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**Aims**

The Open House International Association (OHLA) aims to communicate, disseminate and exchange housing and planning information. The focus of this exchange is on tools, methods and processes which enable various professional disciplines to understand the dynamics of aging a greater sharing of decision-making by ordinary people and to help develop the necessary institutional frameworks which will support the local initiatives of people in the building process.

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There is an article in this issue about the contribution of balconies to thermal comfort in Indonesia. This article presents how the balconies have been used in very different ways in Indonesia. Finally, the authors suggest designing balconies for the sake of thermal comfort. This article was accepted by the founder and editor of Open House International -Nicholas Wilkinson- before he passed away, because he was very interested in the use of balconies in Cyprus. When I read this article about balconies in Indonesia, I remembered our conversations regarding balconies.

Wilkinson was very much aware that the use of balconies depends on climate as well as culture. Outdoor spaces are not used in some cultures. However, Wilkinson was saying that people in Cyprus like the use of outdoor spaces very much. People in Cyprus go for picnics during the months of spring and summer. They have barbecues. Many people have private houses with gardens and these gardens are used very effectively. They like gardening. They like having animals. They like spending time with their family members and visitors in their gardens. Wilkinson was even saying that Cypriots live outside rather than inside. They even sleep outside during hot nights. Noon time siesta (sleep) might also be in the garden under the shadow taking advantage of the lovely breeze. Gardens are used effectively during the winter months as well. Winters in Cyprus are sunny and they are like English summers. People prefer sunny places without wind in their gardens during the winter.

According to Wilkinson the problem starts when the construction of apartment buildings start in the growing cities of Cyprus. Since Cypriots are used to spend most of their time outside, they need large balconies in their apartment flats to have outdoor spaces. Wilkinson was walking around these apartment buildings and checking their balconies. Do these buildings have balconies? Are they sufficiently large to satisfy the needs of Cypriots? What is their orientation? What is their relation with the prevailing wind? He was very unhappy about most of the balconies of these apartment buildings in Cyprus. Some apartments did not even have balconies. He was becoming angry with these types of buildings. Some balconies were very small and badly oriented. There were even some very small French balconies which were designed to contribute to the façade aesthetics. But they were useless.

Some people used their balconies as a kind of storage and some people covered their balconies and turned them into closed spaces. Wilkinson supported the changes made by people very much. He said that it is better to turn a badly designed balcony into a useful space.

Some lucky people had usable balconies in these apartments. Wilkinson was very interested about what people were doing with their balconies. Do people cook or eat on their balconies? Do they work or read on their balconies? Is it only a place for dad to smoke? Do children play on their balconies? Are they safe for children? What type of furniture do they prefer on their balconies?

Nicholas Wilkinson had lived in an apartment block in Famagusta for fifteen years. I remember very well that his flat had a very nice south balcony. He spent almost all of his time there. The balustrades of his ground floor balcony were always full of flower pots with the most colourful flowers. He cooked (barbecuing) there, ate there, accepted visitors there and worked there. He sat there and said hello to every passerby. His cat Lum-lum was also allowed to use this balcony. They enjoyed the sun together during the winter. In summer, they sat under a large white umbrella. The furniture on that balcony was a nice handmade wooden table, comfortable plastic armchairs, barbecue equipment and flower pots. There were also some decorative objects on the table and on the window sills. There was a large clay cup which was full of dry fruits. There were some metal, ceramic and timber objects which were made by his sons. He left that flat approximately five years ago to live in a house he designed. He also designed a nice garden there. He called himself the “gardener.” He taught landscape to students of architecture at Eastern Mediterranean University for many years. The number of outdoor furniture and decorative objects increased in this house. There were also some small sculptures in this garden. Everything is kept as it was left in this house. However, the balcony in his first flat is currently empty. The new residents do not use it. There is no furniture, no flowers, no animals, nobody.

Yonca Hurol
International Technical Editor
1. Introduction

Collective urban memory is a term that refers to memories shaped collectively within place and time, expressing the relation between past and present of a particular place (Ringas, et al., 2011). The concept has been under investigation by several scholars, each defines different elements of the term. For Rossi (1982), urban memory is embodied in the in-between spaces of a city, in street, spaces, and large scale monuments. Halbwachs, on the other hand, pointed to the double nature of collective urban memory which can be found in the physical objects in urban environments, and also in the symbolic or spiritual significances that are adhered to specific spaces and settings. Similarly, Nora (1989), coined the term ‘lieux de memoires’ which refers not only to physical sites of memories like historic cathedrals, prisons and battlefields, but that also include rituals, events and celebrations linked with such physical sites (Nora, 1989).

Alba (2012) presented the factors of urban memory classifying them into: time (referring to one’s different life stages, and the city past), space (referring to specific places, neighborhoods in the city), and groups (referring to individuals and groups in a specific community) (De Alba, 2012).

It is within buildings, urban spaces and settings that crucial events to past, present and future generations occur. That is what makes the built environment one of many potential ways in which collective memory is possibly incarnated, interpreted and reinterpreted. Collective urban memory is essential to maintain group identity and support their sense of place and place attachment. Thus, urban memory is an important aspect of cultural heritage that should to be captured and preserved for current and future generations, an aspect that is missing in local conservation approaches. Moreover, to be maintained, urban memory needs physical, social and moral props.
spaces and settings that are linked with memory, is important to preserve the memory, however, alone, it does not guarantee the continuation of memory. The maintenance and continuation of memory is a complex process that depends on several factors, where the preservation of the physical aspects is only one among several. To help in addressing the maintenance and continuation of memory, it is important to understand how urban memory is created through the “memory formation” process and how it can be maintained through the “memory stimulation and consolidation” process.

This paper addresses the maintenance and continuation of memory, focusing on historic houses that are embedded with meanings and memories significant to their context as potential cultural memory venues. As a case study, the paper investigates the memory of two historic houses that had a major role in the history of the city of Cairo, Egypt. The paper then investigates the remaining traces of the memory that are still communicated, if any, and it examines the channels that are currently used to reconstruct, stimulate and consolidate their urban related memories.

2. The Urban Memory Formation Process
It is important to shed light on how memory is formed and created. Based on the literature, urban memory is not a constituent of the physical dimension alone, but it is a complex mélange of both the social and the spatial features of the setting. In this part, the social and the spatial dimensions of memory are discussed.

2.1. The social dimension of collective memory
It was only with Maurice Halbwachs’ ([1925]1992) great discovery that the relationship between personal memory, and, socialization and communication was broached up. For Halbwachs, it is memory that enables individuals to live in groups and communities and it is through living in groups and communities that individuals are enabled to build their memory(ies) (Halbwachs, 1992). This was also confirmed by A. Assmann (2011) who stressed that even though it is individuals who remember, however, it is the group who makes a memory for itself through erecting monuments or by developing cultural techniques that either support memory to be kept flourishing or promote its oblivion.

Communicative and Cultural memory are two types of memories of severe importance when we discuss the social dimension of the memory formation process. Communicative memory is defined as: ‘memory that is shared outside the avenues of formal historical discourse, yet is entangled with cultural products and imbued with cultural meaning’ (Sturkin, 1997). It is a type of memory that is not institutionalized and is not developed by specialists. It refers to those memories that reside in everyday life interactions and communications (Assmann, 2011). Cultural memory, on the other hand, refers to those objects that can be considered as carriers of meanings such as images, archives, monuments, feasts or other cultural objects and events. Such objects can function as memory carriers for people who might have invested memories in them (Assmann, 2011).

Assmann (2011) differentiated between potential and actual cultural memory. Potential collective memory are the representations of the past as physical entities, like manuscripts stored in archives or in libraries, or like pieces of arts stored in museums. Those potential collective memories are turned into actual collective memories when they are interpreted and reinterpreted by the community and when they are given new meanings (Assmann, 2011). Communicative memory is passed on through normative or narrative channels. The normative is expressed by economic, political or juridical powers. The narrative, on the other hand, is the countless media of culture, including myth, fairy tales, literature, films and everyday conversations (Carrithers, 1992).

Collective memory is not given, it is socially constructed; as we grow in a given group, we spontaneously acquire the frameworks of memory, without a formal instruction (Halbwachs, 1992). The act of remembering within a society is accomplished through the process of ‘localization’. Through the localization process individuals locate their own recollections of the past within the network of the fellow members (Middleton & Brown, 2011), and as we belong to various groups, even within the very same community, we develop varied mental configurations which produces several memories for the same fact. It follows that there ultimately would be as much memor(ies) as there are social groups in a given society (Brockmeier, 2002). The essence of collectivity is, thus, not counted by the number of individuals within a group, but through the collective framework of shared images, events and meanings (Halbwachs, 1992).

Moreover, the past is a social construction that mainly depends on the concerns of the present. In other words, the beliefs, interests and aspirations of the present are the main factors that shape the various views of the past (Halbwachs, 1992). The concerns of the present also shape what is selected to be remembered and what is not (Gross, 2000; Terdiman, 1993). This turned out to be a culture-related matter, and as culture changes, memories that worth to be remembered are changed as well (Brockmeier, 2002).

2.2. The spatial dimension of collective memory
Several studies (Forest, et al., 2004; Hebbert, 2005; Hoelscher & Alderman, 2004; Legg, 2004; Legg, 2005a; Legg, 2005b; Legg, 2007; Rose-Redwood, 2008; Till, 2005) confirmed that sites of memory play a crucial role in reinforcing the collective memory. The
first to introduce Halbwachs thoughts about urban memory to the literature of the built environment was the architectural theorist, Aldo Rossi (1982) who stated that a city remembers through its buildings, and that it is by preserving the buildings of heritage values that the preservation of the memories in the human mind is achieved (Rossi, et al., 1982).

Memory can be manifested spatially in various ways. It can be associated with physical sites, that embody tangible notions of the past, and also with the non-physical dimension of these sites manifested in the celebrations and rituals that commemorate past events and that are held in specific urban spaces (Nora, 1989). Such rituals, festivities, and civic ceremonies serve as main channels in which societies and groups remember (Hoelscher & Alderman, 2004). Conversely, a disruption and discontinuation of urban memory can be synchronized with abrupt or gradual major changes in the physical environment and/or drastic changes in the social milieu (Pastalcy, et al., 2006; Legg, 2007).

Urban memory differs in terms of both, space and time (Legg, 2007). In terms of space, memories are reconstructed differently among nations, regions and continents. Even if similarities and common features exist in the memory reconstruction process across different groups; the processes of memory formations cannot be generalized (Legg, 2007). In terms of time, Every time the reconstruction is rather a reconstruction of the last reconstruction, thus, every time it can be distorted or enriched depending on the perspective or the circumstances of remembering. Moreover, methods and traditions of memory evolve through time (Legg, 2007). By the end of the 20th Century, the west witnessed a shift about the very essence of what and who should be remembered and commemorated. Commemoration processes were widened to include beside the commemorations of heroes, martyrs and glorious moments, the commemoration of shameful events and the memory of violent acts on societies, including, honoring the memory of victims of massacres, genocides, events of mass murder and terrorism (Foote & Azaryahu, 2007).

Meanings and memories associated with spaces, settings and activities are also susceptible to different and sometimes conflicting interpretations, especially during political instabilities. In such periods, acts like pulling down statues, renaming spaces and streets have been common indicators of political change. Cases in transition represent excellent cases to study the formation of collective memory because in such cases, all the questions of how this society remembers its recent past are negotiated and manifested spatially. In such cases, the very same place might have several interpretations and might be remembered differently by different people (Forest, et al., 2004).

3. Urban Memory Stimulation / Consolidation Channels

There would be no prescription to follow in order to stimulate or consolidate a specific memory for everyone to recall. Every person remembers different things, in different situations, and in different ways. However, stimulating and consolidating the memory can for sure be endorsed through different channels. These channels revolve around keeping the story related to architectural structures alive in communicative memory which is a crucial for the maintenance and continuation of memory. This can be done through commemorative events, or place-based rituals, commemorative structures, urban narratives and odonyms among others. The following is a brief discussion about each of these channels.

Commemorative events or place-based rituals represent a very efficient tool helping in collective remembrance. In such events urban spaces act as the theatre of the event, where the event itself is the reproduction of the symbolic and historic value of the urban space. In place-based rituals the meaning of urban space is redefined. During the temporary overriding of the space function, people have the chance to stop, observe and remember. They thus have the chance to re-interact with the surrounding built environment (Loukaitou-Sideris & Ehrenfeucht, 2009).

Commemorative structures are all structures that are erected to convey a specific meaning or to act as a reminder of a specific person or event. This includes statues, memorials and includes also commemorative plaques. Commemorative plaques (usually known as blue plaques) locate specific events in a very concise way within an urban context. Plaque schemes are widely used internationally and they are run by local organizations, local institutions and/or civic societies.

Urban storytelling through organized walking tours is also an efficient tool to keep the story and urban memory vivid in the communication of the group members. Being done in the classical way (city tours) or through virtual reality and digital devices and applications offers creative ways of keeping stories related to architectural structures and urbanism alive in an exciting and easily accessible way.

Odonyms are directly linked to memory as streets and spaces names could be reminders of specific persons or specific events. For Alderman, naming “is a powerful vehicle for promoting identification with the past and locating oneself within wider networks of memory” (Alderman, 2008). Street naming and renaming can be an exercise of power. In intrastate affairs, new regimes are usually keen to validate their existence. One feature of this validation is the renaming process of streets and spaces, replacing street names linked to the previous regime, with names that are linked to the new regime.
4. Historic Houses from Potential to Actual Cultural Memory

Historic houses are historic structures that had witnessed major events, or had hosted a historically significant person. Other historic houses are noteworthy because of the significance of their exterior and/or interior architecture. Such houses are crucial to community identity, and their existence is central to the continuation of their memory within their urban and social context. Historic houses, can easily shift from being ‘potential collective memory’ into ‘actual collective memory’ to their surrounding context, if the conservation process is done comprehensively, that is to include not only the physical and spatial aspects of memory but also to tackle the social dimensions of memory as well.

Internationally, historic houses are getting more and more governmental and non-governmental care. There are several organizations that offer services including providing historical information about the house, or providing technical advice for property owners so that they can take care of their properties and so on. Few examples of non-governmental organizations is the Historic House Association in United Kingdom, the Historic Houses Association in Australia, La Demeure Historique in France and the Associazione Dimore Storiche Italiane in Italy among others.

4.1. Two cases from Cairo

In the following paragraphs, the paper investigates the memory of two historic houses in Cairo aiming at a better understanding of the memory formation process, and at examining the techniques used for their memory stimulation/consolidation process. The two houses are namely: Al-Sadat and Al-Sinnari house. The first is located in Al-Helmiya district and is well preserved, but does not host any functions or activities, and the second is located in Al-Sayeda Zeinab, is well preserved and does play an important cultural role in its social setting. The two houses witnessed a pivotal period in the history of Cairo; the advent of the French Expedition to Cairo (1798 – 1801).

