007); Abu-Lughod (1987), Ettinghousen (1973); Erdem and Özcan 2004; Sauvaget 1946). Andre Raymond (1994, 1995) mentioned that a comparison of Western medieval cities and their urban institutions and an Islamic city show**s** that the latter has lost the regularity of an antique city. Roger (1996) uses typical words such as; "Nothing is more foreign to a Muslim town than the rectilinear avenues of a Roman or a modern city**;** an aerial photograph of any Muslim city makes us think of a maze, or a labyrinth. Instead of being integrated into a planned design, the buildings have forced the communication routes to skirt round them, or to slip between

them as best they could. As a result, there are an extraordinary number of dead-ends and the roads are very rarely straight". Gustave von Grunebaum (1946) wonder why Muslim cities have given up using "the advantage of a straight line as the best route from one point to another" and preferred narrow streets ending abruptly. J. Sauvaget (1946) claims that "the Islamic city is no longer considered as an entity, as a being in itself, complex and alive; it is just a gathering of individuals with conflicting interests who, each in his own sphere, acts on his own account. There are no more municipal institutions". Cul-de-sac is either a semi-private or semi public road for residential groups located along the road without reaching outside and providing people or others one-way access. Nevertheless, much can be said in favor of the cul-de-sac street as a pattern for neighborhood space in Europe and USA (Southworth and Ben-Joseph 2004). This idea based on a quiet, pedestrian-focused environment was created where courts and close arrangements of terraced houses bordered a central green space accessed by a narrow service road connected to the public street system.

The phenomenon of dead-end streets turns public areas into private areas in accordance with the "fina", enabling transfer from one property to another in Islamic law (Yerasimos 1996). It is a kind of "Using Public Space as if it were Private/Semi-Private" process based on the agreement of property owners of buildings having a surface facing towards a dead end. Like dead-end streets, cul-de-sacs and gated communities also give clues about how families, neighborhood**s** and other social relationships change according to urban layout, as well as being good examples of how to turn public spaces to semi-private.

The Roots of Cul-de-sac

Cul-de-sacs in the Islamic/Ottoman context mainly deal with segregation, privacy through space hierarchy and control (Aktüre 1978; Stewing 1966; Lapidus 1967 and Bala & Nafa 2008, Bala et al. 2009, Bala and Yoldaş 2009, Bala 2012)). The Cul-de-sac has been a space of social interaction bringing relationships between relatives and neighbors closer (Figure 4).

DOI: 10.15320/ICONARP.2018.57 – E-ISSN: 2147-9380

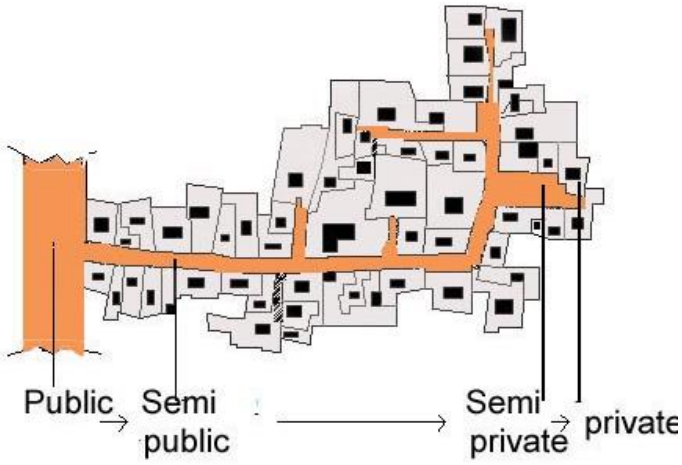

Figure 5. An extension added to a house makes a dead-end street by bridging houses across from each other (Bala 2012, Bala 2010, Bala ve Nafa 2008))

There is a common social reality in traditional Turkish culture that if sons have carried the honor of all the family, then the family roots and relationships are strong and when a son gets married, he cannot leave the larger family alone, so an extension is added to the family house. These houses constitute a dead end by attaching to two separate houses across a street. Two houses facing each other are joined together and constitute two new ends (Figure 5).

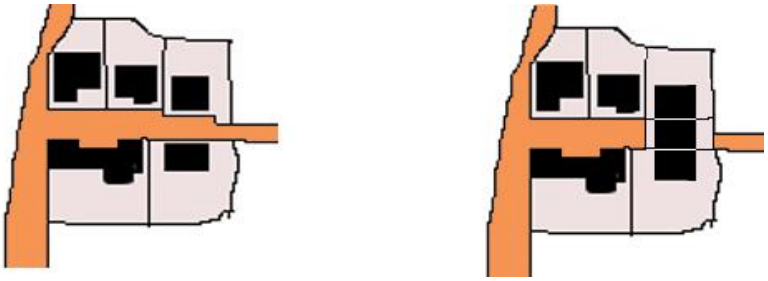

Figure 4. The cul-de-sac can be either a semi-private or semi-public road for residential areas *(Bala 2010, Bala 2012)*

Such a situation is not technically legal considering building regulations within a universal perspective, but it is in fact in line with Ottoman traditions (Yerasimos 1996). In traditional Turkish culture, each member of society must be careful about the others' rights considering the spiritual world. None of the neighbors would construct his house in a selfish way. They were careful about nature, context and neighbors. In other words, people constructed their houses in a way that their buildings did not block incoming sunshine and did not close the view of their neighbors. They have also never destroyed trees or any creature's habitat. All this behavior is in keeping with "mortal rights" according to Islam. To ignore the "mortal right" of an individual is one of the biggest sins according to Islam. Thus, traditional Turkish cities respect nature, context and neighbors' rights. Considering urbanism, religious rules were much stronger than the official rules at that time. According to Stewing (1966), Islamic rules attach more importance to private property rights than

public property rights as long as they do not do directly harm other people. Islamic city culture defined the spatial and physical structure of dead ends.

In Islamic cities, private property is more important than public property and the concept of border is shaped through this understanding. There are common property areas in Islamic cities; however, public benefit liabilities are not applied in these areas as they are applied in Europe and in North America (Stewing 1966). Private property is more important than public property, and an interface is created, which is called "cul-de-sac.' (Stewing 1966; Yerasimos 1996). The owner of a private property can occupy the street in front of his property; moreover he can have the right to use this area permanently. Therefore, this street becomes his "fina." By permission of street residents, two neighbors facing one another may interrupt a road and divide it into two dead-end streets. These two dead-ends become the property of the residents. Therefore, people in this area would privatize the public area. According to Denel (1982), administrative, legal and economic alterations were observed in countries under the rule of the Ottomans after the proclamation of reforms in 1839 (which were a series of six legislative regulations passed between 1848-1882 adopting Western views). These alterations comprise the transforming of the traditional Ottoman city pattern into grids by deteriorating traditional city patterns with new boundaries, property and rights. In modern cities, streets are designed for motor vehicles rather than pedestrians. Thus, development plans propose a grid system and forbid creating cul-de-sacs. In recent years, the cul-de-sac has become both elongated and widened, with more dwellings incorporated. Some urban analysts and planners turned to the Garden City model, and winding streets, crescents and irregular shapes came to dominate urban thinking and design throughout much of the twentieth century.. New Urbanism promotes high-density, mixed-use residential developments in 'walkable' neighborhoods close to public transport, employment and amenities and generally advocates the use of the grid street layout in preference to the cul-de-sac (Morrow-Jones et al., 2004), (Duany and Plater-Zyberk 2003-1992), (Calthorpe 1994), (Kartz 1994), (Cozens and Hillier, 2008). Southworth and Ben-Joseph (1997) note that the term cul-de-sac has become pejorative among many architects and planners, because it represents the essence of suburbia today. Southworth and Ben Joseph (1997) also argue that it is possible to design easily (accessible) residential districts that are interconnected to vehicular system. Nevertheless, the modern approach generally defines a cul-de-sac as an isolated, insular, private enclave, set in formless, sprawl or

DOI: 10.15320/ICONARP.2018.57 – E-ISSN: 2147-9380

similar enclaves, separated socially and physically from the larger world and dependent upon the automobile for its survival (Carmona et al. 2003). Although the cul-de-sac has a function for being a transitional space between public and private space in traditional Turkish cities, they have all but disappeared in modern ones.

The Roots of Gated Communities in Turkey Today

In the modern age, gated communities have created new life styles, spaces and boundaries with their advantages and disadvantages all over the world. The gated community may be called an "architecture of fear," namely fear of the neighbors, fear of theft, fear of the one living outside the gates. On the other hand, cul-de-sacs are derived from friendship and family relations – namely, being friends with relatives, neighbors and nature. A gated community is, in simple terms, a community surrounded by a fence and provided with a gate for entrance. In recent years, numerous papers, articles and books have been published on gated communities and in general gated communities are considered in the light of urban segregationist tendencies (Roitman 2005). In this study, the gated community will be analyzed by comparing them with cul-de-sacs in terms of making a public space serving a community. While gated communities have legal authority to withhold access to outsiders, defended neighborhoods do not have this authority. This legal aspect is important in relation to another aspect. "Open" space within a defended neighborhood should be considered public space, while all space within a gated community should be considered private. However, when public space becomes privatized, accessibility is a major issue because public space is broken down.

The physical boundary defines not only spatial separation but also social separation. There is a large body of research which links segregation with economy, poverty and the lower class (Wilson 1987; Massey & Denton 1993; and Mingione, 1996). Urban violence and fear of crime are usually mentioned as the main reasons for moving to a gated community (Blakely & Snyder 1997; Carvalho et al., 1997; Caldeira 2000; Greenstein et al. 2000; Low 2000; Svampa, 2001; Borsdof 2002; Landman 2002; and Pinto & Rovira 2002). Many authors have referred to the process of choosing a gated community as an act of voluntary segregation, a conscious act and decision taken by an individual or family, contributing to the process of urban social segregation (Greenstein et al., 2000; Borsdorf 2002). Researchers such as Wilson-Doenges (2000) have showed that gated communities are not such a safe place to live. On the other hand, it is important to note that although most of the time the bad effects of living in a

segregated place, which is not only segregated but poor as well, are highlighted, living in a segregated but wealthy place like a gated community also has many drawbacks for its residents. Social segregation hardens and breaks the social fabric through the use of visible barriers that do not allow strangers to go inside the borders of the gated communities. It reinforces social differences and social divisions. There is a lack of contact with different people. Construction of social relations is influenced by the separation established between 'the insiders' and 'the outsiders'. 'The others', who are the people outside and especially the neighbors in the surrounding areas, are perceived by residents of the gated communities as strangers and as potential aggressors. In this way, physical barriers are used to establish a distance, which is not only physical, but also social and symbolic. A gated community features the same characteristics as a defended neighborhood, but is also gated and walled, frequently with a central guarded entrance. Within a defended neighborhood, road and other signs as well as a (closed) video circuit often suggest that it is a private property, while this is not the case**.** The cameras and signs are meant to make outsiders understand that they do not belong there. Most gated communities not only make this known at the entrance, but also within the gates. While gated communities have legal authority to withhold access to outsiders, defended neighborhoods do not have this authority. The legal aspect is important in relation to another aspect. 'Open' space (with the exception of private gardens) within a defended neighborhood should be considered 'public space', while all space within a gated community should be considered 'private'. The private entity responsible for maintenance of the 'open' space is the homeowner association. However, public space thus becomes privatized or parochialized and accessibility is a major issue because *public* space is broken down. This phenomenon involves a group of residents who choose to live in a designated location surrounded by a protective system. They have security devices such as walls, fences, gates, barriers, alarms, guards and CCTV cameras. By and large, the infrastructure and services are of a high quality. They are designed with the intention of providing security to their residents and prevent penetration by non-residents, being conceived as closed places since their inception. Law reinforces their closure as private places, which distinguishes them from other places in the city. Their residents must follow a code of conduct concerning social behavior and construction regulations. Gated communities appear as homogeneous places in comparison to the heterogeneity of the 'open city'. Most of their residents are upper- and middle-class families. Urban violence and fear of crime are mentioned in the literature as the main reasons for moving to

DOI: 10.15320/ICONARP.2018.57 – E-ISSN: 2147-9380

a gated community (Blakely and Snyder, 1997), (Caldeira, 2000), (Carvalho et al., 1997), (Landman, 2002), (Low, 2000), (Pinto and Rovira, 2002), (Borsdof, 2002), (Svampa, 2001), (Greenstein et al. 2000). Many authors have referred to the process of choosing a gated community as an act of voluntary segregation, a conscious act and decision taken by an individual or family, contributing to the process of urban social segregation (Borsdorf, 2002), (Greenstein et al., 2000). Other authors say that gated communities represent a special type of segregation (Carvalho et al., 1997), (Marcuse, 2001). Gated communities contribute to a type of segregation that cannot be defined as either voluntary or subjective, but rather influenced by both (Roitman 2005).

SAMPLE AREAS OF CUL-DE-SACS AND GATED COMMUNITIES IN KONYA

The comparative method between gated communities and cul-de-sacs case studies in Konya consists of analysis by observation and interview. Konya is located in central Anatolian plain of Turkey. Konya was the capital of the Greater Seljuk Empire (1037–1194) and has accumulated a great wealth of cultural, economic, historical and spatial significance over many years of its existence. Konya became urbanized because of its logistical location (Baykara (1985). Being in the heart of Anatolia and being the capital of the Seljuk Empire gave a strong base to Konya regarding urban construction, infrastructure, social development and cultural richness. Thus, there are so many cul-de-sac in the city. Since the beginning of 2000s, gated communities started to rise. According to Topçu (2013), luxurious gated housing that appeal to upper middle classes emerged in the property market in Konya within the last ten years. This study focuses on two typical examples of cul-de-sacs (Pervasız Sokak) and gated communities (Beyzade Housing) in Konya as case studies. The author has lived in Konya and has observed the spatial development of the city over many years. This input is also another reason why this city has been chosen (Figure 6).

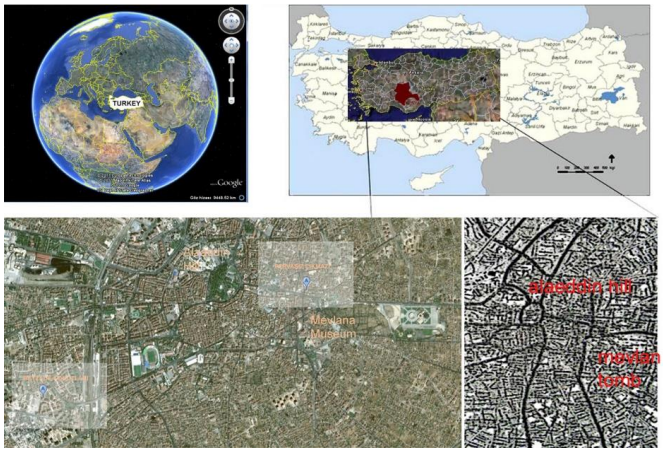

Figure 6. Konya: Alaeddin Hill and Mevlana Tomb (museum) are the landmarks; the areas of study are marked.

The Karatay district, a sub-center in the historical city texture close to the Mevlana Museum, contains many cul-de-sacs that still reflect a traditional Turkish urban life style (Figure 7).

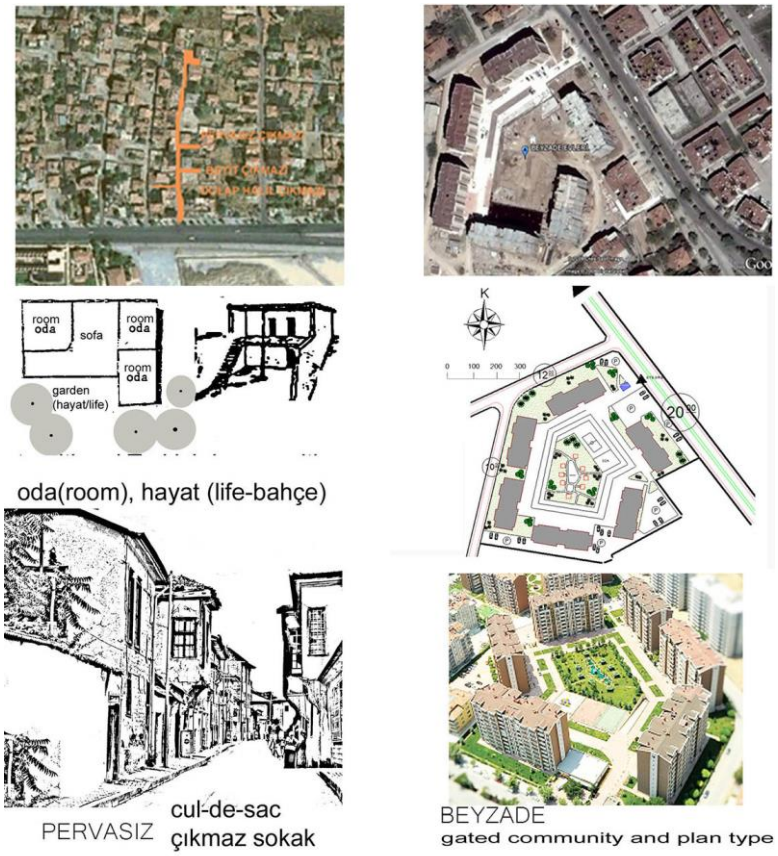

Figure 7. The selected cul-de-sac, Pervasız Çıkmazı, and the selected gated community, Beyzade Housing Complex.

The Karatay district, located in the northeast part of Konya, includes the historical city center and where today not only the spatial properties of traditional Anatolian settlements but also the life style has been conserved. Within the scope of this study, the selected area has a number of cul-de-sacs that show the typical properties of a traditional Turkish city organization. In other words, these cul-de-sacs are socially and physically conserved and are similar to each other. The cul-de-sac selected as a case study,

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Pervasız Çıkmazı, is taken as a closed neighborhood. The other selected example of closed neighborhood is a gated community, the Beyzade Housing Complex, which is located in the Meram district, a sub-center in the southwest part of the city. They have been analyzed according to the topics of site planning, layout properties, resident properties and social infrastructure properties (Table 1).

Table 1: *Analysis Statements of Gated Community in Konya-Site Planning and Layout Properties*

THE MACRO ANALYSIS OF GATED COMMUNITY - Site Planning and Layout Properties					
physical location and relationship with the city center	Density of Population(person)	Total Area (m^2)	Total Building Area (m^2)	Starting and finishing dates	Ownerships (name of firm)
URBAN CENTER Meram District Havzan Quarter	1000	136,729 m^2	97,631 m^2	PHASE 1: 2004 April-December PHASE 2: 2007 December Centralized purchase	(Seha Yapı, purchased from the Municipality of Konya) Seha Yapı
THE MICRO ANALYSIS OF GATED COMMUNITIES - Residential Properties					
Total Number of Blocks		Total Number of Apartments	Number of Floors (each block)	Number of rooms in each Apartment	Floor Area of Apartments
12		216	8	4 + 1 (The top units are duplex)	185 m^2 (net)
THE MICRO ANALYSIS OF GATED COMMUNITY - Social Infrastructure Properties					
Total green area	Indoor Sports Field	Pool Area	Children Playground Area	Shopping Center, Commercial Units	Entertainment Hobby Cafe-Restaurant
2 220 m^2	Fitness center 360 m^2	-	50 m^2	300 m^2	- -

Alver (2010) has socially described the Beyzade Housing Complex by means of interviews made with 35 different residents. All the chosen interviewees were from different genders, ages, education levels and occupations. Each interview took between two to three hours in the home or office of the interviewee, in friendly and

informal circumstances. Since The Beyzade Housing Complex is in the Meram District – an area of high income – it is neither too far from the city center, nor so close to the chaos of the city. The Beyzade Housing Complex was constructed for middle- and high-income economic levels. It consists of 216 residential units with open spaces, sports facilities, a meeting hall, commercial (shopping) units and a common area for social activities, all surrounded by walls with security for 24 hours a day and 7 days a week. It is not possible to claim that this chosen example presents the general properties of all gated communities in Konya. However, it is also a representative example.

Şerife Adacı (Figure 8a), an 82-year-old woman who lives on the Perfasız Cul-de-Sac has stated: *"We are a very large family and all relatives have been living in this cul-de-sac since 1940, although my grandsons and granddaughters have moved to Istanbul for their college education. I have never changed my house and my street. Sometimes my son complains about lack of comfort in the house because it is always cold in the winter. But he forgets that our neighbors are our relatives and we all eat together, and we financially support each other. I usually sit in front of my door, under that green tree, and greet my friends and relatives. In the street, I prepare food for the winter with my neighbor. My eldest son never ever moves to another house. I never let this. Being a large family and living together in this cul-de-sac is an honor to us."*

Güllü Adacı (Figure 8b), a 30-year-old woman and daughter-in-law of Şerife Adacı who also lives on the Perfasız Cul-de-Sac stated: *"When I got married and joined this family, it was a bit difficult for me to adapt to life in this cul-de-sac. However, I eventually got used to it. I cleaned the street as if it were mine, because it is really mine. I am happy living here. At night the street become**s** so dark, I wish that the municipality would bring some street lights to our cul-de-sac."*

Children (Figure 8c) playing outside on Perfasız Cul-de-Sac stated: *"We always play in the street and around it. We bike safely. We wish we had a football area. We have problems going to school because our school bus does not reach our house. On cold winter mornings, we have to walk far to reach a bus-stop."*

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Figure 10: The Beyzade Housing Complex gate with security.

A young woman who did not want to mention her name and who lives on the Perfasız Cul-de-Sac (Figure 9), stated: *"We are living in that old house and on the cul-de-sac as if we were in a village. In the city, people are always complaining about everything. But we are all right with our simple life. I love my neighbors. I myself feel safe in that street. No cars, no danger. We all know each other. We are even aware that you have come to take photos for a while. Maybe you do not meet all of us, but everyone in this street knows why you are here and that you are from a university, because we always share [all information]. It is very important for us to keep our neighbors from danger. We keep to each other and to this street. This street is my living room without a roof. While I chat and drink tea with the other women, my child is playing in the cul-de-sac."*

Figure 8.A: An old woman who is proud of her cul-de-sac and her big family. **8.B:**People living on Perfasız Cul-de-Sac accept that the street is their territory and they clean it. **8.C:**Children playing in the street and bicycling safely.

Ahmet Sayıcı, who lives in the Beyzade Housing Complex gated community (Figure 10.a), stated: *"We are lucky because it is possible to directly access the main road. Our gate is secure and modern. I feel myself like I am a selected one. However, I miss my old neighborhood. In Beyzade, no one knows each other. We are all busy. [We have] no time to visit our neighbors. We only meet with*

each other at the official monthly community meeting to discuss problems of maintenance of the surroundings."

Children playing outside at the Beyzade Housing Complex gated community (Figure 10b) stated: *"We have a playground area and a bicycle path. We have a security guard who protects us 24-7."*

Figure 9. Residents chat, sit, and come together in the cul-de-sac.

***Table 2**: Comparison between Pervasız Cul-de-Sac and the Beyzade Housing Complex gated community.*

	Pervasız CUL-DE-SAC	**Beyzade Housing Complex GATED COMMUNITY**
SECURITY	In spite of not taking special technical or legal precautions for urban crime or vandalism, safety is provided by means of intimacy. To behave and feel as an owner of the cul-de-sac, being well-known and being appropriated provide a special kind of security. However, a special security measure is required, dwellers stated that they felt quite secure in comparison with another living space.	There are high walls, an entrance gate with barriers and security guards. The housing estate management stated that they will set up CCTV cameras and an alarm system. Security is provided with a system based on technological devices, gated barriers, walls, fences, security guards and identity control at the entrance gate.
TRANSPORTATION PROPERTIES	Being a narrow street makes motorized vehicle transportation impossible.	It is possible to directly access the housing complex from the main road. The ground floor is arranged as a car park.
HOUSE PROPERTIES	House units are not sufficiently heated in the winter. The use of garden and street is of a vital importance. Gardens and streets shared by the neighbors are maintained and cleaned. Night lighting is not available.	It has a modern structure material, high specifications, heat, sound, insulation, communication and infrastructure as well as high comfort conditions.
HOUSE PREFERENCES	Dwellers living on Pervasız Street made their preferences under the influence of economical, social and cultural inputs. Relatives who know each other and people who are relatives perceive that living side-by-side is an advantage in overcoming economical	Dwellers have preferred Beyzade Housing Estate because they aim to live under more secure and comfortable conditions and form the social and physical environment with the people of same social-economical level similar to themselves.

DOI: 10.15320/ICONARP.2018.57 – E-ISSN: 2147-9380

	and social difficulties they encounter.	
TECHNOLOGY	Since there are no infrastructure and bus services, it is bereft of technological facilities.	Any basic requirement and technology is used in a high ratio and quality.
COMMON USE	Dead-end-streets are spaces of greeting, socializing, conversing, and resting through living together with neighbors. Though children have not been organized, they create a secure playground on the street.	Common spaces are utilized independently of people and groups with individual inclinations. Living in the closed housing estate has not affected the neighborhood relations in a negative or positive manner. However, those who knew each other before moving to the housing estate use common areas in social interaction. Common areas such as playgrounds, walking paths, bicycle paths, cafés, and sports facilities are comfortable.
RULES	Rules generated from values based on tradition, morals and religion are established by inclination of the residents.	Rules based on certified and legitimate living and spatial arrangements are established.
NEIGHBORHOOD RELATIONS	There are very close and informal neighborhood relations based on sharing. Any dweller of the street knows each other and has contact with each other. Some preparation of winter foods is made through helping each other and gathering at the doorways in the streets. Women do not take part in business life, they gather on the dead-end-street, clean, sweep the fronts of their houses and make tea-chat with each other after their husbands go to the work.	The neighborhood is a very formal structure. Short visits are made only. The number of people known by each resident is generally restricted to their encounters in the elevators and car park. All residents of the housing estate only come together in management meetings where joint resolutions are adopted. Acquaintance with 1-2 residents having contact with other families from the period before moving to the housing estate. Residents are not curious about who lives in the buildings outside of the gated community.
SOCIO-ECONOMIC STATUS	Low-income and high-income families live side-by-side on the street. It has been determined that families living towards the end of the cul-de-sac are of higher economic level.	A homogeneous group with middle- and high-income levels living together.
PRIVACY	Women who particularly spend their life at home as a result of loyalty to traditional and religious roots have weak relationships with public. The end of the cul-de-sac, which changes from semi-public to semi-private, is used.	Privacy has been identified with sovereign boundaries without holding to gender identity.
FAMILY AND RELATIVE RELATIONS	Street dwellers are there for three generations and any one **apart** from two	Families living in the housing estate are nuclear families composed of parents and children. Single residents also live here.

	families is in relationship-kinship with each other. Though there are negative aspects to living on the dead-end-street, these residents do not leave the street because they prefer to live side-by-side rather than living on top of each other as a "big family."	There is rarely any kinship relation. No one apart from next-door, downstairs, or upstairs neighbors generally communicate with each other. Women and men usually work intensively and the house is used a resting space rather than a socializing space.

Table 2, below, has been prepared from observations and interviews with 15 residents of Perfasız Cul-de-Sac and 25 residents of the Beyzade Housing Complex gated community.

CONCLUSION

Cul-de-sacs in the traditional Turkish city are not only a good example of social relations but also "Using Public Space as if it were Private/Semi-Private" process. In the traditional urban texture of Turkish cities, the cul-de-sac is a semi public street that is mainly a safe playing area as well as a semi-private social space for greeting, socializing, sitting and resting. The cul-de-sac may be defined as the sitting room of the neighborhood in traditional usage with four tall walls around it but without a ceiling. However, cul-de-sacs are viewed as a problem for circulation in modern cities, and they are not appreciated. Gated communities, which in this study are called a different kind of cul-de-sac, have started to become popular in modern Turkish cities. Both the cul-de-sac and the gated community have an entrance on only one side and are connected to another larger public street by that one entrance. Like cul-de-sacs, gated communities may also be labeled as "Using Public Space as if It Were Private/Semi-Private." On the other hand, gated communities are based on fear about a neighborhood and have been transferred from a foreign culture outside of Turkey.

The result expected from this study was not only to determine the similarities and differences pertaining to cul-de-sacs and gated communities but also to reveal the positive values generated or existing in these two living areas and provide feedback with the potential of reflecting each other. When describing the culture of cul-de-sacs and gated communities, we managed to understand their particular meaning of space. We learned, by studying cul-de-sacs, the ideas of neighborhood relationships, intimacy, and respect to nature and human being. The cul-de-sac addresses a range of inter-disciplinary issues such as crime, walkability, housing preferences, traffic behavior, traffic safety, cost, sustainability and social interaction. In the modern age and

DOI: 10.15320/ICONARP.2018.57 – E-ISSN: 2147-9380

modern city, these same concepts – especially crime, housing preferences and social interaction – create gated communities that may be labeled as a different type of cul-de-sac. One of the significant problems of today's cities is the sharp-edged transition between private and public space. The cul-de-sac has offered an alternative solution to the sharp-edged transition problem, with particular buildings between public and private spaces which provide soft, gradual and hierarchic transition. On the other hand, a community gate which may be called a kind of cul-de-sac creates segregation not familiar to the neighborhood relationships of Turkish culture. How have human behaviors and perceptions of the neighborhood changed from traditional to modern, namely from cul-de-sac to gated community? Answering that question requires adoption of positive aspects of cul-de-sacs onto gated communities – or vice versa.

REFERENCES

Aktüre, S. (1978). 19. Yüzyıl Sonunda Anadolu Kenti Mekânsal Yapı Çözümlemesi (The Analysis of Structural Anatolian City Space in the last 19th Century, Middle East Technical University Press, Ankara.

Alver, K. (2010). *Steril Hayatlar (Steril Lifes).* İstanbul: Hece.

Abu-Lughod, J. (1987). "The İslamic City, Historic Myth, İslamic City: Historic Myth", İslamic Essence Contemporary Relevance, *International Journal of Middle East Studies*.12,30

Acar, E. (1975). *Osmanlı Anadolu Kentinde Mülkiyet-Doku İlişkileri*, (Basılmamış Yüksek Lisans Tezi), ODTÜ Mimarlık Fakültesi, Ankara.

Aru, K.A. (1998),Yıldız Sey (Ed.), *Tarihten Günümüze Anadolu'da Konut ve Yerleşme (The Settlement and Resident in Anatolian Region From the History to Today),* (p. 329-334), İstanbul: Tarih Vakfı.

Bala, A. H. (2003). Konut Alanlarında Kentsel Arayüzlerin Düzenlenmesine Yönelik Analitik Bir Çerçeve, Selçuk Üniversitesi Fen Bilimleri Enstitüsü, Doktora Tezi, Konya.

Bala, A. H., & Nafa, H. (2008). "Le Cul-de-sac". *On-site Review 19: Street*, spring/summer 2008, Canada, 68-71.

Bala, A. H. Yoldaş, G.N, (2008). "Yarı /kamusal- yarı/ özel Bir Mekân; Çıkmaz Sokaklar" YAPI Mimarlık-Kültür-Sanat Dergisi sayı:322 Eylül Şubat 2008, sayfa 88-93, YEM yayınları, İstanbul

Bala, A..H., Çiftçi, Ç., Meşhur, A.H.F. (2009). Reading Social (De/Re)- Constructions In Urban Neighborhoods: From Cul-De-Sacs To Gated Communities In Anatolian Cities,LIVENARCH IV International Congress (Re/De)

Construction in Architecture, page 675-687, 9-11 July 2009, Trabzon- Turkey

Bala, A. H., (2010). The Privasition Of Public Space In Enclosed Neighbourhood Case; "Fina" To Gated Community, NHR 2010, WS NO: W02_Housing and Spatial Studies, 12th New Housing Researchers' Colloquium, 2-3 July, ITU, Faculty of Architecture, Taskisla, İstanbul-Turkey

Bala, A., H. (2012). "Çıkmaz Sokak"; Mahallenin Üstü Açık Oturma Odası", Güney Mimarlık, Sayı: 10, Aralık 2012, sayfa 27-33, Mimarlar Odası Adana Şubesi Yayını. 2007, sayfa 122-125, Boyut yayınları, İstanbul.

Balamir, A. (1994). Kent Mekânları Sonatı (The Sonato Of Urban Spaces). In İ. Tekeli (Ed.), *Kent Planlama, Politika, Sanat* (s. 105-113). Ankara: Middle East Technical University.

Baykara, T. (1985). *Konya In Seljuklu Periot*. Ankara: Ministry of Culture and Tourism.

Berktay, A. (1996). Modernleşme Sürecinde Osmanlı Kentleri Editör:Raul Dumont ve Francois Georgeon Tarih Vakfı Yurt Yayınları, İstanbul.

Blakely, E. J, Snyder, M. G. (1997). *Fortress America. Gated Communities in the United States*. Washington DC and Cambridge: Brookings Institution and Lincoln Institute of Land Policy.

Borsdorf, A. (2002). Barrios cerrados en Santiago de Chile, Quito y Lima: tendencias de la segregacio´n socioespacialen capitales andinas. In. L. F. Cabrales Barajas (Ed.), *Latinoame´Rica: Pai´Ses Abiertos, Ciudadescerradas* (pp. 581-610). Mexico: Universidad de Guadalajara, UNESCO.

Calthorpe, P. (1994). The New American Metropolis: Ecology, Community & American Dream, Princeton Press, New York.

Caldeira, T. P. (2000). *City of Walls: Crime, Segregation and Citizenship in Sao Paulo*. Berkeley: CA University of California.

Carvalho, M., Varkki George, R. & Anthony, K. (1997). Residential satisfaction in Gate-guarded Neighborhoods in Brazil. *Environment and Behavior*, 29, 734–768.

Cozens, P., Hillier, D. (2008). The Shape of Things to Come: New Urbanism, the Grid and the Cul-De-Sac. *International Planning Studies*,13:1, 51-73.

Çelik, Z. (1996). 19.Yüzyılda Osmanlı Başkenti Değişen İstanbul Türk Tarih Vakfı Yurt Yayınları İstanbul.

Çevik, S., Özen, H. (1995). Özel Kamusal Mekan Olgusunun Geleneksel ve Günümüz Yaşama Çevrelerinde İrdelenmesi, Uluslar arası 7. Yapı ve Yaşam Fuarı Kongresi, Bursa

DOI: 10.15320/ICONARP.2018.57 – E-ISSN: 2147-9380

Denel, S. (1982). *Batılaşma Sürecinde İstanbul'da Tasarım ve Dış Mekanda Değişim ve Nedenleri (In The Period Of Westernization Design and Changes in İstanbul and The Reasons of The Changes)*. Ankara: Middle East Technical University.

Duany, A., Plater-Zyberk E., Alminana R. (2003). The New Civic Art: Elements of Town Planning. New York: Rizzoli International Publications. ISBN 0-8478-2186-2

Duany, A., Plater-Zyberk, E. (1992). Towns & Town-Making Principles, Harvard University Graduate School of Design, Cambridge.

Erdem, R., Özcan, K. (2004). XVI.Yüzyıl Anadolu-Osmanlı Kentlerinde Çıkmaz Sokak Olgusunun Kökenleri Üzerine Bir Araştırma, Selçuk Üniversitesi BAP Proje No: 2000/049,s.8-21, Konya.

Fabiyi, O. (2004). *Gated Neighbourhoods and Privatisation of Urban Security in Ibadan Metropolis.* No. 16 IFRA. Ibadan: Occasional.

Greenstein, R., Sabatini, F. & Smolka (2000). Urban Spatial Segregation: Forces, Consequences, And Policy Responses. *Land Lines*, 12, 6. 66.

Grunebaum,G. (1961), *Medieval Islam: A Study in Cultural Orientation*. Second edition. Chicago, London: University of Chicago.

Gustave, G. (1946) The Structure of the Muslim Town, *Islam*, 19, 141-158.

Güner, D. (2010). İstanbul Kıyı Alanlarında Değişen Kamusallıklar http://www.archplus.net/index.php?s=Publikationen&c=237

Hakim, B. (2007). Generative Processes for Revitalising Historic Towns or Heritage Districts Albuquerque. *Urban Design International*, 12, 87-99.

Hakim, B. (2010) The Islamic City and its Architecture: A Review Essay. *Third World Planning Review*, 12, 1, 75.

Hassan, R. (1972). Islamond Urbanization in the Medieval Middle East. *Ekistis*, No 195, 86

Hillier, B., Hanson, J. (1984). *The Social Logic of Space*. Cambridge: Cambridge University.

Kartz, P. (1994). The New Urbanism: Toward an Architecture of Community; Mc Graw-Hill, Inc. New York.

Keleş, R. (1999). *Kent Bilim Terimleri Sözlüğü (The Terminology Dictionary of The City Science*. Ankara: İmge.