Al-Sadat house

Shamsuddin Abul-Anwaar al-Sadat, the owner of the house, was one of the most respected Sheikhs of Al-Azhar. He had authorities on common people because of his possessions, his status as the leader of Wafaiya Sufi order (Cole, 2007; Raymond, 1973). When Bonaparte came to Egypt, he knew the deep influence of Sheikhs on lay people, so he tried to win their admiration and approval by all possible means (al-Jabarty, 2013). On the administrative level, Bonaparte asked the Sheikhs of Al-Azhar to form a ‘Diwan’ (a council) to run the state’s affairs, however, the Diwan’s Sheikhs together with other Sheikhs of Al-Azhar represented the main source of uprisings against the French troops (al-Jabarty, 2013). Sheikh al-Sadat was one of the nine members of the Diwan and also an important struggler against the Expedition. He was a prominent leader and a main incentive behind Cairo’s first and second revolts against the French troops (al-Jabarty, 2013; Raymond, 2001).

During the Mamluks and Ottomans era, the house was a few steps away from the west bank of Birkat al-Fil, a pond that once hosted on its banks the most richly decorated residential palaces for aristocrats in the city (Younes, 2010). The pond was dried in the early 19th Century, and the area witnessed radical changes through different historic periods. Today the house is reached through the alley and square bearing the name of ‘al-Sadat’. It is currently listed as an Islamic monument by the Ministry of State for Antiquities and it is one of the very few remaining examples that combine the characteristics of both a waterfront property and Cairene Ottoman residential architecture (Younes, 2010) (Figure 4). The house hosts several beautiful examples of Mashrabiys and ceilings woodworks, and it also includes one of the most beautiful Salamlık decorated with tiles that were imported from Turkey (Maury, et al., 1983) (Figure 5).

The house was recently renovated. However, its memory is completely lost. As there are no marketing, or publicity or activities of any sort undertaken in the house, it rarely attracts visitors. Even when it receives visitors, they would not find any information about the place. Moreover, as the house is not visited regularly, there is a reluctance in the cleaning and maintenance processes in the house, which affect the house negatively. Not to mention that the house is detached from its social context as it does not play any significant role for the local community living in its vicinity (Figure 6).

Al-Sinnari house

The house belonged to Ibrahim Katkhuda al-Sinnari, a rich and potent Mamluk, he built his house at the end of the 18th Century (Maury, et al., 1983). Like the previous case, the whole area surrounding the house has been transformed by urban sprawl and modern constructions. However, the current state of the house that is located in Al-Sayeda Zeinab district, matches, to a great extent, the meticulous description that can be found in historic documents (Figure 7).

Today, reaching the entrance of the house is through ‘Monge cul-de-sac’, a dead-end alley that was named after Gaspard Monge, one of the most influential savants who accompanied the Expedition to Egypt (Maury, 2001). During the French Expedition, al-Sinnari house, was confiscated and used as the premises of the Commission of Science and Arts that accompanied the Expedition. In this house, the commission produced the twenty-volume book
‘Description de l’Égypte’ which is considered one of its greatest achievements (Amin, 2014). The volumes represent a valuable source of documentation of Egypt that offers a thorough documentation of several aspects of life in Egypt at that time, including, irrigation, farming, crafts, customs, folk music, among others. With the departure of the Expedition, the institute research activities were stopped. In 1911, the house was identified as the only one remaining house among three houses that were requisitioned by the French to house the Commission of Science and Arts (Williams, 2002; Maury, 2001). In 1916, Charles Gaillardot, proposed to use the house to display his collection and personal library that included documents of the French Campaign in Egypt and Syria. The Committee for the Conservation of the Monuments of Arab Art, and the Ministry of Religious Endowments, approved his request and appointed him as a curator for the collection. This continued until 1926, then, there were plans to transform the house into a Napoleonic Museum to be inaugurated in 1935, but that was never achieved (Amin, 2014). During the 60’s the house hosted the Center of Archaeological Crafts, affiliated with the Egyptian Antiquities Organization. By 1992, and especially after the 1992 earthquake, the house suffered several damages (Alexandrina, n.d.). Then, by the mid 90’s, Egypt, France, and the UNESCO, co-operated to restore the house, and it was inaugurated in 1998. A year which marked the 200th anniversary of the arrival of Bonapart’s savants to the historic house (Maury, 2001).

Today the house is under the administration of Bibliotheca Alexandrina and is used as a cultural center in Al-Sayed Zeinab district, aiming to ‘raise cultural, artistic, and scientific awareness in the surrounding areas, and encourage young people to engage in public life’. Towards this aim, the house hosts seminars, forums, exhibitions, and theater performances in order to recapture the spirit of the historic house as a platform of ‘Science, Culture and Arts’ (Alexandrina, n.d.).

5. Discussion and Conclusion

The continuation of urban memory is essential in the maintenance of groups’ identity and the consolidation of their sense of place and place attachment. However, the continuation of urban memory requires more than the mere preservation of the physical aspects of the built environment. Collective memories are socially constructed without formal instruction; they flourish through the communication between community members. Although this communication is shared outside the formal venues, and though it is not - and should not - be institutionalized, it is the role of the architectural and urban preservation/conservation/management stakeholders to provide opportunities to ‘localize’ the preserved structures into the everyday communication, to include them into the everyday life interactions, and to encourage all possible channels that help in maintaining the preserved structures into the narrative channels shared by...
the community. When this happens, the preserved objects are transformed into actual collective memories as they are given new meanings that are interpreted, and re-interpreted based on the several existing social frameworks, ideologies, backgrounds, and also based on the community’s concerns of present, selections and preferences.

Historic houses can act as pillars to support urban memory in the communication of everyday life of their surrounding social context. Although historic houses are getting more and more governmental and non-governmental attention on the international level, they still need severe attention at the local level. Historic houses in Egypt need specialized governmental and/or non-governmental bodies to provide services and information that would help in the maintenance of the memory of these houses.

The paper reviewed two sites of memory that witnessed a turning point in Egypt’s modern history, that is the French Expedition in Egypt, namely, al-Sadat house and al-Sinnary house. The review of the works undertaken in the two houses highlights the difference and the distance between the concept of restoration and the essence of conservation. In al-Sadat house, the building is restored, but its history and memory are not. The memory and story of the house were not revived within or after the preservation process. Hence, today, apart from its aesthetic qualities, the house does not play any role for its social context. Thus meanings and memories that are disembodied in the house are not re-embodied in the society. Currently, it remains a potential cultural memory and not an actual cultural memory.

On the other hand, al-Sinnary house, has been always used and re-used, and currently, the house is reused as a cultural center that attempts to restore the historic spirit of the house and its historic role in supporting sciences, arts and culture. Thus, the spirit of the house and its story are recaptured parallel to the preservation of its physical aspects. The chan-
nels of stimulating and consolidating memories in this house can be improved, though.

From the discussed cases, giving more attention to the importance of the communicating the memory of historic houses as an integrated and inseparable act of the preservation process is needed. Preserving the physical aspects of historic houses without providing the tools for interpretation and re-interpretation of its history leads memory to death and will always produce an incomplete conservation act, because spatial/urban memory, like all sorts of memory, need social and moral props to remain alive. Although the Egyptian Ministry of State for Antiquities had few experiences in re-using houses, for cultural events like al-Harawi House or al-Amir Taz Palace, yet, this trend should be adopted as a conservation strategy, not as exceptional cases. Moreover, the use and re-use of monuments should not be restricted to the cultural use only. Historic buildings can be reused in several other functions depending on the surrounding community needs as well as the convenience and appropriateness of the nature of the proposed reuse for the historic building.

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CONTRIBUTION OF BALCONY ON THERMAL COMFORT: RUSUNAWA SURABAYA

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Abstract
Dwelling, which is a basic human need (Maslow, 1970) should act as an object of technology that serves as a place for individuals or families to conduct all their daily activities in order to meet their needs in life. In case of sustainability, thermal comfort is one of the most important comfort conditions that must be achieved (Szokolay SV, 1980). Proper air movement control may lessen the demand for energy, thus reducing the expense of providing a comfortable home (Boutet, 1987). However, to ensure the acceleration of air movement, the availability of both inlet and outlet openings in the building or space become an absolute requirement (Olgyay Victor, 1973).

Rusunawa is a typical rental-apartment in Indonesia that served for low income families. The types of existing space generally include: a multi-functional space, a kitchen, and a bathroom/WC, and sometimes is furnished by a balcony. There is only one living space in rusunawa that is the multi-functional space which is often used for: living, sleeping, studying, watching TV, eating, storing, child-caring, and probably more other functions. Not to mention if the family has a home-based business. Among rusunawa unit types that existed in all fourteen locations in Surabaya, some of them were built without a really outdoor balcony, meaning that the balconies were provided indoor, instead of in the cantilever system. These indoor balconies accommodate the same household activities as those of outdoor balconies. However, the contribution to the internal thermal comfort may not be the same.

By using Ecotect analysis 2011 program, This research intends to investigate the comparison of thermal conditions of the inner space between rusunawa unit having a balcony (outdoor), and rusunawa unit without a balcony (indoor). The result of this comparison is meant to convince the contribution of unit having a balcony to the thermal comfort of inner space, to ensure whether the design of the future rusunawa units should be equipped with a balcony or not. To further reassure its contribution, this experiment is continued by comparing between unit having just a balcony and unit having a balcony that equipped with sun-devices.

Keywords: Thermal Comfort, Balcony, Contribution, Rusunawa, Surabaya

BACKGROUND

The presence of balcony on dwelling units, especially in multi-storey housing with double loaded corridor, is desperately needed as balcony is the only place/space which directly related to outer space. With the existence of balcony, the acquisition of fresh air to the space inside becomes better (Givoni Baruch, 1998). Moreover, the balcony can be a place to enjoy the outside scenery in more comfortably (Pile, 1988). In rusunawa, balcony may act as a desirable extension of the multi-functional space because it can enhance the exterior space and modulate the open outdoor space.

However, there are important things that must be considered in designing the presence of a balcony in low cost apartment units like in rusunawa. The considerations according to (Neufert, 1980) include among others: regarding its orientation to the sun as this could affect the thermal and visual comfort of the interior space adjacent to it; regarding its orientation to the view as this could damage the viewing comfort for people who are watching from inside; regarding the position of neighboring flats and buildings as perhaps these buildings could hinder the chances of getting the flow of fresh air, the influx of sky light, as well as the beauty of outside sceneries etc. The other important factors are size and privacy.

Furthermore, as time passes, the need of families for space will also develop. This can be due to the increasing needs of space areas and space numbers due to increased household members or increased family activity. For that, most of the residents of rusunawa do extension of space by way of occupying the front corridor which is actually a public circulation space. In addition, some are also expanding the space by using the balcony behind as an inner space. In Surabaya, not all units of rusunawa have a real balcony, which is supported by cantilever structure and is outside (outdoor). Some units of all the 14 unit types in Surabaya, the balcony is located inside (indoor), or
it can be said do not have a balcony. Here the benefits of the existence of the balcony should be clarified. This study observed at to what extent the balcony can contribute to the thermal comfort of the inner space.

This research is especially concerned about the design of balcony against the thermal condition inside the multi-functional space, as in rusunawa this is the only living space where users do most of their daily activities. Therefore, it is needed to be examined whether the existence of balcony can guarantee the thermal comfort of users living within the multi-functional space. In Surabaya, all multi-functional spaces of rusunawa units are directly connected with its balcony. So the hot air that may hit the balcony should not worsen the thermal comfort inside the multi-functional space. This concern deserves to be an issue as Surabaya lies in the humid tropic areas.

SUPPORTING THEORY
According to Neufert (1980), there are several types of balconies based on its position: corner balconies, shared balconies, separated balconies, staggered balconies, and loggias. Balcony of rusunawa units in Surabaya only that which is categorized as shared or separated. Important considerations in designing a balcony according to Fairweather and Sliwa (1972) include: 1. Orientation to the sun and view; 2. Position of neighboring flats and buildings; 3. Its relationship with the family room, studio, kitchen, and sometimes the bedroom. In the case of rusunawa in Surabaya, the space directly related with the balcony referred to no.3 above is the only multi-functional space. Other important factors that need to be solved include: space size, privacy, protection against road noise, excessive solar heat, and wind and rain. This study only concerns about the excessive solar heat.

In principle, the thermal comfort of a building can be achieved when the heat flow from the outdoor to the indoor environment of the building can be minimized. The thermal conditions or heat acquisition of a building which is caused by the building envelope can be explained through the theory of heat transfer by Lechner (2007) as follows:

1. By conduction, in which heat enters the building through the building envelope (walls and roof) as well as interior partitions.
2. By convection, in which heat enters the building through air infiltration that coming through the holes and openings on the building envelope.
3. By radiation, in which heat enters the building as radiation of the sun heat penetrates the building.

In designing the openings there are a few things to note namely the layout of openings for entry and exit of the wind, in order to get the exchange of air. So, in this case, the orientation of the openings to the wind direction is crucial. Then, one of the envelope ornaments that affect the thermal conditions is sun-shading that is incorporated in the external elements of the building envelope which are intended to limit the increase of internally generated heat from solar radiation. Therefore to strengthen the balcony's contribution to the inner space thermal conditions, this study is continued by a follow-up simulation that observes the sun heat protection / sun-devices.

This is all because now it is time for a house to be sustainable with its environment. In order to create such an atmosphere, many things must be done. The goal is to reduce the negative impact on the house and its environment. Environmental-based designs among others include: the most important is the minimization of energy as a vital resource for human survival. So far we know electricity as an irreplaceable source to turn on lights, turn on air conditioning, watch TV, and more. Now we have to save money, and replace that energy source with renewable energy, such as solar photo-voltaic that accumulate.
Another effective effort is to maximize airborne exposure with cross ventilation design, proper use of voids, and ventilation, as well as a wide roofing or sun-protecting to counter direct solar heat. All of these can reduce the use of lights and air conditioning so as to reduce the use of electrical energy (Givoni B, 1998).

So what is meant as ecological shelter is not only a house with a lot of green environment, but the beauty / comfort and coolness of the environment inside the house is more important because it is more directly related to the occupants. Providing a balcony which is sheltered from the hot sun is one of efforts in order to cool the space which then can save energy for cooling and refresh the space because the air change can be more smoothly.

Hedy C Indriani (2010), in her study entitled “Ventilation Performance in Rusunawa Dupak Bangunrejo Surabaya”, observed ventilation performance through airflow and air change rate parameters that are derived from simulations using ALOS software. The results of this study indicate that when the orientation of the openings is within the wind shadow area then the inner space does not receive wind. What occurs precisely is getting wind suction / pressure. The design of openings needs to pay attention to the area of inlet and outlet because if air change rate does not increase, this means that the internal wind speed becomes low and the thermal comfort is not met.

Susanto, Witjaksono and Prawata (2014) examined the ‘Thermal Comforts of Flats in West Jakarta.’ The study sought thermal comfort with quantitative research methods, using Design-Builder and Ecotect simulations of openings and overhangs against its thermal comfort variables. These variables include air temperature, wind speed and relative humidity. In this study it was stated that thermal comfort according to Lipsmeier: for air temperature is 24°C-28°C, for wind speed is 0.2-1,5m/s and for Relative Humidity is 60%-70%.

Tyas (2015) in the study entitled “Building Orientation on Thermal Comfort in Leuwigajah Cimahi Flat”, analyzed about the thermal comfort aspects of these rusunawa buildings. The applied method was field observation and interview and analysis using Ecotect software for natural lighting. In designing the rusunawa, she concluded that is not only aesthetic to note, the comfort aspect is also important in order to become a comfortable residence inhabited. This is also the fact and the reason why this study is carried out.

RUSUNAWA IN SURABAYA
Up to 2015, Surabaya had 14 low cost apartments (rusunawa) that scattered throughout the city. The types of rusunawa buildings can be classified into three groups: 8 were built in double loaded corridor in which the corridor is in the middle serving both sides of unit rows; 3 in single loaded where the corridor serves only a single row of units; and the remaining three are in twin blocks in which the building consists of twin opposite single loaded buildings. Each rusunawa unit in Surabaya can be considered as involving four unit parts or spaces namely: a multi-functional space, a bathroom/toilet, a pantry or kitchenette, and a balcony. So almost all daily activities, comprising both private and public activities must be performed in the multi-functional space, as this space is the only place that can be considered as living space. Balconies are always located backward. Regarding thermal comfort, the existence of balcony really affects the thermal conditions in the multi-functional space, as this balcony becomes the way of the
wind inflowing from the outside which is then blown into the multi-functional space. However, the existence of balcony needs examination whether it is advantageous or dis-advantageous especially to the thermal condition of multi-functional space.

IV. THE INDOOR BALCONIES
Not all of low cost apartment units in Surabaya have a balcony (Kisnarini, 2015). Among all of the existing low cost apartments, balconies of three rusunawa units: Gunungsari, Waru-Gunung and Tanah Merah are not really connected to outer space. The backside space of these three rusunawa units is covered by a barrier which is composed largely of glass and smaller parts of walls. These spaces have the same function as the other real balconies. Therefore these balconies can be included as indoor instead of outdoor balconies. For proposing the more comfortable design of rusunawa units in the future, the presence of these three indoor balconies will be examined by thermal simulation. To determine whether the outdoor balcony is better than indoor balcony in terms of thermal conditions resulted in the inside multi-functional space, comparison between the two must be carried out.

THE EXPERIMENTS
5.1. The Software
Autodesk Ecotect Analysis 2011 is used as software for simulation in this research. This program was developed in 2000 by Dr. Andrew Marsh. In this research the simulation is functioned as a tool to find the values i.e. Qs, Qc, and Qx, as well as the mean radiant temperature (MRT) in the space, in order to get the thermal conditions in the multi-functional space as well as the influence of the existence of the balcony. Data input entered in the simulation process are: plan, the spatial dimension of models, and climatic data. While the output data generated from the software are thermal analysis in graphs, as well as realistic photographs in color that shows numerical prediction and thermal level on the points that have been determined in the beginning previously.

Before starting the simulation it should be mentioned the weakness of the use of Autodesk Ecotect 2011 software are: 1). 3-dimensional modeling connections do not always work with other programs (Autocad, Revit, etc.) so it is required to create models directly in Ecotect. 2). Ecotect is only capable of reading and calculating a 3-dimensional surface model (only a surface, not a solid piece). 3). The process runs in accordance with the complexity of input elements and materials. The more complex the input data is entered the longer the calculation.

How to cope with weaknesses: a). Models should be created in Autodesk Ecotect 2011 with specified time intervals storing to reduce errors in simulation execution. b). In modeling it is recommended that snap objects be activated to avoid the lack of accurate intersecting lines. C). The object is simplified but must be able to represent the object to be simulated.

5.2. Advantages in using Ecotect Analysis 2011
1 By inputting data of climate, materials of the building, as well as dimensions of building elements, this software is able to act as a tool for thermal simulation and optimization in a building design as well as its passive solar system.
2 This software provides visual display which is understandable easily.
3 This software is able to calculate a building with a high level of complexity, with compensation or consequences the length of time taken for running the simulation.
4 This software is able to calculate the vents and openings in the building as a part of which also affect the thermal conditions.
5 The simulation result can provide a temperature profile graphs of indoor and outdoor for 24 hours.
6 This software can read the thermal conditions of each building elements, as it can be divided into several zones as required.

5.3. The Modeling
To be comparable, the compared units must be prepared in the same dimension. According to (Kisnarini, 2015), to be a functional and adaptable space, the area of rusunawa unit must be at least 40m². Therefore the dimension of models are made (5x8)m². The width is managed to be 5m since the last rusunawa unit type developed in Surabaya (rusunawa Gunungsoni) was designed to be 4m wide, and this experiment means to widen 1m in order to ensure the functionality and adaptability of space. Moreover, by this unit width (5m), the unit length becomes 8m on which the mass distance for cross ventilation is better than when the unit length is 10m as the unit with is 4m.

Figure 3. Consideration why dimension of unit is decided to be (5x8)m²
Then to be applicable in simulation, the models should be simplified. As shown in figure 2 above, it is seen that Gununsari and Waru Gunung can be considered as similar cases. Therefore models to be compared can be reduced from three into two cases, each of which then is created into unit with no balcony and unit having balcony. So the areas of all models are similar $(5 \times 8) = 40 \text{m}^2$. The difference between type1 and type2 is on the placement of toilet, that made the dimension of balcony on type1 is $(1.5 \times 3.5) \text{m}^2$ while balcony on type2 is $(1.5 \times 3) \text{m}^2$. The simplified models can be seen in the figure below.

Unit without a balcony has full dimension of $5 \times 8$ square meters. Unit that has a balcony, its length dimension is reduced by the balcony that goes 1 meter inward and jutted 0.5 meters outward. So the balcony

Figure 4. In case of double loaded, $(5 \times 8) \text{m}^2$ units enshape thinner mass $\Rightarrow$ better acceleration of air.

Figure 6. Models after simplification.
roof also jutted 1 meter outward. The difference between model 1 and model 2 is only on the toilet / bathroom position, on which one extends against the width of the unit, the other shortens the width of the unit.

VI. RESULTS OF ECOTECT SIMULATION

6.1. Comparison between unit no balcony and unit having balcony

The following paragraphs discuss the results of the simulation regarding internal heat gain that occurs in the multifunctional space without a balcony (type a), that compared to the same space when it has a balcony (type b), both that happened at type 1 (representing Gunungsari / Waru Gunung), and that happened at type 2 (representing Tanah Merah). The simulation is carried-out by using Autodesk Ecotect 2011.

From the figure above it is seen that there is no difference between the simulation results of type 1 and type 2. Units that are not furnished with balcony (a) experienced hotter indoor air. This can be proven from the more portion of lighter red and yellow color that occurs in (a) units no balcony. The difference of the darkness level between the red color that occurred on (b) units and that of (a) units is very thin, it is about below 1 degree Celsius. But this is enough for proving that the existence of the balcony gives the opportunity in improving the inner space thermal condition. The presence of yellow color around the area of the frame line on (a) results indicates the heat source which is likely to penetrate into the space. The portion of yellow color is almost no longer exists on (b) results. Also, on (1b) result, the color around the frame line looks darker than that on (2b) result. This may indicate that the longer balcony dimension protects better than that on the shorter one.

The temperature difference between the hottest yellow colors on top and the coldest blue colors at the bottom in this simulation is ten degrees. When it is observed more carefully it can be affirmed that the indoor temperature of the (b) units which are slightly darker red is about 28 degrees, while temperature of (a) units which are a bit brighter red is about 28.5 degrees. This difference is not much, but the yellow color around the frame which is indicated around 35 degrees Celsius, is able (potential) to cause the thermal condition inside the room becomes very uncomfortable (hotter).

To further convince the balcony’s contribution to the improvement of thermal conditions in inner space, a further simulation is performed. In the further simulation, the non-shading device balcony will be compared to balcony that having shading devices.

6.2. Comparison between balcony no sun-devices and balcony having suns-devices

These paragraphs follow-up the result of the previous simulation regarding internal heat that occurs in the

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Figure 7. Simulation result comparison between unit no balcony and unit having balcony.

Figure 8. Model of balcony with sun screens / devices.
multifunctional space above by comparing the internal heat condition when the balcony without sun devices and when the balcony has sun devices. The sun devices should be made so that the heat entrance can be eliminated as maximum as possible, however they must remain allowing the entrance of air flow as much as possible into the internal space. Due to thermal comfort, this effort is necessary for cooling the internal space of building especially for those that located in the humid tropical climate area. The following figure shows the models that are applied on the further simulation.

From the figure above it is seen that the result of further simulation of balcony equipped with sun-devices has the best indoor thermal condition. The most right pictures have the darkest red color meaning that they have the coolest internal temperature compared to those middle and left pictures. This indicates that sun protection is very effective in improving the inner space thermal conditions.

In plain view it can be said that the ratio among the three internal temperatures ranges between: $28^\circ - 30^\circ$ Celsius ($28^\circ$ Celsius for space having balcony equipped with sun devices, $29^\circ$ Celsius for space with balcony only, and $30^\circ$ Celsius for space without balcony). When most right pictures are observed more thoroughly, the thermal condition on (1c) looks slightly better than the thermal condition on (2c). This may indicate that the longer balcony provides greater improvement on thermal conditions.

VII. CONCLUSION
From the above results it can be concluded that the units having balconies experiencing better ambient temperatures compared to those without balcony. With the support of sun protection/devices, the improvement of thermal conditions in the inner space is much better. The reason is most likely from the heat source which is saved / buried in the frame as the boundary. The heat that accumulated in the border frame will be less if in front of it there is a balcony that opens out
(outdoor balcony).

So, it can be summarized that the balcony with sun-devices has a huge contribution to the improvement of the inner space thermal conditions. So there is no doubt that the future design of the rusunawa units in Surabaya should be equipped with an outdoor balcony which is expected to be able to cool the inner space temperature namely that occur in the multi-functional space.

However installing a balcony needs to pay attention so that as small as possible external heat is able to enter. Outer space should be made cooler, for example with shady trees so that the incoming air does not have the chance to bring the heat to the inside. So the air outside / in front of the balcony should be made as cool as possible.

In the future research, it is necessary to examine if the presence of sun devices of the balcony is either vertical or horizontal. It is required to compare the two so that we can ascertain which sun-devices designs are better in order to improve the indoor thermal conditions of the unit space.

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Abstract

It is a well-known fact that global warming is the extraordinary threat facing the world. The main reasons of these are human activities. Human beings have been contributing to the global warming in different ways for many years. Right material and product selection are some of the most important factors in the process of eliminating the negative effects of constructions on the natural environment and users. The life cycle of building materials involves the processes in which the products are extracted from the source. These processes are the stages of production, transportation, construction, use, demolition and destruction. Making wrong decisions in the selection and use of building materials may cause negative effects in the environment. The major purpose of this study is to examine the embodied energy of the traditional and contemporary building materials according to the characteristics of the local climate. It will answer the question of; “What the embodied energy of a house was in the past and now” in Northern Cyprus. It will help to find out building materials with low embodied energy. There is no published database prepared for or in Northern Cyprus. In order to measure and evaluate the embodied energy of buildings and construction products in the world, there are no integrated systems in the Northern Cyprus at this point, while different countries have unique systems depending on the environmental, economic and social conditions of those countries. Measuring and controlling the environmental performance of environmental development is essential for the sustainable development of the Northern Cyprus.

By using the The Inventory of Carbon & Energy (ICE) program the embodied carbon statuses, embodied energy and transport energy and manufacture energy were discussed for each building material. As a result of this research it was found that locally produced or locally existing materials do not always give the best result in terms of embodied energy all the time. The energy consumption of building materials used in buildings and their associated carbon emissions will assist in the selection of environmentally friendly materials.

Keywords: Embodied energy; Construction materials; Housing; Low carbon dioxide (CO2); Environmental impact
the building is demolished. This can take hundreds of years. Embodied energy can be perceived as the base energy required constructing it. Thormark (2006) stated that in order to assess the life cycle perspective of total energy used, operational energy and embodied energy should be added together. As a necessary limitation of this study, this research covers only the embodied energy. The biggest source of energy consumption is building services (lighting, appliances, and mostly space cooling). According to the records of electricity authority of Northern Cyprus (NC), domestic buildings alone accounted for 30 percent in 2017 of total energy produced. This percentage is increasing every year about 6 percent because of the increasing population.

The operational energy need of a house is very much interrelated with the selection and use of building materials which forms the building fabric. The energy required for heating and cooling mostly depends on the building fabric (e.g. walls, roof). The embodied energy requirement is also influenced by material selection. The processing of raw material, manufacturing and installation of different building materials have different energy requirements. This is referred as the embodied energy. The energy consumed ends up with emitting greenhouse gases as a consequence of the operational and embodied energy associated with all buildings (Thormark, 2006). The selection of building materials should be satisfying the needs without causing any “adverse impact” on the environment (Reddy & Jadagish, 2003). Using local products, renewable energy sources, re-usable materials, etc. can reduce the embodied energy but this is inadequate to relieve the concerns. Thormark (2006) and Szokolay (2004) stated that as buildings become more energy efficient, the amount of energy for building services decreases, but embodied energy becomes a more important consideration. The question today is the “CO₂ emitted during the construction process or the energy required producing the building material”. The electricity used during constructions in Northern Cyprus is shown in Fig 1 as 2.4 per cent, but the energy required to produce the materials is not included on the charts. The amount of “Embodied” energy can be expressed as the unseen bit of an iceberg.

Domestic buildings account for 30 per cent of the nation’s energy used in 2016 in NC but the actual rate goes above that calculated because of another type of fuel usage in winter seasons. The calculated amount is only the operational energy of buildings, and it doesn’t include the embodied energy consumption. Many different building materials are brought together to construct a simple building. For instance; glass for windows, timber or aluminum for doors, bricks, concrete, iron, tiles, ceramics, etc. Different building materials have very different environmental impacts. This is partly because of the processes building materials goes through during their manufacture. Between all the important issues of the overall environmental impact of materials, embodied energy calculations are only one factor. Hence, embodied energy should not be perceived as the “environmental indicator”; it can be criticized as the major one (Treloar, 2001). Embodied energy and building material choice require more research and elaboration. The description of embodied energy can be as “the amount of energy required to produce an object” as stated by Roaf, Fuentes and Thomas (2001). It is possible to calculate the embodied energy of building materials for each component or for the whole building. Embodied energy ratings of buildings can lead to benchmarking standards for embodied energy in every country, as already there are benchmarks for operational energy for raw materials. Most of the time, the energy type and raw material used is nonrenewable, because using renewable energy and considering reusing and recycling is not widely applicable yet. The reduction in reserves is the principal reason for environmental degradation. Degradation is caused in two main ways (Roaf, Fuentes and Thomas, 2001).

* Atmospheric emissions, principally CO₂, contributing to global warming
* Resulting from the effects other emissions to global warming

The measurement units of embodied energy vary from material to material and to methodology to methodology.

In general, cradle to gate figures represented by MJ/tonne, cradle to site and cradle to grave by MJ/m². Also it can be measured in kilowatt-hours (kWh) per tonne (t) or per cubic meter (m³) of material. Sometimes gigajoules are used instead of kilowatt-hours – one gigajoule equals 278 kWh. (Harris &
Borer, 1998). For instance; carpet and windows can be measured with m² they are covering materials, as concrete can be measured with its m³ or tones. Paint has one of the lowest embodied energy rates, but needs to be reapplied many times after a building’s life (Thormark, 2006). In cases like paint, life cycle assessment of the building can draw a better understanding of embodied energy calculation because the continuous maintenance should be taken into account. For 50 years life time, it may be reapplied more than 10 times. As a limitation of the research the life cycle analysis will not be included in this study. However, the method explained above is not the only way to calculate embodied the energy of materials.