Kubat, A., Asami, Y., Istek, İ. (2001). *Characterization of Street Networks in Turkish-Islamic Urban Form.* (Proceedings). 3rd International Space Syntax Symposium, Atlanta.

Kubat A.S., Topçu M. (2009). Antakya ve Konya tarihi kent dokularının morfolojik açıdan karşılaştırılması. International Journal of Human Sciences, 6(2), 334-347.

Landman, K. (2002). Gated Communities in South Africa: Building Bridges or Barriers?.Paper presented at the International Conference on Private Urban Governance, Mainz, Germany, June 6 –9.

Landman, K. (2004). "Who owns the roads? Privatising Public space in South African cities through neighbourhood enclosures". Publications of CISR Building and Construction Technology South Africa.

Lapidus, I. M. (1967). *Muslim Cities in The Later Middle Ages*. Cambridge: Harvard University.

Low, S. M. (2000). The Edge and the Center: Gated Communities and the Discourse of Urban Fear. *Issue American Anthropologist*,103, 45-58. Retrieved March 18, 2001 from Wiley Online.

Marcuse, P. (2001). "Enclaves yes, ghettos, no: segregation and the state" Paper presented in the International Seminar on Segregation in the City Lincoln Institute of Land Policy, Cambridge, MA, 25–28 July.

Massey, D.,& Denton, N. (1993). *American Apartheid: Segregation and the Making of the Underclass*. Cambridge: MA, Harvard University.

Mingione, E. (1996). *Urban Poverty and the Underclass A Reader*. Oxford: Blackwell.

Morris, A. (1979). *History of Urban Form Before the Industrial Revolutions*. London: George Godwin Limited.

Morrow-Jones, H., Irwin, E. & Roe, B. (2004). Consumer preference for neotraditional neighbourhood characteristics, Housing Policy Debate, 15(1), pp. 171–202

Moughtin, C. (1992). *Urban Design-Street and Square*, Great Britain: Butterworth Architecture.

Mumford, L. (1989). The City In History. New York: Harvest Book.

Newman, O. (1972). *Defensible Spaces, People & Design in Violent City.* London: Architectural.

Pinto, Rovira A. (2002). Los barrios cerrados de Santiago de Chile: en busca de la seguridad y la privacidadperdidas, in: L. F. Cabrales Barajas (Ed.), *Latinoame´rica: pai´ses abiertos, ciudades cerradas* (pp. 351–369). Guadalajara. Mexico: Universidad de Guadalajara, UNESCO.

Raymond, A. (1994). Islamic City, Arab City: Orientalist Myths and Recent Views, British Journal of Middle Eastern Studies, Vol. 21, No. 1, pp. 3-18

Raymond, A. (1995). Osmanlı Döneminde Arap Kentleri (The Arabic Cities In Ottoman Period), translated by Bektay A., Tarih Vakfı Yurt Press, İstanbul.

DOI: 10.15320/ICONARP.2018.57 – E-ISSN: 2147-9380

Roitman, S. (2005). Who Segregates Whom? The Analysis of a Gated Community in Mendoza, Argentina. *Housing Studies*, Vol. 20, No. 2, 303–321.

Rykwert, J. (1982). Learning From The Street, The Necessity of Artifice, s 102-113 New York Arredamento Mimarlık, s 97-98, 2006/12.

Sauvaget, J. (1946). Historiens arabes : pages choisies, traduites et présentées par J. Sauvaget, Paris, 1946, in-8° br., 192 pages. Réimpression 1988.

Saoud, R. (2002).*Introduction of the Islamic City*. Manchoester: FSTC Limited.

Southworth, M.,& Ben-Joseph, E. (2004). Reconsidering the Cul-de-sac. Access, 24, 28–33.

Sözen, M.,&Tanyeli, U. (1992). *Sanat Terimleri Sözlüğü (Art Terminology Dictionary)*. İstanbul: Remzi.

Stewing, R. (1966). İstanbul'da Çıkmaz Sokaklar (The Cul-de-sac İn İstanbul). T. Yazman and Ş. Yazman (trans), İstanbul: Baha.

Svampa, M. (2001). *Los que ganaron. La vida en los countries y barrios privados*. Buenos Aires: Biblos

Topçu, M. (2013). Impact of Gated Housing Estates on Housing Values; Case of Konya, Turkey, Research Ppares of Wroclaw University of Economics, Economy and Space, ISSN 1899-3192, 155-166

Yerasimos, S. (1996). Modernleşme Sürecinde Osmanlı Kentleri, Paul Dumont and Francois Georgeon (Ed), Ali Berktay (Trans), İstanbul: Tarih Vakfı Yurt.

Webster, C.J. (2002). Gated Cities of Tomorrow. Town Planning Review, 72: 149-170.

Wilson-Doenges, G. (2000). An exploration of sense of community and fear of crime in gated communities, Environment and Behavior, 32, pp. 597–611.

Wilson, W. J. (1987). *The Truly Disadvantaged; The Inner City, The Underclass and Public Policy.* Chicago: The University.

Resume

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ICONARP
International Journal of Architecture & Planning
Received 09 Oct 2018; Accepted 09 Nov 2018
Volume 6, Issue 2, pp: 358-370/Published 28 December 2018
DOI: 10.15320/ICONARP.2018.58–E-ISSN: 2147-9380
Research Article

Investigation of Architect and Non-Architect Participants' Perceptual Evaluations on Different Period Mosque Facades

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Abstract

In architecture, perception based studies about building facades have become more popular. In recent studies, mostly residential buildings and business center type of buildings had been selected as target buildings. The lack of study of the perception of the facades of religious structures has created the basic motivation for this work. In the current study, the facade features of (Seljuk period, Ottoman period and Republic period) some important mosques from different periods were evaluated according to the adjective pairs of complexity, preference and impressiveness variables. Also, whether or not the general views of the mosques represent Islamic religion and their level of arousing curiosity were questioned. For this purpose, in the study, a total of 16 mosques were used. The results obtained from the participants as architect and non-architect are given. It is seen that the participant architects show a statistically more negative approach compared to those who are non-architects in the perceptual evaluations of the facades of the mosques for complexity variable. On the other hand, there was no statistically significant difference between the participants' evaluations of preference and impressiveness variables (at $p < 0.05$ level).

Keywords: *Perception, Mosque, Architect, Non-Architects, Facade*

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INTRODUCTION

The values that buildings represent in terms of architecture depend on many elements. The most important of these factors is the building facade. The meaning that the architect attributes to the building is often understood from the facade of the building. The urban space and the building facades consisting of vertical and horizontal components determining the limit of the building potentially reflect the character of the architect in many different dimensions. The building facades reflecting the architect's character also give information especially about the space that it bounds and the spirit of the city it is in. Krier (1993) defines the facades of buildings as the walls that limit the urban spaces where exterior turns into interior or the intersection (interpenetration) areas where the function changes whereas he classifies the facade as a membrane actually separating the spirit of the city and the spirit concealed at the essence of the building in a distinguishable way. The building facade can also be defined as an interface between the architectural space and the urban space.

By analyzing the architecture facade from different angles, it is possible to have important knowledge in architectural form. The building makes sense of itself through the dialogue between the facades and inside. The items on the facade often point to the beliefs, concepts, and ambitions of the architect that the architect wants to attribute to the building. According to Robert Venturi meaning to be assigned to the building facade is very important and if necessary, this meaning must be attributed to the facade by using non-architectural elements. Norman Foster, on the other hand, shows the facade more as a means of control and display.

Facade, which reveals the identity of the building, communicates with the environment, people through the signs it carries. The facade is read by a human through the eye, which is the most effective sense organ in the reception of an external stimulus of the human brain, and related visual perception. On the facade, all the secret and nonsecret codes the architect wants to give are perceived by the person within a short time and the meaning in architectural construction begins with the signs given by the structure, the primary indicator. The perception of human regarding the facade occurs by interaction with the facade, getting information as a result of this interaction and putting this information in his mind as a whole of experience and then using it. Baytin (1994) and Füeg (1981), state that an architect needs to know in advance what effect the vision will bring about and what reaction it will receive in order to be able to reflect what he or she wants to tell, to see what kind of impressions he or she will obtain

DOI: 10.15320/ICONARP.2018.58 – E-ISSN: 2147-9380

from geometric forms and the architecture can only exist through the human that can perceive.

There are numerous studies in the literature that have become more popular in the last two decades in which the effects of building facades and the building interiors on people are evaluated. In these studies, the studies were conducted on how the physical properties of spaces affect people's perception-behavioral evaluations. In all of the studies, (Evans, 2003; Tsunetsugu et al., 2005; Küller, 2002; Kobayash and Sato, 1992; Noguchi and Sakaguchi, 1999 and Dunn and Hayes, 2000) associating the socio-emotional reactions of people with buildings and interiors, it has been seen that the physiological response of the human being is interrelated with the visual environment and space design.

In the studies on building facade and interior perception, mostly dependent variables were used such as preference, complexity and impressiveness variables. For example some researchers (Berlyne, 1974; Herzog ve Shier, 2000; Imamoglu, 2000; Stamps, 2003; Devlin and Nasar, 1989; Kaplan et al., 1972; Nasar, 1983; Akalın et al., 2009; Wohlwill, 1968 and Crozier, 1974) examined building visuals facade using the variable of complexity and preference.

In perceptual studies in literature, the comparison of age, gender, education level as well as architects and non-architects groups have been made. In the study conducted by Hershberger (1969) that entered the literature for the first time, the perception differences between architects and non-architects were examined. Later, various studies were carried out on the basis of this study (Hershberger ve Cass, 1974; Groat, 1982; Devlin & Nasar, 1989; Nasar, 1989; Stamps, 1991; Imamoğlu 2000, Akalın et al., 2009). In the study carried out by Brown and Gifford (2001) to determine the perception differences between the designer and the user where the effect of social factors in perception is studied, it has been found that the education got creates differences in perception. Similarly, Gifford et al. (2000, 2002) examined in their study that architects, as compared to non-architects, have a different approach to aesthetic evaluations of building facades physically and emotionally. As a result, both groups were found to have different emotional evaluations on the building characters. The common result obtained from studies is that architects' evaluation is more critical than non-architect groups.

In the studies conducted on the perception of building facades, mostly residential buildings and business centre type of buildings were selected as examples. In particular, the lack of study of the

perception of the facades of religious structures has created the basic motivation for this work. In accordance with this purpose, it has been aimed to determine in which direction the literature will be supported by the data obtained through mosque images, in terms of concepts such as preference/liking, complexity and impressiveness variables makes a difference in the perception of mosque images. For this purpose, the data obtained through mosque visuals will be investigated in terms of the preference, complexity and impressiveness variables. Thus, it will also be determined whether architectural education makes a difference in perception of mosque images.

MATERIAL and METHOD

The mosques are the symbol of the second largest religion, Islamic religion, in the world and used as places of worship with different designs that are built differently according to the climate conditions, periods, countries and architectural trends within the geographical boundaries where the Islamic religion is spread. In this study, it has been aimed to determine the effects of mosques on the perceptual performance of architects and non-architects/laypersons. In the first phase of this study, Arslan and Yıldırım (2017) examined the effect of age, gender and education level differences on participants' evaluation of the same mosque visuals. In this study, the differences between perceptual evaluations of architects and non-architects will be evaluated. The choice of participants, digital photographs used in the study, the design of research study and statistical evaluation methods are explained below respectively.

50 architects and 50 non-architects participated in this study randomly selected from among the people living in the central settlement area of Konya. In this study, besides historic museums from the past, 16 different mosque examples built according to the modern architectural insights have been dealt with. Mosque samples from Turkey have been examined in three sub-groups. In the 1st group, the mosques of the 10th - 14th centuries, which are within the present-day borders of Turkey (Anatolia), representing the Seljuk architecture which was a trend created by the Seljuk Empire; in the 2nd group, the examples from the Ottoman architecture, which was a created by the Ottoman Empire, which dominated a very wide area in the world including the territory of Turkey since the end of 14th century until the 20th century have been studied. In the 3rd group, the new modern era mosques of the Republic of Turkey after the collapse of the Ottoman Empire have been examined. The only parameter in the selection of mosques is the construction periods. The digital photograph of the facade views of a total of 16 different mosques used in the survey study

DOI: 10.15320/ICONARP.2018.58 – E-ISSN: 2147-9380

was manifolded in the sizes of 130 x 180 mm² colorful and high quality (600 dpi). The numerical distribution of the mosques divided into 3 groups is shown in Table 1 and the digital photographs of the mosques sorted according to periods are given in Figure 1.

Table 1. Numerical distribution of mosque

Group	Mosque Group Name	Historical Period	Sample Number
1. Group	Seljuk Architecture	10-14 centuries	5
2. Group	Ottoman Architecture	14-20 centuries	5
3. Group	Republic Period of Turkey Architecture	20 centuries -	6
Total Mosque Number			16

On the basis of research hypotheses, dependent variables were dealt with in two dimensions and these were measured using a detailed survey. The survey form used consisted of two parts: the first part asked for general information such as the age, gender, education and job of the participants. The second part consisted of a five-point semantic differential scale about participants' perceptual evaluations of the facade characteristics of the mosques. The participants then had to evaluate the importance of each of the bipolar adjective pairs on a 1–5 semantic differential scale where 1=beautiful and 5=ugly. The technique of altering the sets of items consisting of three different adjective pairs from positive to negative, as previously done by Berlyne (1974), Imamoglu (2000), Akalin-Baskaya and Yildirim (2007), Akalın et al. (2009, 2010) and Arslan and Ceylan (2012) was adopted to reduce the probability of respondents simply marking the scale on either end of the extremes. The semantic differentiation scale is not intended to measure only one dimension of the perceived space; it is an important scale enabling many qualities to be measured in one go and allowing objective assessment of subjective assessments. Survey data were obtained in about 2 months by face-to-face interviews at home and workplaces of participants in 2015. The surveys were applied to the participants at different times of the day including weekdays or weekends. The participants completed the survey in approximately 20 minutes.

Alaeddin Mosque, NİĞDE,TURKEY

Eşrefoğlu Mosque, KONYA, TURKEY

İplikçi Mosque, KONYA,TURKEY

Divriği Ulu Mosque, SİVAS,TURKEY

Alaeddin Mosque, KONYA,TURKEY

Group 1 - Samples of Seljuk Architecture

Aziziye Mosque, KONYA,TURKEY

Yıldız Hamidiye Mosque, İSTANBUL, TURKEY

Ortaköy Mosque, İSTANBUL,TURKEY

Selimiye Mosque, EDİRNE,TURKEY

Sultan Ahmet Mosque, İSTANBUL, TURKEY

Group 2 - Samples of Ottoman Architecture

TBMM Mosque, ANKARA, TURKEY

OSB Mosque, BURSA, TURKEY

Gazi Emir Mosque, İZMİR, TURKEY

Ahmet Hamdi Akseki Mosque, ANKARA, TURKEY

Dört Minareli Mosque, KIRŞEHİR, TURKEY

Sekine Hatun Mosque, KONYA, TURKEY

Group 3 - Samples of Republic period

Figure 1. The digital photographs classified according to the periods of the mosques (Arslan and Yıldırım, 2017)

DOI: 10.15320/ICONARP.2018.58 – E-ISSN: 2147-9380

In this study, the participants' perceptual evaluations of the facades of the mosques were considered as "dependent variables". There are many factors that influence the participants' perceptions of facade features of the mosques. From these factors, "the mosques of different periods" and "job" were considered "independent variables". These two identified independent variables were grouped as; X_1: The facade features of the mosques (Seljuk period, Ottoman period and Republic period), X_2: Job (Architect and Non- Architect). Percentage values, arithmetic mean and standard deviations of the data obtained in the study were calculated and Cronbach Alpha reliability tests of data were performed. Single variance analysis (ANOVA) was performed to test whether the differences between dependent and independent variables were statistically significant at $P < 0.05$ level. To compare the significant means of the variance in the analysis, the data is presented in graphic form.

RESULTS AND DISCUSSION

In this study, the facade features of (Seljuk period, Ottoman period and Republic period) some important mosques from different periods were evaluated according to the adjective pairs of complexity, preference and impressiveness variables. Also, whether or not the general views of the mosques represent Islamic religion and their level of arousing curiosity were questioned. For this purpose, in the study, a total of 16 mosques were used, with at least the photographs of 5 mosques from each group. The results obtained from the participants with the help of a survey are given below, respectively.

The reliability of the semantic differential scale including perceptual evaluations of participants about facade features of the mosque was tested with Cronbach alpha and the results are given in Table 2. The Cronbach alpha reliability coefficient of all adjective pairs used in the study is 0.83. In the previous studies, the scale coefficients over 0.70 were accepted reliable (Cronbach, 1951; Kaplan and Saccuzzo, 2009; Panayides, 2013). In this context, is scale was also found reliable.

Table 2. Results of reliability analysis of the dependent variables

Dependent Variables	Scale Items	Item Reliability	Scale Reliability
Preference	beautiful - ugly	0.78	0.83
Complexity	simple - complex	0.82	
Impressiveness	impressive - unimpressive	0.70	

Note: For each dependent variable, the scale reliability is provided.

In this part, the differences between the perceptual evaluations of participants about the facade characteristics (Seljuk period, Ottoman period and Republic period) of the mosques according to the dependent variables were statistically tested. According to this, the mean and standard deviation values of dependent variables were determined in 3 groups (preference, complexity and impressiveness). The results are given in Table 3.

Table 3 shows that it is determined that differences among the perceptual evaluations of the facade attributes of the mosques varies according to the various professional status (architect and non-architect). From the evaluation of the means it can be seen that non-architect participants have a more positive perception of the facade attributes of the mosques for complexity variable than architect participants.

Table 3. Means and standard deviation values of the dependent variables according to professional status of participants

Dependent Variables	Professional Status				Total	
	Architect		Non-Architect			
	M[a]	SD	M	SD	M	SD
Preference	2.27	1.13	2.28	1.17	2.28	1.13
Complexity	2.85	1.19	2.69	1.16	2.82	1.19
Impressiveness	2.59	1.21	2.69	1.18	2.61	1.21

Notes: M: Mean, SD: Standard Deviation. [a]: Variable means ranged from 1 to 5, with higher numbers representing more negative responses.

The differences between the perceptions of facade attributes of the mosques in terms of professional status (architect and non-architect) were also tested using ANOVA (Table 4). According to the results given in Table 4, the differences between the dependent variables including the perceptions of the facades in terms of participants' professional status was found to be statistically significant (at a level of $p < 0.05$) for complexity variable. Consequently, it can be said that the differences between the participants' professional status have a significant influence on perceptual evaluations and participants from the non-architects evaluated mosque facades more positive than the architects. This result, which belongs to the complexity variable, was previously reported by Akalın et al. (2009). However, this result does not support the result of İmamoğlu (2000). As Imamoglu (2000) has mentioned, non-architecture students, in comparison to architecture students, in general rated house façades (both traditional and modern) as more complex, especially for the perceived maximum complexity level. Gifford et al (2000) has shown that architects and non-architects base their emotional assessments on almost entirely different sets of

DOI: 10.15320/ICONARP.2018.58 – E-ISSN: 2147-9380

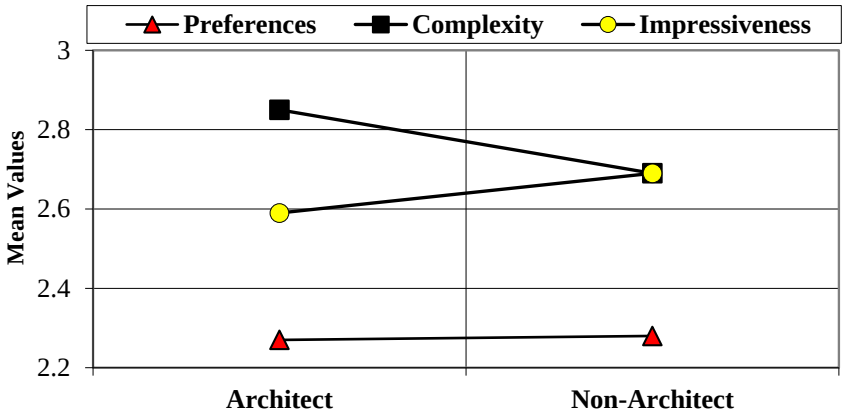
objective features, which as he suggests, help to explain why the aesthetic evaluations of both groups are virtually unrelated.

Table 4. ANOVA results of the dependent variables in terms of the professional status of participants

Dependent Variables		Sum of Squares	df	Mean Squares	F	Results
Preference	Between Groups	0.026	1	0.026	0.020	0.888ns
	Within Groups	3501.173	2698	1.298		
	Total	3501.199	2699			
Complexity	Between Groups	11.148	1	11.148	7.843	0.005*
	Within Groups	3835.112	2698	1.421		
	Total	3846.261	2699			
Impressiveness	Between Groups	4.208	1	4.208	2.867	0.091ns
	Within Groups	3959.885	2698	1.468		
	Total	3964.093	2699			

Notes: F: F Value, df: Degree of freedom, * p< 0.05 is the level of significance, ns: not significant.

On the other hand, there was no statistically significant difference between the participants' evaluations of preference and impressiveness variables (at p <0.05 level). This result supports the preference result of the previously published Imamoğlu (2000). The differences between participants' perceptions of the mosque facades for dependent variables (preference, complexity and impressiveness) depending on their professional status (architect and non-architect) are illustrated in Figure 2.



The effects of interactions between independent variables (participants' professional status and mosque groups) depending on participants' perceptions of facade features of the mosques for dependent variables (preference, complexity and impressiveness) were tested using the MANOVA. According to the results given in Table 5, the main effects (participants' professional status and mosque groups) and the two-way interactions for participants' professional status * mosque groups (at a level of p < 0.05) were found to be significant.

Figure 2. Effects of professional status of the participants to the dependent variables
Note: Variable means ranged from 1 to 5, with higher numbers representing more negative responses

Table 5. MANOVA of the independent variables

Independent Variables	Value	F	df	Sig.	Result
Professional Status	0.008	4.385	3	0.004	$P < 0.01$*
Mosque Groups	0.290	90.016	6	0.000	$P < 0.01$*
Professional Status * Mosque Groups	0.009	2.270	6	0.034	$P < 0.05$**

Notes: F: F value, df: Degree of freedom.

** p< 0.01 and * p< 0.05 are the level of significance.

CONCLUSION

The followings have been aimed in this study: to determine the effect of the facade characteristics of the mosques of different periods on perceptual evaluations of people through mosque images; to compare the results obtained with respect to the variables of preference, complexity and impressiveness; to determine whether architectural education makes a difference in the perception of mosque images.

According to the results, the differences between the dependent variables including the perceptions of the facades in terms of participants' professional status was found to be statistically significant (at a level of $p < 0.05$) for complexity variable. On the other hand, there was no statistically significant difference between the participants' evaluations of preference and impressiveness variables (at $p < 0.05$ level).

The study shows that the participant architects show a statistically more negative approach compared to those who are non-architects in the perceptual evaluations of the facades of the mosques for complexity variable. This result was previously reported by Akalın et al. (2009), but does not support the result published by Imamoglu (2000). These results may be due to the fact that the group of non-architect participating in the survey considered the religious structures more symbolically. Also, architects know the existence of more and more different buildings may have caused them to respond more positively than non-architects in different types of mosques.

REFERENCES

Akalin-Baskaya, A., & Yildirim, K. (2007). Design of circulation axes in densely-used polyclinic waiting halls. Building and Environment, 42, 1743–175.

Akalin, A., Yildirim, K., Wilson, C. & Kilicoglu, O. (2009). Architecture and engineering students' evaluations of

DOI: 10.15320/ICONARP.2018.58 – E-ISSN: 2147-9380

house facades: Preference, complexity and impressiveness. Journal of Environmental Psychology, 29(1), 124-132.

Akalin, A., Yildirim, K., Wilson, C. & Saylan, A. (2010). Users' evaluations of house façades: Preference, complexity and impressiveness. Open House International, 35(1), 57-65.

Arslan H.D. and Yıldırım K., (2017). "Perceptual Evaluations of Different Period Mosque Facades: Preference, Complexity, Impressiveness and Simulative" Megaron Journal, 12,4,511-523.

Arslan, H.D., Ceylan M., (2012). "Judging Primary School Classroom Spaces Via ANN Model" Gazi University Journal of Science, 25, 1,

Baytin, Ç. (1994). " An Approach to the Case of New Buildings in Historical Environments, An Applied Model for Istanbul, İstanbul Technical University, Graduate School of Natural and Applied Sciences, PhD Thesis, İstanbul.

Berlyne, D. E. (1974). Studies in the new experimental aesthetics. New York: Wiley.

Brown, G., Gifford, R. (2001). Architects Predict Lay Evaluations Of Large Contemporary Buildings: Whose Conceptual Properties?, Journal of Environmental Psychology, . 21, 93-99.

Cronbach, L.J. (1951). Coefficient alpha and the internal structure of tests, Psychometrika, 16 (3): 297-334.

Crozier, J.B. (1974). Verbal and exploratory responses to sound sequences varying in uncertainty level

Devlin, K. & Nasar, J.L. (1989). The beauty and the beast: Some preliminary comparisons of "high" versus "popular" residential architecture and public versus architect judgments of same. Journal of Environmental Psychology, 9(4), 333-344.

Dunn, J. V., Hayes, M. V. (2000). Social Inequality, Population Health, and Housing: A Study of two Vancouver Neighborhoods", Social Science & Medicine, Vol. 51, No. 4, pp. 563-587.

Evans, G. W. (2003). The Built Environment and Mental Health, Journal of Urban Health: Bulletin of the New York Academy Medicine, 80, 4, 536-555.

Füeg, F. (1981). "Mimarinin Temelleri", Çev: Kazmaoğlu, M., Yapı, No. 39, sf. 28-32, YEM Yayınları, İstanbul.

Gifford, R., Hine D. W., Müler-Clemm, W., Reynolds, D. J. and Shaw, K. T. (2000). Decoding Modern Architecture: A Lens Model Approach for Understanding the Aesthetic Differences of Architects and Laypersons, Environment and Behavior, Vol. 32, pp. 168-187.

Gifford, R., Hine, D. W., Clemm, W. M., Shaw, K. T. (2002). Why Architects and Laypersons Judge Buildings Differently: Cognitive Properties and Physical Bases, Journal of Architectural and Planning Research, Vol. 19, No. 2, pp. 131-148.

Groat, L. (1982). Meaning in post-modern architecture: an examination using the multiple sorting task. Journal of Environmental Psychology, 2, 3-22.

Hershberger, R. G. & Cass, R. (1974). Predicting user re-sponses to buildings. In J. L. Nasar, (Ed.), Environmental Aesthetics: Theory, Research, and Applications. NewYork: Cambridge University Press, pp. 195-211.

Hershberger, R. G. (1969). A study of meaning and architecture. In J. L. Nasar, (Ed.), Environmental Aesthetics: Theory, Research, and Application. New York: Cambridge University Press, pp. 175-194.

Herzog, T. R., & Shier, R. L. (2000). Complexity, age, and building preference. Environment and Behavior, 32, 557–575.

Imamoglu, C (2000). Complexity, preference and familiarity: architecture and nonarchitecture Turkish students' assessments of traditional and modern house facades. Journal of Environmental Psychology, 20, 5–16.

Kaplan, R.M. & Saccuzzo, D.P. (2009). Psychological Testing Principles, Applications, and Issues. 7th Edition. (Belmont, CA.: Wadsworth)

Kaplan, S., Kaplan, R. & Wendt, J.S. (1972). Rated preference and complexity for natural and urban visual material. Perception and Psychophysics, 12(4), 354-356.

Kobayash, K., Sato, M. (1992), Type Ia Supernova Progenitors, Environmental Effects and Cosmic Supernova Effects, Type Ia Supernova: Theory & Cosmology, pp. 63-89.

Krier, R., (1993) "Architecture and Urban Design" Academy Editions.

Küller, R. (2002). The Influence of Light on Circarhythms in Humans, Journal of Physiological Anthropology and Applied Human Science, Vol. 21, pp. 87–91.

Nasar, J. L. (1983). Adult viewers' preferences in residential scenes: a study of the relationship of environmental attributes to preference. Environment and Behavior, 15, 589–614.

Nasar, J. L. (1989). Symbolic meaning of house styles. Environment and Behavior, 21, 235-257.

Noguchi, H., Sakaguchi, T. (1999). Effect of Illuminance and Color Temperature on Lowering of Physiological Activity, Applied Human Science Vol. 18, No. 4, pp. 117-123.

Panayides, P. (2013). "Coefficient alpha: interpret with caution", Europe's Journal of Psychology, Vol. 9 No. 4, pp. 687-696.

Stamps, A. E. (1991). Comparing preferences of neighbors and neighborhood design review board. Environment and Behavior, 23, 618–629.

Stamps, A. E. (2003). Advances in visual diversity and entropy. Environment and Planning B, Planning and Design, 30, 449–463.

Tsunetsugu, Y., Miyazaki, Y., Sato, H. (2005). Visual Effects of İnterior Design in Actual-Size Living Rooms on Physiological Reponses, Building and Environment, Vol. 40, pp. 1341-1346.

Wohlwill, J. F. (1968). Amount of stimulus exploration and preference as differential functions of stimulus complexity. Perception and Psychophysics, 4, 307–312.

DOI: 10.15320/ICONARP.2018.58 – E-ISSN: 2147-9380

Resume

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Research Article

ICONARP
International Journal of Architecture & Planning
Received 13 Nov 2018; Accepted 16 Dec 2018
Volume 6, Issue 2, pp: 371-398/Published 28 December 2018
DOI: 10.15320/ICONARP.2018.59–E-ISSN: 2147-9380

ICONARP

Determining a Strategy for Sustainable Development of Local Identity: Case of Birgi (İzmir/Turkey)

Kadriye (Deniz) Topçu*

Abstract

Today, it is difficult to retain and strengthen local character in the globalizing world. Showing the advantages of small towns and to strengthen their identities with focusing on '*small realities in a globalizing world*'' by increasing the value of local differences is an important subject in the global atmosphere. From this point, taking the advantage of Birgi's (Izmir/Turkey) having strong natural, man-made and cultural identity, this study aims to find out the most appropriate planning strategy for the sustainability of Birgi's (İzmir-Turkey) local character and identity which was selected as a case study. This study made some on-site observations for establishing the existing local identity potentials of Birgi. After these observations, within the scope of the study, first of all, strengths, weaknesses, opportunities and threats (*SWOT factors*) of the settlement were identified. Additionally, to determine the most appropriate planning strategy, a numerical SWOT analysis called A'WOT analysis which is the combination of Analytical Hierarchy Process (*AHP*) and SWOT analysis was used. Then, identified SWOT factors prioritized by an expert group (*35 person*) using A'WOT analysis. After finding general and local priority values of SWOT factors, four planning strategies were displayed by using TOWS matrix. Then, the most appropriate strategy among these planning strategies was chosen

Keywords: *Sustainability, local identity, A'WOT analysis, TOWS matrix, Birgi*

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according to their priority values. In conclusion, it was found that "*Entering to Slow City Movement*" planning strategy is the most appropriate and important strategy between prioritized planning strategies for the sustainability of Birgi's local identity.

INTRODUCTION

Due to fast changes in technology and the shift from local to a globalized world, cities are forced to compete with each other in order to be an attractive tourist destination, workplace, cultural place and much more (Kotler and Gertner, 2002). In this globalizing atmosphere, today, it is difficult to retain and strengthen local character. There are many related reasons why local characters in many locations have disappeared over the last 70 years within this competitive atmosphere. One effect of disappearing local character is an *increasing homogeneity* between cities and societies (Featherstone, 1993) or *homogenization of urban identity* in the globalizing world. The scale and speed of development carried out by organizations operating nationally or globally, producing placeless, non-place and similar commodities in the name of efficiency. You can find a typical, similar building in everywhere. Modern development and/or redevelopment, unfortunately, usually aim at the efficiencies of large-scale construction and maximum use of site. Accordingly, the design is oriented towards creating a monotonous, standard *'any place'* image rather than enhancing a sense of heritage and tradition that builds citizen identification and pride (Appleyard & Jacobs, 1982; Oktay, 1998).

As the world has become universally more similar, the desire for *uniqueness of place* has grown and remains strong today. For this reason, it is obvious that the sustainability and livability of authentic settlements which embody strong urban identities is rather important. So, it is an important necessity that they should be undertaken rather carefully. In other words, analyzing sustainability of local identity as a case study is more important today (Radstrom, 2011). However, smaller urban areas which have a local identity generally do not receive as much attention, and frequently find themselves attracted to foreign '*solutions*'. Therefore, the local sense of place, in many locations, is at risk if it is not properly sustained.

Showing the advantages of small towns and to strengthen their identities with focusing on '*small realities in a globalizing world*" by increasing the value of local differences is an important issue (Miele, 2008, URL, 2). It is about protecting the environment, about promoting local goods and produce, and about avoiding the

DOI: 10.15320/ICONARP.2018.59 – E-ISSN: 2147-9380

"*sameness*" that affect too many towns in the modern world in a negative way.

By these above concerns, Birgi (*İzmir/Turkey*) which has a strong authentic and local identity and did not live the globalizing effects was studied in the scope of the study. The aim of the study is to find the most appropriate strategy for the sustainability of Birgi's local identity. To find the most appropriate strategy and to sustain the local character, first of all, spatial characteristics and local identity of Birgi, its potentials and problems were displayed. Secondly; strengths, weaknesses, opportunities and threats (*SWOT*) of Birgi were identified under the present circumstances and within the perspective of historical background. Later on, to systematically evaluate the SWOT factors and make them commensurable as regards their intensities and to improve the quantitative information basis, a hybrid method called 'A'WOT analysis' was used. In this method, in which SWOT and AHP are used together, the importance of SWOT groups (*strengths, weaknesses, opportunities and threats*) and the priorities of each SWOT factors in each SWOT groups can be quantified. In this way, they can be measured and set in order.

A total of 35 experts (*urban planners and urban planner candidates*) who have previously experienced Birgi, graded the determined SWOT factors. With this analysis, according to the priority values, four alternative planning strategies for Birgi were developed. Later on, the most appropriate strategy for the sustainability of Birgi's local identity was chosen by using the same prioritization process and TOWS matrix.

LOCAL IDENTITY AND ITS COMPONENTS

Identity is one of the essential goals for the future of good environment. Lynch (1981) defines identity as '*the extent to which a person can recognize or recall a place as being distinct from other places*'. People should feel that some parts of the environment belong to them. The urban environment should be an environment which encourages people to express themselves, to become involved, to decide what they want and act on it. To attract and hold people, an urban environment should cultivate a strong, independent image for which people can develop strong identification and affection (Appleyard and Jacobs, 1982; p.11; Oktay, 1998; p.17).

Identity is a process, not a found object. It may be linked to the trail left by civilization as it moves through history. The trail is the culture, or identity of that civilization (Abel, 1997). In this point, it can be said that urban identity is an historical process which is

formed by the different overlapping cultural layers and can be formed and change in the course of time (Tekeli, 1990). Therefore, the urban environment has to be considered from a historical perspective to understand the important periods regarding the settlement, not only by understanding historically significant buildings, but rather through the evolution of the local urban context, with respect to human activity, built form, and nature (Aly, 2011). Therefore, to understand the identity of an environment, we should know the complex interaction of natural, social and built elements.

Local identity is a reflection of all the local people's traditions, culture, aspirations grouped together. It reflects their needs, their successes, their failures and their future (Aly, 2011). The most evident social indication areas of traditional Turkish cities' local identities are '*mahalle*'s (*neighborhoods*). '*Mahalle*' is the smallest built environment of the city and generally has mosque, primary school, bath, *külliye*, grocery, coffee house, open and green areas and playgrounds. The people of these areas are connected with each other by strong relationships.

However, today, parallel to the changing life styles, these areas started to evolve into only the accommodation and housing units from the symbol of the social areas. Neighborhood and social relations of these areas are not much more seen today. This situation is one of the crucial problems of modernization, individualization and alienation process. In this point, Birgi settlement which selected as a sample area is rather important example in terms of being authentic place, sustaining its social pattern and its former traditional '*mahalle*' understanding.

In addition to social structure, natural environment conditions of the settlement (*i.e. topographical situation, geographical data, climate, existing water resources, flora, geological structure etc*.) are also effective on forming local identity. Land structure affects local identity whether through the settlement form or positioning of the buildings. Natural and topographical data are important inputs because these data give an opportunity for determining structure types, location of the structures and shape of the structure groupings (Ayan, 1985; Ocakçı, 1993; Deniz, 2004). Besides, architectural (*i.e. building colors, materials, roof types, orientation of the buildings etc*.) and planning scale properties (*i.e. narrow or wide streets, green pattern etc.*) are generally produced based on climate data. Accordingly, it can be said that natural data is actually one of the important constituents of the local identity and affects the identity of built environment directly.