Transport is one of the more difficult aspects of calculating embodied energy as it is not so possible to make correct calculations about the travel miles of every single material. One of the factors affecting the energy used in transport is the weight of the material weight; more energy is required to move heavy weights than lighter ones. Existing local materials might not be qualified enough to meet the needs. “Local materials or products” refer to those within “a number of” miles radius of a specific site in a larger countries like UK. In this research “local material” will refer to the materials available geographically in Northern Cyprus because the island itself has a small biodiversity. The local materials of Northern Cyprus are gypsum, sand, aggregates, clay, cement, earth, mosaic and marble. The other materials required for building construction and finishing (e.g. ceramics, glass, etc.), which is not available on the island and have to be imported to the country as raw material or readymade. The materials and energy sources needed for construction are limited. For many years, materials which have low energy consumption were used in building construction, because of the undeveloped technology, limited transport, etc. As far as high technology introduced to the construction sector, local materials, and materials with low impact (e.g. earth) are ignored as construction materials. Afterward concrete, brick, steel become the most popular construction materials in developed and developing countries. For local materials, the maximum road transport possible from source to the site in NC is 70 miles. For imported building materials sea transport is the only way used today in NC. Energy consumption for sea transport is less easily defined than road transport. Even though the sea transport is more ecofriendly than road and air transport, it matters when local material could have replaced the imported ones. The CO₂ emitted by the sea transport could be saved.

Waste is a factor affecting the environmental impact of the materials. Some materials can be reused many times and do not go to landfill easily, where some materials cannot be recycled and go to landfill directly after one time usage. It is essential to be aware of these directly land filled materials after the one time use and avoid using them especially as a building component. Land filling any material cause methane production and it contributes to global warming. There are some building materials which can be reused very simply, taken out of one building and put into another (e.g. window and doors, roof tiles, etc.). This is the ideal way to use second hand materials. Recycling is the eprocessing processing of materials into new products. Upcycling is the use of waste materials to provide useful products of greater use and value. Downcycling is the recycling of a material into a material of lower quality. Most of the time recycling refers to down cycling (e.g. concrete into aggregates).

Some materials, such as glass, usually require an energy intensive process of recycling, before they can be reused. In general, this is still worthwhile in energy terms, and of course saves on finite sources. The fact that these materials are capable of being recycled can offset, to some degree, the high energy cost of their initial production. Environmentally speaking, the least preferred option for waste is disposal, but still the one most commonly used. Unsorted waste is simply dumped on the ground and left for the future generations to be dealt with. The question can be raised here is “What happens to the building materials used in a house after their disposal in NC? Are they recycled, reused?” There is no recycling facility in Northern Cyprus by 2017. For instance; the concrete, bricks, timber materials, etc., used today cannot be reused or recycled. There are many other materials going to landfill after their disposal instead of being reused or recycled. Reusing and recycling activity should be encouraged and material waste should be avoided. Not all land filled materials have same effects on the environment because they have different time durations to breakdown in nature. The breakdown products also include so-called “landfill gas”. The gas typically consists of 50-70% methane and 30-50% carbon dioxide with traces of other chemicals. These study especially focus on the effect on...
the manufacture and transport energy of building materials in Northern Cyprus. This situation is directly related to the reduction of energy required for building construction. It is necessary for architects, designers, and clients to understand energy-related tools and calculations especially for houses. Therefore, this research introduces embodied energy of building materials. How much energy a house consumed in the past and now in Northern Cyprus? Which building materials are being imported from abroad and could they have been replaced with local building materials to reduce the transport energy? Is it worth importing these materials or is it only wasting of energy? Probably not all of the materials being imported nowadays is really necessary because many years ago, the houses were being constructed with local materials. They are no longer being used as construction materials in house design in Northern Cyprus. With the ease of importing and developing technology, the world became a single piece of land with no separate bioregions. To identify building materials with low energy requirement and low CO2 emitting materials is necessary to reduce the greenhouse gases.

2. Limitations and Boundaries in the case study
This study is limited to comparative analyses between traditional and contemporary buildings and their building materials options considered for application in Northern Cyprus. The embodied energy calculations for this study is based on Inventory of carbon & Energy (ICE) version 2.0 Beta. The delivered rate for each building material is in MJ/kg. There are some exceptions like windows and carpet; their embodied energy rates are in terms of m². This can be accepted as a limitation of this study. Different transport distances, can be added onto the “embodied energy rate” to get more accurate embodied energy figure for different countries. For instance, a building material might travel longer distances to arrive to the construction site in Northern Cyprus. Cradle to site is not appropriate for any country other than UK where the database is prepared. This database is one of the newest databases on embodied energy in UK and it is widely covering most of the building materials’ embodied energy rates. There is no published database prepared for or in Northern Cyprus, which is why the ICE one is being used for this research.

In this study, however, out of the myriad materials normally used in a building, the evaluation has been kept limited to those having the largest stake in its erection. In addition to the “cradle to where?” debate, the “cradle to site” and “cradle to gate” introduces some other questions to the agenda. Both start from the raw material stage until building materials’ transmission to the construction site also it includes the transport between these stages. When considered, there is more than one method of manufacturing a material. These methods are;

- By the user, “based on personal needs or on the local cultural heritage”
- By a craftsman who has “developed a method of manufacture through experience”
- By an engineer, directly or indirectly, through electronics (Berge, 1992).

The first two is labour intensive, but the third option is very much related with relying on mechanical processes. When compared, the labour intensive methods are better than the electronic machineries in terms of environmental impact of the building material, as CO2 emitted from the machinery has a greater impact on the environment. For this research, Cradle to site approach is used essentially. The embodied energy value optimized for this study is the energy required to:

- quarry the raw material
- transport to the manufacturing unit
- manufacture the building material
- transport the finished material to the site

3. Case Study
The case studies have been selected carefully to equalize the transport loads and to use the same bioregion for comparison. Both of them are in Lefke (35° 06’ N, 32° 51’ E), Northern Cyprus. Lefke is one of the rural areas in NC which managed to preserve most of its traditional buildings and at the same time hosting new buildings. The houses are similar in shape and size. They are both single story houses and rectangular. Their similarity in terms of square meters played an important role in selecting them for comparison purpose. The main reason of selecting one traditional and one contemporary is to see what the embodied energy of the buildings was in the past and
today. This can lead to make better building material choices in terms of reducing embodied energy. Also, complete case studies are more holistic than statistical studies of many houses.

Each material and its amount used in the house has to be determined, in order to make the embodied energy calculations. The required material quantities for calculation of the embodied energy are derived from architectural drawings and the architect’s/owner’s specifications. The building components examined will be: foundation construction and floor finishes, wall construction and wall finish, roof construction and roof finish, doors and windows, opening components. The ability of the materials to be reused or recycled, manufacture process, etc. also considered to provide a holistic appraisal of their use.

The transport loads for local materials in Cyprus included in the embodied energy figures even though it is clear that transport does not play an important role in embodied energy calculations for local materials in general. It is reported by Ministry of Commerce that all imported building materials arrive in NC from Famagusta port and sea transport miles of an imported material could vary between 140 sea miles (from Turkey) to almost 13500 sea miles away (from USA), may be even more in some cases. The understanding of “sea miles” is different than well known “road miles”; 1 sea mile is almost equal to 1.13 road miles. 17.85 liters of fuel oil required for 1 sea mile for an average container ship used in NC for sea transport. The fuel oil required for 140 sea miles is almost 2,499 liters of fuel oil and 240,975 liters of fuel oil for 13500 sea miles.

After materials arriving to the island, vehicle transport required to take materials to local distributors and to the construction site. For this research, the road transport considered for imported materials as they will be directly taken from the port to the construction site.

### Table 1. Quantities Of Traditional House Building Materials

<table>
<thead>
<tr>
<th>Building components</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>Foundation construction</td>
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<tr>
<td>Floor building</td>
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<tr>
<td>Wall construction</td>
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<td>Door and window</td>
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### Table 2. Quantities Of Contemporary House Building Materials

<table>
<thead>
<tr>
<th>Building components</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>Foundation construction</td>
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<td></td>
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<tr>
<td>Door and window</td>
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</table>

Lefke is 70 road miles away from the port. An average sized vehicle used in NC for transporting building materials requires 70 liters of fuel oil for this kind of transport. It includes the amount of fuel oil required for the return journey to the port.

For all imported building materials, it is necessary to add 70 road miles as they have to be transported to the site from the port.

Road transport miles 2.8MJ/tones/mile
Sea transport miles 0.155 MJ/tones/mile (West, Atkinson, & Howard, 1994).

### 3.1 Characteristics of the building components and material used in the traditional and contemporary buildings

The case study selected is a good example to traditional architecture of Cyprus. The house is made of sun dried mud bricks (adobe). According to the construction system and materials used, the house could have been constructed in the 20th century, around 1920s. The house is 176 m² and there is no use of concrete. Therefore, it is a good example to compare with a contemporary building. All building materials are quantified as m² (e.g. window) or m³ (e.g. earth) (table 1). Most of the materials are then converted into kilograms for the final calculations.

The materials used for construction of this house were commonly local, minimum process requiring and reusable & recyclable materials. The construction techniques used for the mud brick house are highly labour intensive and avoid the use of framework. The imported building materials kept minimum and local materials used heavily. This house as a representative of all traditional houses proves us in a way that building a long lived house with local materials is possible.

The Contemporaray house is made of fired clay...
bricks. Before the local production of bricks, transport distances for this building material were high. Today, the distance of bricks travelled for this specific site is less than 40 miles. In total, the house is 180 m². All building materials quantified as m² (e.g. window) or m³ (e.g. earth). Most of the materials then converted into kilograms for the final calculations (table 2).

In contemporary building, all windows are without shutters. Compared to traditional house, materials used for contemporary building construction is less reusable. For instance, earth mud bricks to fired bricks and reinforced concrete columns, timber rafters to reinforced concrete roof, local stone to reinforced concrete foundation.

4. Results and Discussion

The materials used in a building construction can tell us a lot about the environmental impact of the building, but the impact of building materials can be underestimated without careful calculations. The traditional house and the contemporary building will be compared by the help of different charts showing the building materials’ embodied energy. All transport distances are calculated for Lefke. The traditional house, is analysed in terms of building materials it consumed. This is followed by the same analysis for the contemporary house (table 3).

The manufacture energy is calculated as the cradle to gate embodied energy of the building materials. Quantity will be shown with "q", density with "d", embodied energy rate with "e.e.r" and the total manufacture energy with "m.e." The formula used for both tables below is:

\[ q \times d \times e.e.r = m.e. \]

Materials with no density property have quantity in terms of kg directly (e.g. roof tiles) or the embodied energy rate is in terms of MJ/m² (e.g. windows).

The Table 4 below represents total embodied energy (cradle to site) of each building material used in the construction of the traditional house. The manufacture and transport energy showed separately to point out the role of transport especially on heavy materials like natural stone. Timber windows, different than others, have an embodied energy boundary of “cradle to gate” because of insufficient data. Fired brick, steel and roof tiles are already in terms of kg. They do not need density coefficient.

4.1 Comparison

Total embodied energy of building components of two houses were compared instead of examining materials individually for each house.

Some assumptions had to be done for calculating the embodied energy of foundation (fig. 2). The traditional house has a foundation area of 35.3 m² and almost have 1 meter of depth. In this case, the volume of the foundation is 35.3 m³. The typical foundation of traditional houses includes around 24 per cent mortar and 76 per cent of stone (calculated by construction and planning department of NC). According to this percentage, 26.8 m³ of yellow stone could have been used for constructing such a foundation.

Concrete is produced in NC, and cement essentially used for concrete production is exists in NC. This material has a road transport miles around 30 miles. The yellow stone foundation performs better in terms of embodied energy for a house with such a location in NC. However, the concrete would have been produced within 20 miles to construction site, the total cradle to site embodied energy of concrete and yellow stone would be same. Therefore both could have been
suggested in terms of embodied energy. The fig. 3. above is representing the total “cradle to site” embodied energy (manufacture + transport) in terms of MJ/kg of the floor finishing materials but to make a better comparison for floor finishing materials, the total embodied energy figure broken down into MJ/m² below. The total embodied energy (manufacture + transport) for white marble is 156.3 MJ/m², for marble tile; 180 MJ/m², for timber flooring (hardwood); 151 MJ/m² and for ceramics it is 167 MJ/m² for the case studies. According to the calculation, it is clear that use of hardwood timber flooring as it is the best floor finishing material amongst other three in terms of embodied energy even though it is an imported material to NC.

The fig. 4. above presents the total “cradle to site” embodied energy of Wall construction materials of traditional house and contemporary building in terms of MJ/kg. There is no embodied energy rate of mud brick. Hence, rammed earth assumed as the construction technique used for the traditional house. The soil is obtained directly from the site. The thickness of the walls are 60 cm and the wall thickness of fired bricked walls is 20 cm. The columns are 25 cm by 25 cm in general. The steel used in the contemporary building construction consumes 59 per cent of the total “cradle to site” embodied energy required for wall construction. The fired bricks used accounts for 33 per cent and the concrete columns 8 per cent in the total amount. 91800 MJ consumed to manufacture the bricks and 3427,2 to transport them to the construction site. Steel consumed 172200 MJ to be manufactured and 3427,2 to transport them to the construction site. Steel consumed 172200 MJ to be manufactured and 3427,2 to transport them to the construction site. Steel consumed 172200 MJ to be manufactured and 3427,2 to transport them to the construction site. The thickness of the walls of two case studies are very different. The rammed earth would not be as strong as concrete in thinner widths but the material used (soil) is a natural material and can be used in bigger amounts without harming the environ-

The cement plaster used for coatings over fired bricks in the contemporary building example, consumes the 88 per cent of the total “cradle to site” embodied energy of wall finish (fig. 5.). The wall ceramics covers an area of only 53 m² (covering 10 per cent of the walls) and accounts for 11 per cent of the total “cradle to site” embodied energy. Paint consumes only 1 percent but it covers an area of 483 m². In the traditional example, gypsum plaster is the only material used as wall finishing material. When the total embodied energy figure broken down, gypsum plaster consumes 49 MJ to cover 1 m² and cement plastering consumes 153.6 MJ for the same area. For a house with such location, using gypsum plaster rather than cement plastering is better in terms of embodied energy. The fired brick wall could be covered with a more natural alternative to cement plaster, such as earth plaster. The manufacture energy of these materials is more important than their transport energy. For instance cement plaster consumed 68856,5 MJ to be manufactured and only 5356 MJ to be transported to the construction site. Paint used consumed 579,6 MJ to be manufactured and 30,9 MJ to be transported, also wall ceramics consumed 8216 MJ to be manufactured and 4852 to be transported. The gypsum used in traditional house consumed 20182,5 MJ to be manufactured and 1569,7 to be transported to the site. The amount of timber (softwood) used for constructing the roof of the traditional house is roughly 9 m³, and the amount of concrete used in contemporary building is 36.5 m³ (fig. 6.).
The roof tiles used in the traditional house covers the entire roof, where in the contemporary building, the roof tiles used partially. The roof tiles account for 79 percent of the total embodied energy of the traditional house, and timber used for rafters is only about 21 percent. In the contemporary building example, the concrete used accounts for 93 percent of the total embodied energy, and roof tiles accounts for only 7 percent. The traditional roof covers an area of 199 m² and contemporary building roof 187 m². When the embodied energy broken down to MJ/m², it is found out that; 896.4 MJ used to construct the 1 m² of traditional house roof and 1108.2 MJ consumed for covering same amount of area in contemporary building. According to the embodied energy calculations reinforced concrete roof would not be the preferred option in terms of embodied energy.

The fig. 7. above includes the embodied energy calculation of sill and jamb (both contemporary and traditional), and glass used over doors (used in traditional house) and timber shutters (used in traditional house). Their embodied energy calculations include transport energy consumption, unlike the windows in the next chart. The natural stone used for sill and jamb purpose accounts for 49 percent of the total amount of energy consumed, timber shutters 25 percent timber doors 25 percent and glass used over the doors accounts for 1 percent in the contemporary house. For contemporary building example, 64 percent accounts for timber doors, 31 percent for concrete which is used as jamb and 5 percent for travertine stone which is used as sill. The lowest embodied energy could be achieved if concrete could be used as jamb and travertine as sill for a house with such a location.

It is calculated that timber window requires 108.1 MJ and aluminium window 2890.2 MJ to manufacture 1 m² of window for a house in NC (fig. 8.).

When considered that timber obtained locally (from 2 miles away) and aluminium is imported to NC from different countries such as China, England, etc and the average sea mile distance is 2841.5. It is clear that the total embodied energy of the aluminium window would go much higher than it is in the chart above. The fact that cannot be ignored about the windows is; aluminium windows are double glazed and timber windows are single glazed. The embodied energy rate for double glazed aluminium is 5470 MJ/m² and for double glazed timber windows it is only 230 MJ/m² to 490 MJ/m². The use of aluminium is not good enough in terms of environmental impact to be preferred. The maintenance of the windows like repainting is not included in the calculations. They have been evaluated as the primary energy they consumed to be manufactured.

5. Conclusions
This paper demonstrated how important the embodied energy calculations are for the material selection for houses aiming low environmental impact. The comparison of different building trends proved that...
many of contemporary building construction materials used in NC have high embodied energy as demonstrated by the calculations. The result of this research is; locally produced or locally existing materials do not always give the best result in terms of embodied energy all the time. This is an important finding, as many people assume the reverse. Even transportation is not such a factor to affect all the embodied energy calculations for a house in NC. The great effect of the manufacturing process of a building material on the environment is underlined with the examples (e.g. high manufacture load of marble tiles). Both houses evaluated in this research could have been performed better in terms of embodied energy if the calculations presented within this research have done before proceeding to construction.

To conclude the research it is necessary to remind that all calculations are based on ICE database. As there are some doubts about embodied energy and its calculation rates, the variety of the database is argumentative but the fact is an embodied energy calculation of the case studies could not be completed without the database. All results are in terms of Mega Joules only because of the absence of the reliable data on embodied carbon rates. Transport energy consumption calculations can be adapted to other places in NC as well as the rest of the world as ICE is an international database.

Another limitation of the study was the windows embodied energy could only be calculated within the scope of “cradle to gate” because of this total embodied energy do not cover the manufacture energy loads of windows, paints, etc. Some techniques and construction materials used by traditional house have no embodied energy rate like mud bricks and field stone. This situation was another limitation of the study. Rammed earth and yellow stone used for calculating the total embodied energy. The operational energy and the embodied energy should be united to reach the lowest impact on the environment both during the construction and the life of the building. As it takes a whole research to calculate the embodied energy of all building materials used for constructing a house, it is easier to find the operational energy of a house. Simply, energy bills can tell how much kW used in a month. It is managed to reach 6 energy bills of the traditional house, each representing one month. The rest has been worked out with electricity authority of NC. The total kW used in a year is determined as 7482 kW. This amount has to be converted into kWh (kilowatt hours) first and then to MJ (mega joules). To convert the kW into kWh, 7482 kW has to be divided by 365 (no of days in a year) multiplied with 24 (no of hours). 7482 kW / 365x24 = 0.85 kWh. 1 kWh is equal to 3.6 MJ. 0.85 x 3.6 = 3.07 MJ is consumed in an hour. The yearly consumption in terms of MJ can be found by multiplying 3.7 MJ with 365 (no of days in a year) multiplied with 24 (no of hours). The total operational energy determined for the traditional house is 26935.2 MJ in a typical year.

In the bigger picture, embodied energy consumed by the traditional house is equals to almost 22 years of operational energy. The calculation based on the assumption of same operational energy requirement for its life. The traditional house was constructed almost 80 years ago. The total embodied energy is up to 17.6 per cent of the operational energy until today. The percentage decreases, as far as building lives longer. This rate is around 10 per cent in the UK for a house with 60 years of lifetime, but rising quickly if housing is very energy efficient, uses high embodied energy materials and has a short life. It can then be up to 50% quite easily. There was no data about what the operational energy consumption of the contemporary house can be because it was still under construction and no benchmarking standards determined in NC yet. The electricity authority of NC claims that contemporary houses consume more operational energy than traditional houses but this is still too generalized to work out with.

The total overall energy use for constructing houses and operating them is reflected at least 47.6 percent of the total energy produced. It should be pointed out that this is only an assumption because case studies cannot generalize the most accurate figures for NC.

It is essential to make embodied energy calculations within the operational energy reduction acts in order to reduce the overall impact of buildings on the environment. Acts reducing only one of them only causes the other one to cost more in terms of energy. The material selection for constructing a house does not depend on the architect or on the designer at all the time. Sometimes it depends on the client. There are some basic issues to consider about keeping low the embodied energy of the building which is particularly relevant for Northern Cyprus. These are:

Choosing whole unprocessed materials (e.g. sun dried brick rather than fired brick). The heavy processing of materials during the manufacturing process has a great impact on the environment because of the use of fossil fuels. The NC government just started to make researches and trials on renewable energy sources like solar and wind. Renewable energy can be used mainly in industrial plants to significantly reduce the fossil fuel consumption. Using renewable energy during the manufacture will definitely reduce the embodied energy rate of the building material.

Choosing low embodied energy materials (e.g. timber doors rather than aluminum doors). According to Roaf, Fuentes and Thomas (2001), materials with high embodied energy are; Steel, Concrete, Timber bricks, Cement, Aggregates, Glass and Plaster. When the list considered, the contempo-
rary house is all built with significantly high embodied energy materials. With such knowledge, it should be avoided to use these materials, especially in large amounts. In NC, traditional buildings are good examples to show that buildings can be constructed without these high energy consuming materials. Buchanan and Honey proved that a significant decrease in CO₂ emissions would result if wood (as it is renewable and sustainable) is used instead of steel, concrete, or aluminum. When this knowledge applied to the case studies of this research, timber framed windows and doors could be preferred instead of aluminum windows, using timber for constructing the roof of the house instead of reinforced concrete, timber columns instead of reinforced concrete can reduce the overall embodied energy of the contemporary house case study.

Choosing materials with the ability to be reused or at least recycled (e.g. roof tiles instead of reinforced concrete roof). During the selection of any material, those that have been or can be reused or recycled should be favored, reuse is not the best option all the time because of the transportation, in spite of not requiring an extra stage of reprocessing involved in recycling. But in countries like NC with small transport distances, reuse or recycle would save large amounts of embodied energy compared to using new products. For instance, to produce a single brick 10,125 mJ is required in NC. This amount of energy equals to transport (road) a single brick for 1071 miles in NC. Recycling building materials require some sort of plants (e.g. to crush the glass) but simply reusing materials do not require any industrial support. Today, there is no recycling plant in NC but this kind of a facility can be encouraged. In the developing world within the conscious of the serious environmental treats, all countries will take some sort of steps in terms of reducing their overall eco footprint. It is very important in terms of environmental impact for an island to be self-sufficient as possible.

Choosing materials according to it’s; transport distances, country of origin, process type, raw material source and quality. (Thormark, 2006). For instance, it takes a material with 10 kg weight 1.395 MJ to transport for 900 sea miles (1017 road miles); same material with same weight can only go less than 50 miles on road. Not all fossil fuels have the same impact on the environment.

Foundation construction: It is less damaging the environment to use additional labor instead of additional fuel cost. In the case where concrete cannot be avoided because of soil conditions or other building types required rather than housing, the aggregates used in the manufacture of concrete could be produced by down cycling unwanted concrete. This will reduce the embodied energy rate of the concrete and recycling can be encouraged in NC. As mention above, some industries like recycling plants can be introduced to NC.

Floor Finish: When practically considered, using imported building materials does not sound like a good option but calculations disproved this technically. The debate of local and import come into question for this building component. According to calculations, timber flooring consumes less energy than other materials used in the case studies. The great energy load of marble tiles and white marble is perhaps a good reason not to prefer these materials as floor finishing even though marble locally exists in NC.

Wall Construction: The use of locally sourced earth almost has no effect on the environment. When realistically considered, the earth has been ignored as a building material for many years. According to Harris and Borer (1998), “the vernacular in its raw form is too uncomfortable to satisfy our needs today”. The technology is taking the comfort to further levels and it is the idea behind the change in traditional design. The new building trends and sudden decrease in the interest of traditional materials and techniques in NC is an example. At the same time, technology is one of the main reason for the increase of energy requirement. Another way to reduce the general embodied energy rate for a house made from fired brick can be achieved by using different types of bricks in different places; such as “low-and medium-fired bricks in the internal partition walls and well fired bricks outside” (Berge, 1992). Also using un-fired bricks will reduce the embodied energy figures because the firing process raises the highest consumption in terms of energy. In NC, fired bricks are the only type produced. Using second hand fired bricks (in the case of weak plaster or gypsum plaster) is an environment friendly solution too.

Wall finish: The use of gypsum plaster as a coating on the wall is better than cement based coating in two ways. Gypsum plaster has a lower impact on the environment, and it is easy to remove from the wall. When applied on fired bricks, afterwards during the demolishing step it can be removed from the brick easily and the bricks can be re used. Cement plastering do not give this chance. Paint has a low embodied energy but has to be reapplied many times which increases the total embodied energy over the building life. Also, earth plaster can be used. It is natural and can be sourced locally.

Roof construction and finish: In terms of embodied energy, using timber is much better than other building materials like concrete. In addition, minimal waste is created in the production and use of timber, as there are viable ends uses for virtually every part of the tree only it is sourced sustainably. Good quality timber can easily be re used or recycled. The lower quality pieces can be burnt for energy recovery
to reduce the demand for fossil fuels.

When timber used for constructing the roof, it is required to use roof tiles. The manufacture of a roof tile, because it requires firing process like bricks, requires a high amount of energy. The material is heavy at the same time, which means high energy required for transport. The timber and roof tiles can be re used, but not concrete. If the roof tiles and timber have to transport for long distances, using pre-cast concrete can be considered if the transport distance of concrete is short. The distance of roof tile manufacturers the site is 50 miles and concrete plants 40 miles. Second hand roof tiles should be favored all the time.

Doors and windows: Today pine trees in NC are not harvested anymore to produce door and window frame. This situation leads to imported timber doors and windows from countries as far away as the USA. The total transport energy of aluminium and timber are equal but not the distances. Both aluminium and timber windows can be re used, but in terms of energy waste and pollution timber is much more environment friendly. Even though aluminium is rich in terms of reserves, the energy used for manufacture and even recycling the product is high. Timber windows are single glazed in the traditional house but double or triple versions is available to save more energy in the winter.

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Abstract
Various demands and requirements of foreign home-buyers from different background are yet unclear to most of the residential developers. The aim of this study is to blueprint a fuzzy mapping of psychological phenomena reflected in consumer behavior, and to develop a Fuzzy Analytic Hierarchy Process (Fuzzy-AHP) decision making model to assist residential developers in dealing with potential foreign customers. Through a questionnaire survey in the form of pair wise comparison matrix among 126 expatriates, this study introduces a new approach to assist residential developers dealing with expatriates’ preference on house purchase in Malaysia in a simple and efficient way. With this fuzzy mapping, residential developers could utilize psychological phenomena to manipulate expatriates’ preference on housing purchase rather than to merely comply passively.

Keywords: Environmental Sustainability System, Housing Preference Assessment; Fuzzy-Analytic Hierarchy Process; Expatriates; Decision-making tool, Triangular fuzzy numbers.

1.0 Introduction

Housing or dwelling is considered as real estate resources (Klumbye & Apanaviciene, 2014). There are certain attributes contributing to the distinctiveness of real estate resources which outstand among other commercial products (Rahadi et al., 2013; Kawabata et al., 2014). These attributes comprise of housing fixed location, building long life span, government policies, and market characteristics (Shen et al., 2017). Property consumers normally look up several key factors and do their own weighing for decision making (Amédée-Manesme et al., 2016). In the last decade, there has been a gradual increment of foreign high net worth individuals who have joined Malaysia’s My Second Home (MM2H) Programme that offers long-term-residence status (Abdul-aziz et al., 2014a). In the last decade, there has been a gradual increment of foreign high net worth individuals who have joined Malaysia’s My Second Home (MM2H) Programme that offers long-term-residence status. The MM2H Programme prior to being rebranded in March 2002 was known as the silver Hair Programme launched by Malaysian government in 1987. The silver Hair Programme primarily targeted the foreign retirees who aged 50 years old and above who possessed certain minimum financial capabilities. In the Silver Hair Programme, those foreigners who succeeded in applications were granted visas for a maximum duration of 5 years. With the lack-luster performance by the Silver Hair Programme, MM2H is more liberal in its migration policy as it abolishes the minimum age criterion in order to target younger foreign who will soon to be a member of the retirement coterie (Wong & Musa, 2014). To date, there are many foreigners who made their homes in Malaysia whom are from both developed and developing countries (Teck-Hong, 2012). In consequence to the programme, it has become a growing phenomenon that this group of people who been granted for 10 years visas are willing to own their properties (Zainal et al., 2012).

Abdul-Aziz et al. (2014b) investigated the methods on how the residential developers in Malaysia set up their strategies to cater for the MM2H markets utilizing the 4P’s marketing framework devised by McCarthy (1960). McCarthy (1960) at the latter stage reclassified Borden’s 12 elements of marketing mix into 4P’s which are product, price, promotion, and place. Instead of investigating the physical attributes in exploring the housing market, it should be done via the architectural psychology perspective as well (Ata et al., 2012). Architectural psychology deals directly with the response of people to designed environments (Philip, 2001). The residential properties in Malaysia can be categorized into either horizontal such as bungalow and terraces, or vertical such as flats, apartments, and condominiums. Different types of residential properties possess different living environments and cater for different people (Aliu & Ajala, 2014). It is important for developers to primarily understand the foreigners’ requirements on properties to explore and tackle the specific market. In order to
establish a clear understanding on the demand and requirements of foreign Home-Buyers, the developers can utilize the applications of fuzzy logic inspired by Zadeh (1965) as a decision-making tool in circumstances highly covered by vagueness and subjectivity.

Fuzzy-AHP is an extension of the classical AHP method firstly introduced by Saaty (1987). It is able to encounter with the vagueness and imprecision of linguistic judgments (Patel et al., 2016). Fuzzy-AHP is a developed combination of Saaty’s Analytic Hierarchy Process with the Zadeh’s fuzzy set theory to solve hierarchical uncertain problems (Calabrese et al., 2013). Chronologically, van Laarhoven & Pedrycz (1983) presented the first Fuzzy-AHP method to compare the fuzzy ratios drawn by the triangular fuzzy numbers. Fuzzy-AHP has wide-ranging applications in real world problems for instances in the healthcare service (Büyüközkan et al., 2011), the ICT service industry (Calabrese et al., 2013), the construction sector (Plebankiewicz, 2014; Chou et al., 2013), the human resources management (Chou et al., 2012), and the supply chain (Patil & Kant, 2014). The application of fuzzy-mapping in this study is thus expected to come out a satisfactory delineation on the housing preferences of expatriates in Malaysia. The aim of this study is to blueprint a fuzzy mapping of psychological phenomena reflected in consumer behavior, and to develop a Fuzzy Analytic Hierarchy Process (Fuzzy-AHP) decision making model to assist residential developers in dealing with potential foreign customers.