DOI: 10.15320/ICONARP.2018.59 – E-ISSN: 2147-9380

Surely, the other important factors of local identity is built environment (*man-made environment*) which people shape and mould with his/her own culture. Built environment that consists of urban occupancies (*structures, image elements etc*.) and urban vacancies (*streets, open and green areas, squares etc*.) generally express its users' ideas, thoughts and ideals (Hough, 1990). According to Ocakçı and Southworth (1995), to establish local identity in built environment, presence, location and meaning factors are more important. Similarly, John Montgomery (1998) stated that the stable physical setting (form), the activities, and the meaning constitute the three basic elements of the identity of places. According to him, the first two of these elements can probably be apparent, but the component of meaning is much more difficult to grasp. Much more focus must be put on the 'sense of place' which is the aura and impression of the place. Meaning and character have more than a purely visual or spatial dimension, and they cannot be instantly achieved by the implementation of a new urban design scheme. So, meaning of a place is a process which is shaped and completed with culture and life experiences of its users. In this point, it can be said that if socio-cultural environment which consists of traditions, customs, life styles, demographical and institutional structure (Ocakçı and Southworth, 1995) passes through to build environment, we can talk about '*sense of place*', '*place identity*' or '*local identity*' concepts.

Sustainability of local identity can be achieved by continuity of color, texture, material, floor covering, scale, façade details, lightning, vegetation and silhouette (Lynch, 1960) of the settlement. In this perspective, in order to speak of identity, it probably would not be wrong to say that continuity of certain conditions that must exist in the community should be provided (Öngül, 2012). So we should know the certain conditions of the area to find the most appropriate strategy for sustainability of Birgi's local identity.

In these senses, first of all, Birgi's historical periods and breaking points that affect its local identity were investigated and then existing identity conditions which were classified as the following aspects were analyzed;

- Social environment aspect (*Neighborhoods 'mahalle'*)
- Built environment aspect (*urban fabric, architectural and symbolic values*)
- Natural environment aspect (*topographic and environmental sources*)

After analyzing existing identity conditions, problems and potentials of the area were displayed to develop a basis for SWOT analysis.

A GLIMPSE ON LOCAL IDENTITY OF BIRGI

Historical Background and Breaking Points of Birgi

Birgi, which was established for the purpose of defense, on a hillside on the coast of the lowland, being in a convenient position for castle construction (Bozoğlu, 1998) is at the height of 400m. above the sea level and located at the edge of the Küçük Menderes River (Kaistros) which is irrigated by a large and fertile plain (Figure 1). The population of the settlement is 1932 in 2017 while it was 2214 in 2013 (URL 1).

Figure 1. Location of Birgi in its vicinity and Turkey

At the intersection of civilizations in Western Anatolia, Birgi, since ancient times, has always known and been open to settlement due to its geographical location, its underground-surface richness, its proximity to water resources and its being a natural defense space. The name of the settlement was '*Dioshieron*', meaning *'the holy place of Zeus*' in antiquity, '*Christopolis*', meaning *'the city of Jesus*' in the Medieval period, '*Pyrgion*' meaning *'fortress and bastion*' in the Byzantine period and "*Birgi*" in the hands of the Turks. The settlement was under the rules of Lydia, Persia, Greek, Roman, Byzantine, Aydınoglu, Ottoman and Republican period respectively.

It was located on the trade axis; from Ephesus to Tire, from Tire to Sardis which was the capital of Lydia. Therefore, at the antiquity, especially in Lydian period, Birgi was rather an important city. In Byzantine period, it was an episcopal center for a while (*1193-1199*). It had lived its brightest period during the Aydınoğlu period (*it has captured in 1308*). In this period, Birgi was in a very good economic situation and had become a science and cultural center as a capital and equipped with many valuable architectural works that reflect the power and splendor of the Aydınoğulları era (*caravanserais, darussifas, public soup kitchens, fountains, bridges etc.*) (Yavuz, 1980; Anonymous, 2001; Tanaç,

DOI: 10.15320/ICONARP.2018.59 – E-ISSN: 2147-9380

2001; Gençsoylu, 2009, Altınoluk, 1997). Briefly; Birgi was an important religious and cultural center from the first era to the Ottoman period.

It is known that the settlement of Birgi, which was captured by the Ottomans in 1390, retained its former power of structural character in the period of its first domination (Tanaç, 2001). The settlement between the years 1425 and 1575 was the second largest city of Aydın Province and one of the largest cities of Western Anatolia. In the 17th century, it is one of the largest and most productive of the province of Aydın, and is at the top of the list for the production of its land and the population living on it. In these periods, leather, silk production and weaving were made in the settlement. On the other hand, with the Ottomans reestablishing the region after the Fetret period, Birgi completely lost its old capital image. Especially after the late 17th century, it fell into a period of collapse, and suffered a massive loss of population. Towards the end of the Ottoman period; the development of İzmir and Aydın and the formation of the new trade axes away from Birgi caused Ödemiş to develop and to replace Birgi (Yavuz, 1980; Anonymous, 2001; Tanaç, 2001; Altınoluk, 1997; Gençsoylu, 2009).

There are many breaking points for beginning to decline and entering to the collapse process of Birgi settlement, especially after the change in the role of the settlement that the Ottoman Empire gave. Natural, physical and social breakpoints which cause the regression of the settlement and slow down the developmental acceleration of the settlement can be listed in the most general form as follows:

- Plague diseases (1560, 1865)
- Earthquakes in various periods (1653, 1846-1850, 1944, 1994). These earthquakes caused considerable damage in various parts of the settlement or in important monumental structures (Altınoluk, 1998) (*i.e. damage in Great Mosque and some buildings*).
- The flood caused by the flooding of Birgi Stream in 1939 caused great damages in the region (Bozoğlu, 1996) (*i.e. Derviş Ağa Külliye focused major destruction*).
- Suffered great damage as a result of the fires in the occupation while Greek invasion between 1919 and 1922 (Altınoluk, 2001; Bozoğlu, 1996).
- Since the 18th century, the social life of the society began to differentiate. The railway trade, which was the technology of that period, entered to the differentiated life. With these changes, the topographic features which contributed to the

development of the settlement, began to prevent the development of the city, caused to be kept hidden and protected. As a result, the Birgi economy had also decreased. For these reasons, the settlement could not grow and the trade axis gradually shifted to other places (Tanaç, 2001).

- In the mid-nineteenth century, after the reforms, the economic decline in the business area, made Birgi to be weak economically. Therefore, outward migration and decrease in population could be seen within the settlement (Tanaç, 2001).
- The disappearance of the religious center identity because of the closure of the Imam-i Birgivi Madrasah (*16th century*) (*1925*), which made Birgi a center of religion (Tanaç, 2001).

The above-mentioned developments, which can be described as breakpoints and have great effects on the spatial structure of the settlement, have very important effects in shaping Birgi's current structure. In general, it has seen that the 20th century was an unfortunate period for Birgi because of many earthquakes, floods, wars and Greek invasion. For Birgi, this situation began to improve only after the 1960s. In these years, historical artifacts were repaired and the whole settlement was declared as "*protected area*". With the legal facilities provided, historical urban areas were covered within the scope of the protected area, oriented to the protection of structure groups instead of the individual structures. And, the unconscious destruction of structures had been tried to be prevented. These developments were rather important steps for protecting Birgi's local identity and for making it alive.

Briefly, it can be said that the settlement of Birgi is one of the few settlements with a history that has managed to preserve its existing identity as much as possible, even though it has been exposed to many disasters in the historical process.

Evaluating Local Identity of Birgi by Social Environment Aspect; *Neighbourhoods-'mahalle'*

The '*neighborhood*' concept (*mahalle-in Turkish*), which is the most significant physical and social building block of the spatial characteristics and local identity of the Turkish city, gives a unique identity to the settlement of Birgi in terms of providing unity in social life. The neighborhoods (*Camii Kebir, Demirbaba, Kurtgazi and Cumhuriyet*) within the structure of Birgi settlement are not only physical formations but also living spaces where values such as unity, togetherness and solidarity are kept alive. These living spaces, where neighborhood relations and social life are connected with strong bonds and still maintain the traditional

DOI: 10.15320/ICONARP.2018.59 – E-ISSN: 2147-9380

way of life, are united with the physical spaces and constitute the original identity of Birgi. The social life as well as the physical environment is still hidden in today's conditions, therefore the originality of Birgi settlement further increases.

The physical formation of the neighborhood also has a number of functional elements that support the preservation of social life (*outdoor bakeries within the neighborhood, fountains etc.*). These types of elements made the social relations alive and provide togetherness, and the sustainability of social life. Human-scale streets are living spaces that allow neighborhood relations to be intensively kept alive.

The people of Birgi is rather hospitable to local and foreign tourists, open minded to new ideas, thoughts and movements. Therefore, many festivals, activities can be made and sustained in its active social life.

In addition to neighborhood life in the formation of social identity, some habits such as dowry preparations of young girls, folk dances, folk songs, henna nights, weddings, street conversations, hospitality, solidarity, various customs and traditions and coffee chats continue to a certain extent (Eruzun, 2000). These kinds of habits are important data for Birgi's social identity.

Evaluating Local Identity of Birgi by Built Environment Aspect; *Urban Fabric, Architectural and Symbolic Values*

Birgi is a typical "*Turkish city*" with its streets, religious buildings and traditional houses. Many descriptions had been made about Birgi within the historical process. For example; Charles Texier described Birgi as "*…beautiful trees shade the streets, houses painted in many colors create a rich landscape for Birgi*…", Weber mentioned about Birgi that the river which passes through the settlement is the most important value of it and the medieval bridge over the river gives a very nice view with the old plane trees. And, Evliya Çelebi described Birgi as "*…invisible from the gardens and vineyards*…" (Altınoluk, 2007).

Birgi which has skillfully placed on three-dimensional terrain by using the topographical data of the land in the most correct way, has an integrated identity with its houses with courtyards in terms of architectural viewpoint (Tanaç, 2001). According to the observations, the original or slightly altered examples in the settlement seem quite high. Birgi has many officially registered buildings and monumental structures. This is also an indication of the originality of the settlement.

The old traditional pattern of Birgi is seen in the Camii Kebir district, where the old texture is preserved by getting rid of the

fire. This neighborhood with its urban features and housing typology carries the Turkish City character more than the other neighborhoods and is noteworthy for the stone or soil dead end streets that are positioned according to the topography (Bozoğlu, 1996).

Archaeological richness of the settlement is seen within the Demirbaba district. On the stone walls near the roof, one can see some cypress, pomegranate and sun motifs which are the symbols of Birgi. These motifs were made by using tile and white flint stones and represent abundance. This neighborhood also offers an original perspective and identity to the settlement with its unique texture (Altınoluk, 1998).

Cumhuriyet district, which is the historical-traditional commercial center of the settlement, reconstructed in the early 20th century (*in the 1925's*), as the Greek army destroyed the district by the fire during the withdrawal process (Bozoğlu, 1996; Tanaç, 2001). Therefore, the historical value of this district is weaker when compared with the other districts of the settlement. However, in the process of reproduction of this district, it is a very important and sensitive attitude in order not to act against the traditional character, to protect the urban identity and to revive it (Eruzun, 2000). The streets in this district are in a geometric order and there is no dead-ends (*cul-de-sacs*) (Bozoğlu, 1996; Tanaç, 2001).

Kurtgazi district which is located on the western slope of the settlement is forced by the paths since they are located perpendicular to the slope (Tanaç, 2001). It has a texture that can be considered as original but has lost value in terms of quality. In addition, the fact that the topographic structure is quite steep in this region has brought the structures parallel to the slope and this situation has added a unique identity to the settlement in terms of urban view.

The houses in the Birgi settlement, which has a homogeneous texture, commonly were made by masonry technique. Generally 1 or 2 storey houses with courtyards, service spaces such as wide entrance doors, barn, store, warehouse, bakery, hayloft, woodshed and coop, common street ovens which is open to the public within the districts, fountains (*wall/square*), lack of or shortage of the window openings to the outside world, designing of the real life area on the first floor of the houses, sofa and iwan (*eyvan*) designs in rooms constitute the architectural identity of the settlement. In addition to these values, one can see that the ground floors of the houses are generally surrounded by high stone walls. As a building material, the lower floors of the majority

DOI: 10.15320/ICONARP.2018.59 – E-ISSN: 2147-9380

of the houses are masonry and the upper floors are wooden carcasses. It can be said that the emergence of the rooms in the interior space is formed by the emergence of the self-built street pattern with "*cumba*"s. All of these properties make a holistic effect on the architectural identity of the settlement and they also give a distinctive identity to the built environment, outer space (Bozoğlu, 1996). In addition to the built environment, these values also constitute to the social fabric of Birgi (Figure 2).

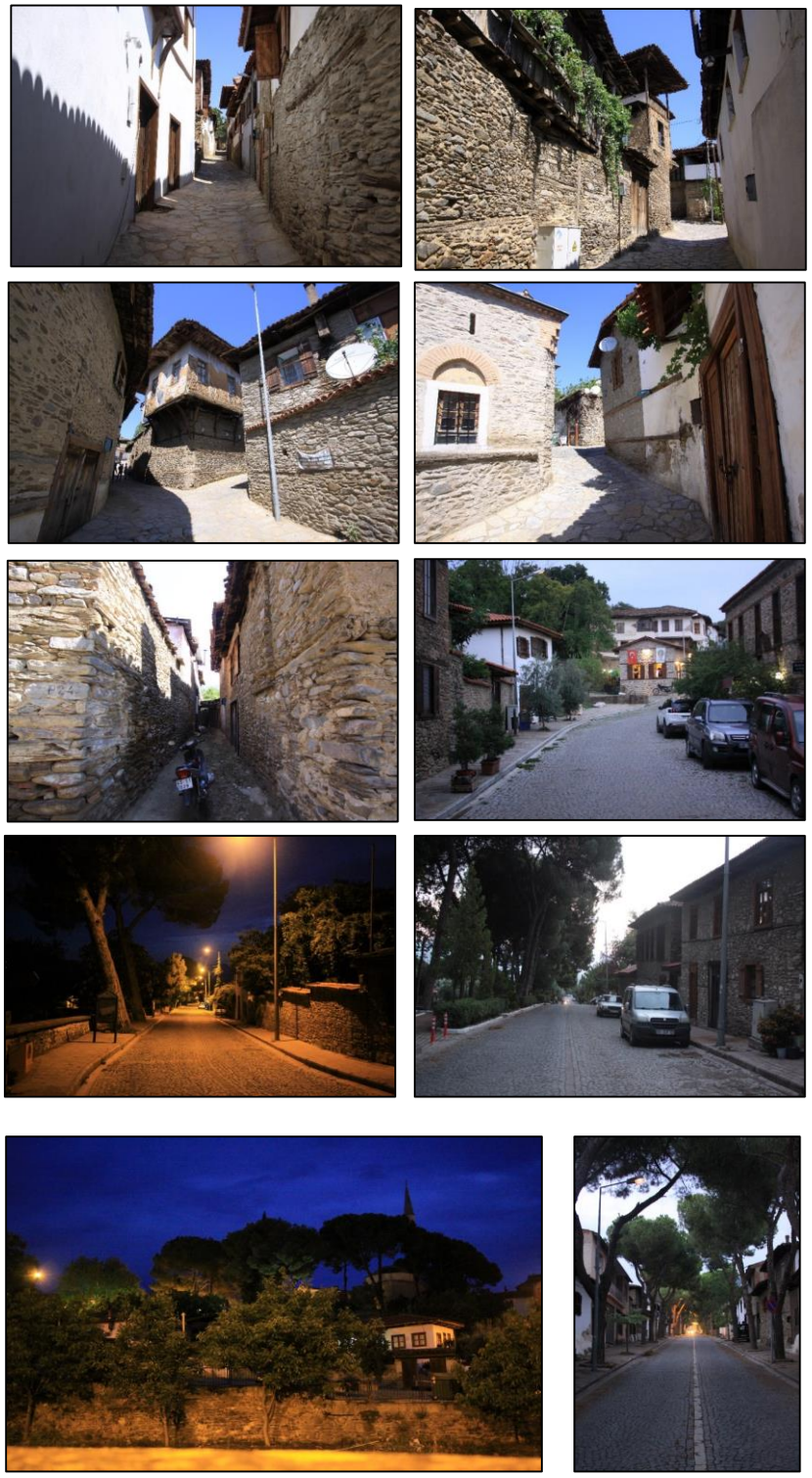

Figure 2. Examples from traditional structures and street patterns of Birgi (K. Topçu, 2018)

Some symbolic values also have contributional effects on Birgi's whole identity which is formed by its traditional architecture and urban fabric. Birgi has many original fountains which are made by bricks and reusable materials and has the Grand Mosque, which can be considered as a unique example of Turkish wood processing, as a spatial characteristic. Many madrasah and mosque examples were located in the settlement as a reflection of the city identity gained from antiquity. Birgi has many religious buildings and civil architecture examples that symbolize the period of Aydınoğlu Principality and Ottoman Empire (Tanaç, 2001).

There are many important architectural values within the settlement which contribute to the Birgi's own identity. They can be sorted as the followings; Ulu Mosque, Güdük Minare Masjid (Kütük Minareli Mosque), Derviş Ağa Mosque (Çarşı Camii), Karaoğlu Mosque, Aydınoğlu Mehmed Bey Tomb, Sultan Şah Tomb, Kale Madrasah (*it is dilapidated and some of the student cells were destroyed*), İmam Birgivî Madrasah which is restored and is located at the main square, Derviş Ağa Madrasah (Çukur Madrasah), Çarşı Bath (*one part of this bath is grocery*), Sasalı Bath, Birgi Şeyh Muhiddin Bath, Bıçakçızade Fountain, Beyler Fountain, Küpuçuranlar (Pankuduz) Tower, Library and Çakırağa Mansion which is well-known as the most important value within the settlement (Figure 3).

Figure 3. Examples of monumental-symbolic values of Birgi (K. Topçu, 2018)

Evaluating Local Identity of Birgi by Natural Environment Aspect; *Topographic and Environmental Sources*

In addition to its social, architectural, urban and symbolic formations; rising, descending and valley formations of its topography has also great effects on Birgi' identity. They give Birgi a very special visual identity along with the urban-architectural formations. Birgi, which descends from north to south, has been located in an identifiable area, which is partially fragmented by valleys. Birgi can also be described as a settlement that provides good examples of urban spaces using this special topographical structure correctly (Anonymous, 2001).

Birgi settlement is generally descended from north to south. The decreasing slope to the south and the spreading topography

DOI: 10.15320/ICONARP.2018.59 – E-ISSN: 2147-9380

reinforce the development of the settlement in this direction. The northward contractionary area and its rising topography in the west can be seen as a threshold to prevent the development of the settlement in these directions.

One of the main determinants of the spatial identity and characteristic of the settlement, which has a large number of underground and surface water resources, is the Birgi River and its bridges. Birgi River feeds the Küçük Menderes River, flow through the settlement and divide the settlement into two parts (*There are 5 bridges over the river*).

The valley that defines the settlement area to the east of Birgi stream is a very important environmental value with its green texture (Figure 4-5).

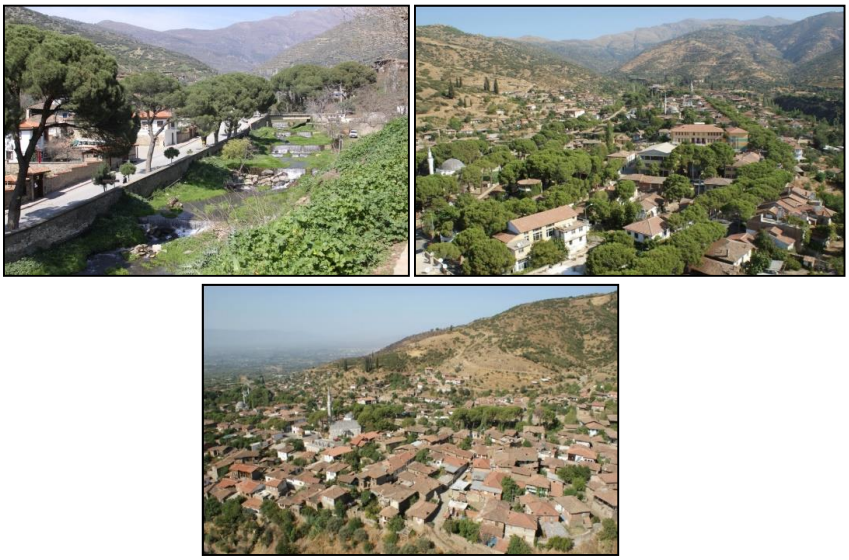

Figure 4. Settlement on the valley (Turkish Aeronautical Association, 2009) and Birgi River (K. Topçu, 2009, 2018)

Figure 5. Photographs showing the natural identity of the settlement (K.Topçu, 2018)

Meticulously preserved of the flora (Eastern Mediterranean flora) which located in the slopes and valleys of the settlement also adds a different value in the formation of Birgi's local identity. The cultivation of a wide variety of vegetables and fruits (*especially olive, fig, dry fig, potato etc.*) because of its microclimate properties is an indicator of the fertility of the plain. Almost 70% of Birgi people are engaged in agriculture because of their fertile lands that enable product diversity (Anonymous, 2001).

PROBLEMS AND POTENTIALS OF BIRGI IN TERMS OF LOCAL IDENTITY

Although Birgi has many strengths, potentials related having an authentic identity (*strong social, natural and built environment identity*), it has also some problems, weaknesses and threats within its own.

DOI: 10.15320/ICONARP.2018.59 – E-ISSN: 2147-9380

One of the problems of the area is that many of the historical buildings (*especially buildings in Kurtgazi district*) cannot have restored because most of the inhabitants are made of elderly people. This situation has compelled conservation and made people moved away from the conscious conservation activities. So, some unconscious additions or attempts on historical and cultural values can be seen within the settlement. On the other hand, we can say that these small-scale changes worked in favor of the settlement to the effect that Birgi could save its own local identity in the holistic scale. This is also related the migration of young people from the settlement or sliding of the qualified working force to the environs. This is one of the leading problem of the area. Inadequate investments in the region accelerate this process. And, also there is not enough socio-cultural areas for the young people.

Despite Birgi has high agricultural potentials, productive soils and appropriate climate that provide product variety (*approximately %70 people of the settlement work in this sector*), the settlement cannot evaluate this potential because of being not organized and having not marketing strategies related this sector. We can actually explain this with the migration of young population to the environs on account of insufficient employment opportunities that the settlement offers. Accordingly, most of the population is formed by elderly people. Therefore, it seems rather important for sustaining local identity of Birgi that the migrated young population should be regained because of supporting the economy of Birgi. In recent years, state support can be seen for the rural developments. Therefore, this situation can be an important opportunity for the settlement. Presence of local bazaars and existence of food and beverage companies serving local food in the settlement can be great opportunities in this point for developing slow strategies in the fast life. Thus, the most appropriate strategy for this can be considered as 'Cittaslow' movement. Cittaslow (*slow city movement*)[1] approach can be considered as an alternative holistic and positive place-based solution, more human, environmentally correct and sensible for the present and future generations, provided as an answer to the problem of sustaining local identity. This movement, an organized international network of small cities, is attempting to preserve each urban area's own unique characteristics, historical context, local resources, economic & cultural strengths (Mayer& Knox, 2006; Radstrom, 2011) and built around the desire to provide a high quality of life for its residents and visitors. In this way, it increases competition by using city's identity and local values. Additionally, by regaining the young population, some historical

[1] This movement founded in Italy in 1999 by Paolo Saturnini in order to stop the trend of people moving to bigger cities and to address the 'slow food' philosophy in their urban design, urban policy and planning (Miele, 2008; Radstrom, 2011). Slow Food was introduced as a way of protecting local produce, traditional cuisine and the related cultural connection. It originally began due to the increasing prevalence of fast food restaurants in Italian cities and towns (Radstrom, 2011). From that on the network is proliferating in many other countries, in Europe and in other continents. While there were about 100 slow cities in 2007 now there are 228 cities in 30 countries around the world (URL 2).

buildings which are in bad conditions could be gained to the Birgi's economy by functioning them by its own.

Accordingly, insufficient technical staff and budget for the restoration of structures that have to be conserved is also one of the leading problems of the area. Of course, the lack of interest of authorized administrations in this point is effective in the process.

It is observed that architectural and urban pattern of the settlement and environmental, natural and topographic data are supportive for possible alternative tourism potentials (i.e. cultural tourism, natural tourism, agro-tourism, sport tourism, highland tourism, and religious tourism). The settlement has many touristic attractors. These attractors can support some activities within the settlement during the year. (*i.e. photo safari, botanical tours, paragliding, caving, angling, water sports, trekking, bicycle tours, etc.*). When considering the development of the understanding of natural and cultural tourism instead of sea-sand-sun tourism and the increased interest of local tourists to the region in recent years, these above mentioned potentials also give Birgi a great opportunity for developing alternative tourism strategies for the settlement. But, in this scope, there is a need for developing advertising/marketing strategies for Birgi. It can be said that, the necessity of these strategies is actually in a direct proportion with the difficulty of access to the settlement on account of topographical thresholds. This situation also provides Birgi to sustain and conserve its own character and identity. On the other hand, this provides Birgi having low touristic image and inadequate investments in its vicinity.

When we take into consideration the alternative tourism potentials that can be developed, existing various festivals and activities could be an important input for the advertising strategies. For instance, Mimar Sinan Fine Arts University organizes some workshops, summer schools for educational purposes in Birgi since 2000. In the scope of these kinds of studies, the students of architecture, urban planning, restoration and painting have worked on some surveys and silhouette works related the streets and structures of the Birgi. The students of painting department drew wall paintings in the Birgi streets by using local specific figures within a specific composition. These efforts are very important efforts for sustaining the visual-spatial quality, local identity of the settlement as much as announcing its name. However, in this point, it is obvious that accommodation capacity of the settlement is rather insufficient.

The people of Birgi is hospitable to local and foreign tourists, open minded to new ideas, thoughts and movements. This situation

DOI: 10.15320/ICONARP.2018.59 – E-ISSN: 2147-9380

seems us to be an important potential for public participation in order to sustain the local identity.

Having renewable energy resources (*such as wind, sun*) are another opportunities for the settlement. When we take into consideration the southwesters and duration of sunshine (*yearly average duration: 8.02 hours*), we can say that Birgi has a potential for energy production and has a capability to do it by itself.

Additionally, silk production which exist in the 17th century in the settlement but degreased in the length of time can also be evaluated as an important economic potential for Birgi's local identity.

Finally, besides the settlement offers many strengths and opportunities, it has also many weaknesses and threats (Table 2). The important thing is using the strengths, eliminating the weaknesses, obtaining the opportunities and eliminating the threats. By doing this, we should able to sustain the local identity of the settlement, Birgi.

METHOD

In this study, to develop appropriate strategies and prioritize them for sustaining Birgi's local identity, as mentioned before, 'A'WOT' analysis was used. This method, which is the combination of SWOT analysis and Analytical Hierarchy Process Technique (AHP), systematically evaluates, quantifies and prioritizes the SWOT factors (*strengths, weaknesses, opportunities and threats*) based on pairwise comparisons. In this way, this method let the SWOT factors not only be the linguistic data (Saaty, 1994, 2005; Kurtilla et al., 2000; Kangas et al., 2001). In other words, AHP assists in carrying out SWOT more analytically. So that alternative strategic decisions, the choice alternatives can be prioritized with respect to the strategic choice situation as a whole. The aim in applying hybrid method (*A'WOT analysis*) is to improve the quantitative information basis of strategic planning processes (Kangas et.al. 2001).

In SWOT analysis, the most important internal and external factors for the city's future are grouped into four categories; Strengths, Weaknesses, Opportunities and Threats. By applying SWOT in a strategic planning process, the aim is usually to develop and adopt a strategy resulting in a good fit between these internal and external factors. Although the SWOT analysis successfully explores the factors, individual factors are usually described very generally. If it can be used in a more convenient way, SWOT analysis can provide a basis for the formulation of successful strategies. This can be achieved by increasing the strengths,

degreasing the weaknesses, benefiting from the opportunities and abstaining from the threats. However, SWOT includes no means of analytically determining the importance of factors and it easily remains at the level of only pinpointing and listing the factors (Kangas et al., 2001; Yılmaz et.al. 2009). This situation generates a need for using SWOT analysis with a more effective tool (Yılmaz et.al. 2009, Yenice, 2014). In this context, to supply the deficiency of SWOT analysis, there is an approach on the literature called 'A'WOT Analysis'.

A'WOT analysis proceeds as follows and the process given below was used in this study;

1. SWOT analysis is carried out.
2. Pairwise comparisons between the SWOT factors are carried out separately within each SWOT group (*which of the two factors compared is more important and how much more important*) with the aid of Saaty scale (Table 1). With these comparisons as the input, the mutual priorities of the factors are computed. Pairwise comparisons were graded by a total of 35 urban planners/urban planner candidates in this study.
3. The mutual importance of the SWOT groups is determined.
4. The strategy alternatives are evaluated with respect to each SWOT factor as in the AHP.
5. Global priorities are calculated for the strategy alternatives in accordance with the general A'WOT decision hierarchy (Kangas et. al., 2001; Nastase and Kajanus, 2008).

Table 1. Relative importance scale (According to Saaty (1994, 2005))

Intensity of importance	Definition	Explanation
1	Equal importance	Two activities contribute equally to the objective
3	Moderate importance	Experience and judgment slightly favor one activity over other
5	Strong importance	Experience and judgment strongly favor one activity over other
7	Very strong or demonstrated importance	An activity is strongly favored and its dominance is demonstrated in practice
9	Extreme importance	The evidence favoring one activity over another is of the highest possible order
2, 4, 6, 8	Intermediate values	When a compromise needed

There are different application areas of A'WOT Analysis on literature (Kurttila et. al., 2000; Pesonen et.al., 2001; Steward et.al., 2002; Kajanus et.al., 2004; Masozera et.al., 2004; Shrestha et.al., 2004; Leskinen et.al., 2006; Shinno et.al., 2006, Yenice, 2014). In this study, A'WOT analysis was used in an urban area

DOI: 10.15320/ICONARP.2018.59 – E-ISSN: 2147-9380

different from the other studies to produce alternative development strategies and to choose the best among them.

FINDINGS

SWOT Analysis of Birgi

In decision-making process, firstly, there is a need to determine the SWOT factors of the sample area (*Birgi*) which is the first stage of A'WOT analysis. While determining these factors, according to Saaty scale (Table 1), it is needed that the number of factors cannot exceed nine factors[2]. From the findings of local identity values, problems and potentials of Birgi which were assessed above, SWOT analysis of the settlement can be developed like below (Table 2).

[2]Based on the principle that the human brain can compare 7 ± 2 elements at the same time (Schomoldt et al., 1995), the number of factors in each Swot group should not be more than 9.

Table 2. SWOT Analysis of Birgi

STRENGTHS	**WEAKNESSES**
S1- Strong natural beauty (forest areas which have nectar flowers like chestnut, linden tree and having water resources etc.) **S2-** Conservation of traditional lifestyle and social pattern **S3-** Productive soils that provide product variety **S4-** Having strong historical and archeological heritage (having authentic architectural pattern and monumental structures) **S5-** Hospitability of the people. Most of them are hospitable to new ideas **S6-** Hosting festivals, summer schools, workshops and various activities in it **S7-** Having many touristic attractors (such as highland tourism, photo safari, botanical tours, paragliding, caving, angling, water sports, trekking, bicycle tours, having religious tourism potential) **S8-**Sensitive approach of conservation **S9-** Having traditional handicrafts (like silk handlooms)	**W1-** Lack of advertising and marketing strategies of the settlement **W2-** Lack of organization on evaluating and marketing the crops. Having not using the existing agricultural potentials efficiently **W3-** Dilapidation of some historical and cultural values rapidly because of the physical impossibilities (generally elderly people are living) **W4-**Insufficiency of accommodation **W5-** Insufficient technical staff and budget for the restoration of structures that have to be conserved, Lack of interest of authorized administrations. **W6-** Some unconscious additions or attempts on historical and cultural values **W7-** Lack of qualified workforce **W8-** Lack of socio-cultural areas
OPPORTUNITIES	**THREATS**
O1- Appropriate climate that increases agricultural productivity **O2-**Development of the understanding of tourism related natural and cultural heritage. Offering high alternative tourism potentials. **O3-** Increased interest of local tourists in the region **O4-** Providing state support in rural development in recent years **O5-** Weak transportation linkages that allow the urban pattern to be saved **O6-** Being in the limelight of non-governmental organizations (NGO) (Historical Cities Union provides opportunities on behalf of citizens and Çekül Foundation supports the restoration projects in this vicinity) sun) **O7-** Allowance of activities during the year. **O8-** Having renewable energy resources (such as wind, **O9-** Presence of local bazaars and existence of food and beverage companies serving local food.	**T1-**Possible natural hazards such as earthquakes, floods **T2-**Migration of young people from the settlement, sliding of the qualified working force to the environs **T3-** Weak transportation linkages with the environs **T4-** Inadequate investment in the region **T5-** Low touristic image

A'WOT Analysis of Birgi

Pairwise comparisons between SWOT factors and groups constitute the second stage of the study. Pairwise comparisons between the SWOT factors in this study are carried out separately within each SWOT group (*which of the two factors compared is more important and how much more important*) with the aid of Saaty scale (Table 1). With these comparisons as the input, the mutual priorities of the factors are computed. Gradings were made by the total of 35 urban planners & urban planner candidates in this study. The results of the analysis; local priority values of each SWOT factors and global priority values of each SWOT groups are given below (Table 3).

Table 3. *Local and global priority values (weights) of SWOT factors*

SWOT Groups	Group priority	SWOT factors	Consistency ratio	LOCAL PRIORITIES (Priority of SWOT factors within its own group)	GLOBAL PRIORITIES (Overall priority of SWOT factors)
Strengths	**0,564**	S1	0,05	0,135	0,076
		S2		0,117	0,066
		S3		0,136	0,077
		S4		**0,175**	**0,099**
		S5		0,083	0,047
		S6		0,115	0,065
		S7		0,124	0,070
		S8		0,060	0,034
		S9		0,055	0,031
Weaknesses	0,126	**W1**	0,05	**0,226**	**0,028**
		W2		0,211	0,027
		W3		0,153	0,019
		W4		0,122	0,015
		W5		0,078	0,010
		W6		0,081	0,010
		W7		0,095	0,012
		W8		0,034	0,004
Opportunities	0,280	**O1**	0,09	**0,176**	**0,049**
		O2		0,164	0,046
		O3		0,110	0,031
		O4		0,119	0,033
		O5		0,066	0,019
		O6		0,072	0,020
		O7		0,101	0,028
		O8		0,073	0,020
		O9		0,119	0,033
Threats	0,031	T1	0,08	0,180	0,006
		T2		**0,265**	**0,008**
		T3		0,232	0,007
		T4		0,226	0,007
		T5		0,096	0,003

Note
-The consistency ratio of the comparisons between four SWOT groups is 0.24.
-The bold numbers indicate the most significant factors.

DOI: 10.15320/ICONARP.2018.59 – E-ISSN: 2147-9380

According to the derived results, the strengths of the settlement are stronger compared with the other groups (*group priority: 0,564*). Among the strengths factors, the S4 factor (*having strong historical and archeological heritage-having authentic architectural pattern and monumental structures*) is the strongest factor with the values of 0,175 (*local priority*) and 0,099 (*global priority*). Lack of advertising and marketing strategies of the settlement is the weakest factor among the other weaknesses factors (*W1 local priority: 0,226; W1 global priority: 0,028*). *Appropriate climate that increases agricultural productivity* constitutes the top priority among the opportunities group with the values of 0,176 (*local priority*) and 0,049 (*global priority*). And, the *migration of young people from the settlement, sliding of the qualified working force to the environs* is the most threatening factor of the settlement (*0,265-local priority and 0,008-global priority*). The following priorities can be seen on the table above. (Table 3).

Developing and Prioritizing Possible Strategies for Birgi

The third stage of the analysis, TOWS matrix (Weihrich, 1982) was formulated according to SWOT factors which have the highest prioritization values from each SWOT groups. These values can be seen in the Table 3. Kurttilla et al. (2000) stated that strategy alternatives should be determined in a way to cover SWOT factors with the greatest weight. On this stage, by examining the possible scenarios, it was tried to determine the strategies by using the strong priority of the strengths, eliminating the weakness, obtaining the opportunity and eliminating the threat.