2.0 Housing Preference Assessment and 4PS Framework

According to Rahidi et al. (2013), the real estate customer preferences can be categorized into two main categories, including: a) environment characteristics and b) dwellers characteristics. Environment characteristics are the attributes related to the external environment of human beings. The neighborhood environment refers to the surrounding physical area such as industrialized area and retail area. Meanwhile, the neighborhood dwelling referred to the types of building located nearby, for instances retail complexes, office premises, school, and factories (Le & Supphellen, 2017). On the other hand, the dwellers characteristics can be divided into dwellers’ demographics and dweller social economy (Rahidi et al., 2013). Dwellers’ demographics basically include the dwellers’ age, gender, marital status, and educational level, which implicitly represent the individuals’ social background (Renigier-Bilozor et al., 2017).

The idea of the 4Ps framework was revamped as Borden’s 12 elements of marketing mix by Borden (1984), which referred to product, price, promotion and place. Residential properties can be classified into myriad types such as bungalow, terrace, flats, apartments, and condominiums (Tan, 2008). Different housing tends to cater different needs (Almatarneh, 2013). The international retirees in the Tuscany, Italy and Portugal preferred landed properties while in Spain, they would choose apartments and flats. Housing size and the amenities available also affect the housing preferences (Wang et al., 2017). Explosive nature attraction such as coastal, countryside and highland areas is the hotspots for foreign retirees. For instance, there are numerous British retirees in southwest France converged in well-serviced small towns and villages. Property developers can render their development by establishing ample greenery, landscaping, and recreational facilities. The price of residential properties always plays a major role in the Home-Buyers’ preference (Almatarneh, 2013). From a marketing perspective, promotion strategy is vital in order to make a successful business. The developers hence should utilize appropriate promotion mediums such as news papers, websites, and social networks in relation to the geographical boundary to advertise the properties on sold. The housing preference is largely due to the human’s psychological cognitive, and people from different nationality and psychological background tend to have different preferences.

3.0 Managerial Psychological Phenomena

Psychological phenomena are the phenomena that occur remarkably among the human being and are coined into certain psychological terminology or theory.

3.1 Boiled Frog Syndrome

When a frog is dropped into a pot of boiling water, it will immediately jump out from the pot. However, when a frog is placed in a pot of cool water and the temperature of water is increased slowly, the frog will not jump out but will remain to stay in the water until it is cooked (Boyatzis, 2006). Many people are just like frogs because they are unable to detect and identify the gradual but devastating changes in life. The focus on isolated and immediate incidents is related to how human minds function and thus it is difficult for human to detect slow changes, long term implications and connections. Humans can accept slow adjustments which may cumulate to become major change, but for those changes which are made drastically, they are most probably not acceptable (Boyatzis, 2006).

3.2 Birdcage Effect

James (1890) introduced the birdcage effect. If a beautiful bird cage was hung in the most conspicuous place in the room, in a few days, the host will have to make one of the following two actions: throw the cage away, or buy a bird for the birdcage. As long as someone came into the room and saw the empty cage, he will ask the host: “Bird? Dead?” If the host answers that he never owns a bird before, the guest will ask...
him that why he needs a birdcage. Finally, the host would have to buy a bird for this birdcage or through it away (James, 1890).

3.3 Broken Windows Theory
The broken windows theory is a metaphor that if a bad situation is remained unsolved, eventually the situation will be worsen. Considering a building with a few broken windows, if the windows are not repaired, the tendency for vandals to break a few more windows will increase. Eventually, vandals may even break into the building (Adams, 2006).

3.4 Watch Law
A man with a watch knows what time it is. A man with two watches is never sure and it will cause chaos and make people lose confidence in the exact time. It is a metaphor to illustrate that a man cannot choose at two different codes of conducts and values, elsewhere he will be in disarray (Lawless, 1979).

3.5 The Name-Letter Effect
The name-letter effect is one of the widest used measures of implicit self-esteem (Nuttin, 1985). It represents the phenomenon that an individual prefers the letters in their own name and selects these above other letters in choice tasks. The task procedure is generally called initial-preference task (IPT). Participants were given a list of letters, and only some of the letters were from their own names. Participants were asked to circle the preferred letters from the list. Results revealed that the letters belonging to the participants’ own names were preferred (Nuttin, 1985). The name-letter effect differs from “implicit egotism” and the latter attributes to the way people allegedly gravitate towards places, people and situations that reflect themselves, including perhaps similarities with their own name (Pelham et al., 2005; Krizan & Suls, 2008).

3.6 Sheep Flock Effect
Sheep are always together in a flock not due to the sense of community, but rather because it helps them to minimize the probability when travelling alone being hunted by the predators. This herding instinct is always perceived as a natural way for animals to protect themselves against their predators. A scientific study outlined that the larger groups of the flock are better at detecting predators and they could avoid the predators at higher chance (Christine, 1997).

3.7 Hedgehog Effect
Hedgehog effect is an analogy about the challenges of human intimacy. Originally, it delineates a circumstance in which a group of hedgehogs try to stay close to each other in order to share heat during the cold weather (Maner et al., 2007). However, they were hurt by one another with their sharp spines. However, once they stay away from each other, they could not stand the extreme cold weather. Therefore, they must maintain a suitable proximity to one another so that no one will be hurt nor will get cold (Maner et al., 2007).

4.0 Research Method and Procedures
A research can be classified into exploratory, descriptive or explanatory. Exploratory research creates new ideas or hypotheses and generates techniques for measuring and locating future data; whilst the descriptive research aims to describe or clarify a sequence of steps and it adopts the mechanism to report on the background of a situation. The explanatory research tests a theory principle or extends a theory to a new innovative topic. This study is an exploratory research as it aims to create a new Fuzzy-AHP model in determining the expatriates’ preference on housing.

4.1 Sampling and Data Collection
Both qualitative and quantitative approaches were mixed in this study. The quantitative approach was through a questionnaire survey in the form of pair wise comparison matrix to determine the relative importance weights of the criteria outlined, and the qualitative approach was through the focus group to establish the questionnaire form and formalize the criteria for the model. The profile of focus group is shown in Table 1. With the facilitation from the focus group, a pool of deep and meaningful information was obtained for the development of the Fuzzy-AHP model. The brainstorming session enabled immediate and primary information being obtained.
The sample area for this study is Klang Valley Malaysia due to the rationale that Klang Valley is the capital economic hub and hot spot for most of the expatriates in Malaysia. Besides, as compared to other regions in the country, Klang Valley consists of myriad types of housing which caters for different demands and there are bunch of on-going property development projects in this area. A total number of 126 expatriates from 6 different regions were approached by the researcher to fill in the pairwise comparison matrix to diminish the dominance of single country’s bias. The profile of the respondents as the general group was established in Table 2.

The respondents’ preferences on housing were grouped into two primary categories which are the environment characteristics and dwellers characteristics. The focus group developed a fuzzy hierarchy between the psychological phenomena and housing criteria. The details pertaining to the appearance and development of the Fuzzy-AHP model is discussed in the next section. A hypothetical run of the developed model was conducted to test its feasibility.

4.2 Fuzzy-AHP Model Development

4.2.1 Selection of Decision Making Approach

Conventional analysis only assessed two criteria such as the environment characteristics and dwellers characteristics. Meanwhile, the recent 4Ps framework was better developed including four elements: product, price, place, and promotion. However, it did not include the element of human, which shall be the main subject to be investigated. Human preference is subjective in nature. It is rather difficult to determine the expatriates’ preference because they are from foreign lands. The traditional AHP thus however, could not effectively encounter the subjectivity in human judgments. Nevertheless, assisted by the Fuzzy Set Theory, Fuzzy-AHP has the strength in forming more accurate descriptions on subjective data. The fuzzy pair wise comparison is more reliable in delineating people’s judgments than using the crisp number in the traditional AHP pair wise comparison. Fuzzy-AHP model is proven to facilitate decision-making process, where the complexity and vagueness incorporated with the human subjectivity could be mitigated effectively. The focus group integrated the 7 psychological phenomena as sub-criteria of the primary elements into the Fuzzy-AHP model. The next section presents reflections of psychological phenomena among Home-buyers.

4.2.2 Psychological Phenomena Reflected among Home-Buyers

There are various psychological phenomena in the world, yet the focus group determined 7 most commonly perceived ones among Home-Buyers, namely: broken window theory, boiling frog syndrome, bird-cage effect, name-letter effect, watch law, sheep flock effect, and hedgehog effect. The freewheeling approach was adopted in the focus group to obtain real-life reflections of these psychological phenomena dictating expatriates’ preference on housing purchase, including: a) Bulk advertisement as marketing strategy, b) Expatriates’ friend recommendations on housing, c) User-friendly design, d) Design familiar to homeland, e) A “Wow” design, f) Tranquil view or environment, g) High level of security is provided, h) Easy access to public or neighbor, i) Expensive yet large space and its contrary situation, j) Expensive yet catch spot and its contrary situation, and k) Comfortable distance with those from same homeland. These real-life reflections of psychological phenomena originated from the focus group were listed in Table 3 in a systematic manner.

4.2.3 Developing Fuzzy-AHP Model

The development of Fuzzy-AHP model comprised of five steps.

Step 1: Configuration of a Hierarchy Tree

A hierarchy tree was structured in order to break down the main goal into sufficient details in which all the criteria can be assessed in a holistic manner as shown in Figure 1. In general, the highest level of the hierarchy tree is the primary goal of the decision making problem. In cascading forms, the main goal of the hierarchy tree is further decomposed into the criteria and sub-criteria that support the main goal in subsequent levels. In the context of residential developer’s decision-making, the primary goal is to identify the housing preference of expatriates in Malaysia. Some decision criteria were retrieved based on the criteria established in the 4Ps’ framework developed by McCarthy (1960) including: product, price, place, and promotion. Nevertheless, the focus group added in a new element ‘people’ which deemed to be an important decision criterion in the new Fuzzy-AHP model. The

<table>
<thead>
<tr>
<th>Psychological Phenomena</th>
<th>Positive (+)</th>
<th>Negative (-)</th>
</tr>
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<tbody>
<tr>
<td>Broken window theory</td>
<td>Bulk advertisement (BW)</td>
<td></td>
</tr>
<tr>
<td>Boiling frog syndrome</td>
<td>User-friendly design</td>
<td>High level of security</td>
</tr>
<tr>
<td>Bird-cage effect</td>
<td>Outstanding design</td>
<td></td>
</tr>
<tr>
<td>Name-letter effect</td>
<td>Familiar design</td>
<td></td>
</tr>
<tr>
<td>Watch law (W)</td>
<td>High price, catch spot</td>
<td>Low price, small space</td>
</tr>
<tr>
<td>Sheep flock effect</td>
<td>Friend’s recommendation</td>
<td></td>
</tr>
<tr>
<td>Hedgehog effect</td>
<td>Suitable proximity to offer with Avoid crowding</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Psychological phenomena reflected in circumstance of expatriates’ housing preference.
real-life reflections on psychological phenomena served as sub-criteria in the hierarchy tree. The vague decision making problems were configured within a simple hierarchical structure, where the decision criteria were placed in a cascading manner into four levels. The uppermost level appeared as "Types of housing preferred by expatriates", followed by two primary decision criteria, namely: "buy" and "rent" as the second level. The third level consists of the five backbones including: 'product', 'price', 'place', 'promotion', and 'people'. The 4th level was the classification of psychological phenomena accordingly.

Step 2: Fuzzy Pair-wise comparison
After the configuration of this hierarchy tree, the decision criteria were prioritized accordingly to the relative weight through the pair-wise comparison process. Fuzzy comparison scales were used because they could accurately capture people's subjective judgments in the decision making process. The decision maker thus could specify the preferences in the form of human linguistic descriptions on the importance of each decision criterion. Triangular fuzzy number (TFN) is more appropriate than crisp number as sometimes, human perceptions lie within certain intermediate zone. Using the TFNs, the corresponding linguistic judgments were converted into fuzzy numbers. Consequently, a fuzzy comparison matrix was produced.

Step 3: Aggregation of Individual TFN into Group TFN
The individual TFNs were then aggregated into group TFNs to ensure the consistency by diminishing all the individual TFN preferences. The relative importance weights of each criterion were measured by the extent analysis method. The aggregation process from individual TFN into group TFN was undertaken using the operational laws introduced by Zadeh (1965). Consider two TFN $M_1$ and $M_2$, $M_1 = (\bar{1}, m_1, u_1)$ and $M_2 = (\bar{2}, m_2, u_2)$. The operational laws are as follows: 

$$ M_1 \circ M_2 = (\bar{1} \times m_2 + \bar{2} m_1 + m_1 \times m_2, u_1 + u_2) $$

- Fuzzy Addition Law
- Fuzzy Multiplication Law
- The inverse of TFN $M_1 = (\bar{1}, m_1, u_1)$:
$$ M_1^{-1} \approx (\frac{1}{u_1 + \bar{1}} \times m_1, \frac{1}{u_1 + \bar{1}}) $$
- The scalar multiplication of a TFN $M_1 = (\bar{1}, m_1, u_1)$:
$$ \beta \times (f_1, m_1, u_1) = (\beta \times f_1, \beta \times m_1, \beta \times u_1), \beta > 0 $$
$$ \beta \times (f_1, m_1, u_1) = (\beta \times u_1, \beta \times m_1, \beta \times f_1), \beta < 0 $$

Step 4: Weight Calculation
After the fuzzy comparison matrix was established, the relative importance weight for each single criterion in the hierarchy tree was calculated using the extent analysis method developed by Chang (1996). According to Chang (1996), there were three levels involved to calculate the criterion relative importance weights:

![Hierarchy Tree Diagram](image-url)
Step 5: Synthesize of Final Weights

Finally, the relative importance weights of criteria were computed starting from the lowest level up to the top level. The final weight was a normalized vector of the overall weights. In order to demonstrate the feasibility of the developed Fuzzy-AHP model, a hypothetical run was conducted, and the result is presented in the next section.

5.0 Hypothetical Run

The hypothetical run of the Fuzzy-AHP model was carried out in the general group among 126 expatriates living in Klang Valley Malaysia.

Step 1: Configuration of Hierarchy Tree

The hierarchy tree was developed in Figure 2. The third level comprised of five main critical decision factors, including: “Product”, “Price”, “Place”, “Promotion”, and “People”. Belong to each of these five main critical decision factors are their respective sub-factors in the fourth level. For example, “Promotion” consists of two sub-factors, namely: “Bulk Advertisement” and “Friends’ recommendations”. There are altogether fourteen sub-factors established at the lowest level. The sub-factors, decision factors, and decision criteria were assessed in the next step using fuzzy scale pairwise comparison form.

Step 2: Pair-wise Comparison using Fuzzy scale

Fuzzy scales were used in conjunction with the pair-wise comparison to deal with the uncertainty. It accurately reflected the human natural language in measurable terms by using the fuzzy scale. The focus group created the pair-wise comparison form using TFNs as shown in Table 4.