In this study, the first four prioritized factors of all SWOT groups were taken into consideration to determine the strategies. However, while producing planning strategies, not all of the four prioritized factors were used within each SWOT groups. The factors that could be related to the planning strategy were chosen among the priority factors. Through TOWS matrix, prioritized possible strategies were developed like below on the basis of sustainability (Table 4). After producing planning strategies, to determine the priorities of the strategies, 5 expert opinions were received by using the same questionnaire base which was used before for the factor priorities. And, the results were given in the Table 5.

According to Table 5, among the four alternative strategies, it was seen that the first strategy (SO Strategy-Entering to Slow City Movement) has the highest priority for the sustainability of Birgi's local identity.

Table 4. TOWS Matrix for Birgi - produced alternative strategies for 'Birgi' according to priority values (from Weihrich, 1982)

TOWS MATRIX	**Prioritized strengths** **S4-** *Having strong historical and archeological heritage (having authentic architectural pattern and monumental structures)* **S3-** *Productive soils that provide product variety* **S1-** *Strong natural beauty (forest areas which have nectar flowers like chestnut, linden tree and having water resources etc.)* **S7-** Having many touristic attractors (*such as highland tourism, photo safari, botanical tours, paragliding, caving, angling, water sports, trekking, bicycle tours, having religious tourism potential)*	**Prioritized weaknesses** **W1-** *Lack of advertising and marketing strategies of the settlement* ***W2-*** *Lack of organization on evaluating and marketing the crops. Having not using the existing agricultural potentials efficiently* ***W3-*** *Dilapidation of some historical and cultural values rapidly because of the physical impossibilities (generally elderly people are living)* **W4-***Insufficiency of accommodation*
Prioritized opportunities **O1-** *Appropriate climate that increases agricultural productivity* **O2-***Development of the understanding of tourism related natural and cultural heritage. Offering high alternative tourism potentials.* **O4-** *Providing state support in rural development in recent years* ***09-*** *Presence of local bazaars and existence of food and beverage companies serving local food.* **O3-** *Increased interest of local tourists in the region*	**SO STRATEGY** ***'Entering to 'Slow City Movement'*** *Strategy 1* *(S4,S3,S1,O1,O2,O9,O3)*	**WO STRATEGY** ***'Increasing in agricultural production, its organization and marketing'*** *Strategy 2* *(O1,O4,O9, W1,W2)*
Prioritized threats **T2-***Migration of young people from the settlement, sliding of the qualified working force to the environs* **T3-** *Weak transportation linkages with the environs* **T4-** *Inadequate investment in the region* **T1-***Possible natural hazards such as earthquakes, floods*	**ST STRATEGY** **'Development of Alternative Tourism Sector'** *Strategy 3* *(S4,S3,S1,S7,T2,T3,T4)*	**WT STRATEGY** **Becoming a cultural center focused on artistic activities** *Strategy 4* *(W1,W3,W4,T2,T3,T4)*

Table 5. *Prioritization of the alternative strategies*

	Produced Strategies for Birgi	
STR1	**Entering to 'Slow City Movement'**	**0,425**
STR2	Increasing in agricultural production, its organization and marketing	0,175
STR3	Development of Alternative Tourism Sector	0,335
STR4	Becoming a cultural center focused on artistic activities	0,065

DOI: 10.15320/ICONARP.2018.59 – E-ISSN: 2147-9380

CONCLUSION

Birgi, which managed to hide itself from today's environment in which all the values are upside down, was able to protect its original identity except invasions, earthquakes and floods. As one of the few settlements that protect traditional dwellings, monumental structures and nature triads, Birgi reflects an authentic identity and appears to be capable of achieving a strong chance. It also has a different meaning with its houses which bring interesting views to interesting streets.

Today, along with its natural structure, social and cultural life and urban texture shaped by historical cultural layers, it has a strong and unique local identity that keeps alive the concept of '*sense of place*'. Sustaining and maintaining this situation is very important in terms of protecting the collective memory. From this important point, within the scope of the study, among the different strategies based on sustainability concept developed for Birgi settlement, it is evident that the "*Entering to Slow City Movement*" strategy has a priority for sustaining Birgi's local identity.

It is obvious that the sustainability and livability of authentic settlements which embody strong urban identities is rather important and they should be undertaken rather carefully (Radstrom, 2011). In this point, Cittaslow (slow city movement) approach can be considered as an alternative holistic and positive place-based solution, more human, environmentally correct and sensible for the present and future generations, provided as an answer to the problem of sustaining local identity.

In addition, this is a movement which respects '*small realities*' in a more and more global connected world (Radstrom, 2011) and can be considered as a positive attitude towards the similar cities which lose its local properties and an urbanization politics which put forward traditional life styles, preserve local life style, consume local products versus 'fast food' culture (Uslu, 2009; Keskin, 2012).

In recent years, cities are in search for new ways to promote themselves because of being updated continuously to compete with the other cities. In that sense, cities develop strategies to support, to `sell` and advertise them within the global market. One of the ways for cities which do not want to be one of the homogeneous places or want to be in the world stage by preserving its local identity and properties is to participate in to this international network. However, this situation is only for the cities which have the population under 50.000. Today, the network is proliferating in many countries, including Europe and other continents. While there were about 100 slow cities in 2007,

now there are 228 cities in 30 countries all around the world (URL 2). In Turkey, today, there are 11 slow cities from different parts of the country such as Seferihisar (İzmir), Gökçeada (Çanakkale), Taraklı (Sakarya), Akyaka (Muğla), Halfeti (Urfa), Perşembe (Ordu), Şavşat (Artvin), Vize (Kırklareli), Yalvaç (Isparta), Yenipazar (Aydın) and Uzundere (Erzurum). Birgi can also be the other slow city candidate in Turkey with its strong local identity.

For participating in Cittaslow movement, Birgi should fulfill some necessities. For this, it is important to be taken into account the followings; 1. Environment Politics, 2. Infrastructure Politics, 3. Quality of Urban Life Politics, 4. Policies on agricultural, touristic, artisans and craftsmen, 5. Plans for hospitality, awareness and education, 6. Social harmony, 7. Partnerships. When we consider all of the strengths and opportunities of the settlement, there is no reason for fulfilling the above necessities and participating in the 'Cittaslow' movement (slow city movement).

REFERENCES

Abel, C. (1997). *Architecture and Identity, Towards a Global Eco-Culture*, Architectural Press.

Altınoluk, Ü. (1997). *Su Şehri Birgi*, İlgi dergisi, sayı:89, sf. 3-7, İstanbul.

Altınoluk, Ü. (1998). Selvi ve Birgi, *İlgi dergisi*, sf.14, İstanbul.

Altınoluk, Ü. (2001). *The Field Studies in Birgi: The Example of Industrial Archeology*, Traditional Environments in a New Millennium, Amasya.

Altınoluk, Ü. (2007). *Geleneksel Kent Dokusu Birgi*, Ege yayınları, İstanbul.

Aly, S.S.A. (2011). *Modernization and Regionalism: Approaches for Sustainable Revival of Local Urban Identity*, Procedia Engineering 21, 503-512, Elsevier.

Anonymous, (2001). *Birgi*, Kültür Bakanlığı yayınları, sf.3. Ankara.

Appleyard, D. Jacobs, A. (1982). *Toward an Urban Design Manifesto*, IURD Working Paper 384., University of California, Berkeley.

Ayan, M. (1985). *Konut Alanları Tasarım İlkesi*, Kent Koop. Yay. 52, Ankara.

Bozoğlu, T. (1996). *İzmir İlinde Bir Kültür Merkezi: Birgi*, Arkitekt Dergisi, sayı 440, sf. 86-95.

Clare, C. M. & Francis, C. (1997). *People Places: Design Guidelines for Urban Open Space*, Wiley; 2nd Edition.

Deniz, K. (2004). *Konya'da Farklı Üç Kentsel Mekanda Kent Kimliği Üzerine Bir Araştırma*, Basılmamış Yüksek Lisans Tezi, Selçuk Ünv., Fen Bilimleri Ens., Konya.

DOI: 10.15320/ICONARP.2018.59 – E-ISSN: 2147-9380

Eruzun, C. (2000). *Türkiye'de katılımcı korumaya bir örnek Birgi Yaz Okulu modeli*, Tasarım+Kuram, sayı.2, sf.13-26.

Featherstone, M. (1993). *Global and Local Cultures*, *Mapping the Futures: Local Cultures*, Global Change (eds. John Bird et al.), 169–87. London: Routledge.

Gençsoylu, Z. (2009). *17 ve 18. Yüzyıllarda Birgi Kazası*, Adnan Menderes Ünv., Sosyal Bilimler Ens., Yüksek Lisans Tezi, Aydın.

Hough, M. (1990). *Out of Place*, Yale Unv. Pres.

Kajanus, M. Kangas, J. and Kurttila, M. (2004). *The Use of Value Focused Thinking and A'WOT Hybrid Method in Tourism Management*, Tourism Management, Volume: 25, pp: 499-506.

Kangas, J. Pesonen, M. Kurttila, M. & Kajanus, M. (2001). *A'WOT: Integrating the AHP with SWOT Analysis*, ISAHP 2001, Berne, Switzerland, pp. 189-198.

Keskin, E. B. (2012). *Sürdürülebilir Kent Kavramına Farklı Bir Bakış: Yavaş Şehirler (Cittaslow)*, Paradoks Ekonomi, Sosyoloji ve Politika Dergisi, cilt: 8, sayı: 1, 81-99.

Knox, P.L. (2005). *Creating Ordinary Places: Slow Cities in a Fast World*, Journal of Urban Design, vol.10, no.1, pp. 1-11, Routledge.

Kotler, P. and Gertner, D. (2002). *Country as a Brand, Product and Beyond: A Place Marketing and Brand Management Perspective*, Journal of Brand Management, vol. 9, no. 4-5, pp. 249-261.

Kurttila, M. Pesonen, M. Kangas, J. and Kajanus, M. (2000). *Utilizing the Analytic Hierarchy Process (AHP) in SWOT Analysis – A Hybrid Method and Its Application to a Forest-Certification Case,* Forest Policy and Economics, v: 1, pp: 41-52.

Leskinen, L. A. Leskinen, P. Kurttila, M. Kangas, J. and Kajanus, M. (2006). *Adopting Modern Strategic Decision Support Tools in the Participatory Strategy Process – A Case Study of a Forest Research Station*, Forest Policy and Economics, Volume: 8, pp: 267-278.

Lynch, K. (1960). *The Image of the City*, MIT press.

Lynch, K. (1981). *A Theory of Good City Form*, MIT press, Cambridge, MA.

Masozera, M. K. Alavalapati, J. R. R. Jacobson, S. K. and Shrestha, R. K. (2006). *Assessing the Suitability of Community-Based Management for the Nyungwe Forest Reserve*, *Ruanda*, Forest Policy and Economics, v.8, pp: 206-216.

Mayer, H. Knox, P. L. (2006). *Slow Cities: Sustainable Places in a Fast World,* Journal of Urban Affairs, v.28. n.4. p.321-334. ISSN: 0735-2166.

Miele, M. (2008). *Cittaslow: Producing Slowness against the Fast Life*, Space and Policy, vol.12, no.1, pp. 135-156, Routledge.

Montgomery, J. (1998). *Making a City: Urbanity/Vitality & Urban Design*, Journal of Urban Design. vol.3. no.1.

Nastase, C. Kajanus, M. (2008). *The Role of the Universities in a Regional Innovation System - A Comparative A'wot – Analysis*, Interferente Economice, n.23., pp. 219-224.

Ocakçı, M. (1993). *Şehir Kimliği ve Çevre İlişkileri*, İ.T.Ü Mimarlık Fak. Şehir ve Bölge Planlama Bölümü Ders Notları, İstanbul.

Ocakçı, M. Southworth, M. (1995). *Elements of Urban Identity; the Case of the Beykoz District of Istanbul*, IURD, Working Paper 650, Unv. of California, Berkeley.

Oktay, D. (1998). *Urban Spatial Patterns and Local Identity: Evaluation in a Cypriot Town*, Open House International, vol.23, no.3, p.17-23.

Öngül, Z. (2012). *Analysing the City Identity of Nicosia from a Historical Perspective: External Effects, Solutions Proposed*, Procedia - Social and Behavioral Sciences, 35, p.284-292.

Pesonen, M. Kurtila, M. Kangas, J. Kajanus, M. and Heinonen, P. (2001). *Assessing the Priorities Using A'WOT among Resource Management Strategies at the Finnish Forest and Park Service*, Forest Science, v.47, n.4, pp: 534-541.

Pink, S. (2009). *Urban Social Movements and Small Places,* City, vol.13, n.4, pp. 451-465, Routledge.

Radstrom, S. (2011). *Identity: an Introduction and History of Cittaslow*, Italian Journal of Planning Practice (IJPP), vol.1, issue.1, p.90-113, ISSN: 2239267X.

Saaty, T.L. (1994). *How to Make a Decision: The Analytic Hierarchy Process*, Interfaces, vol. 24, no. 6, pp.19–43.

Saaty, T.L. (2005). *Theory and Applications of the Analytic Network Process*, Pittsburgh, PA: RWS Publications.

Schomoldt, D. L. Peterson, D. L. and Smith, R. L. (1995). *The Analytic Hierarchy Process and Participatory Decision Making*, Proceedings of the 4th International Symposium on Advanced Technology in Natural Resource Management, (Editors: J. M. Power, M. Strome and T. C. Daniel), pp: 129-143, Bethesda, MD, U.S.A.

Shaftoe H. (2008). *Convivial Urban Spaces: Creating Effective Public Spaces*, Earthscan publications ltd.

Shinno, H. Yoshioka, H. Marpaung, S. and Hachiga, S. (2006). *Quantitative SWOT Analysis on Global Competitiveness of Machine Tool Industry*, Journal of Engineering Design, vol.17, n.3, pp: 251-258.

Shrestha, R. K. Alavalapati, J. R. R. and Kalmbacher, R. S. (2004). *Exploring the Potential for Silvopasture Adoption in South-Central Florida: An Application of SWOT-AHP Method*, Agricultural Systems, vol.81, pp: 185-199.

DOI: 10.15320/ICONARP.2018.59 – E-ISSN: 2147-9380

Steward, R. Moarmed, S. and Daet, R. (2002). *Strategic Implementation of IT/IS Projects in Construction: A Case Study*, Automation in Construction, vol. 11, pp: 681-694.

Tanaç, M. (2001). *Birgi'nin Yok Olma Nedenlerinin Sosyal ve Fiziksel Boyutu*, TAÇ Vakfı 25. Yıl Anı Kitabı, Türkiye'de Risk Altındaki Doğal ve Kültürel Miras, TAÇ Vakfı yayınları, sf. 317-332, İstanbul.

Tekeli, İ. (1990). *Bir Kentin Kimliği Üzerine Düşünceler*, Antalya Kent Merkezi İçinde Kalekapısı ve Çevresi Kentsel Tasarım Yarışması Notları, Antalya.

Uslu, A. (2009). *Sürdürülebilir Yeşil Kent Fikirleri, Örnekleri ve Türkiye İçin Dersler*, 21. Uluslararası Yapı ve Yaşam Kongresi Bildiriler Kitabı, Bursa: TMMOB Mimarlar Odası Yayını.

Weihrich, H. (1982), *The TOWS Matrix: A Tool for Situational Analysis*, Long Range Planning, 15 (2) , 54-66.

Yavuz, B.G. (1980). *XIII. ve XIV. Yüzyıllarda Ödemiş Yöresindeki Babalar*, Bülten 5, sf.25. Ödemiş.

Yavuz, B.G. (2005). *Birgi: Coğrafyası, Halk Bilgisi, Tarihçesi, Tarihi Yerleri*, Birgi Kent Kitaplığı, İzmir.

Yenice, M.S. (2014). *Konya Tarihi Kent Merkezi İçin Turizm Odaklı Yenileme Stratejileri,* Artium, vol.2. no.1, pp. 70-84.

Yılmaz, E. Coşgun, U. Koçak, Z. Ay, Z. Orhan, K.H. (2009). *Katılımcı Yaklaşımla Ekoturizm Stratejilerinin Belirlenmesi ve Önceliklendirilmesi: Cehennemdere Vadisi ve Köprülü Kanyon Milli Parkı Örnekleri*, Çevre ve Orman Bakanlığı yayın no:386., DOA yayın no:51, Teknik Bülten no.29, ISBN: 978-605-393-055-6, T.C. Çevre ve Orman Bakanlığı Doğu Akdeniz Ormancılık Araştırma Enstitüsü, Tarsus.

URL 1: http://www.nufusune.com

URL 2:Cittaslow official website, http://www.cittaslow.net (2016, 2018).

Resume

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DOI: 10.15320/ICONARP.2018.59 – E-ISSN: 2147-9380

Research Article

ICONARP
International Journal of Architecture & Planning
Received 01 Apr 2018; Accepted 06 Nov 2018
Volume 6, Issue 2, pp: 399-412/Published 28 December 2018
DOI: 10.15320/ICONARP.2018.60–E-ISSN: 2147-9380

ICONARP

The Determination of Deteriorations on The Mısırlıoğlu Bridge (Konya, Turkey) by Non-Destructive Techniques (NDT)

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Abstract

Transportation has been one of the basic requirements of humanity since the earliest periods of civilization. One of the architectural structures designed to meet this requirement is historic stone bridges. One of the most important stages in these conservation works is the assessment of materials that constitute the structures. Non-destructive testing techniques (NDT) are widely used to obtain qualitative data and also make comparisons. In this study, it was aimed to determine deteriorations on the Mısırlıoğlu Bridge located in Sille settlement of Konya by NDT technique and to form the map from obtained values to perform conservation works. As a result of the analyses performed, considerable deteriorations in the building stones used in the abutments and arches of the structure were determined. Besides, it is detected that uniaxial compressive strength (UCS) value of the fresh samples is high (UCS: 61 MPa) while UCS values of the building stones used at the bridge decrease in the range of low and high (8-51 MPa) due to the atmospheric effects.

Keywords: *Deterioration, Konya, Mısırlıoğlu Bridge, non-destructive tests (NDT), Sille*

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INTRODUCTION

Konya is an important city that dates back to the Neolithic periods and later, hosted the Hittite, Phrygian, Greek, Roman, Byzantine, Anatolian Seljuk, and Ottoman civilizations. One of the oldest settlements in the city is Sille settlement. Sille is located approximately 11 km northwest of Konya. Sille is a settlement where many cultures lived together in tolerance and harmony until the beginning of the 20th century. In Sille, which is famous for its stonemasonry, there are many architectural works that reflect the cultural richness of civilizations from the past to the present (Beycan, 2017). These architectural works are mostly built with Sille stone of volcanic origin (dacite, andesite and rhyolite) quarried from the region. Some of the monuments that constitute the cultural texture of the region are the Aya Elena Church, Çay Mosque, Karataş Mosque, Sille Tepe Chapel, Ak Hamam (Bathhouse), and Mısırlıoğlu Bridge (Figure 1).

Figure 1. Some samples of the monuments in Sille settlement; a) Aya Eleni Church, b) Çay Mosque, c) Karataş Mosque, d) Sille Hill Chapel, e) Ak Hamam (Bathhouse), f) Mısırlıoğlu Bridge.

Sille stone, which constitutes the architectural texture of the region, is subjected to deterioration processes as a result of atmospheric effects (Fener and Ince, 2015). It is very important for the restoration practices to be carried out to determine the extent to which the deteriorations of the structures forming the cultural texture in the region have been developed. The interdisciplinary studies (architectural, civil and geological engineering, chemistry, biology, etc.) aimed at determining

DOI: 10.15320/ICONARP.2018.60 – E-ISSN: 2147-9380

deterioration in situ and in the laboratory have recently become prominent (Korkanç, 2013). In-situ analyses include systematic field observations, documentation, measurement, and drawing techniques. Laboratory studies are based on determining the index, strength, mineralogical and petrographic properties of building stones. However, the relations between the laboratory values and the deterioration grades of stone materials in the structure cannot be located on the structure one to one. NDT applications, which have become widespread in recent years, allow obtaining the deterioration data only by contact, without damaging historical monuments. Furthermore, deterioration identifications can be made by comparing the deterioration data obtained by NDT with the geomechanical properties of the building material obtained in the laboratory (Delgado Rodrigues, 2015).

Although there are studies in the literature on the engineering properties of Sille stone (Ozdemir, 2002) and the deterioration processes of the rock by rapid deterioration tests (freeze-thaw and salt crystallization) (Fener and Ince, 2015; Zedef, Kocak, Doyen, Ozsen, and Kekec, 2007), there are no studies on the deterioration processes of this stone used in historical monuments. In this study, deteriorations on the Sille Mısırlıoğlu Bridge, which is one of the monuments where load and humidity-related damages are observed intensively, were tried to be determined with NDT. Therefore, in-situ tests (humidity measurement and Schmidt hammer rebound tests) were applied to the structure. By comparing the results of the Schmidt hammer test on the rock and historical structure, deterioration mapping was performed and risky areas in the structure were determined.

MATERIALS AND METHODS

This study consists of the two stages; the first is determination of the index-mechanical properties of Sille stone in the laboratory, and the second is non-destructive testing (NDT) performed on the Mısırlıoğlu Bridge. For laboratory studies, homogeneous block samples, which were similar to the stones used in the construction of the historical monument, were collected from ancient stone quarries which are very close to monument. In order to determine the index-mechanical properties of the rocks from these samples, suitable core samples for the relevant standards were prepared. To determine the deterioration, relative humidity (RH) and Schmidt hammer rebound (SHR) tests were carried out in the area. Additionally, the geochemical characteristics of rocks were made in the ACME Laboratory, Canada.

DESCRIPTION OF THE MISIRLIOĞLU BRIDGE

The Mısırlıoğlu Bridge is located on the Çaybağ Creek in Sille settlement located in the northwest part of Konya city centre (Figure 1.f). The bridge is of a one-eyed arch type and was built by the masonry technique using 104 pitch-faced stones and block stones on the northwest side and 111 pitch-faced stones and block stones on the southeast side. The bridge is 7.18 m in length, 2.72 m in width, and 4.31 m in height. The stone railings forming the upper structure of the bridge are connected to each other by iron cramps to limit the pedestrian line. Though the bridge has no inscription on it, but the construction is considered to date back to the 19th century (Karpuz, 2009).

INDEX-STRENGTH PROPERTIES

Values of porosity and water absorption by weight were determined using saturation and calliper techniques. NX size core samples were used in these tests (ISRM, 2007). Trimmed core samples were used to determine dry densities and P-wave velocity according to ISRM (2007) standards. The uniaxial compressive strength tests were conducted on core samples having a diameter of 54 mm and a length-to-diameter ratio of 2.0-2.5 (ASTM, 1986). Böhme abrasion tests were conducted in accordance with EN-14157 (2004) using an abrasion testing machine.

PETROGRAPHIC AND GEOCHEMICAL PROPERTIES

Sille stone has a light-dark pink colour, and the rocks have aphanitic porphyritic textures in macro samples (Figure 2a, c). In the polarized microscopy of the fresh samples of Sille stone taken from the quarry and the decomposed samples taken from the bridge, 29% plagioclase, 26% volcanic glass, 19% biotite, 17% plagioclase microlite, 8% quartzite, and 1% opaque mineral were observed (Figure 2b, d). The geochemical composition of both fresh and decomposed samples is presented in Table 1. According to the TAS diagram proposed by Le Bas, Le Maitre, Streckeisen, and Zanettin (1986), the samples are named as dacite (Figure 3). Thin section examination and geochemical data of the samples exhibit similar characteristics. According to the obtained data, this bridge is made of Sille stone.

DOI: 10.15320/ICONARP.2018.60 – E-ISSN: 2147-9380

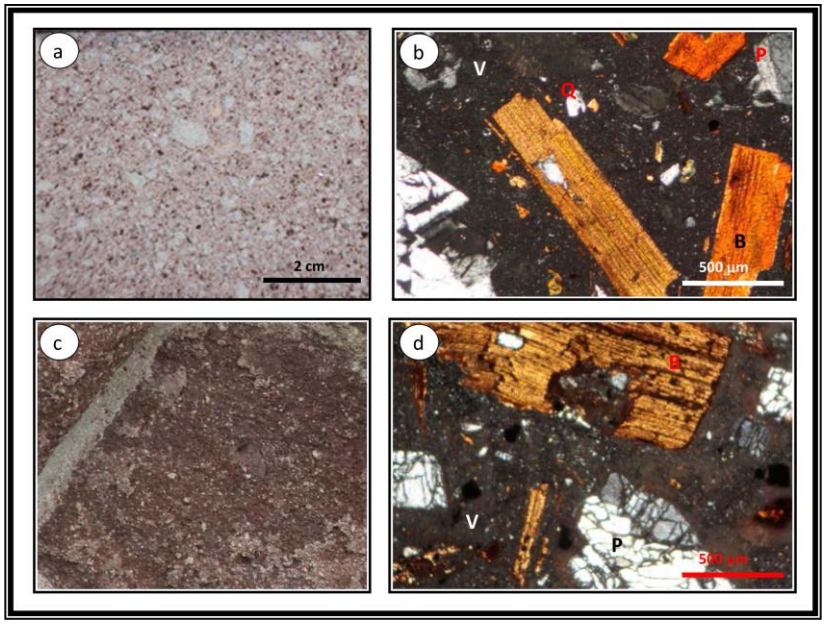

Figure 2. Macroscopic image of samples a) fresh, c) deterioration, microscopic image of samples b) fresh, d) deterioration (crossed polars)(P:plagioclase,B:biotite,V:volcanic glass, Q: quartzite).

Table 1. Chemical composition of the rock samples.

Sample	Major element oxide (%)											
	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	MnO	Cr_2O_3	LOI
Fresh sample	68.68	14.24	3.35	2.02	3.67	3.16	3.52	0,42	0,10	0,08	0,002	0,53
Deterioration sample	66,81	14,77	3,52	2,18	4,03	3,50	3,60	0,44	0,12	0,09	0,002	1,38

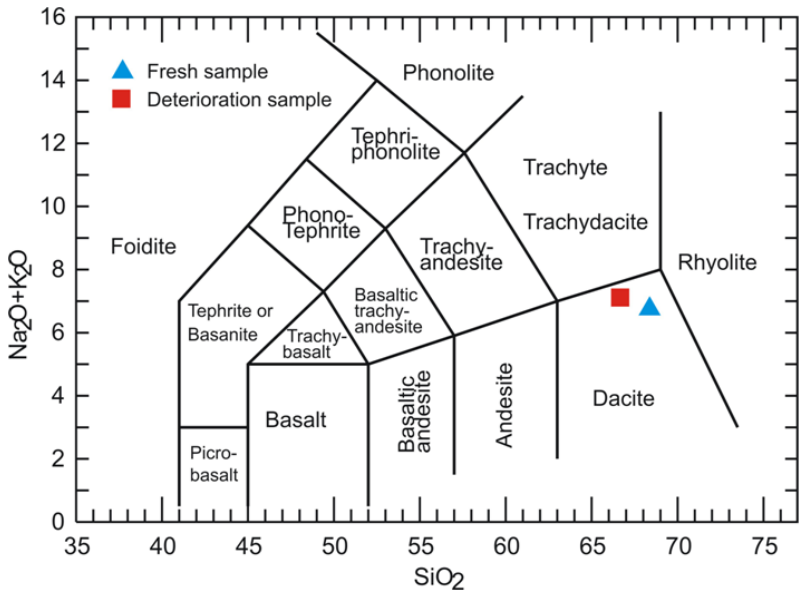

Figure 3. TAS (Total Alkali vs. Silica) diagram of (Le Bas, Le Maitre, Streckeisen, and Zanettin, 1986).

IN-SITU TEST

In the field and laboratory studies, rock's hardness was determined using Schmidt hammer type-L. The Schmidt hammer rebound test was conducted in accordance with the methods proposed by the standard ASTM (2014). Relative humidity values

of the building stones were determined by using Trotec T660 equipment.

MAPPING

Serial photos were taken to prepare the deterioration maps of the Mısırlıoğlu Bridge, with Cannon EOS 600D camera and then orthophotos were attained from these photos by using Agisoft PhotoScan Pro (64bit) program (Figure 4a). Subsequently, the original design of the monument was prepared (Figure 4b-c). Finally, data obtained from non-destructive tests (NDT) were processed on this drawing (Figure 4d-e).

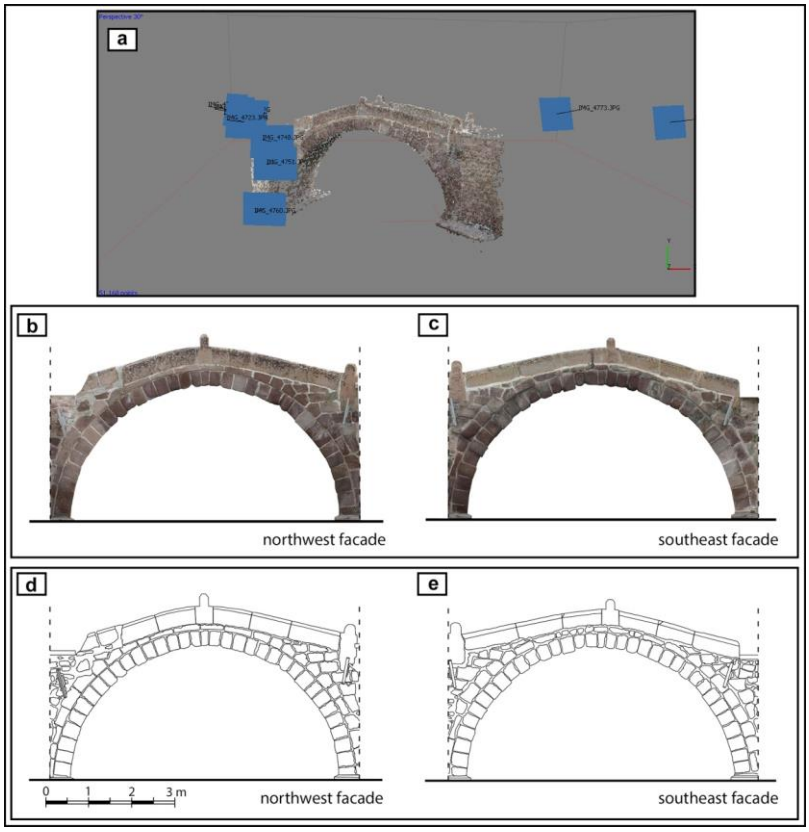

Figure 4. Image modelling and drawing stages a) the stage of processing structure photographs with Agisoft PhotoScan Pro, b-c) orthophoto image, d-e) survey drawings.

RESULTS AND DISCUSSION

INDEX-STRENGTH PROPERTIES

Some geomechanical properties of Sille stone are given in Table 2. Mean values of dry density (ρd), porosity (n), water absorption by weight (aw), P-wave velocity (Vp) and Böhme abrasion loss value (BA) were determined as 2.32 g/cm3, 5.60%, 2.43 %, 3.72 km/s and 16.05 cm3/50cm2, respectively.

DOI: 10.15320/ICONARP.2018.60 – E-ISSN: 2147-9380

Table 2. Some geomechanical parameters of Sille stone (mean value).

Sample	Properties						
	ρ_d (g/cm^3)	n (%)	a_w (%)	Vp (km/s)	BA (cm^2/50cm^2)	UCS (MPa)	SHR
Sille stone	2.32	5.60	2.43	3.72	16.05	61.00	46

Uniaxial compressive strength (UCS) mean value of Sille stone is 61.00 MPa and Schmidt hammer rebound mean value is 46. According to the classification made by NBG (1985), Sille stone is a "high porous rock". The UCS values of the stone were classified as "high strength" rock class based on ISRM (1979) classification.

NON-DESTRUCTIVE TESTING RESULTS

The main factor in the deterioration of building stones is the water content of the material. Water changes the physical behaviours and chemical properties of the material and causes irreversible damage (Hoła, Matkowski, and Hoła, 2017; Sandrolini and Franzoni, 2006). In conservation works, the determination of the presence and movement of water in building stones is crucial in terms of the determination of the origins of deterioration. For this purpose, relative humidity measurements were made from each building stone, and the measured values were presented in the maps (Figure 5).

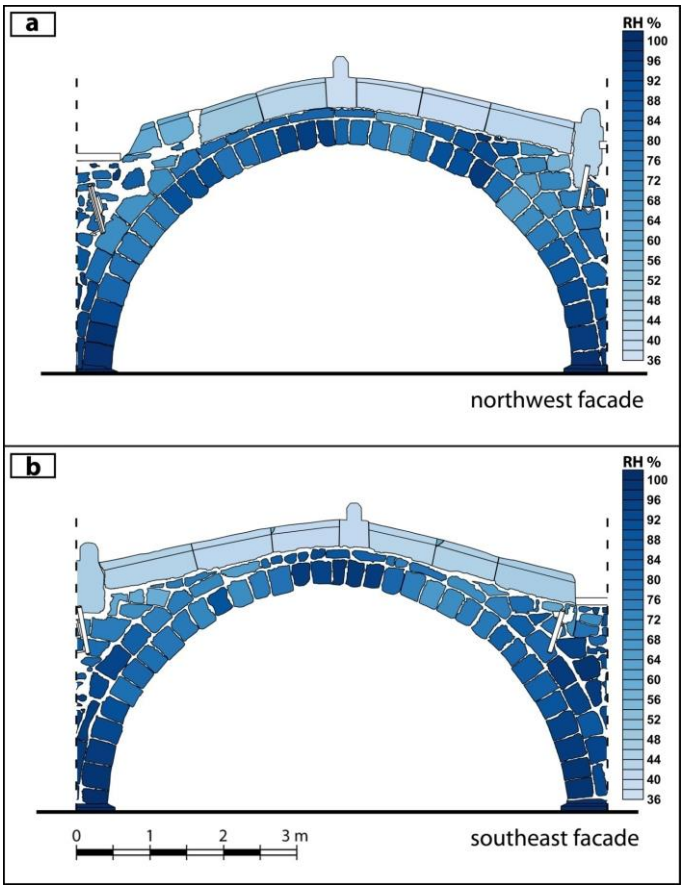

Figure 5. Relative humidity maps of stones in the Mısırlıoğlu Bridge, a) northwest facade, b) southeast facade.

The relative humidity values of the building stones used on the outer surface of the bridge vary between 36% and 100%. Upon examining the relative humidity maps, the presence of high humidity in the abutment and arch of the structure draws attention. The presence of humidity in the abutment is associated with the rise of the creek water under the capillary effect. The presence of humidity in the arch is due to the evaporation and then condensation of the creek water when it reaches the structure. Furthermore, different sizes of the stone facings forming the bridge floor are explained by the fact that the water leaking from the surface is drained from certain points of the arch (Figure 6).

Figure 6. Aerial photograph of the Mısırlıoğlu Bridge.

The surface hardness is one of the basic properties of the material. Decreases in the surface hardness value are directly associated with the deterioration status of the material. The Schmidt hammer rebound test is an NDT used to determine the surface hardness of stone materials (Hatır, Korkanç, and Başar, 2018; İnce, Bozdağ, Tosunlar, Hatır, and Korkanç, 2018; Korkanç, İnce, Hatır, and Tosunlar, 2018). There is a direct relationship between these test data and uniaxial compressive strengths of rocks (Aydin and Basu, 2005). In the study, the Schmidt hammer rebound test, which indirectly estimates the UCS, was applied to each building stone and the obtained values are presented in the maps (Figure 7).

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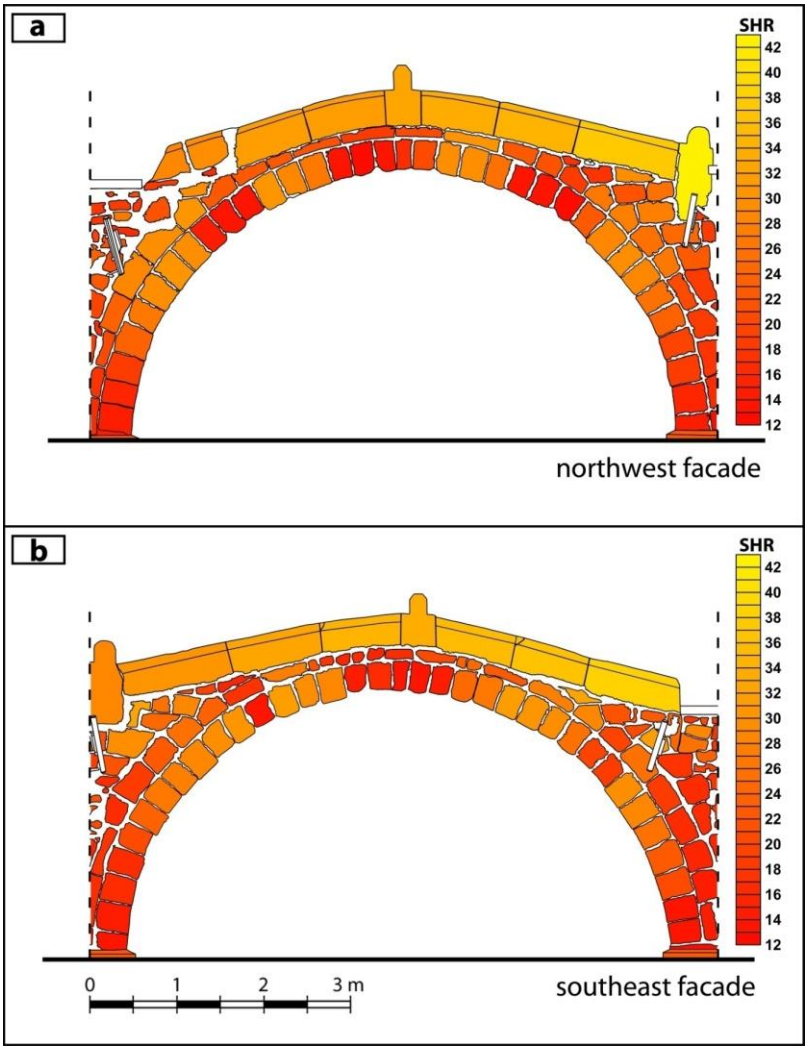

Figure 7. SHR distribution maps of the building stones in the Mısırlıoğlu Bridge, a) northwest facade, b) southeast facade.

The Schmidt hammer rebound values in the stones used on the bridge vary between 12 and 42. The UCS values of each building stone on the bridge were determined using the equation proposed by Fener, Kahraman, Bilgil, and Gunaydin (2005) (Equation 1). The statistical data on the estimated values in the northwest and southeast fronts of the bridge are presented in Table 3.

$$UCS = 4.24 * e^{0.059*SHR} \quad \text{(Equation 1)}$$

Table 3. Descriptive statistics of data used in the analysis.

Facades	UCS-MPa			
	Minimum	maximum	mean	Standard deviation
Northwest	8.61	50.53	16.51	6.81
Southeast	8.61	39.91	16.33	6.55

The UCS values of the building stones of the bridge were determined to vary between Low-High strength according to ISRM (1979) (Table 4).

Table 4. Classification of the stone used in Mısırlıoğlu Bridge according to UCS values (Values in table are the number of stones measured, classification "low", "medium" and "high" according to UCS values was according to ISRM (1979)).

Facades	Estimation UCS - MPa		
	Low (5-15)	Medium (15-50)	High (50-120)
Northwest	55	50	1
Southeast	59	50	-

Upon examining the prepared Schmidt hammer rebound maps, the hardness values were found to be low in the abutments and arch of the bridge. Moreover, there is also a significant relationship between the deterioration process and sizes of the building stones (Gökçe, İnce, Fener, Taşkıran, and Kayabali, 2016; Korkanç, 2018). As stone sizes decrease, the ratio of deterioration increases and the SHR value decreases. Deterioration types such as spalling, rounding, flaking, and efflorescence were observed in stones in which the SHR value decreased (Figure 8-9). Upon comparing, the data obtained from the Schmidt hammer rebound and relative humidity tests, the SHR values decrease in regions where water is active and the most intense deterioration is observed in these regions.

DETERIORATIONS OBSERVED ON THE MISIRLIOĞLU BRIDGE

As a result of the examinations performed on the Mısırlıoğlu Bridge in Sille settlement, stone breakage, spalling, rounding, flaking, efflorescences, fissure (atmospheric); higher plant, lichen (biological), cement-based mortar, graffiti, and unoriginal stone (anthropogenic) deterioration types were determined, and then discoloration-deterioration maps were prepared (Figure 8, 9). Spalling (Figure 8a), flaking, and efflorescence types of deteriorations were determined in the abutments of the structure. In the arch part, rounding, flaking, geological weakness, and efflorescence deteriorations were determined (Figure 8b-e). The iron cramps in the railing systems on both sides of the bridge caused fissures due to thermal expansion and corrosion (Figure 8f). Intensive biological activities (lichen and algae) were observed in these regions (Figure 8g). The higher plant growth caused by mortar dissolution is partly noted in the structure (Figure 8h). Another problem on the bridge is man-made damage (stone breakage and graffiti) (Figure 8i and j). Cement-based mortars applied unconsciously to the bridge (Figure 8k) caused efflorescence due to the salts they contain. Furthermore, unoriginal stones were used during the rehabilitation of the creek area (Figure 8l).

DOI: 10.15320/ICONARP.2018.60 – E-ISSN: 2147-9380

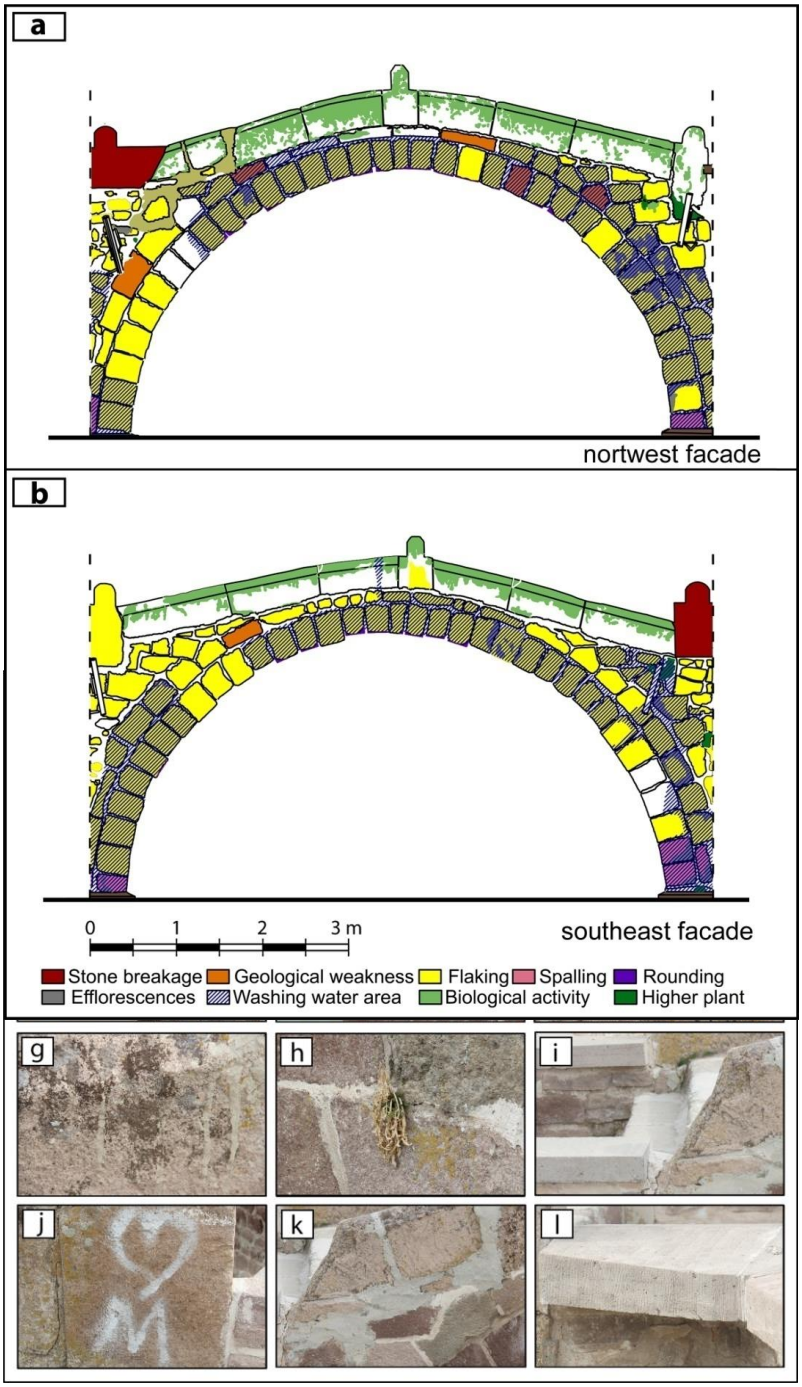

Figure 8. Deterioration views in the Mısırlıoğlu Bridge; a) spalling, b) rounding, c) flaking, d) geological weakness and rounding, e) efflorescence, f) fissure, g) biological activity, h) higher plant, i) stone breakage, j) graffiti, k) cement based mortar, l) unoriginal stone.

Figure 9. Discoloration-deterioration maps of the Mısırlıoğlu Bridge.

CONCLUSION

Sille stone is the most important building material that shapes the architectural texture of Konya and especially Sille settlement. Sille stone used in historic buildings in the region deteriorates due to various factors (environmental, climatic, biological, anthropogenic, etc.). The determination of the origins and degrees of influence of damage by NDT is extremely important for conservation works. In this study, deteriorations on the

Mısırlıoğlu Bridge located in Sille settlement were examined by NDT and the results obtained were presented below:

-The most effective deterioration detected in the structure is of atmospheric origin. In the deterioration process, the presence of humidity in the structure plays a crucial role. Upon examining the locations of the deteriorated stones and deterioration amounts with the SHR value map, it is observed that the highest deterioration is in the abutments and arch.

-The block sizes of the building stones used the bridge are highly effective in the deterioration process. Deterioration types and the status and the dimension of examined monument is important for selection of non-destructive techniques applied in the analysis of historic stone monuments.

-Based on the analysis it is detected that UCS values of the building stones used at the bridge decrease due to the atmospheric effects.

REFERENCES

ASTM. (1986). D2938. Standard test method for unconfined compressive strength of intact rock core specimens.

ASTM. (2014). D5873. Standard Test Method for Determination of Rock Hardness by rebound Hammer Method, Annual book of ASTM standards(American Society for Testing and Materials, West Conshohocken), 1-6.

Aydin, A., & Basu, A. (2005). The Schmidt hammer in rock material characterization. Engineering Geology, 81(1), 1-14. doi:https://doi.org/10.1016/j.enggeo.2005.06.006

Beycan, A. D. O. (2017). Evaluation of Sille Settlement in the Context of Ecological Tourizm. Iconarp International Journal of Architecture and Planning, 5(1), 151-171.

Delgado Rodrigues, J. (2015). Defining, mapping and assessing deterioration patterns in stone conservation projects. Journal of Cultural Heritage, 16(3), 267-275. doi:https://doi.org/10.1016/j.culher.2014.06.007

EN-14157. (2004). Natural Stone Determination of the Abrasion Resistance, Brussels.

Fener, M., & Ince, I. (2015). Effects of the freeze–thaw (F–T) cycle on the andesitic rocks (Sille-Konya/Turkey) used in construction building. Journal of African Earth Sciences, 109, 96-106.

Fener, M., Kahraman, S., Bilgil, A., & Gunaydin, O. (2005). A comparative evaluation of indirect methods to estimate the compressive strength of rocks. Rock Mechanics and Rock Engineering, 38(4), 329-343.

Gökçe, M. V., İnce, İ., Fener, M., Taşkıran, T., & Kayabali, K. (2016). The effects of freeze–thaw (F–T) cycles on the Gödene travertine used in historical structures in Konya (Turkey). Cold Regions Science and Technology, 127, 65-

DOI: 10.15320/ICONARP.2018.60 – E-ISSN: 2147-9380

75.doi:https://doi.org/10.1016/j.coldregions.2016.04.005

Hatır, M. E., Korkanç, M., & Başar, M. E. (2018). Evaluating the deterioration effects of building stones using NDT: the Küçükköy Church, Cappadocia Region, central Turkey. Bulletin of Engineering Geology and the Environment. doi:10.1007/s10064-018-1339-x

Hoła, A., Matkowski, Z., & Hoła, J. (2017). Analysis of the Moisture Content of Masonry Walls in Historical Buildings Using the Basement of a Medieval Town Hall as an Example. Procedia Engineering, 172, 363-368. doi:https://doi.org/10.1016/j.proeng.2017.02.041

İnce, İ., Bozdağ, A., Tosunlar, M. B., Hatır, M. E., & Korkanç, M. (2018). Determination of deterioration of the main facade of the Ferit Paşa Cistern by non-destructive techniques (Konya, Turkey). Environmental Earth Sciences, 77(11), 420. doi:10.1007/s12665-018-7595-z

ISRM. (1979). Suggested methods for determining the uniaxial compressive strength and deformability of rock materials. Int J Rock Mech Min Sci Geomech Abst, 16, 135-140.

ISRM. (2007). The complete ISRM suggested methods for rock characterization, testing and monitoring: 1974-2006: International Soc. for Rock Mechanics, Commission on Testing Methods.

Karpuz, H. (2009). Türk kültür varlıkları envanteri: Konya 42, (Vol. 1): Türk Tarih Kurumu Yayınları.

Korkanç, M. (2013). Deterioration of different stones used in historical buildings within Nigde province, Cappadocia. Construction and Building Materials, 48, 789-803. doi:https://doi.org/10.1016/j.conbuildmat.2013.07.033

Korkanç, M. (2018). Characterization of building stones from the ancient Tyana aqueducts, Central Anatolia, Turkey: implications on the factors of deterioration processes. Bulletin of Engineering Geology and the Environment, 77(1), 237-252. doi:10.1007/s10064-016-0930-2

Korkanç, M., İnce, İ., Hatır, M. E., & Tosunlar, M. B. (2018). Historical Granaries at Taşkale (Turkey) Under Risk: A Geotechnical Analysis. Mediterranean Archaeology & Archaeometry, 18(1).

Le Bas, M. J., Le Maitre, R. W., Streckeisen, A., & Zanettin, B. (1986). A chemical classification of volcanic rocks based on the total alkali-silica diagram. Journal of petrology, 27(3), 745-750.

NBG. (1985). Engineering Geology and Rock Engineering. Norwegian Group of Rock Mechanics, Norway.

Ozdemir, A. (2002). Capillary water absorption potential of some building materials. Geological Engineering, 26(1), 19-32.

Sandrolini, F., & Franzoni, E. (2006). An operative protocol for reliable measurements of moisture in porous materials of ancient buildings. Building and Environment, 41(10), 1372-1380. doi:https://doi.org/10.1016/j.buildenv.2005.05.023

Zedef, V., Kocak, K., Doyen, A., Ozsen, H., & Kekec, B. (2007). Effect of salt crystallization on stones of historical buildings and

monuments, Konya, Central Turkey. Building and Environment, 42(3), 1453-1457.
doi:https://doi.org/10.1016/j.buildenv.2005.12.010

Resume

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DOI: 10.15320/ICONARP.2018.60 – E-ISSN: 2147-9380

ICONARP
International Journal of Architecture & Planning
Received 03 Apr 2018; Accepted 02 Nov 2018
Volume 6, Issue 2, pp: 413-432/Published 28 December 2018
DOI: 10.15320/ICONARP.2018.61–E-ISSN: 2147-9380
Research Article

A Slow City Movement: The Case of Halfeti in Turkey

Fatma Kürüm Varolgüneş*
Fatih Canan**

Abstract

In today's world where globalization is increasing, many cities cannot ada pt to rapid changes. The changing lifestyles of the inhabitants of the city cause a rapid loss of urban differences and originalities. Several movements have emerged to solve these problems. One of these movements is the slow city movement proposed for a better environment and social life. The slow city movement sets out the parameters that ensure the viability of cities, which give importance to the continuity of the improvement of social, economic, cultural and environmental qualities. This movement, which strives for the preservation of originality against the impact of globalization, has a great importance in order to increase the quality of urban life.

The aim of this work is to identify the strengths and weaknesses of sustainable development of the slow city declared places, and to identify the threats and opportunities that can be faced. In this way, targets and

Keywords: *Halfeti, slow city movement "Cittaslow", SWOT analysis, Turkey*

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strategies for the sustainability of the desired criteria for cities declared as slow cities can be determined. In the study, environmental analysis and situation analysis were carried out by observation and inventory collection method in Halfeti province of Urfa declared as slow city. The local people and tourists who visited the area were interviewed and SWOT analysis was conducted by brainstorming method. The district of Halfeti consists of two regions. The old Halfeti area is a very old settlement; some of the buildings it contains are under the waters of the Euphrates, in the appearance of an open-air museum. The new Halfeti is a region formed with non-specific regulations and illegal and distorted building is seen intensively. With the declaration of Halfeti as a slow city, the tourism movements have begun to accelerate. As a result of this study, it has been determined that this region with historical and natural beauty has been caught unprepared for tourism development. For this reason, it is necessary to prioritize rehabilitation efforts in the region and prepare action plans for the new Halfeti settlement. The conclusion is that Halfeti's unique identity values should be promoted on a global scale and protected as cultural heritage. It is expected that the results obtained in the study will also be a road map for other slow cities similar to Halfeti.

INTRODUCTION

Today the effects of globalization is on rise in all over the world. Particularly the development and widespread use of mass communication tools and their accessibility by many people has made the world much smaller than before. This has affected life modes and trade exchanges in the world. As a result, societies have undergone changes in their way of life, especially in cities in developing countries. Many cities cannot adapt to rapid changes. The changing lifestyles of the urban people cause the rapid disappearance of the things that make a city original, authentic and unique. In order to solve these problems, various movements have been revealed. One of these movements is the slow city movement “Cittaslow”, which is recommended for a better environment and social life. People seeking a different way of life rather than consumption-oriented life, which does not give happiness and peace, has revealed the Cittaslow movement in the urban scale. According to a definition, Cittaslow is an international network of small towns that combines urban planning and slowing cities in planning. The Cittaslow movement encourages societies to adopt slowness as a lifestyle. It also encourages food production using natural and environmentally friendly techniques. It is both a social movement and a model for urban governance; it emphasizes local distinctiveness in the context of globalization and seeks to improve the quality of life locally (Yılmaz, 2016). It aims to move away from fast models of urban design. In addition, some properties such as slow cities, slow food,

DOI: 10.15320/ICONARP.2018.61 – E-ISSN: 2147-9380

slow life and slow travel depends on “slow” philosophy (Kamel, Orabi, & Taha, 2017).

Cittaslow's main philosophy is to create an antithesis to the fast life. However, at the same time, it values ecology and sustainable development, which is nourished by locality and authenticity (Dickinson, 2009; Yurtseven & Kaya, 2011). Slow city movement sets out the parameters that give importance to the continuity of the improvement of social, economic, cultural and environmental qualities and the viability of the cities. This movement, which strives to preserve authenticity against the influence of globalization, is a great way to increase the quality of urban life.

The slow city movement, which originated in Italy, was inspired by small and medium-sized towns in Italy. The infrastructure required for this movement to be functional should be provided. It is more important to stimulate local dynamics against external factors. In other words, instead of clone towns, it is tried to ensure the continuation of local township cities. Emphasis on local, regional and cultural awareness and the original values of cities is among the main objectives. In short, it can be said that living in cities that participate in the slow city movement will correspond to a higher urban quality of life. Because living in these cities means controlling environmental pollution, promoting local development means protecting traditional architecture, culture and traditional life style. There will undoubtedly be a high quality of life with the control of such problems.

LITERATURE REVIEW

Cittaslow means slow city and has recently emerged as a small network of international cities in Italy, addressing the philosophy of slow food in urban design and planning (Dickinson, 2009). Cittaslow philosophy advocates continuing to live at a pace that is enjoyable for life. The Cittaslow movement claims that cities that are self-contained, sustainable, protect crafts, nature, traditions and customs, but also have no infrastructure problems, where residents can communicate and socialize with each other, use renewable energy resources and benefit from technology are realistic alternatives (Cittaslow, 2018). Cittaslow towns introduce a place-based identity approach to their urban plans. Cittaslow has adopted the principle of encouraging local diversity and economic and cultural strengths, strength from historical sources and traditions, and a slow, comfortable living pace (Semmens & Freeman, 2012). Paolo Saturnini (Mayor of GreveinChianti) founded Cittaslow in the year 1999. Saturnini saw the need to preserve the authenticity and properties of smaller urban regions (Miele, 2008). Cittaslow aims to preserve the quality of life

integral to each city's sense of place, environmentally sustainable. The underlying philosophy is to identify and support each city region's assets and ways of life which have traditionally formed its identity (Radstrom, 2014).

The main purpose of the slow city movement is to protect the local and authentic identity of the cities and to improve the quality of urban life. Slow cities are trying to achieve this goal by controlling air, water, noise and light pollution, encouraging alternative energy resources and recycling, increasing green areas, protecting traditional architecture and lifestyle and strengthening local development. The cities who take part in Cittaslow movement endeavours to effect the following main principles: They mind public health, in this context, they care for procurement of healthy products and food; they encourage traditional handicrafts and valuable craft studies; they mind the structure of the city. In this context, they construct squares, theatres, shopping centers, coffee houses, and restaurants without harming the structure of the city; they are respectful to traditions, which provides a tranquil and peaceful atmosphere (Ekinci, 2014).

As a concept, Cittaslow focuses on improving the quality of life of local people rather than tourists. This can only happen if the local people embrace tranquillity. In this process, it is important that municipalities give importance to working together rather than prohibitions. Slow city philosophy encourages cities to identify areas of strength and weakness and to develop a strategy in this respect. Therefore, some criteria have been put forward to be a slow city. These criteria are presented in detail in Table 1. Cities with Cittaslow title are determined according to these criteria.

Slow city (Cittaslow) criteria serve as a road map for local governments wishing to reach a sustainable city. It encourages the development of projects in areas such as reducing carbon footprints of cities, making use of renewable energy sources, recycling, collecting waste oil and batteries and organizing energy saving campaigns (Göçkan, 2012). It is not expected that the city will be able to meet all of the slow city criteria at the moment. Cities are considered to need time to meet all of the slow city criteria.

DOI: 10.15320/ICONARP.2018.61 – E-ISSN: 2147-9380

Table 1. The cittaslow criteria *(Source: Charter, 2018; Doyduk & Okan, 2016; Yılmaz, 2016)*

1. Energy And Environmental Policy
1.1 Verification of air, water and soil quality of the city
1.2 Plans for the promotion and dissemination of differentiated refuse collection
1.3 Dissemination of industrial and domestic composting
1.4 Existence of a purification plant for urban sewage
1.5 Municipal plan for saving energy, with reference particularly to the use of alternative sources of energy
1.6 Ban the use of genetically modified seeds in agriculture
1.7 Regulation of advertisements and traffic signs
1.8 Control of electromagnetic pollution
1.9 Program for controlling and reducing noise pollution
1.10 Systems and programs for controlling light pollution
1.11 Adaptation of environmental management systems
1.12.Conservation of biodiversity
2. Infrastructure Policies
2.1. Efficient cycle paths connected to public buildings
2.2. Length (in km) of the urban cycle paths created over the total of km of urban roads, Plans for safe mobility and traffic
2.3 Bicycle paths connecting schools and public buildings
2.4 Plans for alternative transportation including mass transit, pedestrian and bicycle
2.5 Accessibility of public places and those of public interest
2.6 Promotion of programs to facilitate family life and social connections, recreation and assistance for those in need
2.7 A centre for medical assistance
2.8 Quality green areas and pedestrian accessibility
2.9 A plan for the distribution of locally produced merchandise and the creation of commercial centres for natural products
2.10 Agreement with the shopkeepers with regards to the reception and assistance to citizens in trouble, i.e. "friendly shops"
2.11 Revitalization of the city including upgrading and redevelopment of urban areas
2.12 A program for urban restyling and upgrading
2.13 Integration of a citizen information office with a Cittaslow information window
3. Quality of Urban Life Policies
3.1 Window for bio-architecture and programs for the training of personnel assigned to the information project for the promotion of bio-architecture
3.2 Equipping the city with cables for fibre optic and wireless systems
3.3 Adopting systems for monitoring electromagnetic fields
3.4 Providing refuse containers in keeping with the environment and the landscape and refuse removal according to established timetables
3.5 Planting environmentally suitable and autochthonous plants in public and private places
3.6 Providing services for the citizens, including dissemination of municipal services via the internet and plans for creating and educating the citizens in the use of an internet-based civic network.
3.7 A plan for controlling noise in specifically noisy areas
3.8 A plan concerning colours
3.9 Promotion of telework
4. Safeguarding Autochthonous Production
4.1 Development of organic farming
4.2 Certification of the quality of artisan produced products and objects and artistic crafts
4.3 Programs for the safeguarding of artisan and/or artistic craft products in danger of extinction
4.4 Safeguarding traditional methods of work and professions at risk of extinction
4.5 Use of organic products and/or local products and the preservation of local traditions in restaurants, protected structures and school cafeterias
4.6 Programs for educating taste and nutrition in schools in collaboration with Slow Food
4.7 Favouring the activities of wine and gastronomic Slow Food presidia for species and preparations risking extinction
4.8 Census of the typical products of the territory and support of their commercialization (updating of markets for local products, creation of appropriate spaces)
4.9 Census of trees in the city and enhancing the value of large trees or 'historical trees'
4.10 Promoting and preserving local cultural events
4.11 Promoting urban and school gardens for autochthonous cultures grown with traditional methods
5.Hospitality
5.1 Training courses for tourist information and quality hospitality
5.2 Using international signs on the tourist signs at the historical centres with guided tourist itineraries
5.3 Reception policies and plans to facilitate the approach of the visitors to the city and access to information and services (parking, extension/flexibility of opening hours of public office, etc.) with particular regards to scheduled events.
5.4 Preparation of 'slow' itineraries of the city (brochures, websites, home pages, etc.)
5.5 Making the tourist operators and storekeepers aware of the need for a transparency of prices and the exhibition of rates outside the business establishments.
6. Awareness
6.1 Provide the citizens with information on the aims and procedures of what a Slow City.
6.2 Programs to involve the citizens in acquiring the 'slow' philosophy and the application of Slow City projects and in particular: educational gardens and parks, book facilities.
6.3 Programs for the dissemination of the Slow City and Slow Food activities.
7. Support To Slow Food Activities And Projects
7.1 Establishment of a local convivial Slow Food
7.2 Education programs for tastes and nutrition for the compulsory and secondary school in cooperation with Slow Food
7.3 Set-up of school vegetable gardens in cooperation with Slow Food
7.5 Use of local products safeguarded by Slow Food and maintenance of nutritional traditions in collective food services, school and canteens with annexed food education programs.
7.6 Support of the typical local area products through implementation of the 'Mercalli della Terra' in cooperation with Slow Food.
7.7 Support of the 'Terra Madre' project and food communities through joint twinning

Cittaslow Movement in Turkey

Many small towns in Turkey are searching for ways to achieve sustainable development. A considerable number of them are considering tourism to stimulate economic growth (Hatipoglu, 2015). Slow-city movement first began in 2009 in Seferihisar,

Turkey. Taking Cittaslow logo and becoming Turkey's first slow-city, Seferihisar has became "Citta-Slow Turkey" coordinator (Bilgi, 2013). Since Seferihisar was the first, other municipalities wishing to join the Cittaslow network were included in this international union, referring to Seferihisar. The following year four other towns started to work toward the Cittaslow goals. Akyaka (Muğla, Aegean Region), Yenipazar (Aydın, Aegean Region), the island of Gökçeada (Çanakkale, North Aegean Sea) and Taraklı (Sakarya, East Marmara Region) were also accepted to the network in 2011(Hatipoglu, 2015). The future aim of the local network is to further grow the network and have at least one Slow City in all seven regions of the country (Hatipoglu, 2015). There are 15 locations in Turkey until 2018, with the title cittaslow. Halfeti has this title in 2013, 9th place. As of 2018, members of Cittaslow in Turkey are shown in Table 2.

Table 2. Members of Cittaslow in Turkey (Cittaslow,2018)

Members of Cittaslow in Turkey		
Akkaya-Muğla	Halfeti-Urfa	Taraklı-Sakarya
Eğirdir-Isparta	Mudurnu-Bolu	Uzundere-Erzurum
Gökçeada-Çanakkale	Perşembe-Ordu	Vize-Kırklareli
Gerze-Sinop	Şavşat-Artvin	Yalvaç-Isparta
Göynük-Bolu	Seferihisar-İzmir	Yenipazar-Aydın

In towns that are included in the CittàSlow Network and have the capacity to provide significant resources to the national economy, the preservation of natural and historical textures is of great importance in terms of delivering these cultural heritage values to future generations as well as providing them with sustainable tourism at the national and global scale.

MATERIAL

The material of this study is the Halfeti district of Urfa, which has been declared a slow city. The study mainly focuses on observation, interviewing and analysis. SWOT analysis was conducted with local business owners by brainstorming. The results of the study are expected to be an example for the other slow cities which are similar to Halfeti district of Urfa province.

Urfa – Halfeti / Turkey

Halfeti, a district of Urfa province, was the 9th Cittaslow in Turkey. This historic and touristic city accommodates (Ekinci, 2014) 39,861 people as of 2017. Halfeti is located on the eastern shore of the Birecik Dam Lake in the Middle Euphrates Division of the Southeastern Anatolia Region and is located in the province of Gaziantep and Urfa, bound to Urfa. Located between two big cities,

DOI: 10.15320/ICONARP.2018.61 – E-ISSN: 2147-9380

Halfeti has an important place in terms of its location (Fig. 1). Under the influence of the Euphrates, the city of Halfeti has a particular microclimate. The environmental conditions allow many products to be grown in the district. With this advantage, the district center is in the foreground in terms of agriculture according to the surrounding districts (Boyraz & Bostancı, 2016). Halfeti is close to a Mediterranean climate. Most of Halfeti has been submerged in water by the Birecik Dam, which was built in 2001 between Birecik and Halfeti (Fig. 2). Consequently, many inhabitants of Halfeti had to migrate or move to new settlements (Ballice, 2010). The waters of the Birecik Dam have made Halfeti the tourism center of Southeastern Anatolia within 10 years. In the district, due to the increased intensity, a general planlessness prevails. There are 17 small, but quite interesting, rock settlements lined side by side in the Savaşan village, which lies beneath the waters of Birecik Dam Lake, 3.5 kilometers north of Halfeti (Yamaç, 2015). Two of these buildings are used for touristic purposes by the tea garden on the beach. Opposite to Savaşan Village, there are numerous dwellings around Rum Kale that is located on the west Wall of Euphrates. Rum Kale is the most important historical building of this part. This castle, also named as "Hromgla" in ancient scripts, is now on a peninsula (Yamaç, 2015).

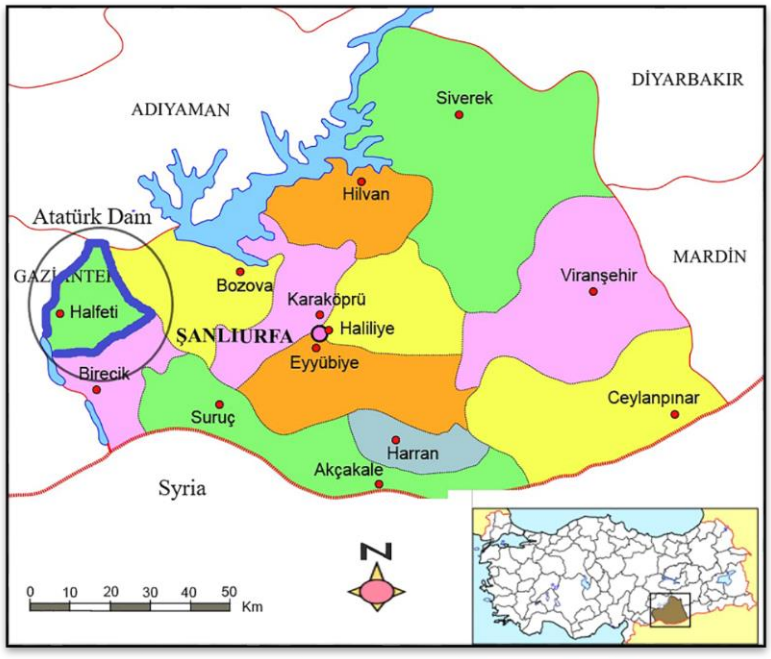

Figure 1. Location of Halfeti
(Source: Boyraz & Bostancı, 2015)

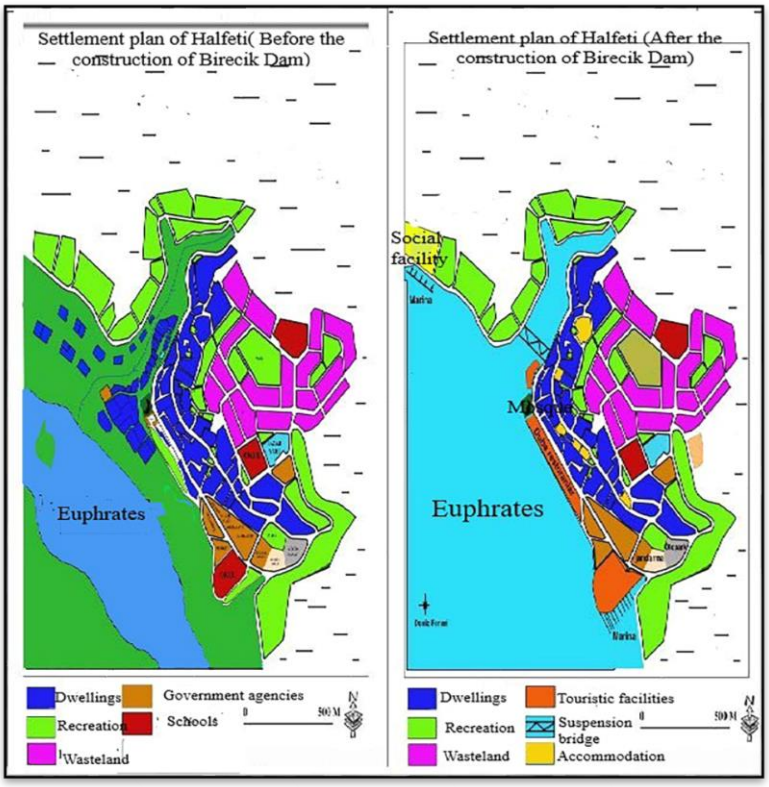

Figure 2. Pre and post dam settlement of the former Halfeti *(Source: Boyraz & Bostancı, 2015)*

Traditional Architecture in Halfeti:

Standing like an oasis in the middle of the arid land, the original architectural texture of Halfeti is made up of two-story and garden houses made of cut stone called Nahat (means that it is obtained from calcareous stones that get harder over time) by the Armenian stone masters. The house of Halfeti, set in winding streets, form part of the landscape. Generally, two, sometimes three storey, all these houses built of white stone are adorned with elaborate stencil work (Ballice, 2010). Houses were built in an architectural layout design that would not interfere with the sight of one another (Fig. 3). Historical houses opened to narrow streets with valley slopes have not been roofed due to the effect of warm climate. This roof system, which is open on top, is called "dam". In the summer months, people sleep on the thrones set up on the dam. "Bird Houses" made for doves fed in the houses add a different originality to the traditional architecture (Fig. 4). The front of all the houses rising above the steep slopes, which dominate the Euphrates River, overlooks the Euphrates River. These houses in the Savaşan Village, a part of which are flooded and offer an exceptional view are the cultural heritages to be protected (Fig. 5).