Via the pair-wise comparison, the fuzzy evaluation matrix containing the pair-wise comparison results was constructed in Table 5 and 6, for Level 3 and Level 2&1, respectively, and the average values were tabulated in Table 7.

Step 3: Aggregation of Individual TFNs into Group TFNs

For each evaluation matrix, the fuzzy synthetic extent values were calculated for the degree of possibility.
Table 4. Pair-wise comparison form of TFN scale.

Table 5. Evaluation on sub-criteria in Level 3.

Table 6. Evaluation on sub-criteria in Level 2 & 1.

Table 7. Evaluation matrix of sub-criteria.
The normalized weight vectors were computed to determine the final weights for each criterion as shown in Table 8.

**Step 4: Weight Calculation**

The calculations of each criterion’s importance weights is shown in Table 9.

**Step 5: Synthesize of Final Weights**

The overall decision criteria and respective importance weights were plotted in Figure 3, which clearly delineates the relative importance of each criterion with respect to its upper decision criterion. The clusters of the overall decision criteria with respective importance weights was plotted in Figure 4. The vertical axis represents the relative weights while the horizontal axis represents the distance between the cluster groups. There are totally four significant clusters formed among the decision criteria. Interestingly, three out of the four clusters were formed with low relative weights and some criteria do not belong to any cluster groups.

In a nutshell, the residential developers could have a clear picture on the criteria that dictate the preferences of expatriates on housing. For instances, with respect to “Product”, the sub-criteria of “User-friendly design” scored with a higher weight than the other two sub-criteria such as “familiar design” and “outstanding design”. Besides, with respect to “Price”, the highest weight goes to the sub-criterion of “Lower price, town skirt”, which shows that the expatriates would square up the cost with the location of housing. Meanwhile, with respect to “Place”, the sub-criterion “Tranquil view/
environment” is more focused by the expatriates. In addition, with respect to “Promotion”, the sub-criterion of “Friends’ recommendations higher importance than “Bulk advertisement”. Expatriates rely more on friends’ recommendations in purchasing or renting a dwelling. On the other hand, with respect to “People”, apparently the expatriates would consider avoiding crowd, thus the sub-criterion “Avoid crowding” has a higher weight than another sub-criterion “Easy to socialize with neighbour”.

Looking at the five decision criteria, it is apparent to see the criterion “Product” obtaining the highest weight among the others four. All the sub-criteria were established in reflecting the seven psychological phenomena. For instance, the sub-criterion of “Friends” reflects the sheep flock effects with a high weight. With this fuzzy mapping, residential developers could actually utilize the psychological phenomena to manipulate the expatriates’ preference on housing purchase rather than to merely comply passively. Nevertheless, all these weighted criteria can be used as parameters in making decision on what types of housing to be developed to cater the particular community needs.

6.0 Conclusions and Recommendations

The paper introduces a new approach to assist residential developers dealing with expatriates’ preference on house purchase in Malaysia in a simple and efficient way. The developed fuzzy mapping is capable to deal with the vagueness of human thinking and to structure it into a systematic manner for multi-criteria decision making. With this fuzzy mapping, residential developers could actually utilize the psychological phenomena to manipulate the expatriates’ preference on housing purchase rather than to merely comply passively. Moreover, all these weighted criteria can be used as parameters in making decision on what types of housing to be developed to cater the particular community needs. The number of psychological phenomena reflected in this study was only seven among thousands thus for future research, this type of fuzzy mapping could be ventured in-depth to acquire more comprehensive results. For the expatriates, they could actually utilize the psychological phenomena to manipulate the expatriates’ preference on housing purchase rather than to merely comply passively. Nevertheless, all these weighted criteria can be used as parameters in making decision on what types of housing to be developed to cater the particular community needs.

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Housing Preference for Modern Urban Designers Using Fuzzy-AHP

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URBAN DESIGN OF HISTORIC DISTRICTS BASED ON ACTION PLANNING.

Yanjun Wang

Abstract
Historic districts are faced with inadequate features protection and landscape destruction in the process of accelerating urban construction, urban design focuses on how places function in addition to how they look, this theory is suitable for the protection of historical districts. At the present stage, the traditional urban design of historical districts has a series of problems, such as uncomprehensive research about characteristics, incomplete workflow and the lack of transformation route from design scheme to implementation, the main reason is that there is a mismatch between the setting goal and planning implementation. Urban design based on "Action planning" has the characteristics of comprehensive research contents, specific implementation plans and complete workflow, it arranges the workflow with four stages, including design preparation, design planning, design implementation and design evaluation, which is a new exploration and attempt to turn traditional blueprint-oriented into action-oriented. Urban design of North Shuncheng Lane Historic Districts in Xi’an city used action planning as a concept and established an framework including "identify development status and problems—construct action target and strategy—determine action projects and specific plans—improve and evaluate the results", to implement design ideas into practice and to guide the protection of historic districts. Above all, action-oriented planning is considered the key to the development of historic districts.

Keywords: Action planning; Urban design; Historic districts.

1. INTRODUCTION

Improving the level of urban planning is a major goal of New Urbanization in China. Urban design plays an important role in ensuring the implementation of urban planning and guiding the rational development of spatial structure with unique characteristics such as multi-subject crossing and flexible operation mechanism. It can be defined as the art of place making in cities and towns (WALTON, 2000) with an aim to enhance quality of human life (MCHARG, 1992). That is, urban design could focus on how places function in addition to how they look (SHIUE, 2014) .Large-scaled urban design of urban areas has been carried out all over China. Historic districts as an important carrier to extend the urban context and to reflect cultural characteristic, are facing with problems of destruction and inadequate protection of features in the accelerating construction process. It is imperative to apply urban design theory to realize the protection of historic districts.

Although the methods of urban design in historic districts are basically similar to those in urban areas, it has unique aspects in characteristic research, cultural continuity or public participation, etc. It not only pays attention to building entity and street environment that form the material space, but also puts more emphasis on the expression of social and cultural factors, including the inheritance of traditional features and cultural characteristics, the combination of historical context and modern life and so on (RUAN et al, 2001). There is a growing body of work across various disciplines that recognize the impact of the urban design on historic districts, and thus on contributing to continuation of historical context. In Western developed countries, urban design has been used to protect historic districts and their landscape features (WU et al, 2009; GU et al, 2013). Through the investigation of historical development and current situation, it identified landscape elements and spatial patterns of historic districts by employing type method, parameter method, etc. from the aspects of architecture elevation, block function or space layout, and transformed the static mode of elevation update or space reuse gradually to dynamic mode of function improving (TIESDELL et al, 2006; HUO et al, 2013). Urban design of historic districts in China is carried out from the reconstruction of spatial order or the restoration of old architecture elevation, and is divided into two categories: museum static protection and dynamic adjustment protection (WU et al, 2003). Update methods include incremental organic updates, newly-built districts with the preservation of traditional forms, function updates and replacements and so on (WANG, 2003; HUO et al, 2013; YANG et al, 2014). Through summarizing the literatures and practices, it
indicates that the number of urban design keeps increasing and the protection ranges continue to expand. However, the immature standard of urban design and the incomplete management procedure lead to a lacking of connection between the setting goal and the implementation effect, which will cause urban design to fail to guide the construction of historic districts effectively (WANG et al, 2005).

The reason for this problem lies in the mismatch between the setting goal and planning implementation (ZHANG, 2012). Main problems in traditional urban design in historic districts can be summarized as follows. First, Content of urban design lacks sufficient expression of characteristic. Urban design at present pays too much attention to the form of material space, and lacks the research on the comprehensive characteristics including material space, social economy, tradition culture, life styles and so on. Second, design process of urban design is not perfect. The emphases of different design stages are not clear, which cause the whole process is not complete and the final results are tedious. Third, the lack of transformation route from plans to implementation. Traditional urban design uses diagrams to guide the implementation of each element, and lacks the analyses on projects feasibility, which leads to the fact that it is difficult for the results to link up with the construction and to make adjustments according to implementation effects.

Therefore, it is necessary to establish an effective implementation route between urban design and design objects to transform the planning paradigm from blueprint plan to action plan. “Action planning” is created in the 1960s, it is defined as “the implementation-oriented planning” to solve problems at the local level (STONE, 1989), which proposes specific projects that can be implemented in the near future based on the principle of convenient for implementation in areas that need to be developed such as new development zone or old city center. Implementation is regarded as the key issue in urban planning.

Frienmann advocated to establishing a rational planning model of action oriented by taking into account planning and planning implementation (FRIENMANN, 1987). Improving the effectiveness of planning and the concept of “action planning” was widely recognized, a new trend appeared to articulate the connection and integration between planning and action (CHEN et al, 2017). The theory of action planning had wide applications in the UK and the US since the 2000s. Since 2002, the Single Local Development Framework (LDF) in UK has initiated a reform of the planning system, replacing the traditional structural planning and local planning with a single local development framework, it included government development goals and prospects, action plans for construction or transformation in the near future, and map of areas where action is needed. Action planning was also implemented as a component of urban planning in major cities in the US. The New York urban planning in 2030 takes "Greener and Better New York" as its theme, which contains information intended to encourage the implementation of policies and projects essential for the Central Area’s effective functioning, growth, and quality of life, reflecting the practical concept, definite action plan, dynamic implementation process of action planning (HE, 2011). As spatial production in China has entered a post-growth period, urban renewal becomes the dominant pattern of place making (HIN, 2011), some cities try to combine the blueprint and a dynamic update mechanism, action planning is applied to the master plan, town plan and overall urban design (QIAN et al, 2012; YANG et al, 2015). For example, Harbin discussed the effective path to the implementation of metropolitan coordinated region planning by putting forward research emphases and contents from the aspects of its problem, target and demand (YU et al, 2006). Recent construction in Shenzhen adapted the consultative action plan aimed at stock development and multiple stakeholders (ZOU, 2013). Action planning in Guangdong guided the regional development transformation through the establishment of the task system of the distribution of powers, the preparation mechanism of interaction between the upper and lower levels, and the flexible support policies (Luo, 2014). Empirical accounts of planning practice can help to build a pragmatic kind of planning theory, and planners pay more attention to the action-oriented, dynamic process of plan making. Meanwhile, its application in historic districts urban design is relatively less. This paper will take North Shuncheng Historic Districts of Xi’an city as an example to put forward the urban design based on action planning. The purpose of this study is to establish a method of conservation and update of historic districts based on action-orientation by arranging action framework and action projects.

2. URBAN DESIGN OF HISTORIC DISTRICTS BASED ON ACTION PLANNING

2.1 Research emphases

The emphases of urban design with action planning in historic districts lies in the analysis of the demand of future development and specific steps of action projects. The correct positioning of future development needs to be combined with a deep understanding of historic districts’ social, economic, ecological, cultural conditions and its status in urban development, etc. On the basis of comprehensive investigation about status and concepts learned from other advanced areas, appropriate action projects should be proposed based on the principle of realizing the comprehensive interest of districts, also the feasibility of each project and the synergy between different projects should be
considered totally. According to the external environment and the change of district itself, constantly adjustment of development strategy should be made to implement the basic conclusions of the previous investigation into space, and to push urban design to be carried out step by step.

2.2 Design framework
According to the emphases of urban design of historic districts based on action planning, the framework can be divided into four stages: design preparation, design planning, design implementation and design evaluation. The advantage of providing specific planning steps lies in the continuous needs in increasing quality of life and in helping urban designers to construct action strategies in solving problems with solutions that could adapt to the local environment. Figure 2 (see below) displays the proposed inclusive steps that could be adopted by either public sector or private sector with a collaboration with academia anytime and anywhere. Below are description and explanation for each step within each stage in details.

Design preparation stage includes present situation analysis and thematic studies. The prophase of urban design should start from site analysis to identify problems to be solved or well-being status to be optimized. Urban design based on action planning breaks through the traditional analysis of material space only and analyzes present situation including basic situations such as the historical evolution, the districts’ status in the urban development, and material aspects such as the use of land, the status of buildings, and other non-material aspects such as the history of the districts, folk customs and traditional culture. Thematic studies involve industrial layout research, public activity research, elevation landscape research, cultural context research and so on. The unique characteristics, the development advantages and directions for future development of target districts will be pointed out in this stage.

Design planning stage includes the development orientation and development strategy. The accurate development orientation is an imperative prerequisite for sustainable development. Traditional urban design emphasizes the future development of material space, lacking support from industry, culture or ecology. Urban design with action planning determines the development goal based on the full evaluation of present resources and constructs comprehensive development strategies from space, industry, culture, ecology and on on, so as to achieve sustainable development from all parts.

Design implementation stage includes the implementation and arrangement of specific projects. Converting development strategy into action projects will help to increase the rationality and operability of urban design. The traditional urban design empha-

sizes the spatial planning under the guidance of improving the layout of historic districts, while the urban design based on action planning arranges specific projects such as industrial planning, public space planning and cultural planning to optimize the industrial layout, to guide the public space and to explore cultural resources. It defines project subjects and project sequences at the same time. Detailed and practical action projects are the keys to realizing the setting goal and development strategy.

Design evaluation stage includes results improvement and effects evaluation. Through the establishment of mission system, compilation system and evaluation system, this stage provides scientific guidance for policy environment. Traditional urban design evaluates setting goals at the final time. Urban design with action planning is a dynamic and long-term planning, and summarizes the implementation and sustainability of projects according to effects in time. Experts are invited to evaluate the implementation effects and the public are encouraged to give advice on the contents of action projects so as to provide guidance for the future urban design. Strengthening the evaluation is a significant guarantee for the implementation of action projects.

2.3 Realistic meaning
Action planning can be applied to a variety of settings, including urban upgrading, community development, settlement planning and so on. Compared with the traditional blueprint planning, it pays more attention to the planning implementation process, emphasizing practicability and public participation. The blueprint planning emphasizes the future of the city, while action planning emphasizes who will implement that plan and how to realize the vision in a strategic way (CHEN

Figure 1. Technology roadmap for urban design of historic districts based on action planning.
et al., 2017). Table 1 reflects the differences in planning time, planning concept, planning process and planning evaluation between action planning and blueprint planning (LUO, 2014).

Introducing the concept of action planning into urban design of historic districts helps to solve the existing problems such as the inadequate expression of characteristics, incomplete framework and the lack of transformation route, it has the following realistic meanings. First, the preparatory stage of action planning broadens the research content of historical blocks. Action planning takes into account the current situation comprehensively including material space, social economy, ecological environment, cultural tradition and so on, and constructs strategy according to local characteristics. Second, each stage of action plan improves the design process. Action planning arranges framework around core issues including basic analysis, target position, development strategies, action projects and effects evaluation, and points out the relations and priorities of different work stages.

### 3. URBAN DESIGN OF NORTH SHUNCHENG LANE

#### 3.1 Development status and problems

North Shuncheng Lane Historic Districts are located inside the northern of ancient City Wall in Xi’an city. Xi’an is the capital of thirteen ancient dynasties, it is the eastern terminal of the Silk Road and is recognized as one of the most important cities in Western China, both historically and currently. City Wall was built during the Ming Dynasty in 1370, it is the largest and best preserved ancient City Wall in China. North Shuncheng Lane is used to be called Madao Lane to transport material, it’s about 950 meters long and covers a total area of about 20 hm². Through investigation, North Shuncheng Lane can be divided into two parts by the middle Gaoyangli Road. Residential mode in the north is street system, with the space level of street-lane-courtyard-neighborhood with long street and short lane. Buildings in the south are mostly long plate-like residential buildings or administrative office buildings (Fig.2).