DOI: 10.15320/ICONARP.2018.61 – E-ISSN: 2147-9380

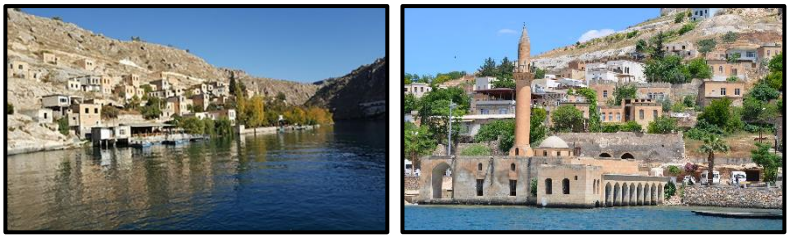

Figure 3. Settlement of dwellings *(Photo: Authors, 2018)*

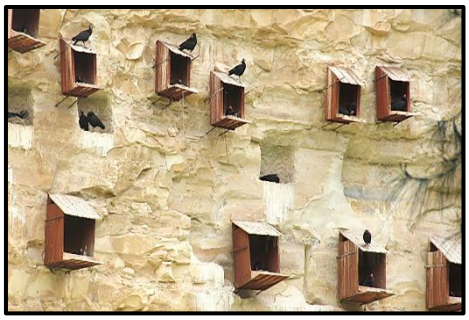

Figure 4. Birdhouses in Halfeti *(Source: Ballıce, 2010)*

The former Halfeti settlement was set up on the western, southern and northern slopes of the "Çatal" hill, which is a barren land, where the topography shows fluctuating properties, instead of fertile alluvial lands that the Euphrates River has swept. Thus, both fertile lands were used as irrigated agriculture land, and the district center was established not on the deep valleys but on the higher slope, thus benefiting from the sun as much as possible (Boyraz & Bostancı, 2015). The "rock church", carved from the rock on the slope opposite to the "Savaşan Village", consists of two rectangular plan sections in the east-west direction. The church, which has rock masses in the east, west and south, has a single nave and a single apse, and the northern front is open(Fig. 6). The Kaya Church, located on the eastern slope of the village 200 meters before the Euphrates River, is now on the edge of the lake. The walls of the church are made of sculpture technique and are decorated with various types of crosses in different sizes. Halfeti, which has hosted many civilizations, has an important cultural heritage. There are 96 registered cultural assets in Halfeti, 13 archaeological sites, 1 urban site and 82 registered buildings. Rumkale, located within the borders of Halfeti, where St. Nerses Church, Barsavma Monastery and many other historical buildings took place, was known as "Şitamrat" during the Assyrian period.

Figure 5. General view of the Savaşan village *(Photo: Authors, 2018)*

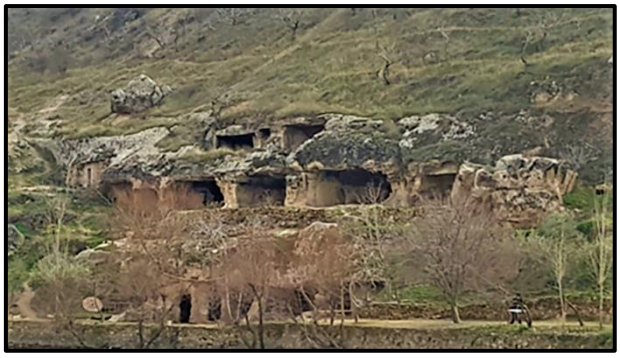

Figure 6. Savasan Village cave dwellings *(Photo: Authors, 2018)*

The most important examples that have been carried today from the dwelling architecture of the town are The Bey Mansion, The Muhittin Ganneci House (Fig. 7) and Feyzullah Efendi Mansion (Fig. 8). Feyzullah Efendi Historical Mansion (1901-1902), located in the Kale village due to the fact that the city is under water, was moved to Harran University Osmanbey Campus (2000-2003), 150 km. away from the Birecik Dam within the lake boundaries. The 100-year-old stone mansion's rebuilding by transporting has been first in Turkey. The stone and wood workmanship of the building, which is located in a large garden and built in two stories as "outside sofa", "iwan" and U plan, as in traditional Turkish houses, is very smooth. Today, this mansion located within the campus of Harran University is actively used as a venue where cultural activities are held, including conference rooms, reading rooms and oriental rooms (Kürkçüoğlu, 2012). The legendary "Black Rose", which was grown in the region, has become a symbol of the city. Halfeti, with its diversity of flora and fauna, will be able to protect "Cittaslow" feature for a long time if it can maintain this diversity. The architectural and natural texture of the Halfeti district, which has hosted many civilizations, presents a visual feast to its guests who have joined boat trips, like an open-air museum, after surrendering to dam waters.

Figure 7. The Bey Mansion (left) The Muhittin Ganneci House(right) *(Source: Kürkçüoğlu, 2012)*

DOI: 10.15320/ICONARP.2018.61 – E-ISSN: 2147-9380

Figure 8. The Feyzullah Efendi Mansion *(Source: Kürkçüoğlu, 2012)*

New Architecture in Halfeti

When the waters of Birecik Dam covered a large part of Halfeti in 2000, "Karaotlak" location 9 km away from the center of the district was established with the name "New Halfeti". The new district center, with its barren nature devoid of greenery and with esthetically deprived constructions, cannot keep the place of old Halfeti. On the other hand, the new constructed buildings in planned urban area have no identity and the new urban settlement is completely at odds with the traditional urban texture (Fig. 9).

The new settlement in Halfeti is planned on a flat area. The urban texture of the new Halfeti, with similar dimensions and rectangular forms is monotone. Apart from the superficial differences on the building facades, the apartment buildings and the streets they form are repeating each other (Fig. 10). In addition, the hotel building, which was built at a dominant point of Old Halfeti, caused great damage to the existing silhouette (Fig. 11). The irregular development of the new Halfeti puts the district's Cittaslow identity in danger.

Figure 9. Irregular buildings in New Halfeti *(Photo: Authors, 2018)*

Figure 10. The general Image of the new Halfeti *(Photo: Authors, 2018)*

Figure 11. The hotel that damage the existing silhouette *(Photo: Authors, 2018)*

In the district, it is necessary to preserve the architecture, the traditional way of life that forms the basis of Cittaslow. In the newly created Halfeti, the basic criteria of Cittaslow must be established and implemented.

METHOD

The success of cities in today's competitive environment, where economic, socio-cultural and technological changes are intense and new performance criteria are emerging, depends on developing strategies that will maximize benefits from opportunities by identifying their strengths and weaknesses. In the study, environment and situation analysis were carried out by observation and inventory collection method in Halfeti province of Urfa declared as slow city. Using these methods, Halfeti's spatial characteristics and functional identity values were determined.

The study first sought to identify the strengths and weaknesses for the sustainable development of the Halfeti District, which was declared Cittaslow, and to identify the threats and opportunities that external environmental conditions posed. On the other hand, in the process of obtaining data within the scope of the research, the technical infrastructure of the study was established by conducting a literature search on the subject. In the light of

DOI: 10.15320/ICONARP.2018.61 – E-ISSN: 2147-9380

collected information, assessments are grouped systematically by SWOT analysis.

SWOT Analysis is an abbreviation for strengths, weaknesses, opportunities, and threats (Özcan, 2013). In this analysis method, the positive and negative aspects of the internal and external environmental factors related to the field of the research are addressed and contributions to the decision making process are provided. The two main components of SWOT are the indicators of the internal situation described by existing Strengths and Weaknesses and the indicators of the external environment described by existing Opportunities and Threats (Markovska, Taseska, & Pop-Jordanov, 2009). SWOT analysis is a phase in which internal and external factors are considered together to develop a strategy for a topic and the results obtained later are used in the decision-making process. This evaluation method also contributes to the development of alternative strategies in the decision making process related to the subject. In this study, a 20-person group questionnaire was applied for verifying the strengths-weaknesses, opportunities and threats assessed by the SWOT analysis and ordering the outputs according to their importance. The reason for the preference of the district residents in the survey is that they should have more information about the district according to the visitors coming from the outside. This questionnaire, in which more than one choice can be marked in questions, was conducted face to face. Frequencies and percentages were used to systematically rank the importance orders of the answers of the district residents. These surveys constituted the brainstorming section of the SWOT analysis and the determined criteria were ranked in order of importance according to the questionnaire results.

RESULTS AND DISCUSSION

The demographic status of the focus group determined by the residents of Halfeti district was first revealed. The work was usually carried out at coastal enterprises. 60% of the participants consisted of men and 40% women. Men were more likely to participate in the questionnaire because of the greater number of men in the working life. In the selection of the focus group, especially those who have witnessed Halfeti's transformation process and lived in this area for a long time are preferred. For this reason, 35% belongs to the 56+ age group, 30% belongs to the 46-55 age group, 25% belongs to the 36-55 age group and 10% belongs to the 26-35 age group. In the questionnaires, they were asked what they were doing to determine the job opportunities available in the district. 45% of respondents have restaurant, tea garden or accommodation facility operators while 30% are tour

guides, 15% are farming agricultural products with priority for peanut production and 10% are in the fishing industry (Table 3). Before the Birecik Dam which was built in 2000, most of the residents of Halfeti were earning their livelihood, mostly by land building. Today, most of the population is employed in tourism industry.

Table 3. The demographic situation

Demographics		**Freq. (n)**	**Percent. (%)**
Gender	Female	8	40
	Male	12	60
Age	26-35	2	10
	36-45	5	25
	46-55	6	30
	56+	7	35
Occupation	Tour Guide	6	30
	Business manager	9	45
	Fisherman	2	10
	Farmer	3	15

The strengths of the Halfeti district in order to maintain its sustainability as a slow-city can be ranked from the most important to the least important, according to the answers given by Halfeti residents as follows. As shown in Table 4, Halfeti's most important strength is its rich cultural, natural and natural assets. Other strengths are listed in order of importance, natural resources and pristine environment, geographical location, potential tourism potential and is Turkey's ninth cittaslow settlement. Cittaslow has been said to be the lowest district by residents of the county having a county. For this reason, the fact that the “Cittaslow” phenomenon is not well known in the region has not been adequately studied.

Table 4. Strengths to continue Halfeti's sustainability as a slow city (max. three preferences) (n=20)

Strengths	**Freq. (n)**	**Percent. (%)**
Geographic location	10	50
Rich history, culture and nature assets	14	70
Natural resources and pristine environment	11	55
To be 9 th cittaslow settlement in Turkey	5	25
Potential for upgradeable tourism	9	45

When the answers given by the residents of Halfeti are listed according to percentages, The most important opportunity of the Halfeti slow-city is the attraction of Old Halfeti, which is immersed in the waters of Birecik dam. In addition, the increase in interest in nature, history and culture tourism and the increase in awareness about preserving cultural heritage presents an important opportunity for preparation of tourism destinations for

DOI: 10.15320/ICONARP.2018.61 – E-ISSN: 2147-9380

Halfeti District. Besides the strategic importance of the neighboring cities of Antep and Urfa, the expansion of the Cittaslow philosophy around the world and the increased interest in organic farming can be listed as extra opportunities for Halfeti.

Table 5. Opportunities to continue Halfeti's sustainability as a slow city (max. three preferences) (n=20)

Opportunities	Freq. (n)	Percent. (%)
Old Halfeti buried in the waters of Birecik dam has become tourist attraction	17	85
The spread of Cittaslow philosophy in the world	6	30
Increased awareness of cultural heritage protection.	9	45
Increasing interest in nature, history and culture tourism	12	60
The increase in the strategic importance of the neighboring cities of Antep and Urfa	7	35
Increase in the given importance of organic agricultural products	3	15

According to Table 6, the weaknesses in terms of sustainable development according to the residents of the district are; sufficient promotion and marketing can not be done, the fact that the awareness of being a slow-city is not sufficiently developed in the county, the fact that the facilities located in the districts can not do enough work in winter and the economic recession is experienced, infrastructure and service quality do not respond to needs, the inadequacy of state aid and support, lack of active local government and lack of quality in facilities established for tourists.

Table 6. Weaknesses to continue Halfeti's sustainability as a slow city (max. three preferences) (n=20)

Weaknesses	Freq. (n)	Percent. (%)
Not enough promotion and marketing	12	60
In the province, awareness about Cittaslow is not sufficiently developed	9	45
Local government can not be active enough	5	25
Infrastructure and service quality is unsatisfactory	7	35
Inadequate state aid and support	7	35
In winter, facilities can not work	9	45

Inadequate hygiene conditions in established facilities	3	15

As stated in Table 7, the biggest threat to the sustainable development of the Halfeti District is the irregular development of the newly established district of Halfeti. This situation seriously disturbs the residents of the district. In addition, illegal structures in the old and new Halfeti, the weakness of the touristic recognition of the county, the weakness of the zoning and building inspection and economic instabilities, threats to Halfeti's regular development and economic growth.

Table 7. Threats to continue Halfeti's sustainability as a slow city (max. three preferences) (n=20)

Threats	**Freq. (n)**	**Percent. (%)**
The irregular development of the newly established Halfeti district.	14	70
The continuing of illegal construction in the old Halfeti and the new Halfeti region	11	55
The weakness of the touristic recognition of the county	10	50
Economic instabilities	5	25
Weakness of construction and building inspection	7	35

In Table 8, the threats and opportunities for the sustainable development of the Halfeti District are compared with the strengths and weaknesses, and the order of importance is determined and systematically ranked because of the questionnaire. The emerging picture is important to focus on strengths and address weaknesses and opportunities.

Table 8. Strengths and weaknesses, opportunities and threats for slow city Halfeti

	Strengths	**Opportunities**
Positive	S1-Rich history, culture and nature assets S2- Natural resources and pristine environment S3-Geographic location S4- Potential for upgradeable tourism. S5- To be 9th cittaslow settlement in Turkey	O1- Old Halfeti buried in the waters of Birecik dam has become tourist attraction O2- Increasing interest in nature, history and culture tourism. O3- Increased awareness of cultural heritage protection. O4- The increase in the strategic importance of the neighbouring cities of Antep and Urfa

DOI: 10.15320/ICONARP.2018.61 – E-ISSN: 2147-9380

		O5- The spread of Cittaslow philosophy in the world O6- Increase in the given importance of organic agricultural products
Negative	**Weaknesses**	**Threats**
	W1-Not enough promotion and marketing W2-In the province, tourism awareness is not sufficiently developed W3-In winter, facilities cannot work. W4-Infrastructure and service quality is unsatisfactory W5-Inadequate state aid and support. W6-Local government cannot be active enough W7-Inadequate hygiene conditions in established facilities	T1-The irregular development of the newly established Halfeti district. T2-The continuing of illegal construction in the old Halfeti and the new Halfeti region. T3-The weakness of the touristic recognition of the county T4- Weakness of construction and building inspection T5-Economic instabilities

CONCLUSIONS AND RECOMMENDATIONS

In this study, it was tried to determine the status of Halfeti as a tourism destination since being declared a slow city and tried to determine how to use the existing potential more efficiently by SWOT analysis method. With this study, it is revealed that Halfeti's rich history, architectural heritage, cultural and natural assets, climate and natural environment are causing visitors to attract from different regions. With the building of the Birecik dam, Halfeti, a part of which is buried under water, has become stronger in contrast to its anticipation of disappearance and has become an important center for tourism in the region. Along with the fact that it is a slow city, studies have started to protect the properties that the cities with Cittaslow title have to carry. However, it has been found that the people of the region cannot fully understand the privilege of being a slow city. The necessary initiatives to address this lack of consciousness must be made in a planned manner. The Cittaslow phenomenon must first be addressed to the people of the region and then to the visitors through advertising and promotions.

The weaknesses of the newly established Halfeti region are more oppressive than stronger directions. Irregularities and illegal buildings are the greatest threats to the regular and sustainable development of the district, which has lack of infrastructure in terms of urbanism and architecture and lack of service. It is clear

that if the municipality cannot take precautions against this distorted development, it will have negative effects on the image of the village. In the face of these weaknesses and threats, the fact that the city has been declared a slow city is a great opportunity in terms of tourism and economic development. In addition, the recent increase in interest in nature, history and culture tourism is a strong influence on Halfeti's use of this opportunity. Parallel to tourism development in Halfeti, accommodation facilities should also be improved. Many of the accommodation in the immediate vicinity are not suitable for the mass of tourists interested in nature and culture tourism. The fact that the district of Halfeti is a member of the Cittaslow movement is very important in terms of the image of the village. In this study, it seems that the increasing demand for tourism is not ready to respond. It has concluded that Halfeti's unique identity values should be emphasized in order to be protected as a cultural heritage through the introduction on a global scale. For this reason, it is necessary for the district administration to attach importance to this issue and to develop measures in the context of sustainable urban development, keeping the current potential of Halfeti within the specified criteria. The most accurate growth strategy for Halfeti will be achieved without pollution, by preserving its natural texture and by moving to the future. Many types of alternative tourism (ecological tourism, nature tourism, culture tourism etc.) can be developed in Halfeti.

Cittaslow movement evaluated in the district of Halfeti, should be interpreted correctly and expanded nationally. In the cities where Cittaslow is declared, the places where local designs are performed should be produced respecting the nature and architectural texture. By providing more investment and capital circulation to these cities, the concept of tourism should be presented at local scales with the theme of Cittaslow. Evaluation of historical, natural, cultural and geographical beauties in conservation-use balance and reviving in tourism industry will make an important contribution to the country's development.

DOI: 10.15320/ICONARP.2018.61 – E-ISSN: 2147-9380

REFERENCES

Ballice, G. (2010). Halfeti–Rumkale Natural Heritage from East to West (pp. 321-331): Springer.

Bilgi, M. G. (2013). Permacultural Conservation, Planning, Management and Educational Practices in the Cittaslow of Turkey. Selcuk University, Journal of the Institute of Social Sciences (29), 45.

Boyraz, Z., & Bostancı, M. S. (2015). Tourism Potentiality of Old Halfeti (Şanlıurfa) Replaced by Birecik Dam. Journal of World of Turks, 7(3), 53-77.

Boyraz, Z., & Bostancı, M. S. (2016). New Halfeti (Sanlıurfa) With Regard to Site of Establishment, Development and Characteristics of Function. Journal of World of Turks, 8(1), 83-107.

Charter, C. I. (2018). http://www.cittaslow.net/content/our-principles.

Cittaslow, (2018). http://cittaslowturkiye.org/.

Dickinson, J. (2009). Adapting tourism for a lower carbon future: A slow travel approach. Paper presented at the Transport and tourism. Challenges, issues and conflicts. Proceedings of the travel and tourism research association Europe, Annual Conference.

Doyduk, H. B. B., & Okan, E. Y. (2016). Sustainable City Branding: Cittaslow–The Case of Turkey. Global Place Branding Campaigns across Cities, Regions, and Nations, 162.

Ekinci, M. B. (2014). Sustainable Tourism Development in Halfeti and Ayvalık as the Recent and Potential Cittaslows. Paper presented at the 9th International Conference: New Perspectives in Tourism and Hospilaty, Burhaniye, Balıkesir.

Hatipoglu, B. (2015). "Cittaslow": Quality of Life and Visitor Experiences. Tourism Planning & Development, 12(1), 20-36.

Kamel, N., Orabi, R., & Taha, S. (2017). Slow Tourism Experience: an Innovative Approach for Sustainable Tourism development in Egypt (The case of Siwa). International Journal of Heritage, Tourism, and Hospitality, 10(2/2).

Kürkçüoğlu, S. (2012). A Coastal City in the Southeast: Halfeti. Şanlıurfa Journal of Culture and Arts History and Tourism, 13(1), 34-41.

Markovska, N., Taseska, V., & Pop-Jordanov, J. (2009). SWOT analyses of the national energy sector for sustainable energy development. Energy, 34(6), 752-756.

Miele, M. (2008). Cittáslow: Producing slowness against the fast life. Space and Polity, 12(1), 135-156.

Özcan, K. (2013). Protection of cultural heritage in historic towns: The experience of Birgi. Milli Folklor, 25(98), 46-58.

Radstrom, S. (2014). A Place Sustaining framework for local urban identity: An introduction and history of Cittaslow. Italian Journal of Planning Practice, 1(1), 90-113.

Semmens, J., & Freeman, C. (2012). The value of Cittaslow as an approach to local sustainable development: A New Zealand perspective. International Planning Studies, 17(4), 353-375.

Yamaç, A. (2015). Cave Dwellings of Halfeti–Urfa (Southeastern Turkey). Paper presented at the Proceedings of International Congress of Speleology in Artificial Cavities Rome,Italy.

Yılmaz, R. (2016). Research on Slow City Movement within the Context of Sustainable Urban Planning: The Case of Vize, Kırklareli-Turkey. Global Issues and Trends in Tourism (pp. 716).

Yurtseven, H. R., & Kaya, O. (2011). Slow tourists: A comparative research based on Cittaslow principles. American International Journal of Contemporary Research, 1(2), 91-98.

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DOI: 10.15320/ICONARP.2018.61 – E-ISSN: 2147-9380

Research Article

ICONARP
International Journal of Architecture & Planning
Received 02 Aug 2018; Accepted 16 Dec 2018
Volume 6, Issue 2, pp: 433-460/Published 28 December 2018
DOI: 10.15320/ICONARP.2018.62–E-ISSN: 2147-9380

ICONARP

An Anatolian City: A Research on Cinema Culture and Movie Theaters in Eskişehir

Berna Üstün*

Abstract

Not only physical presences, but also histories and memories of the cities transform. The changes in the built environments result in the erasure of past records from urban space as well as from the minds of urban dwellers. Photographs and movies record the past and document the life and culture in the built environment. Movie theaters are important as they are the sites of meanings and memories of the past. First movie theaters were built after cinema was embraced by urban dwellers as a cultural activity and a realm of socialization. In order to be accessible by citizens, movie theaters were positioned at the centers of the cities as new social and public spaces. In Turkey, cinema appeared as an institution after the republic was established, spread in 1940s, and became a lifestyle and a means of socialization in 1960s. Pioneering steps of the cinema culture took place in Istanbul and soon spread primarily in big cities such as Ankara, Adana, Izmir, and Eskisehir. Eskisehir also met cinema culture in the republican period. As cinema became a popular means of socialization, the number of movie theaters including open air theaters raised up to 25 in the most vivid period. The advent and expansion of TV in 1970s and video in 1980s, however, undermined the cinema culture. In the later years, the cinema culture which existed in many independent movie theaters spread in various

Keywords: *Cinema culture, movie theaters, movie theaters in Eskisehir.*

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parts of the city transformed into the smaller multi-movie-theaters in sterile spaces, i.e. shopping malls, as a part of shopping and dining culture. The movie theaters were not able to resist capitalism, and closed down one by one, and were erased from the urban space as well as from the memories of the citizens. This research aims at exploring and documenting the transformation of Eskisehir's independent movie theater buildings, which were considered as spaces of socialization for many years in the modernization process of the republican period.

INTRODUCTION AND SCOPE OF THE STUDY

Watching movies, discussing about movies, are talking on cinema are all acts of socialization process, and according to Jarvie (1970), this is what makes cinema a social institution, such as family, religion and school (Jarvie, I. C., 1970, as cited in Erkılıç, H., 2009: 144). Hauser considers cinema as a democratic art, since it does not belong exclusively to a class or to a cultural circle. "Unlike plastic arts such as painting and sculpture, and unlike high culture products such as classical music, cinema address all layers of the society and bring them together in the movie theaters for the duration of the screening." This is why cinema was considered to have a structure that resolve class differences, and to be the most popular field of art (Hauser, A., 1984: 420, as cited in Erkılıç, H., 2009: 144).

Movie theaters are an extension of public urban spaces; therefore, they are more than places to watch movies only: They are spaces that constitute street culture and urban identity. Movies screened in a city, and the social characteristics of the audience should be studied as indications of urban development levels (Kırel, 2005: 191). In this context, this research focuses on the development of cinema culture in Turkey, the importance of performance arts (cinema, theater, etc.) in the socio-cultural life of Eskisehir, and gradual disappearance of independent movie theaters in the city.

DEVELOPMENT OF CINEMA CULTURE IN TURKEY

Cinema began with the first movie screening in Le Grand Café, Paris, in 1825 by Louis Lumiere (Ulutak, N., 1988: 1). Soon after its emergence, cinema was introduced in Turkey too. Sigmund Weinberg, who was a follower of what happened in Europe, and who had connections with the company Pathe, screened the first movie to the public in Sponeck Brasserie in Galatasaray, Istanbul on December 12th, 1896. Weinberg continued the screenings in Fevziye Coffee House to the public, and to special groups (Akçura, G., 2004: 175-177).

The number of movie theaters in Turkey was so limited until 1920. There were ten movie theaters, most of them being in Istanbul, and a few in Izmir. After 1923, especially between 1924

DOI: 10.15320/ICONARP.2018.62 – E-ISSN: 2147-9380

and 1927, many movie theaters were built (Erkılıç, E., Kebikeç, 2009: 92).

The first movies were silent. The addition of sound was a much later technical improvement. As in all over the world, in the silent movie theaters in the Ottoman Empire, music was played live to attract people, to accompany the movie, and to enjoy the audience during the entractes. Depending on the sizes and characteristics of the movie theaters, a group of musicians used to play during entire screening. The groups would include a violin and a piano, and might well expand to an orchestra of ten or twelve. The bands used to prepare and rehearse what they would play in order to be synchronous with the moving images, and they watched the movies before they were screened to the public (Akçura, G., 2004: 189-191).

The first experiments in sound in movies during the silent movie period were performed with gramophones. On September 25th, 1929, in Opera Movie Theater in Beyoglu, Istanbul, the first sound film "Women Join the Army" was screened (Akçura, G., 2004: 196). Theater players dominated Turkish cinema until 1939, and their influence continued until 1950s. From 1950 on, cinema started to become a profession, with its own professionals. Experiments once being phantasies in the beginnings of cinematic art soon became business sector. Cinema went through crises in economic and political depression periods, but it sought its way out by innovations. As movie theaters have not only been the places of amusement, or cultural institutions; but also the reflections of social problems, they experiences many crises. Property owners of movie theaters had to direct their investments towards more fruitful solutions in time; and movie theaters became office buildings and residences (Bodur, F., 1990).

Open air movie theaters also appeared at the end of the 19th century as soon as cinema was introduced in Turkey. The easiest way to build a cinema theater was to enclose a vacant lot with board fences in the places with appropriate climate conditions. About the garden movie theaters, Akçura claims the following: "Cinema manager of the early period soon discovered that. It is almost impossible to make an entire list of old open air movie theaters, since they were neither registered in city guides, nor in insurance maps. We cannot find much in memoires, either. Most of the old movie theaters did not even have names. They are generically called garden cinemas" (Akçura, G., 2004: 201). Especially in the months of Ramadan, many mobile movie theaters were built in vacant lots in various spots in cities, as well as in towns and villages of Anatolia as sole public entertainment means. Today, these nostalgic screenings are still held in many places.

SOCIO-CULTURAL LIFE IN ESKISEHIR / BEGINNING OF CINEMA AND THEATER IN ESKISEHIR

Various important factors contribute to the socio-cultural life in Eskisehir. An essential one is the fact that groups of immigrants in various periods settled in the city and they shared their knowledge and experience with the local people. After the war between Ottomans and Russians in 1877-1878, many Rumelian immigrants settled in Eskisehir, and the city had a complex character with the variety of population, language, religion, race and culture. These communities with their distinct cultural traditions had intense cultural interactions with the local population called "manav". Immigrants were also the source of early improvements in agriculture and industry in Eskisehir (Kırlı, E., 2001: 262-263).

Another important step in the development of the city is the construction of Anatolian railways. Three hundred workers and engineers from France, Italy and Switzerland lived in the city with their families for a long time. The documents show that 150 European families were living in Eskisehir in 1894. Railway employees were the examples of a new lifestyle for Anatolia, with their clothes, languages, schools, restaurants, hotels, clubs, and other social structures. Anatolia railways was put into service in 1892, and it made Eskisehir a vivid and developed city in its economy and daily life compared to other Anatolian cities, especially during the years of the First World War (Efe, Ayla, 1998: 97-98). Priests of Saint Augustine de I'Assomption settled in Eskisehir in 1891 and established a school to educate the children of European workers and engineers. 60-80 Catholic, Protestant, Orthodox, Gregorian, Jew and Muslim students learned French, Armenian, Turkish, mathematics and music in this school. Priests and sisters provided public health services (Sarıöz, P., 1997: 90). Documents show that the population of Eskisehir in 1893 was 67000, 19000 of which were non-Muslim. Cucinet claims that there were 11 mosques, 6 prayer rooms, a Greek church, an Armenian church, and a Catholic chapel (Atuk, A., 2002: 114) (Figure 1).

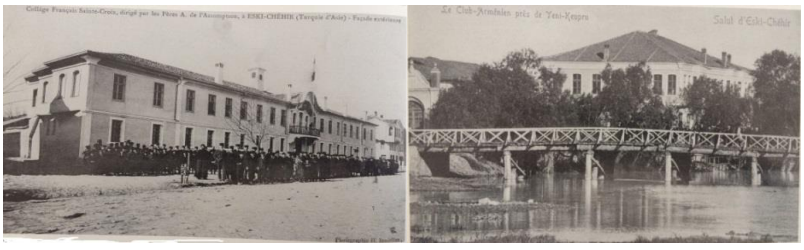


Figure 1. Students and tutors in front of Saint Croix French College; from Pierre de Gigord's collection. Goksu Bridge, Armenian school and club at the beginning of the century; from Pierre de Gigord's collection *(Sarıöz, P., 1997: 90).*

According to written sources, heater in its western sense appeared for the first time in Eskisehir in 1912. The Armenian

DOI: 10.15320/ICONARP.2018.62 – E-ISSN: 2147-9380

Club established a theater in 1912, managed by Salim Bey, and it staged the works of Turkish writers. This theater was the origin of theater and cinema culture of the city with its multicultural structure (Baraz,T.,1988: 6).

In this period, many theater companies on tour staged their plays in Eskisehir, and many local theater activities were also held. Besides these, theatrical village plays continued to be a part of the cultural life in the city. Traditional Puppet Theater was also important for Eskisehir (Elmalıoğlu, E., 2006: 11).

The first quarter of the 20th century witnessed a vivid entertainment life in Eskisehir. The city was the stage for many cultural activities which cannot even be imagined today, and opera and ballet performances attracted many audiences (Atuk, A., 2002: 118).

Community Centers were established in 1932, and attached a great importance to theater. Eskisehir Community Center had a huge impact on the cultural development of the city, and Eskisehir Community Center Theater Group was a natural component in this process. The group performed many plays from 1933 to 1945. In 1933, Darülbedayi staged a play in Esksehir in its Anatolia tour. In 1934, many plays were performed in Asri (Modern) Movie Theater.

In late 1930s, there were many open air and garden theaters in Eskisehir, and in 1939, there were two plays a night, on five days a week. Theater critiques were published in a local newspaper, Kocatepe. Istanbul Municipal Theaters used to perform in Asri Movie Theater once a week, and in 1949 they started performing in Yeni (New) Movie Theater (note 1) (Elmalıoğlu, E., 2006: 13-14-15). In this period, the number of movie theaters in the city center was five, most of which were garden movie theaters (Figure 2).


Eskişehirde çocuklara parasız sinema

Eskişehir (Hususi) — Buranın Halk sineması gazetemizin 23 Nisan çocuk bayramı için İstanbul sinemalarında küçüklere mahsus tertib ettiği bedava seansları örnek alarak fakir çocuklar için bedava bir seans tertib etmiştir. Gönderdiğim resim sevindirilen yavruları sinemanın kapısında göstermektedir.

Figure 2. A newspaper report on May 2nd, 1937 *(From Y. Yastıkçı's archive)* Free screenings for children in Eskisehir

Eskisehir (Special) – Local community movie theater takes what some movie theaters in Istanbul did for April 23rd National Sovereignty and Children's Day, and organizes free screenings for poor children. The picture shows the happy children at the gate of the theater.

After the Community Center in Eskisehir was closed, the theater could not find any other place as a stage. The problem was solved by Osman Bozok, the manager of Sugar Factory, who had a theater and concert hall built in the factory campus. This hall served Eskisehir's need for many years. After it was built, Istanbul Municipal Theaters and Ankara State Theater performed there. Eskisehir Atatürk High School's Thetaer Group also staged their plays there two nights a week; and the great interest Eskisehir audience showed made it necessary to develop an entrance fee system. After the establishment of a radio by the group, radio plays were started to be broadcasted (Elmalıoğlu, E., 2006: 18).

Further contribution to the socio-cultural development of the city came from the industrial campuses in the city, namely, State Railways and Sugar Factory campuses. State Railways Social Center was opened by İsmet İnönü in 1946. It was not only a venue for artistic and cultural activities, but also a realm where modern way of life was introduced to the public. It had two indoor halls and a garden where families and groups could gather in all seasons. Bands and jazz groups started performing in Ankara and in other cities from 1946 on, and aimed at spreading modern polyphonic music culture. An arts and sports magazine, which included actual news and technical information, started to be published in 1946, and filled the gap in the realm of publishing in the region. The Social Center served the urban public, and its sports halls, movie theater, guesthouse, educational units, cafeteria and library made it a center of attraction in Eskisehir. As this lifestyle was promoted in the media, the employees of this institutions were considered to be in a high status (Yatağan, N., 2013: 160). The first established theater was started by the students of the academia in 1960s, however it was closed due to financial reasons in a few years. Many theater groups performed in the city during 1970s and 1980s, and finally in 1986, the Department of Theater in the State Conservatory, Anadolu University was established, and the city had its first educational center for theater (Elmalıoğlu, E., 2006: 172-175). Cinema festivals organized annually in Anadolu University attract the attention of not only the students but also of the citizens of Eskisehir.

Throughout the modernization process of the republican period, public institutions shared their social facilities with the entire city,

DOI: 10.15320/ICONARP.2018.62 – E-ISSN: 2147-9380

and this had a great impact on the development of the socio-cultural life. Other vivid socio-cultural facilities in the city center were independent movie theaters and garden theaters around the river Porsuk.

Garden Theaters in Eskisehir (Summer Theaters)

The first movie screenings in Eskisehir date back to 1926-1928. The garden creenings started with Cemil of Erzincan. With his mobile projector and silver screen, he screened two-three movies together in tea gardens in the evenings (Bodur, F., 1990: 203-221, Arda, E., 2005: 11-12).

Park Movie Theater (1926-1945) and Ethem Garden Theater were the first summer theaters. İbrahim Kemal built a garden theater opposite Sakarya Police Station in 1920-1930, and screened short silent films. Hasan Tozman opened Yeni Bahçe (New Garden) Movie Theater and Tozman Garden Theater on Porsuk Boulevard in 1939. (note 2). İbrahim Çanakçı founded Asri Bahçe (Modern Garden), Küçük Atlas (The Little Atlas) and Büyük Atlas (The Grand Atlas) movie theaters on Porsuk Boulevard in 1952-1953. In 1950s, Ethem Berksoy and Muharrem Rıfkı Gösteren screened movies in the tea garden where Kılıçoğlu Movie Theater used to be until recently. In 1953, İbrahim Çanakçı transformed his summer theater to a building with a capacity of 300 audiences. After this building was torn down in 1958, Kılıçoğlu Movie Theater was built in 1961 in the same spot. Çiçek Bahçe (1942), Renk Bahçe (1973-1978), Emek Bahçe (1975), Dilek Bahçe and Bahar Bahçe were the other garden cinemas on Porsuk Boulevard (Bodur, 1990, 203-221) (Figure 3).

Figure 3. Renk Bahçe Movie Theater *(Atuk's archive),* Eskisehir Yeni Newspaper, 1940, July 3rd, 1971, Sakarya Newspaper *(Yastıkçı's archive).*

The movie "Lily" with Turkish language and songs is the best movie of the year 1940, and it will be screened in the Family Summer Theater in Yalaman Island. Children under 14 will not be accepted. Movie starts at 8.30 p.m. Tickets cost 10-15 cents.

Last evening, 10672 persons watched movies in garden theaters and other movie theaters. Besides the ones on Porsuk Boulevard, many garden movie theaters were opened in many districts in Eskisehir, however they did not last long. These were Zafer Garden in Zafer District, Osmangazi Garden in Osmangazi District (established by İsmail Aydoğan, and active from 1965 to 1970),

and Seylap Garden in Seylap District (by Osman Düzenli, from 1952 to 1964). One summer theater in Tepebaşı and another in Yıldıztepe districts were run for a short time (Bodur, 1990: 203-221).

After television sets found their place in homes, garden cinemas ceased to be the socializing spots. A number of nostalgic screenings attempted to sustain the culture in recent years.

Independent Movie Theaters

The history of independent movie theaters in Eskisehir also dates back to that of garden movie theaters. The citizens' first encounter with cinema was in 1926, when silent movies were screened in the first movie theaters. Especially from 1935 to 1950, the number of movie theaters in the city increased dramatically. From 1926 to 2008, 16 movie theaters were active in the city and most of them were located in the city center.

This data is the updated information of Feyyaz Bodur's research in 1990. It was not easy to locate where the movie theaters were, since most of them did not remain in the memories of the citizens, but the information was updated by consulting the residents living nearby the spots. Information about these independent movie theaters, including their locations, their old and new photographs will be given below (Figure 4.).

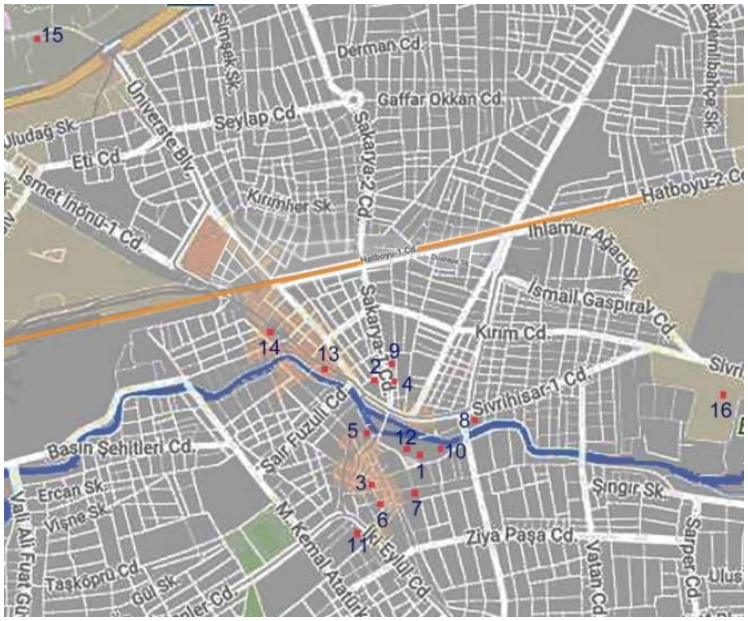


Figure 4. Number and locations movie theaters in Eskisehir from 1925 to 2008 *(Reinterpreted on Google Earth by Üstün, B., 2018)*

1. Park-Lale Movie Theater (1926-1943-unknow)
2. Asri Movie Theater (1928-2009)
3. Ethem Movie Theater (1930-1940)
4. Sizin Movie Theater (1936-1979)

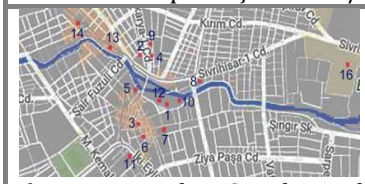
DOI: 10.15320/ICONARP.2018.62 – E-ISSN: 2147-9380

5. Yeni Movie Theater (1936-1990s)
6. Şentürk Movie Theater (1940-1941)
7. Marmara Movie Theater (1940-1979)
8. Şan Movie Theater (1951-1987)
9. Atlas Movie Theater (1952-1987)
10. Yurt Movie Theater (1954-1975)
11. Büyük Movie Theater (1955-1978)
12. Doğan Movie Theater (1957-1990s)
13. Kılıçoğlu Movie Theater (1959-2008)
14. Arı Movie Theater (1973-2000)
15. Cinema Anadolu Movie Theater (1975-today)
16. Sugar Factory Movie Theater (1950)

Park Movie Theater - Lale Movie Theater (1926-1943-unknow):

Park Movie Theater was established by Ethem Berksoy and Hasan Tozman in 1926, and it used to screen silent and short films. After it was closed, Hasan Tozman opened Lale Movie Theater in 1943 at the same place (Sıcaksular, Değirmen Street) (Bodur, F., 1990: 203-221). This region of the city was a marketplace with Turkish baths and shops. Its proximity to Köprübaşı, which can be called the city center, made the neighborhood a frequently used place in the daily life of urban dwellers. Lale Movie Theater used to screen good foreign movies, and the entrance was a long corridor from the street to the cinema hall. The hall included first-class seats, private seats and regular seats (Uluvar, B., 2006 – URL1). Today, the corridor in the entrance of the cinema does not exist, and the saloon is used as a wedding hall (Table 1).

Table 1. Park Movie Theater – Lale Movie Theater

<table>
<tr><td rowspan="4">Park Movie Theater - Lale Movie Theater</td><td colspan="2">Location: Köprübaşı District/ Sıcaksular/Değirmen Street
  
(Reinterpreted on Google Earth by Üstün, B.,)</td></tr>
<tr><td>Dates of Opening and Closing: 1926 Park Movie Theater was opened. 1943 It became Lale Movie Theater. Closing date is unknown.</td><td>Present Use
Wedding hall</td></tr>
<tr><td> 
A newspaper article from 1950s (Yastıkçı's archive)
 
Its use in 1992 (Ulutak, N, 1992)</td><td> 
The wedding hall is at the background. (Üstün, B., 2018)
 
The entrance does not exist now. (Üstün, B., 2018)</td></tr>
</table>

Asri [Modern] Movie Theater (1928-2009):

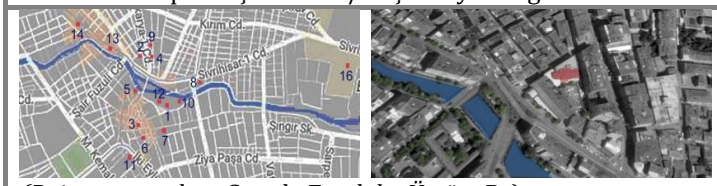
The building of Surp Yerrortutyun Church or Holy Trinity Armenian Church is located in Hoşnudiye District, which used to be an Armenian neighborhood. Armenian habitants in Eskisehir were forced to emigrate, and who remained were expelled in 1922, during the population exchange with Greece. As the church was desolated after this date (URL-2), in 1928, Hasan Tozman and Hikmet Özbil rented the building, which then was owned by state foundations and established Asri Movie Theater (Bodur, F., 1990: 203-221). It was rented from National Estate, and managed by Ethem Berksoy in 1931, by Hasan Tozman from 1932 to July 1937 and by İbrahim Çanakçı from August 1937 on. In July 1948, the building took fire, and stayed under restoration (note 3) (Arda, E., 2005: 35).

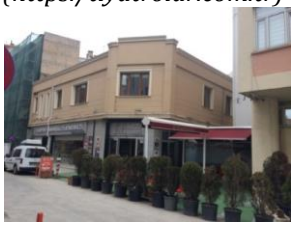
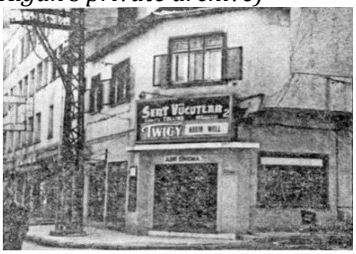
Then, the building was sold, and started working again (URL-3), managed by Hikmet Tozman in 1950, by Cahit Tozman and Kamil Tozman in 1975. While its capacity was 40 in 1965, it increased to

DOI: 10.15320/ICONARP.2018.62 – E-ISSN: 2147-9380

600 in 1990s. It was considered to be one of the luxury movie theaters in Eskisehir. It had massive audience until mid-1970s, with a mini movie theater for children which did not last long due to low demand. From 1974 on, adult movies were screened in the cinema (Bodur, F., 1990: 203-221). It was restored once again in 2009 and today it is used as Zübeyde Hanım Culture Center (URL-2). It is one-volume with a central dome. Its structure with an axis of abscissa towards east can be seen inside. Architectural unity was destructed by an addition of a balcony (URL-4). (Table 2).

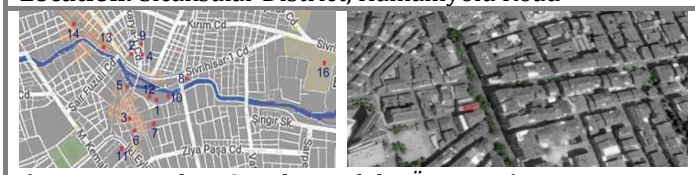
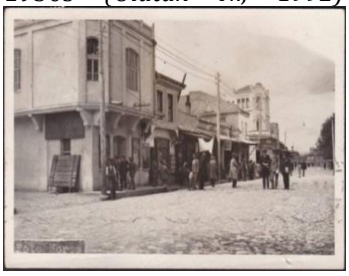
Table 2. Asri Movie Theater

<table>
<tr><td rowspan="6">Asri Movie Theater</td><td colspan="2">Location: Köprübaşı District/Hoşnudiye Neighborhood
 

(Reinterpreted on Google Earth by Üstün, B.,)</td></tr>
<tr><td>Dates of Opening and Closing
Opened in 1928.
Closed in 2009</td><td>Present Use
Culture Center</td></tr>
<tr><td> 
Surp Yerrortutyun Church or Holy Trinity Armenian Church (Algan's private archive)</td><td> 
A view from interiors of Zübeyde Hanım Culture Center in 2018 (https:/tiyatrolar.com.tr)</td></tr>
<tr><td> 
Surp Yerrortutyun Church or Holy Trinity Armenian Church (Algan's private archive)</td><td> 
Zübeyde Hanım Culture Center 2018 (Üstün, B.)</td></tr>
<tr><td colspan="2"> 
Asri Movie Theater in 1990s (Bodur, F., 1990),</td></tr>
</table>

Ethem Movie Theater (1930-1940):
Ethem Berksoy established the movie theater in Hamamyolu Road, Taşbaşı-Banka Street in 1930. It became very popular soon as it was located in a very frequently used axis in the city, which connects the region of the first settlement with a traditional urban texture, Odunpazarı with Köprübaşı the city center with Turkish baths, shops, market places, etc. After it was closed in 1940, the building was used as shops (Bodur, F., 1990: 203-221) (Table 3).

Table 3. Ethem Movie Theater

Ethem Movie Theater	**Location:** Sıcaksular District, Hamamyolu Road  *(Reinterpreted on Google Earth by Üstün, B.,)*	
	Dates of Opening and Closing: Opened in 1930. Closed in 1940.	**Present Use** Multiplex building
	 In front of the building in 1930s *(Ulutak N., 1992)*	 Shops in 1992 *(Ulutak, N., 1992)*
	 Ethem Movie Theater 1930 *(Atuk, A., Üresin H., archive)*	 Multiplex building built on the place of the old building *(Üstün, B., 2018)*

Sizin Movie Theater (1936-1979):
Wine Producer Muharrem Rıfkı Gösteren established the movie theater on Sakarya Road, at the entrance of Bayat Market place in Köprübaşı District in 1936. Silent movies were screened in the movie theater at the beginning (Feyyaz, B., 1990: 203-221). It was the smallest and the cheapest movie theater with two balconies. The ground floor consisted of cheap wooden seats. The seats on the upper balcony were made of leather. The other balcony was furnished with wide and comfortable luxury armchairs (Uluvar, B., 2006 – URL1). Peyami Kanışkan rented the cinema in 1967. In

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1979, the building was demolished, and an apartment building was built on its lot (Bodur, F., 1990: 203-221). (Table 4)

Table 4. Sizin Movie Theater

Sizin Movie Theater	**Location:** Köprübaşı District, Sakarya Road  *(Reinterpreted on Google Earth by Üstün, B.,)*
	Dates of Opening and Closing Opened in 1936. Closed in 1979.
	Present Use Multiplex office building
	 A view of its entrance *(Ulutak, N., 1992)*
	 The apartment house built in 1992 *(Ulutak, N., 1992)*
	 A recent view

Yeni Movie Theater (1936-1990s):

Hasan Tozman established Yeni Movie Theater on Porsuk Boulevard in 1936. The upper floors of the building were used as a hotel. It was managed by Çetin Tozman, Hikmet Tozman, Ethem Arda (in 1977) and Mustafa Öztürk. The saloon was also used for theater and music performances besides screenings. Its capacity was 650 seats, 250 being on the balcony. The first color film was screened in Yeni Movie Theater in 1940 (Bodur, F., 1990: 203-22). (Table 5).

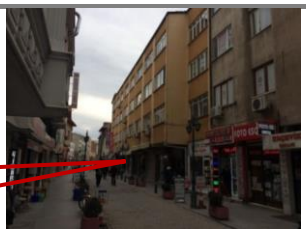
Table 5. Yeni Movie Theater

Yeni Movie Theater	**Location:** Köprübaşı District, Porsuk Boulevard   *(Reinterpreted on Google Earth by Üstün, B.,)*	
	Dates of Opening and Closing Opened in 1936. Closed in 1990s.	**Present Use** Multiplex Office building
	 Yeni Movie Theater (from the social media account *("Adı eski-ruhu genç Eskişehir")*	 A recent view (Üstün, B., 2018).

Şentürk Movie Theater (1940-1941)

Hasan Avar opened Şentürk Movie Theater in 1940 on Kıbrıs Şehitleri Road near Hamamyolu Road. It was used for theater performances in the evenings, and movie screenings during daytime. It lasted only 6-7 months. Today, Sipahi Office Building occupies its lot (Bodur, F., 1990: 203-221) (Table 6).

Table 6. Şentürk Movie Theater

Şentürk Movie Theater	**Location:** Kıbrıs Şehitleri Road behind Hamamyolu   *(Reinterpreted on Google Earth by Üstün, B.,)*	
	Dates of Opening and Closing Opened in 1940. Closed in 1941	**Present Use** Office building
	As it worked for a very short period, its archival images cannot be found. Sipahi Office Building in 2018 *(Üstün, B.,*	

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Marmara Movie Theater (1940-1979):
After Ethem Movie Theater was closed, son of its manager Ethem Berksoy, Dr. Süleyman Berksoy opened Marmara Movie Theater very close to his father's movie theater on Asarcıklı Road. It was a popular cinema due to its location: Hamamyolu tradesmen and Odunpazarı families frequented the place. After 40 years of mostly Turkish movie screenings, it was closed in 1979 (Bodur, F., 1990: 203-221). Prof. Dr. Nazmi Ulutak interviewed its projectionist İlyas Cankılıç for his research in 1992. Cankılıç claims that the first female projectionist of Turkey worked in Marmara Movie Theater (Table 7).

Table 7. Marmara Movie Theater

Marmara Movie Theater

Location: Sıcaksular District, Asarcıklı Road

(Reinterpreted on Google Earth by Üstün, B.,)

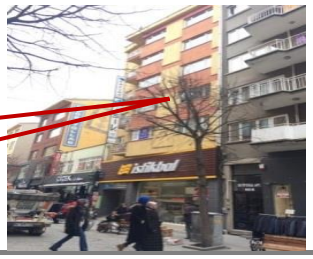
Dates of Opening and Closing
Opened in 1940.
Closed in 1979.

Present Use
Apartment House

Cankılıç claims that the first female projectionist of Turkey worked in Marmara Movie Theater *(Ulutak, N., 1992)*

Apartment house built in 1992 *(Ulutak, N., 1992)*

A recent view *(Üstün, B., 2018)*



Altay – Halkın – Şan and İkizler Movie Theaters (1951-1987):
Dr. İsmail Altay established it in 1951 as Altay Movie Theater on Sivrihisar Road. Fuat Rutkay, the manager of Halk Film run it under the name of Halkın Movie Theater, and Baki Üsküdarlı of Şan Movie Theater in Istanbul and Ethem Arda run it as Şan Movie Theater. Finally İsmail Aydoğan run it as İkizler Movie Theater

until 1987. The building was demolished and became a car park (Bodur, F., 1990: 203-221).(Figure 5) (Table 8).


Bugün Nereye Gitmeli?

SİNEMALAR

Kılıçoğlu Tel: 2063 — Yahşi Yol, Jane Fonda T.

Yeni Tel: 1384 — Milady'nin İntikamı R.T.S.

Asri Tel: 1409

Lâle Tel: 1764 — Ölmeden Gömülenler, Ray M. Hand

Atlas Tel: 1483 — Şehirdeki Yabancı, G. Armey

Şan Tel: 2128 — Kiralık katil G. Armey, Ayrı Dünya Y. Duru L. Sayar

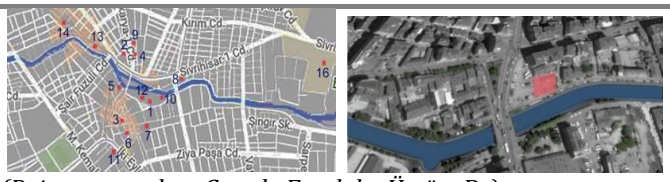
Sizin Tel: 1244 — İnsan Avı, R. Hughes R.T.

Yurt Tel: 2770 — Kurnaz Fatih R.T.S., Merhamet T.

Kısaltmalar: R: Renkli T: Türkçe Fr: Fransızca İ: İngilizce A: Almanca

Figure 5. March 27th, 1973, Şehir Newspaper *(Yastıkçı's archive)*

Table 8. Halkın-Şan-İkizler Movie Theater

Halkın – Şan and İkizler Movie Theaters	**Location:** Sivrihisar Road	
	 *(Reinterpreted on Google Earth by Üstün, B.,)*	
	Dates of Opening and Closing Opened in 1951. Closed in 1987.	**Present Use** It became a gas station and parking garage. Now it is a parking lot.
	It was popular especially in 1960s, but no image of those times could be accessed.	 Gas station in 1990s *(Ulutak, N., 1992)*  Present parking lot *(Üstün, B., 2018)*

Atlas Movie Theater (1952-1987):

Atlas Movie Theater was opened on Sakarya Road in 1952 by İbrahim Çanakçı. Until 1958, it was known as Eski Atlas (Old Atlas), and in 1959 it was restored to be run as Atlas. It was run by Şükrü Pişiren from 1962 to 1967, by İsmet Bey from 1967 to 1968, and İsmail Aydoğan from 1968 to 1969. It remained inactive for years, and after a short period of screening again, it was finally closed in 1987 (Bodur, F., 1990: 203-221). (Table 9).

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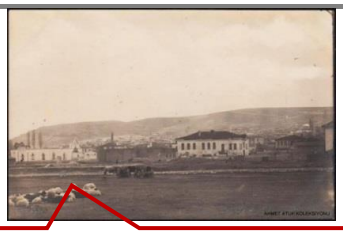
Table 9. Atlas Movie Theater

Atlas Movie Theaters	**Location:** Köprübaşı District/ Sakarya Road  *(Reinterpreted on Google Earth by Üstün, B.,)*
	Dates of Opening and Closing Opened in 1952. Closed in 1987.
	Present Use Office building.
	 In 1980s *(Bodur, F., 1990)*
	 A recent view *(Üstün, B., 2018)*
	 In 1990s, the building was restored to be an office building *(Ulutak, N., 1992)*

Yurt Movie Theater (1954-1975):

Ahmet Atuk claims that Yurt Movie Theater was built in 1954 on the lot where Greek Orthodox Church once was, while Prof. Dr. Ertuğrul Algan asserts that it was Saint Croix French College (Atuk, A., 2002: 110; interview with Prof. Dr. Ertuğrul Algan in February 2018) (Image 12). After the Greek burned and left the city, the church remained in ruins until 1950s. Emin Sazak bought the building from the National Estate (Arda, E., 2005: 49). Bican Toker, Sazak's son in law hired Muharrem Zeytinoğlu to design the new building. The movie theater was on İki Eylül Road, by which summer movie theater Yurt Bahçe Garden Cinema also was run. In 1975, the building was demolished and office and apartment buildings were built in the same lot. Yurt Movie Theater used to have two lounges, one at the entrance and one on the first floor. It was the most comfortable movie theater of its period (Uluvar, B., 2006, URL-1, Bodur, F., 1990). (Table 10)

Table 10. Yurt Movie Theater

Yurt Movie Theater	**Location:** Hamamyolu District, İki Eylül Road   *(Reinterpreted on Google Earth by Üstün, B.,)*	
	Dates of Opening and Closing Opened in 1954. Closed in 1975.	**Present Use** Offices and apartment building
	 Walls of Saint Croix Church, burned and demolished by the Greek before they left the city in 1922 *(Atuk, A., private archive).*	 Yurt Passage and Apartment Building *(Ulutak, N., 1992).*
	 A photo taken in front of the cinema built on the spot where the church once was. *(Ulutak, N., 1992)*	 A recent view *(Üstün, B., 2018)*

Büyük (Grand) Movie Theater (1955-1978)

It was opened on the small peninsula where Akarbaşı Stream met Porsuk River in 1955. The garden was accessed by a bridge. It was the largest movie theater in 1950s. Although it did not have a balcony, there were two lodges at the back of the hall and on the second floor. It often screened Turkish movies, and it also had a summer garden by the hall. After the cinema was closed in 1978, it was used as a market, and now it functions as a store. The interiors have changed dramatically (Uluvar, B., 2006 ,URL-1, Bodur, F., 1990). (Table 11)

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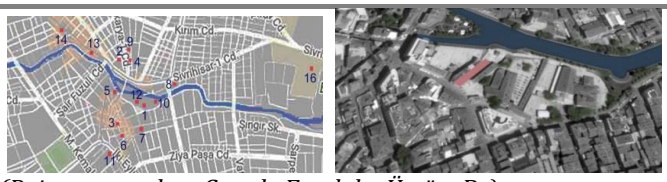
Table 11. Büyük Movie Theater

Büyük (Grand) Movie Theater	**Location:** Köprübaşı District/Sıcaksular	
	  *(Reinterpreted on Google Earth by Üstün, B.,)*	
	Dates of Opening and Closing Opened in 1955. Closed in 1978.	**Present Use** Store
	 Recent view *(Üstün, B., 2018)*	 Recent view *(Üstün, B., 2018)*

Doğan Movie Theater (1957-1990s):

Doğan Movie Theater was on a dead end so close to Lale Movie Theater, a passage connecting them (Uluvar, B., 2006, URL-1). It was opened by İsmail Aydoğan in 1957, and run by Rahmi Kanışkan from 1968, and by Aydoğanlar family from 1970 on. In 1963, it was restored. After 1975, the erotic movie rush made it a very popular movie theater, with seven-eight thousand audiences perweek (Bodur, F., 1990: 203-221). It was closed, and the building was demolished in 1990s. (Table 12)

Table 12. Doğan Movie Theater

Doğan Movie Theater	**Location** Köprübaşı District/ Sıcaksular	
	 *(Reinterpreted on Google Earth by Üstün, B.,)*	
	Dates of Opening and Closing: Opened in 1957. Closed in 1990s.	**Present Use** Vacant lot
	 Doğan Movie Theater in 1990s *(Bodur, F., 1990)*	 Vacant lot today *(Üstün , B., 2018)*

Kılıçoğlu Movie Theater (1959-2008):

Abidin Mortaş, the architect designed the building, and the cinema was opened in 1959. (note 4). The building was designed as an attached plan on the large plot, its front façade facing İsmet İnönü (Doktorlar) Road, and rear facade facing Porsuk River. It used to function as movie theater, office building and apartment building. The movie theater was below the office building part, on the side of Porsuk River. On the ground floor, below the apartment part, there used to be a passage which connected the road with the riverside, and functioned as an entrance to both the offices and the cinema (Karasözen, Rana & Koca, Güler, 2010: 200). It was run by Ethem Arda, one of the most experienced cinema managers of Eskisehir. It was the most innovative cinema of Eskisehir, in terms of the technical equipments, and the movies screened. It also functioned as a theater stage and a concert hall. After years it had one large hall, it was divide into three small saloons, as the number of audiences decreased in time (Tutal, O., URL-5).

Kılıçoğlu Movie Theater transcended a regular movie theater: It used to be the meeting point for the citizens. Campaign were organized to stop its destruction, but the cinema was closed in 2008, and evacuated in 2009. Today, Yalçın Kılıçoğlu Plaza is in the process of construction at the plot. (Table 13)

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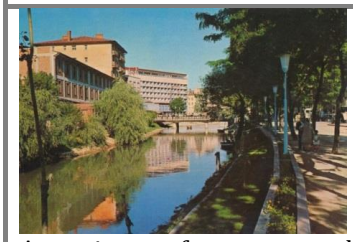
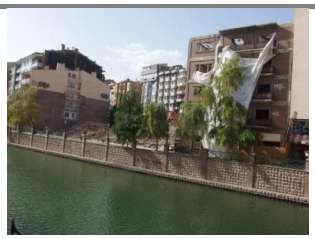
Table 13. Kılıçoğlu Movie Theater

Kılıçoğlu Movie Theater	**Location** Köprübaşı District/ Doktorlar/İsmet İnönü Road	
	  *(Reinterpreted on Google Earth by Üstün, B.,)*	
	Dates of Opening and Closing Opened in 1959. Closed in 2008.	**Present Use** Plaza under construction
	 A view from porsuk Boulevard in 1960s *(Algan, E., private archive)*	 Building demolished in 2010 *(Algan, E., private archive)*
	 Entrance on Doktorlar Road in 1990s *(Bodur, F., 1990)*	 View of Yalçın Kılıçoğlu Plaza from Porsuk Boulevard, 2018 *(Üstün, B., 2018)*

Arı Movie Theater (1973-2000s):

It was opened by Şenol Özgür on İstasyon Road in 1973. It was run by Mustafa Öztürk and Ali Akyüz from 1976 on, by Ali Akyüz and Hasan Ekici from 1981 on, and Rıza Karataş from 1989 on. The cinema with a capacity of 1100 seats was also used for theater plays and concerts (Bodur, F., 1990: 203-221). The movie theater which was located on the basement and ground floors of an apartment building was closed in 2000s. (Table 14)

Table 14. Arı Movie Theater

Arı Movie Theater	**Location** Doktorlar/İsmet İnönü Road  *(Reinterpreted on Google Earth by Üstün, B.,)*	
	Dates of Opening and Closing Opened in 1973. Closed in 2000s.	**Present Use** Office building
	 Arı Movie Theater in 1990s *(Bodur, F., 1990)*	 Arı Movie Theater in 2018 *(Üstün, B., 2018)*

Besides the fourteen independent examples mentioned above, many public institutions built movie theatres in their campuses. One movie theater is known to exist in Turkish Railways facilities, and another in Central Command Headquarters once used as Officer's Club, in the military lodgements. Two of the movie theaters, as mentioned in the introduction of the present study, played a significant role in the socio-cultural life of the city: Cinema Anadolu in Anadolu University, and Movie Theater in Eskisehir Sugar Factory Campus.

Cinema Anadolu (1975-today):

Cinema Anadolu was opened in Yunusemre Campus in 1975. It has a capacity of 400 seats, and it frequented not only by university students but also urban dwellers. The hall functions as theater stage, concert hall and meeting hall (Bodur, F., 1990: 203-221) (Table 15). Throughout its active use since the day it was opened, Cinema Anadolu also hosts the film festival of the university, and attracts citizens of Eskisehir.

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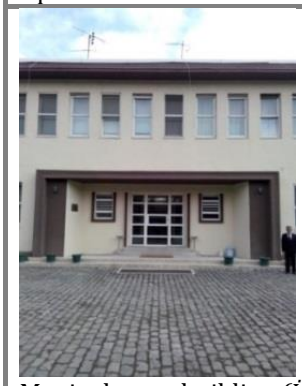
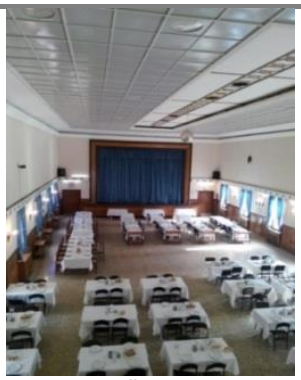
Table 15. Cinema Anadolu

Cinema Anadolu	**Location :**Anadolu University Campus	
	  *(Reinterpreted on Google Earth by Üstün, B.,)*	
	Dates of Opening and Closing Opened in 1975. Still in use.	**Present Use** Active
	 Cinema Anadolu in Yunusemre Campus *(Üstün, B., 2018)*	 *(http://www.beyazperde.com/dosyalar/sinema/dosya-4456/)*

Eskisehir Sugar Factory Movie Theater (1950-today functions as cafeteria):

The movie theater building in the social facilities in Sugar Factory Campus remains today without major alterations. In 1950s, it used to screen movies once a week for the officers, and once a week for their children, on Sundays (Arda, E., 2005: 51) (Table 16). It is an important place, as it served as a theater stage to all the citizens in a period when all theaters were closed in the city. The acoustics and lighting details were designed by German engineers, and the building has a balcony on the upper floor. The hall and the balcony now functions as the cafeteria of the guesthouse. The stage and the silver screen is protected.

Table 16. Eskisehir Sugar Factory Movie Theater

Eskisehir Sugar Factory Movie Theater		
	Location Eskisehir Sugar Factory Campus	
	  *(Reinterpreted on Google Earth by Üstün, B.,)*	
	Dates of Opening and Closing Opened in 1950.	**Present Use** Cafeteria
	 Movie theater building *(Üstün, B., 2016)*	 Interiors *(Üstün, B., 2016)*

CONCLUSION AND EVALUATION

The table 17. demonstrates the active years of the movie theaters in Eskisehir. The first movie theaters were opened in the republican period, and many new ones followed in 1935 and 1950s. As these buildings functioned as theater and concert halls, they played a significant role on the cultural life of Eskisehir.

1970s came with the advent of technologies such as television and video, which altered the cultural habits dramatically. While families used to dress up and gather together to meet others and socialize in movie theaters before, cinema culture became an individual indoors activity.

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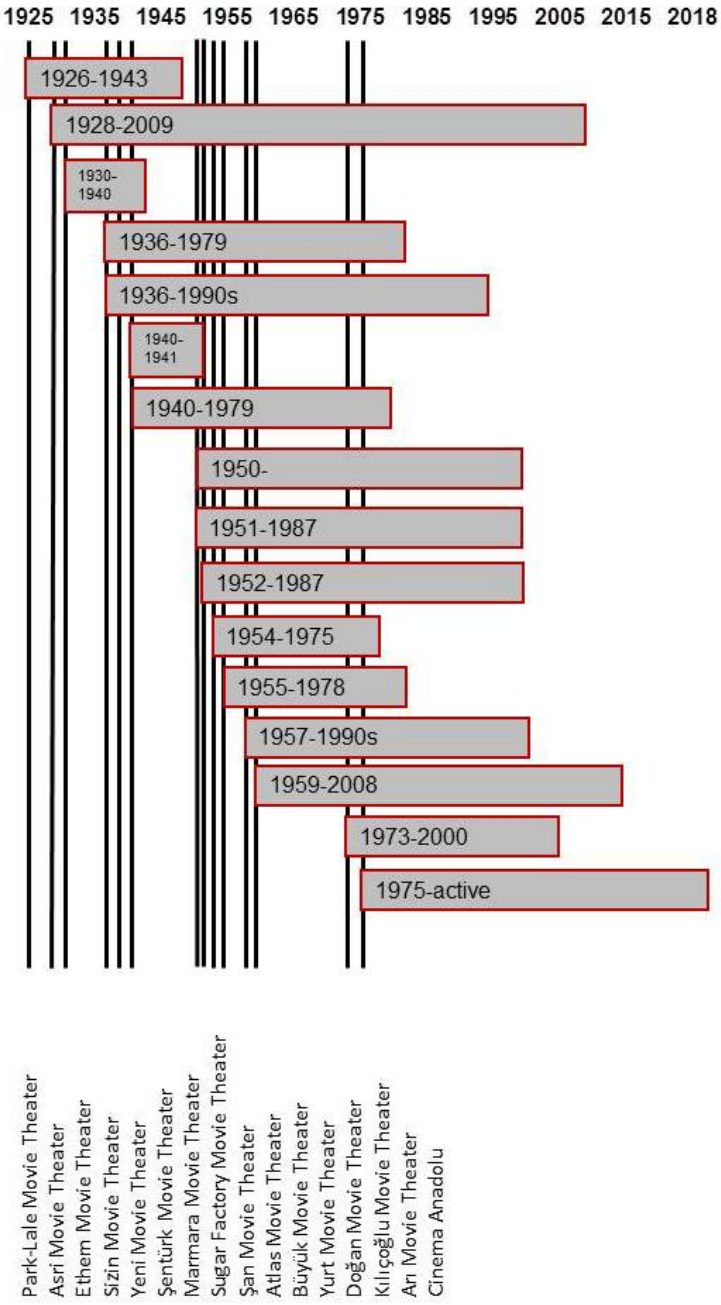
Table 17. The active years of the movie theaters in Eskisehir.



This transformation in media technologies, which allowed the activity of watching movies in other places than cinemas made socialization in cinemas extinct. The transformation of consumption habits and spaces also transformed the forms of cultural consumption. Movie theaters lost their functions, and got into a process of transformation with the impact of the capital. Independent movie theaters ceased to exist, and multi-saloon cinema complexes in the shopping malls appeared.

Global and local aspects of this transformation appeared in Eskisehir in fast phase, from 2007 on. As the first shopping mall,

Kanatlı was opened in the city, Kılıçoğlu Movie Theater, which was the last surviving movie theater, closed in 2008. Now, the only movie theaters of the city are in Kanatlı, Özdilek and Espark shopping malls.

Today, the only independent movie theater is Cinema Anadolu. As technology and consumption transformed, cinema spaces of the modernization process in the republican period lost their architectural variety, and became an object of consumption.

The present study attempts to record and document the transformation of movie theater buildings of the modern republican period in Eskisehir. It focuses on the spatial change in the city, which also alters the quality of urban everyday life.

NOTES

1. In a report to USA Ministry of Foreign Affairs in 1933 it is claimed that "most of the movie theaters are in big cities such as Istanbul, Ankara, Izmir, Adana, Bursa and Eskisehir; cities in Black Sea region, and in rich agricultural areas around Izmir" (as cited in Eugene M. Hinkle, Modern Türkiye'de Sinema, Kebikeç, 28/2009, 98). "The Motion Picture in Modern Turkey", A report to USA Ministry of Foreign Affairs dated August 1st, 1933 (Edited with an introduction by Rıfat N. Bali, The Turkish Cinema in the Early Republican Years. Istanbul: The Isis Press, 2007)
2. Many garden movie theaters with various volumes were opened on Porsuk Boulevard until the year 1978. The River Porsuk and its surroundings have many names. Many citizens call it Yalaman's Island, Islands, Riverside, and etc. The spot is associated with entertainment and leisure. Now, there is no summer theaters left (Atuk, A., 2002: 122). Amusement parks were also built in the area in the past. Now, a hypermarket occupies the lot where summer theater and amusement park once was.
3. Ethem Arda writes the following on the fire in the building: *"On July 2nd, I was working in Bahçe Movie Theater, and Remzi Kamış was in Asri Movie Theater. I went to Bahçe at 8 p.m., and started the evening screening at 9.15 p.m. I do not know when, a worker came running, and told me that the cinema was in fames. He was in a shock. I had nothing to do. It was not possible to cancel the screening in Bahçe, since it was stuffed with audiences. After the screening was over and I went to the building, I saw that it was horrible. The fire was extinguished by the fire service, the building was in smoke. The boss and the chief projectionist Yorgo were not there. They told me that Remzi the projectionist's body was burned, and 26 more were in the hospital. Remzi died in two days. The building was restored in two months* (Arda, Ethem, 2005: 34).

DOI: 10.15320/ICONARP.2018.62 – E-ISSN: 2147-9380

4. Tutal claims that the architectural character of the building*:*

"…….with its balconies on the apartment part, horizontal and vertical construction units, and the spatial impact of the fringe over the balconies, is very similar to other modern buildings, especially those designed by Abidin Mortaş, such as Nur Movie Theater and Hotel. Both building seem to use similar fringes, balconies, windows and doors of the balconies, however, the use of bricks produced by the client provides Kılıçoğlu building with a rich composition of materials, colors and textures" (Tutal, O., URL-5).

REFERENCES

Akçura, G. (2004*), Aile Boyu Sinema*, İstanbul:İthaki Yayınları

Arda, E. (2005), *Sinemanın Büyüsü,* Eskişehir:Uğur Ofset

Atuk, A. (2002), *1001 Eskişehir*, Eskişehir:Onur Matbaacılık

Baraz, T. (1988), *Başlangıçtan Günümüze Eskişehir Basını (1980-1986*), Anadolu Üniversitesi Açık Öğretim Fakültesi Yayınları, No: 134

Bodur, F. (1990), Eskişehir Sinemalarının Dünü Bugünü, *Kurgu Anadolu Üniversitesi İletişim Bilimleri Fakültesi Uluslararası Hakemli İletişim Dergisi,* Eskişehir, Sayı 8:203-221

Efe, A. (1998*), Eskişehir Demiryolu,* Anadolu University, Social Science Institute, Master Thesis, Eskişehir

Erkılıç, H. (2009), Düş Şatolarından Çoklu Salonlara Değişen Seyir Kültürü ve Sinema, *Kebikeç Dergisi*, Yıl 14, Sayı 28:143-162

Hauser, A. (1984), *Sanatın Toplumsal Tarihi*, çev: Yıldız Gölönü, İstanbul:Remzi Kitabevi.

Hinkle, E., (2009), Modern Türkiye'de Sinema, Kebikeç Dergisi, Yıl 14, Sayı:28:91-102

Jarvie, I. C. (1970), *Towards a Sociology of the Cinema*, Rutledge & Kegan Paul.

Karasözen R. &Koca, G. (2010), 1945–1960 Dönemi Eskişehir Modern Kent Merkezinin Oluşumunda Öne Çıkan Yapılar**,** *Anadolu Ünv.Sosyal Bilimler Dergisi*, Cilt 10, Sayı 3:191-211

Kırel, S. (2005). *Yeşilçam Öykü Sineması*. İstanbul: Babil Yayınları.

Kırlı, E. (2001)**,** *19.ve 20.Yüzyılda Eskişehir'e Yapılan Göçler*, Osmangazi University, Social Science Institute, Master Thesis, Eskişehir

Prof.Dr.Ertuğrul Algan ile görüşme yapılmıştır (Şubat 2018)

Sarıöz, P. (1997), *Bir Zamanlar Eskişehir,* Eskişehir:Esbank Yayınları

Ulutak, N. (1988), *Belgesel Sinemanın Temel Özellikleri ve Tarih Felsefesi Açısından Belgesel Sinemada Gerçeklik,* Anadolu

University, Social Science Institute, Doctoral Thesis, Eskişehir

Yatağan, N. (2013), *Cumhuriyet Dönemi Endüstri Yapıları ve Modernleşme İlişkileri Üzerine Bir İnceleme:Eskişehir Tülomsaş Yerleşkesi*, Dokuz Eylül Ünversity, Institute of Science, Master Thesis, İzmir

URL-1 Uluvar, Behçet, 2006, Eskişehir'in Eski Sinemaları, (http://wowturkey.com/forum/viewtopic.php?t=34862), (Mayıs 2017)

URL-2 https://tr.wikipedia.org/wiki/Eskişehir_Surp_Yerrortutyun_Kilisesi (Eylül 2017)

URL-3 https://tr.wikipedia.org/wiki/Eskişehir_Surp_Yerrortutyun_Kilisesi (Eylül 2017)

URL-4 http://eskisehirkulturenvanteri.gov.tr/anitdetay.aspx?ID=165 (Eylül 2017)

URL-5 Tutal, O., http://www.boyutpedia.com/1618/69322/kilicoglu-sinemasinin-gelecegi (Aralık 2017)

Resume

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DOI: 10.15320/ICONARP.2018.62 – E-ISSN: 2147-9380

Research Article

ICONARP
International Journal of Architecture & Planning
Received 15 Jul 2018; Accepted 16 Dec 2018
Volume 6, Issue 2, pp: 461-481/Published 28 December 2018
DOI: 10.15320/ICONARP.2018.63–E-ISSN: 2147-9380

ICONARP

The Importance of Iconic Buildings for City Image: Konya Science Center Example

Emine YILDIZ KUYRUKÇU*

Abstract

Science centers are experimental and applied places that are designed to pave the way for people from all age and with different knowledge to learn the information from the source and to trigger their interest towards science. Science centers convert science into an education in an entertaining manner. Moreover, science centers can be defined as places that exhibit history and culture of the geography that are present in addition to their contribution to science, while being places where science and art are merged to each other in harmony. In recent period, scientific events may create attraction for cities in addition to cultural events, Science centers, where education is found together with entertainment, are now becoming more and more popular in the world and they can sometimes serve as an important focal point of the city by attracting more visitors from certain museums. It is seen in recent period that science centers are being designed as iconic buildings with the purpose of creating attention with their different architecture. Science centers, which are designed as iconic buildings with their interest and curious architectural designs, create a new attraction point by drawing tourists to the city along with the educational activities.

The aim of this study is to reveal the opinions of the architect in the design of Konya Science Center, to analyze the relationship established by the

Keywords: Science centers, icon building, iconic science center, identity of center

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building with the city, its scale with surrounding texture and human, the access to building, its form, material, technology and its spatial presentation to determine whether it is an iconic building or not. For this purpose, science centers' design purpose and their importance for the city are explained firstly, then examples across the world are given. Observations and interviews are made, photographs of the building are taken and any kind of written and drawn resources are utilized in order to determine whether the selected building is in accordance with the definition "iconic building".
As a result, it is determined with this study that Konya Science Center is "an icon building" for the city in parallel with the developing trends in design and construction technology fields in general terms after its analysis in architectural terms. It is hope that Konya Science Center that is featuring icon building will be attention center for Konya city after Mevlana Museum because of owing to its different form, material selection, building and Leeds certified sustainable building.

INTRODUCTION

Science centers, which were established in order to make science more popular among wide masses and where education and entertainment were found together, started to give service in 1960's. Science centers are places where entertainment and education stand together and allow visitors to make examinations just like a real scientist (Weitze, 2003). Science centers, which try to introduce science to non-specialized people in order to make it more popular Persson (2000a), are places where ideas in the world are discovered, researched and tested. It addresses to people from all age groups, culture and educational levels, it satisfies their curiosity, gives response to their questions, ensures their active participation to experiments and allows them to explain the things they learn to other people. Visitors repeat experiments in an interactive environment at science centers and understand thinking like a scientist (Weitze, 2003). With these exhibitions, which transfer information not with classical methods, but with visual, audial, interactive mechanisms that address to emotions, visitors experience scientific facts in an interactive way with computer programs, mechanical and electronic mechanisms, even with simple wooden toys sometimes. It is seen that science centers have unique features of the region they are present within their building, therefore it becomes easier for local visitors to identify science by themselves, while chances are offered for foreign visitors for getting idea about the identity of the city.

In competition conditions that increase depending on the global developments, cities try to differ themselves from other similar cities and be more preferable by this way. In order to develop their images, cities are pushed towards warning city development,

DOI: 10.15320/ICONARP.2018.63 – E-ISSN: 2147-9380

while having pressure towards producing creative solutions to attract more investors and visitors (Richards and Wilson, 2004). One of these solutions is "iconic building" design in the city. Iconic buildings can be defined as symbol buildings, icon buildings, city icons as well. The common quality of iconic buildings is the condition that they become icon of the city, region or country, where they are present. They are the buildings that make people refer to the space they are present with the name of the iconic building (Avcı, 2015; Ateşoğlu, 2008). These buildings draw attention with their designs, concepts or technologies that are used. By attracting the attention of many individuals, buildings draw more visitors to the place. In terms of Iconic buildings, we see their examples in many cities, they provide many contributions to the city they are present in socio-cultural and economic terms.

In addition to cultural events, scientific events also create attraction for cities as well and science centers can be designed as iconic buildings. Science centers, which offer the possibility to visitors of experiencing science as "iconic building" by having values like visibility, transparency together with different dimension, architectural buildings, material selections with many different examples in the world, that are becoming more and more popular in the world and may become an important focal point of the city.

Scientific and Technologic Research Council of Turkey (TÜBİTAK) made the first official project call in 2008 in order to support science center studies in our country. Konya Science Center, which is a project of Konya Metropolitan Municipality, is the first project of this call. Within the scope of this study, Konya Science Center is selected as the example field and it is analyzed in architectural terms whether it carries the quality of "iconic building".

DEFINITION OF SCIENCE CENTER

According to ASTC, science centers can be defined as a place where visitors are connected with science, given curiosity, wonder, encouragement, and first-hand experience, and provided lifelong learning. Emphasizing the social aspect of science centers, Rennie and McClafferty (1995) proposed their definition as a social event having strong affection on behavior and learning. Another important characteristic of science centers is that they are informal learning environments, where learning and entertainment mix together (Weitze, 2003), by allowing visitors to touch, play, and experiment with the exhibits (Quin, 1990). Science centers;

- give a chance to everyone to try experiments (Persson, 2000b; Falk & Dierking, 1992).
- provide people to participate in experiments actively, and use all their senses (Weitze, 2003).
- make people notice effectiveness of science for a society; and improve public awareness of science (Rix and McSorley, 1999).
- provide "exploration of scientific and technological phenomena" (Quin, 1990).
- provide students an entertaining environment less formal than a classroom (Lucas, 1983; Ramey-Gassert L., 1996).
- "can provide hands-on, exploratory science learning in a non-evaluative, relaxed context by offering science through real-world objects and natural phenomena" (Ramey-Gassert L., 1997).
- provide social interaction that was essential source of satisfaction in science center visits and peer-teaching for students (Carlisle, 1995 as cited in Rennie & McClafferty, 1996).
- provide teachers to discover the interactive presentation techniques presented in science centers (Lucas, 1983).
- promote interest and curiosity, and make people notice how the world works (Russell, 1990).
- make a great deal of contributions to the affective domain of the students which includes generating wonder, enthusiasm, excitement, motivation, interest, awareness, and attitudes that affect their learning (Gammon, 2008; Rennie & McClafferty, 1995; Wellington, 1990).

DEVELOPMENT PROCESS OF SCIENCE CENTERS IN THE WORLD

The developments of science museums in the last two centuries can be summarized as follows (Hannu, 1993);

Science Centers in 19th Century

The oldest science center was the center that was formed by Francis Bacon (1561-1626) with empirical scientific method. This classification created the main ideology of science centers and Ashmolean Museum, which was established inside Oxford University in 1683, is considered as the first science museum. The history of the nature is being exhibited at this museum. The first large-scale science and technology museum is Musee National des Techniques museum that was opened in Paris in 1799. The museum aimed to explain science and technology to teachers, students and public. In addition, various scientific tools and devices, along with their theories and working principles are

DOI: 10.15320/ICONARP.2018.63 – E-ISSN: 2147-9380

shown systematically at London Science Museum, which was established in 1857. In those years, Franklin Institute in Philadelphia and Smithsonian Institution in Washington were established in the U.S.A. with great efforts.

Science Centers in 20th Century

Deutsches Museum, which was founded with the efforts of Oscar Von Müller in 1903, formed a modern example of science centers. At this museum, interactive exhibitions that can be touched and experienced by visitors were placed emphasis. Moreover, Planetarium that was opened at the museum in 1925 was the first example of its kind. Museum of Science and Industry in Chicago is the first science museum established in the U.S.A. with the quality of a German Museum. The first full-scale Science and Technology Museum in the U.S.A. was The Henry Ford Museum that was founded in 1929. Following this museum, New York Museum of Science was established in 1935. The Palace of Discovery that was founded in Paris in 1937 was a building with the first modern science center identity. Different than the exhibitions at Deutsches Museum and Museum of Science and Industry in Chicago, modern science and technology was explained at the main level at this center along with efforts to provide contribution to education with various interactive exhibitions.

In 1950's, fast technical developments in industrial society had great impact on developments at interactive science museums and this change at science museums gained pace in 1960's. Exploratorium that was opened in San Francisco in 1969 and Ontario Science Center that was opened in Toronto the same year were new corporations where learn by experience approach was fully applied on exhibitions.

In today's world, there are more than 3.000 science centers. The annual visitor number of these centers exceeds 200 million. One out of every three people in the USA goes to science center at least once a year. Almost all of the science centers become dense in developed countries like America, Japan and Europe. There are scarcely any in developing countries. India is an exception and today there are close to fifty science centers in India.

THE IMPORTANCE OF ICONIC BUILDING FOR CITY IMAGE

The image of a city is usually very important in attracting visitors. One of the most efficient factors in the establishment of city icons throughout the history are the buildings the iconize that city. Architectural icons create the image of the city and cities differ from each other and remembered with these icon buildings. Icon buildings are the most dominant elements of city icons and they

act as an indispensable part of cities. Over the last few decades the term "iconic" has entered common usage for those in and around architecture with a considerable overlap into the mass media. What does it mean to say that a building or a space or an architect is 'iconic'?

Icon is an image, figure, or representation; a portrait; an illustration in a book; image in the solid; a statue. Iconic buildings are mostly considered as symbols that represent the city or country they are built in. But they are not to be confused with monuments; which are buildings that have a historic value or a connection to the history or culture of place or person. Iconic buildings in general, are noticeably different, in terms of design, size, visual appeal, urban fabric, building style etc. they have an impact on people and the place in which they are built. Their lasting impression is what makes them iconic. Iconic architecture is so unique it is associated with and becomes one of the symbols of a place.

Iconic buildings are the ones that have their place in social memory and acted as centers of attentions throughout the history. They carried importance with their qualities like being religious, functional, etc. they had in their time, then they became icons through time (Lökçe 2003). Architectural icons like Eiffel Tower, Taj Mahal, Pisa Tower recall the cities they are found, while being defined on our minds as city icons. (Maralcan, 2006).

Figure 1. Eiffel Tower-Paris/France and Taj Mahal-Agra/India (*URL-1; URL-2*).

These buildings, which are powerful icons that are created on social memory, have been center of attention for humanity from past to today's world. (Ekenyazıcı, 2005; Engez, 2007). In fact, these buildings became more popular than the cities they are present. One of them is Sydney Opera House in Australia. Sydney's most famous icon, acclaimed as one of the most outstanding buildings of the 20th Century. Designed by Danish architect Joern Utzon, and taking 14 years to complete, he resigned mid-way through construction due to political interference, never to return. The Opera house building is seen as icon of Australia by its formal design. The unique style of the building comes from pure curving

DOI: 10.15320/ICONARP.2018.63 – E-ISSN: 2147-9380

shapes that across the harbor in great heroic harmony that represents a masterpiece of modern architectural design, engineering and construction technology in Australia and also Since opening its door in 1973, the Opera House has become a symbol of modern Australia and one of the country's major tourist destinations (Figure 2).

Figure 2. Sydney Opera House, Sydney/Australia, Joern Utzon, 1973 (*URL-3*).

Cities need to find new ways because of distinguishing themselves from their competitors. As Paddison (1993) points out, city marketing is often directed at the levering of private capital to support infrastructural developments. For example, icon buildings frequently feature in urban strategies to develop an image or 'brand' and create competitive advantage, often at great financial cost. Recent examples include the Bilbao Guggenheim museum, Australia the Tate Modern gallery in London and the Baltic Flour Mills in Gateshead.

After the Guggenheim Museum opened museum makes a significant economic contribution to the city's economy and this called in literature the "Bilbao Effect". The Guggenheim museum Bilbao which is a museum of modern contemporary art, designed by Canadian architect Frank Gehry, built by Ferrovial, is located in Bilbao Basque Spain. The museum is designed and covered with glass, titanium and limestone. When we consider material usage of the building it indicates the technology usage. The curves on the exterior of the building were intended to appear random; "the architect said that the randomness of the curves is designed to the catch the light." The museum building is an icon of the city Bilbao Every year millions of tourists are coming to see Bilbao (Figure 3).

Figure 3. Guggenheim Museum, Bilbao/Spain, Frank Gehry, 1997 (*URL-4*).

The iconic buildings are seen as a symbol of cities that are racing on the global platform and are perceived as enhancing the attractiveness of the cities. Iconic buildings where contemporary architectural practices are applied are shaped by different design approaches such as based on urban context, program proposal, innovative design, tabula rasa concept design or approaches that are re-evaluated city's historical or cultural heritage. In the process of urban image design, the iconic buildings that are focused on demonstration added to the city are increasing day by day (Figure 4-6).

Figure 4. 30 St Mary Axe, London/England, Norman Foster, 2003 and Burj Khalifa, Dubai/ UAE, Adrian Smith, 2010 (*URL-5; URL-6*).

Figure 5. Heydar Aliyev Center, Baku/Azerbaijan, Zaha Hadid, 2012 and CCTV Headquarters, Beijing/ China, OMA, 2012 (*URL-7; URL-8)*.

DOI: 10.15320/ICONARP.2018.63 – E-ISSN: 2147-9380

Figure 6. Turning Turso, Malmö/Sweden, Santiago Calatrava, 2005 and Dancing House, Prague/Czech Republic, Frank Gehry, 1992 (*URL-9; URL-10)*.

Modern architecture icons respond to icon pursuit of countries, while acting as powerful symbols as the representative of city icons. We look through architectural view, for a building to be iconic, it must consist or have variety of integrated features such as;

1. Unique design (different and original)
2. Large scale
3. High level (new construction technologies and materials)
4. Spectacular representation (landmark)
5. Specific message signification by the building (metaphoric forms).

With the developing technology digital techniques have provided great advantages in the design process and caused to be radical changes in the architectural formation with their rapidly increasing number, popularity and interesting forms, iconic buildings turned to be the mostly applied architectural structure on city actors' identity search for globalized city.

THE EXAMPLES OF ICONIC SCIENCE CENTERS FROM THE WORLD

Science centers contribute to personal and social development of individuals while providing economic contribution to the city where they are present. Each year more than 200 million people visit science centers or at attend a science center event once a year. Science centers create brand effect in the city and attract many visitors and provide economic contribution as well. There are many science centers in the world that draw the attention of visitors with their different architectural designs to be icon building and attract more visitors. Below, we see science centers that became icon building of the city their different architectural designs (Figure 7-15).

Figure 7. Museu de les Ciències, Valencia/Spain, Santiago Calatrava, (*URL-11)*.

Figure 8. Shanghai Science and Technology Museum, Shanghai/ China (*URL-12)*.

Figure 9. Scientific Center of Kuwait, Salmiya/Kuwait (*URL-13)*.

Figure 10. Phaneo Science Center, Wolfsburg/Germany (*URL-14)*.

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Figure 11. Nagoya City Science Museum, Nagoya/Japan (*URL-15)*.

Figure 12. Glasgow Science Centre, Glasgow/Scotland (*URL-16)*.

Figure 13. NEMO (National Center for Science and Technology), Amsterdam/Netherlands (*URL-17)*.

Figure 14. Kazakhistan Pavilion and Science Museum, Astana/ Kazakhistan (*URL-18*).

Figure 15. Artscience Museum, Singapore (*URL-19*).

These buildings draw attention with their designs, technologies that are used or with their concepts. These "iconic buildings" that are designed by hit architects as a result of contest projects affect the city they are present along with its physical environment. After a while, the city, where these buildings are present, is referred with them and it increases the popularity of the city. The number of visitors who visit these science centers and the expenses they make create an important source of income for the city and creates an employment effect.

MATERIAL AND METHOD

The number of iconic science centers continuously increases in the world and they have great impacts on the city image. It is seen that the last period science centers are designed iconic with different architectural forms and they are the focal point for the city. From this point of view, within the scope of this study, Konya Science Center is selected as the example field and it is analyzed in architectural terms whether it carries the quality of "icon building".

In this study, firstly concepts related, science center, icon, iconic building, iconic science center are defined. Secondly, iconic buildings' impacts on city image and city identity are investigated by the help of selected reference building and icon science center examples are given. Finally, contribution of iconic science centers to the formation of global city and identity as an architectural formation are emphasized. The aim of this research is to determine the general characteristics of the icon structures and to question the Konya Science Center through these features. For this purpose, observations and interviews are made, photographs of the building are taken and any kind of written and drawn

DOI: 10.15320/ICONARP.2018.63 – E-ISSN: 2147-9380

resources are utilized in order to determine whether the selected building is in accordance with the definition “icon building”.

IS THE KONYA SCIENCE CENTER ICONIC BUILDING FOR KONYA CITY?

General Information about The Konya Science Center Project

Scientific and Technologic Research Council of Turkey (TÜBİTAK) published “the Call to Establish Science Centers” on March 27, 2008 in order for people to comprehend the importance of science centers in increasing attention towards science in Turkey and make them widespread around the country. Within the scope of the call, the plan was to give support to the project of establishing a Science Center in one of our cities with metropolis status. Governors, mayors of 16 cities with metropolis status along with the chairmen of the chambers of industry and commerce have attended this call. Project recommendations were prepared by metropolitan municipalities of 6 cities and then one metropolitan municipality left the process with their own will. As a result of the field examination; Konya Metropolitan Municipality gained the right to host the first Science Center that is planned to be established in many cities of Turkey with the support provided by TÜBİTAK (Aydın, 2010).

Konya Science Center, which is the first science center that is supported by TÜBİTAK, is constructed on a 99.347 square meters field in Organized Industry Region on Ankara – Konya highway in Büyük Kayacık Neighborhood, Ankara Boulevard, Selçuklu District of Konya. It is positioned on 25 km distance to city center. Konya Airport is situated ahead of the project in organized industry region (Figure 16).

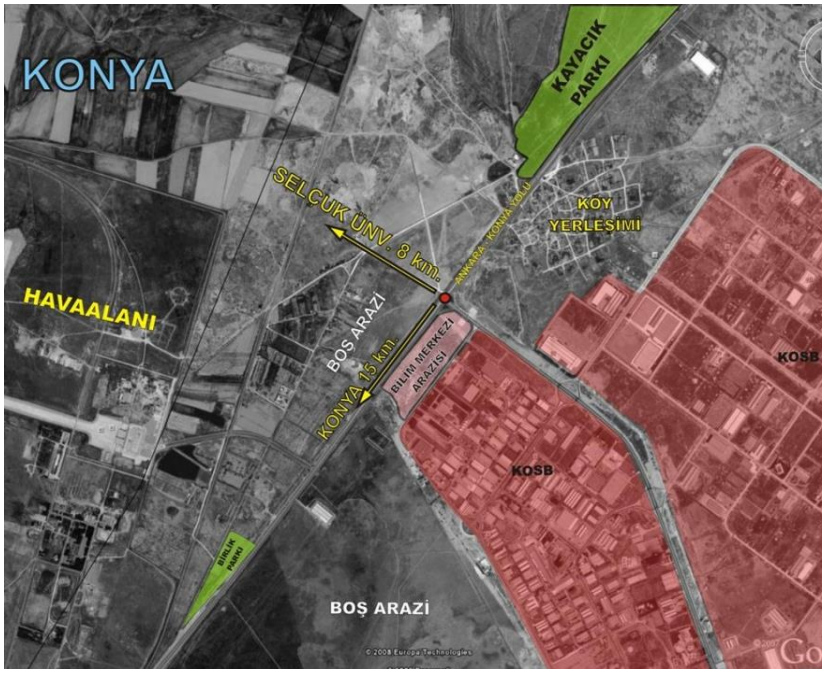

Figure 16. The Location of Konya Science Center (*URL-20*).

Konya Science Center is the first international scale science center of Turkey with 26.248 square meters indoor space and 14.000 square meters of outdoor car parking space along with vehicle roads, 11.000 square meters of walking roads and 47.000 square meters of green fields with thematic exhibitions, outdoor exhibitions, observation and scenic tower, Planetarium, conference halls, laboratories and libraries. With its extraordinary architecture, Konya Science Center is designed by Architect Selim SOMONCU – A Proje setting off from the idea that it shall provide important contributions to the establishment of scientific mentality in our country (Figure 17).

Figure 17. General View of Konya Science Center (*URL-21*).

The Analysis of Konya Science Center in terms of Architectural

Konya Science Center consists of 3 buildings that are connected to each other with bridges; main building, planetarium, observation and scenic tower. Science center's main building, which consists of basement, ground floor, 2 normal stories and a garret, is 110 m

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wide and 30 m high in a geodesic form. It is the biggest project in Turkey that is made with this system. In 134 square meters space of glass front cutting of Konya Science Center, photovoltaic batteries are used to get electricity from solar energy (Figure 18-19).

Figure 18. Konya Science Center Main Building Steel Netting Shell System Construction Stages *(URL-22; URL-23; URL-24; URL-25)*

Figure 19. Konya Science Center Main Building Entrance Side Latest Condition (*Photo: Emine YILDIZ KUYRUKÇU*)

The main building is raised by 2 meters above the level of the road by benefiting from the inclined structure of the land, thus the below ground level of the building is taken to garden level. The siding of the main building is designed as Seljuk ornament sanding pattern study on tempered glass (Figure 20).

Figure 20. The siding of main building (*URL-26*)

1.300 square meters wide and magnificent foyer area welcomes visitors coming to Science Center building. From this area, access is provided to book sales unit, education units, exhibition halls and planetarium and observation house via bridges (Figure 21).

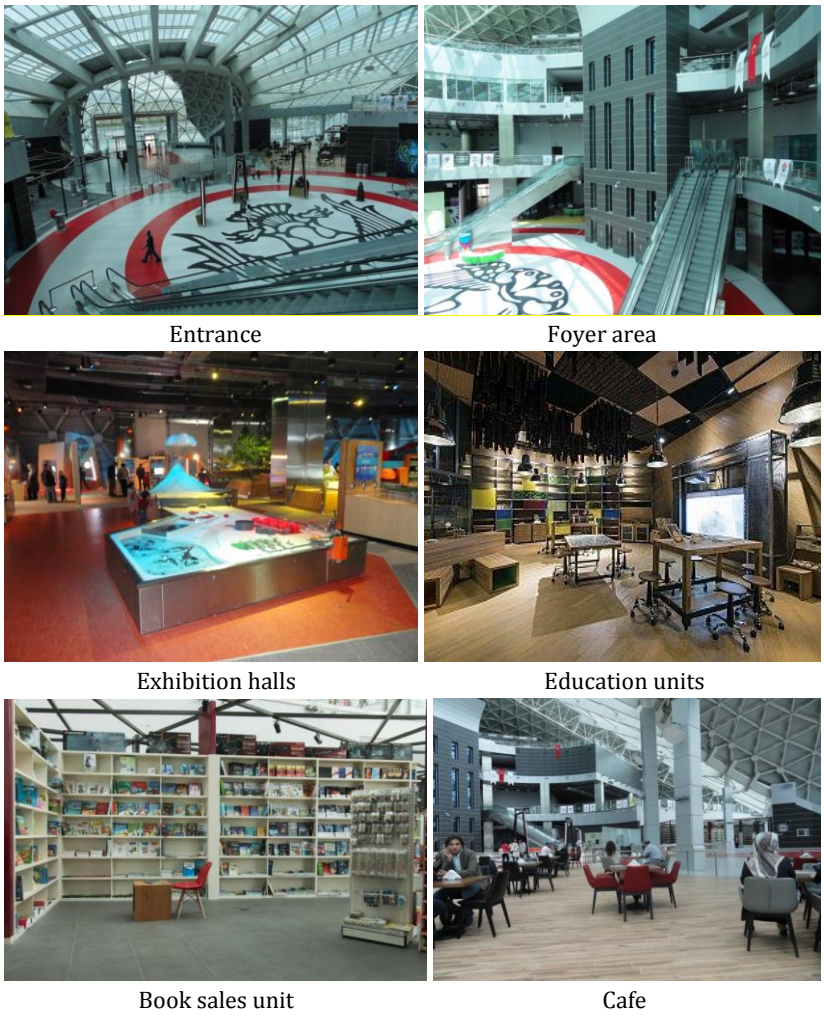

Figure 21. The views of main building indoor space (*Photo: Emine YILDIZ KUYRUKÇU*)

Planetarium, which can be accessed via main building by visitors, is 24 meters wide and 12 meters high while having a geodesic form. Planetarium, which is also known as 'planet house' in Turkish language, has a dome shape and images are reflected on each side of the dome. Therefore, viewers may watch shows with 360-degree angle and with 3-dimention method (Figure 22). There are indoor and outdoor spaces in these places, where celestial bodies and events can be watched. The solutions of Konya Science Center project are realized by Icosa Systems Company. The company was given "Awards of Merit" award at The International Federation of Consulting Engineers (FIDIC) 2014 held in Rio De Janeiro with this project.

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Figure 22. Planetarium of Konya Science Center (*URL-27*)

Observatory with 42 meters height and 150 square meters floor space is present as the 3rd building. Composite panel siding is applied to exterior side of the building. Scenic and Observation Floor are present in this building, where celestial bodies and events may be watched (Figure 23).

Figure 23. Observatory of Konya Science Center (*URL-28*)

Two units of 600 square meters luxury water tanks are constructed in order to benefit from rain water in garden watering system. Special tunnel type holed drainage pipes are used for the infrastructure of landscape areas found around the project. Electricity with windmill system is positioned in the garden of Science Center.

It is seen that the first science center of Turkey that is supported by TÜBİTAK, there are planetarium, observatory, exhibition halls, laboratories, places where scientific developments can be transmitted are present. As a result of the analyses made on the subject It is determined that Konya Science Center is an icon building for Konya because it has iconic building features such as unique design (different form), large scale, new construction

technologies and material selection, landmark, carried specific message signify by the building. As a result of the observations and interviews related with the structure and, it is seen that an important attraction point for visitors coming to the city and it provides important contributions in terms of the vision of the city.

EVALUATION AND CONCLUSION

Science centers are places where people can come together and explore the very mysteries that make up our world. By encouraging public understanding and engagement with science, they serve as important platforms for the empowerment of people, allowing people to make well-informed decisions. They are also exciting learning places for all ages, essential in enhancing societal capacities to adapt in the face of change. Science centers and museums are considered to have the potential to fulfill a major role in the informal learning of science. Impacts of science centers can be classified as individual, political, social and economic. Also, recent research shows that well established in developed countries, iconic architectural designed science centers have undisputed appeal to a wide range of audiences. The number of iconic science centers continuously increases in the world and with their high number of visitors, they have great impacts on the cities.

With many of its social economic, cultural and infrastructural data, Konya is important city. In this study, the science centers, iconic buildings and their impacts to cities are reviewed by literature study and it is questioned whether Konya Science Center carried image structure mission or not and the structure was analyzed in architectural terms.

It is seen that the aim was constructing an iconic building in the design stage of Konya Science Center, which was built in order to exhibit the new icon of the city, to draw investments and tourists, to make the city a center of culture by being a reference. As a result of analyses, observations and interviews made on the subject, it is determined that Konya Science Center is an icon building for Konya city owing to its different form, material selection, and Leeds certified sustainable building. It is understood that the building is in parallel with developing trends in design and building technology fields. The facility, which has wind energy power plant and solar panels in its building, is an important green building example that is constructed in Turkey. In the light of the data, it is determined that the first Science Center in Turkey that is created with the support of TÜBİTAK is an important attraction point for visitors coming to the city and it provides important contributions in terms of the vision of the city. It is thought that

DOI: 10.15320/ICONARP.2018.63 – E-ISSN: 2147-9380

Konya Science Center which is the first science center of Turkey that is supported by TÜBİTAK will be an example for the iconic science center projects to be designed.

REFERENCES

Ateşoğlu, İ. (2008). 'Şehir Markası Oluşturmada Sembol Yapıların Etkisi', *Yerel Siyaset Dergisi*, 17, pp.87-88.

Avcı, Ü. (2015). 'Antalya Kaleiçi'nde Bir Simge Yapı: Yivli Minare', *SDÜ Arte-Güzel Sanatlar Fakültesi Sanat Dergisi*, 7 (15), pp. 52-78.

Aydın, M. (2010). 'Tübitak Öncülüğünde Türkiye'nin İlk Bilim Merkezi; Konya Bilim Merkezi', *Lonca Dergisi*, 33, pp. 6-7.

Engez, A. (2007). Küreselleşme Sürecinde Kentlerin İmaj ve Kimlikleri: Karşılaştırılmalı İstanbul Örneği, Marmara Üniversitesi Sosyal Bilimler Enstitüsü, Yüksek Lisans Tezi, İstanbul.

Ekenyazıcı, E. (2005). İkon yapıların turizm eğilimlerine etkileri, YTÜ Fen Bilimleri Enstitüsü, Yüksek Lisans Tezi, İstanbul.

Falk, J. H. and Dierking, L. D. (1992). *The museum experience*, Washington, D.C.: Whalesback Books.

Gammon, B. (2008). The impact of Science & Discovery Centres: A review of worldwide studies (E. Kell, Ed.), Retrieved from Association for Science and Discovery Centres: https://www.sciencecentres.org.uk/resources/science-centres-worldwide/impact-science-discovery-centres-review-worldwide-studies/.

Hannu, S. (1993). Science Centre Education. Motivation and Learning in Informal Education. Research Report 119, Helsinki University Department of Teacher Education, Doctoral Dissertation, Finland.

Lökçe, S. (2003). İki Şehir İkonu: Sagrada Familia ve Sydney Opera Binası, *Gazi Üniv. Müh. Mim. Fak. Dergisi*, 18 (1), 89-100, Ankara.

Lucas, A. M. (1983). Scientific literacy and informal learning, *Studies in Science Education*, 10(1), pp. 1- 36.

Maralcan, M. (2006). Kentler ve ikonları, *Tasarım Dergisi*, 159, Tasarım Grubu, İstanbul.

Paddison, R. (1993). City marketing, image reconstruction and urban regeneration, *Urban Studies*, 30(2), pp. 339–350.

Persson, P. E. (2000a). "Community Impact of Science Centers: Is There Any?", *Curator: The Museum Journal*, 43 (1), pp. 9-17.

Persson, P. E. (2000b). Science centers are thriving and going strong!, *Public Understanding of Science*, 9(4), pp. 449-460.

Quin, M. (1990). What is hands-on science, and where can I find?, *Physics Education*, 25 (5), pp. 243-246.

Ramey-Gassert, L. (1996). Same place, different experiences: Exploring the influence of gender students science museum experiences, *International Journal of Science Education*, 18 (8), pp.903-912.

Ramey-Gassert, L. (1997). Learning science beyond the classroom, *The Elementary School Journal*, 97(4), pp. 433-450.

Rennie, L. J. and McClafferty, T. P. (1995). Using visits to Interactive Science and Technology Centres, Museums, Aquaria, and Zoos to promote learning in science, *Journal of Science Teacher Education*, 6(4), pp.175–185.

Rennie, L. J. and McClafferty, T. P. (1996). Science centres and science learning, *Studies in Science Education*, 27(1), pp. 53-98.

Richards, G. and Wilson J. (2004). The Impact of Cultural Events on City Image: Rotterdam, Cultural Capital of Europe, *Urban Studies*, 41 (10), pp.1931-1951.

Rix, C. and McSorley, J. (1999). An investigation into the role that school-based interactive science centers may play in the education of primary-aged children, *International Journal of Science Education*, 21(6), pp. 577-593.

Russell, I. (1990). Visiting a science centre: What's on offer?, *Physics Education*, 25 (5), pp. 258-262.

URL-1 http://disney.wikia.com/wiki/File:Eiffel_Tower,_Paris.jpg

URL-2 https://www.tourism-of-india.com/taj-mahal-agra.html

URL-3 https://www.everythingaustralia.com/sydney-opera-house-tour-sydney-1099/

URL-4 https://www.guggenheim.org/about-us

URL-5 http://www.yapi.com.tr/haberler/son-10-yilin-en-gorkemli-10-mimari-yapisi-secildi_74987.html

URL-6 http://www.pinterest.com/pin/407435097519974547/?lp=true

URL-7 http://azerbaijan.travel/en/place/185-heydar-aliyev-center

URL-8 http://time.com/4232532/china-no-more-bizarre-architecture/

URL-9 https://hu.wikipedia.org/wiki/Turning_Torso#/media/File:Turningtorso2011.jpg

URL-10 https://www.pinterest.com/pin/144607838005349153

URL-11 https://www.sfgate.com/travel/article/Vivid-Valencia-spans-centuries-with-surprises-2550918.php#photo-2649403

URL-12 https://www.pinterest.com/pin/508977195378575960

URL-13 https://bookbestrate.com/blog/en/93-ramadan-in-kuwait-things-to-do

URL-14, https://en.wikipedia.org/wiki/Phaeno_Science_Center

URL-15 https://en.wikipedia.org/wiki/Nagoya_City_Science_Museum

URL-16 https://en.wikipedia.org/wiki/Glasgow_Science_Centre

URL-17 https://www.nemosciencemuseum.nl/en/about-nemo/press/photographs/

URL-18 http://smithgill.com/work/kazakhstan_pavilion_science_museum/

URL-19 https://visuallexicon.wordpress.com/2017/10/13/the-artscience-museum-moshe-safdie/

URL-20 http://wowturkey.com/t.php?p=/tr435/konyaturk_7.gif

URL-21 http://www.konya.bel.tr/haberbasin.php?a=bldfoto/14/bsk/tbt_bm_b_8.jpg&haberID=4029&hDurum=FOTO

URL-22 http://www.endeco.com.tr/proje-36-konya-bilim-merkezi.html

DOI: 10.15320/ICONARP.2018.63 – E-ISSN: 2147-9380

URL-23 http://www.konyaninsesi.com.tr/ilk-bilim-merkezinde-son-asamaya-gelindi-23324h.htm
URL-24 http://www.modulcelik.com.tr/tr/konyapi.aspx
URL-25 http://wowturkey.com/forum/viewtopic.php?t=106061 & start=75
URL-26 http://konhaber.com/haber-konya_bilim_merkezi_turkiye_ye_model_olacak-111676.html
URL-27 http://www.akpartikonya.com/ak-yatirimlar/yatirim /22351_turkiyenin-tubitak-destekli-ilk-bilim-merkezi
URL-28 http://www.konya.bel.tr/haberbasin.php?a=bldfoto/13/fen/bilim_bs_b_6.jpg&haberID=3871&hDurum=FOTO
Weitze, M. D. (2003). "Science Centers: Examples from US and from Germany", From the itinerant lectures of the 18th century to popularizing physics in the 21st century-exploring the relationship between learning and entertainment, Proceedings of conference held in Pognana sul Lario, Italy.
Wellington, J. (1990). Formal and informal learning in science: The role of interactive science centers, *Physics Education*, 25 (5), pp. 247-252.

Resume

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