Through thematic studies, problems can found in space, industry, culture and ecology. In space quality, the lack of infrastructure result in lower living quality, the limited road space caused mixed traffic...
modes on the ways. The deficiencies of public space and the increasing space demand resulted in prominent contradiction. In industrial structure, the original features such as tourism and leisure were in a gradual degradation in the process of city development, mixed industrial structure scattered along the road. In cultural environment, the aging damaged landscape could not afford the function of continuing historical context, and the intangible cultural heritage such as traditional crafts and skills was disappearing gradually. In ecological construction, residents spontaneously formed adaptive greening ways such as wall greening, green corridor and potted plant, but the waste was randomly placed along the street, eroding the public space.

3.2 Action Target and Strategy
The goal of urban design should focuses on how to improve living quality and to enhance the inner vitality of area, with maintaining historical, cultural and environmental characteristics of the North Shuncheng Lane, as well as combining protection and multifarious use. Facing the problems learned from thematic studies, urban design starts with the convergence of slow traffic system and public traffic system, the relationship between urban function and space demand, the relationship between leisure life and landscape environment, and breaks down the goals into four sub goals as slow travel, leisurely life, contextual continuity and green ecology.

In the light of four goals, action strategies are proposed to advance urban vitality from aspects of traffic organization, industrial structure, public space and ecological construction. The four sub goals will be transformed equivalently into five action strategies, which are optimizing traffic system, improving traditional landscape, developing industrial structure, guiding public space and advocating low-carbon lifestyle, to make overall arrangement for the development and construction(Fig.3).

3.3 Action Projects and Specific Actions
Action strategies are carried out as specific action projects, including green transportation project, landscape renovation project, functional zoning project, pocket park project and plants exchange project.

"Green transportation project" aims at optimizing traffic system. First, by increasing the walkway width on both sides and setting up node greening and recreational facilities, this project sets up some slow-mov-

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Figure 3: Flow chart of urban design in North Shuncheng Lane based on action planning.

Figure 4: Sketch map of green transportation project.
ing routes with symbolic significances like bricks, woods, stones and other elements to combine the historic districts features in tandem by a systematic form to deepen people’s cognition on the districts with a few simple architectural languages. It also sets up some riding tour routes for tourists, with painting walls along the routes to display the historical story of the ancient City Wall. Walking and Riding traffic network is supplementary to the existing bus system, promoting the mutual developments of public transport at the micro level (Fig. 4). Second, this project organizes one-way traffic. Minghsin Road and the central north-south road with less traffic are defined as one-way traffic in the opposite direction, making full use of the secondary road net with high density but low utilization to evacuate traffic congestion on the main roads.

"Landscape renovation project" aims at recovering the traditional landscape from block scale and building scale. In block scale, this project suggests to constitute the living form of "shop underneath and housing above" to create a traditional atmosphere by using traditional form of narrow width and deep depth. Through the use of same material, same color and same volume, it maintains the original sequence of patterns, and combines high and low dwellings into courtyard with interesting space inside. In building scale, it mainly updates the building facade with the connected but not continuous architectural interface of corridors or brick paving, and focuses on transforming "the Fifth Facade" into roof with double slope or single slope as an important element to maintain the image of traditional landscape (Fig. 5).

"Functional zoning project" aims at developing industrial structure. This project optimizes the functional layout based on original functions including leisure, entertainment, business services and living (Fig. 6). Creative Workshop includes various handicraft shops, allowing visitors to experience the process of making clay, paper-cut and other traditional crafts. Green Workshop encourages residents to replace waste into plants, allowing visitors to experience the process of waste reuse. Artists Workshop transforms the aban-
doned factory into space for creative communication of artists, allowing visitors to experience production process of arts. Courtyard Workshop includes conceptual hotels with Guanzhong courtyard as the prototype, allowing visitors to experience traditional courtyard customs.

"Pocket park project" aims at promoting the quality of leisure space. The study of the public activities of residents found out that the exercising population is mostly the elderly and children, and most of activities are fitness, chatting, chess and card recreational activities. This project uses corner spaces to create flexible pocket parks. Pocket park is a small-scaled open space for various theme activities, and scatters in a patchy form in the local block. Figure 7 shows different kinds of activities in different pocket parks, such as square dance, playing chess or calligraphy exhibition, they are connected in series by walking route to highlight neighborhood characteristics of openness and inclusiveness (Fig.6).

"Plants exchange project" aims at advocating green concept and promoting low carbon lifestyle. This project sets up an exchange platform for waste and plant, and selects rooms for raw materials and manual gardening in Green Workshop. Two types of activities will be carried out as described below. Residents' actions call on local residents to classify household waste and send them to Green Workshop. Staffs provide potted plants of equal value as waste and encourage residents to place them in public places for tourists to appreciate. Tourists' actions give visitors a chance to experience the production process of gardening by using recycled waste like plastic bottles as raw materials. Those handmade potted plants are encourage to place at the display area for the next round of waste exchange. "Plants exchange project" enhances the residents' awareness of environmental protection, as well as provides new posts for local residents, and gains economic benefits through waste collection and recycling.

3.4 Achievement Improvement and Evaluation
The system of action mission, action compilation and action evaluation improves the effectiveness of urban design. First, a cohesive action mission system is built around core problems. In the early stage of planning, attention should be paid to the analysis of the current situation and problems. In the middle of planning, action strategy and implementation plans should be worked out in detail. At the later stage of planning, the construction subject and construction sequence should be clearly defined. Second, a multi-level interactive system of compilation is established to invite experts to evaluate the implementation effects and to encourage public to put forward suggestions for the design contents. Third, an evaluation system with regular inspection is established to urge departments to review the implementation of action projects in time so that action planning can constantly adapt to the needs of urban development. Relevant departments should complete the evaluation reports according to the implementation of action tasks, to provide a realistic basis for the next amendment.

4. CONCLUSION
Design Science has been introduced since 1963 but has not been scientifically documented in a rigorous and systematic way (FULLER et al, 1963). It is concerned “not with how things are, but with how they might be”, and researchers should put focus on the interactions between the design product (creation) and human use experience (utility) that could further guide the advancement of new designs (solutions) in the future (BUCHANAN, 1992). In view of the problems existing in the traditional urban design such as inadequate expression of characteristics, incomplete framework and the lack of transformation route from plans to implementation, urban design based on action planning has the characteristics of comprehensive research contents, complete workflow and specific implementation projects. It denotes four planning stages, namely, design preparation, design planning, design implementation and design evaluation. In the present case study of North Shuncheng Lane Historic Districts in Xi’an city, on the full analysis of the present situations including material space, social economy, ecological environment and cultural tradition, divided goals of slow travel, leisurely life, contextual continuity...
and green ecology were set up, and a series of strategies with "improving traffic organization", "optimizing industrial structure", "restoring traditional landscape", "guiding public activity" and "promoting low-carbon lifestyle" were put forward to construct an implementation-oriented framework. Accordingly, these strategies are translated into action projects. Through "green transportation project", traffic resources are effectively integrated by dredging the inner traffic network of the districts and planning walking and riding routes with the theme of ancient City Wall. Through "pocket park project" and "plants exchange project", different types of activities are arranged in different public spaces, and a platform for the exchange of plants and waste is set up to advocate green concept. Through "functional zoning project", the mixed industrial structures are reorganized to tourism services or handicraft industries. Our surveys of local residents, officials, and investors further confirmed the effects of these strategies.

Future urban design would continue to require an effective way of connecting urban design and design objects and all potential end users to embed into the design process completely. Proposed action planning and design mapping from the current study might provide some insights and scientific evidence with a rigorous research focus during the design process for future urban designers to help promote regional development in a sustainable way. We hope that the practice of urban design in North Shuncheng Lane will help stimulate new research on the urban design of historic districts based on action planning, and will ultimately contribute to changes in policies and practices.

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PERCEIVED INSTITUTIONAL CAMPUS IMAGE AND ITS ENTRANCE EDIFICE.

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Abstract
Entrance edifice of the institutional campus artifice as the visible representation of status in their society. The design shall stand to show the status of the person who develops the setting, it could signify the power of the person or the entire place, and it could sometimes support certain cosmological belief system that prevails in that culture too. This study intended to identify the entrance edifice Physical features that influence observer’s perception of the image of the institutional campus. To accomplish this, physical features of the entrance edifice and its characters were identified and developed into questionnaire material. A logistic regression model was adopted to analyze the Physical features of Entrance Edifice. The findings found the followings: (i) Physical features of Entrance Edifice influence the Visual perception of the Institutional Campus. (ii) The Physical features were found to impact the Visual perception of the Institutional campus in the order of Form Identity, Architectural Elements, Scale and Portion, color and material. These variances are based on the observers’ perception, which can be integrated into the Institutional Campus Entrance Edifice design to strengthen the Image of the Institutional campus. It is clear that Entrance Edifices have the potential to build the image for a greater content and purpose through its Form Identity, Architectural Elements, Scale and Portion, color and material. Nevertheless, the entrance design could be a powerful element to build up the image of the physical settings it serves.

Keywords: Physical features; Visual perception; Entrance Edifice; Institutional Campus.

Introduction
It is evident from pre-historic period that in the process of architectural development one predominant element that stands for portrayal of the purpose, content and characteristics is the entrance gateway design that is in practice widespread for a religion, culture, trade, commerce, invasion of territories, marking of territories and habitation. Turning the pages of history of entrance design there will be a definite purpose and content for it. The design shall stand to show the status of the person who develops the setting, it could signify the power of the person or the entire place, and it could sometimes support certain cosmological belief system that prevails in that culture too.

Campus planning and design have acknowledged certainly in the profession still the academic community has conspired little. However, the concept of campus design is distinctive. The character of built environment has been quantified and evaluated with their impacts many times by the attempts have been made in the field of architecture. Yet, some of the studies along with the perception of physical characteristics of the settings have been done on the macro and micro-scale campus qualities and its impact (Amir, 2016). The built environment qualities may be specified through its “character” or “ambiance” of the building in the settings or of an appropriate location. Observers’ perceive the built environment in these aspects which become their visual perception about that environment. Thus, in designing a building, the creation of outward expression, the image, of buildings is significant factor in the formation of public perception (Peter, 1991). The observer’s perception, which can associate the visual perception and place attachment, thus contains the physical and perceptual layers (Greg & Brabyn, 2012).

In recent years, the Engineering Institutional Campuses are increasing in their numbers. The Engineering institutes are under in the pressure to market them for the survival of highly competitive business domain. For this case, they are trying to build their images by constructing iconic built structures on their campus (Jiwoo & Mikyoung, 2014). The institutional campus image is now the kind of information and also advertisement. The observer’s first impression about the Institution experienced from the access point. Here, the Entrance Edifice of the Institutional Campus artifice as the visible representation of status in their society. The physical features and characteristics of the Entrance Edifice have been experienced by the observers. Regarding this, for instance, some of the Engineering Institutes have designed their Entrance Edifice with particular elements in their Institutional
campus image settings. Berg & Kreiner (1996) states that there is broad scope to investigate the relationship between the physical landscapes and its image from the observer’s perception. Therefore, this study intends to identify the Entrance Edifice Physical features that influence observer’s perception of the image of the Institutional Campus. This study can determine, how observers perceive the Entrance Edifice and how the Physical features of the Entrance Edifice induce the Institutional Campus Image.

**Literature Review**

The image of the physical landscapes can be perceived as an independent event (Rapoport, 1990). It possesses a vital image, it can express its importance to the observers of the environment. Lynch (1960) states that the image of the environment may differ between the observer’s perceptions. In his view, the quality of the physical object has the high possibility of inducing a strong image in observers mind. Rapoport (1990) mentioned that observers’ perception is based on their environment where they live. And, also, Susan (2007) states that qualitative aspects of the building depend on the people perception among the physical setting. In this regard, so far, the effects of various characteristics of perceived spatial quality have been studied, studies have provided static data and have assessed spaces like streets, buildings and landscapes (Stamps, 2011; Franz & Von der Heydre, 2003).

Some of the studies have been done on how the educational institution’s perceived image is positively connected to the place identity in the institution settings (Marcouyeux & Fleury-Bahi, 2011). Yet, some researchers state that the environmental impact of green in the Institutional campus (Wong, Jusuf, Win, Thu, Negara & Xuchao, 2007). Outdoor thermal environment and thermal comfort are also quantified in the campus clusters (Tianyu, Qiong, Akashi, & Qinglin, 2012). Together, these cited research works done on the built environment quantitative aspects. However, the relationship between the perceived image of the Institution (i.e. built environment qualitative aspect) and its Entrance Edifice, have not yet been assessed in terms of its physical features.

Institutional Campus, it is an environment where multidisciplinary activities happened like daily life, education, research, recreation, sports, residential, etc.,. The Institutional campus quality is based on these activities which added to the physical landscapes and create the significant image (Jiwoo & Mikyoung, 2014). Thus, Institutions displays their qualities through the physical landscapes to form an image among the observers. In terms of physical landscapes, the built form, overall layout design and Entrance Edifice are supposed to be designed as visual representatives of the Institutions (Thirumaran & Babu, 2014). The physical features of the built structures will facilitate a more significant perception in the physical environment (Richards, 1994). Park & Kim (2008) specified that the observers also remember the image of the physical environment. Naser (2008) states that the measures of the physical landscapes and its perceived characteristics of the environment may vary. For built structure, physical features might gauge the size and proportion, and also it may relate other properties such as quality (Stamps, 2010). Tawfiq (1997) argues that the facade elements of the built form or structure conspire to express and communicate the character of the environment settings. Entrance Edifice as built form acts as the structure by which an observer judges his or her position relative to the Institute environment. For the better understand, the relationship between perceived image of the Institutional Campus and Its Entrance Edifice, this study aims to analyze how the Physical features of Entrance Edifice affect the image of the Institutional Campus. The Entrance Edifice that were discussed in terms of their contribution to the overall image of the Institutional campuses considered in the case studies.

**Methods and Material**

### 3.1. Model Selection

This study used Multinomial selection model, related to the statistical analysis of the survey data, to assess the Physical features of the Entrance Edifice on the selected Institutional Campuses in Tamilnadu Region. The reason why variables of the Physical features were chosen was that the physical features and its characteristics of the built form strongly evoke the Visual perception of the place.

In logistic regression, the high correlation between the variables can conspire to errors. Thus, interaction test and co-linearity analysis are conducted to select the variables (Feinstein, 1996). From the interaction tests, the significant values of all the variables are produced. The significant of the interception is evaluated. The values are performed by the cross tabulation test from Pearson Chi-Square. And the co-linearity analysis is related to the significant values of the interaction test. The variables with significant values of below 0.20 are taken into the logistic regression analysis (Hosmer & Lemeshow, 2000). Model fitting test, parameter estimation and classification test had been performed in the logistic model.

For our study, the observers’ had three conditions: (i) Entrance Edifice does not influence the Institutional Campus Image; (ii) Entrance Edifice may influence the Institutional Campus Image; and (iii) Entrance Edifice influences the Institutional Campus Image. That is, the dependent variable is a Multinomial selection problem. Consider, when an observer perceives that Entrance Edifice does not influence the Institutional Campus Image, the dependent variable takes on the value of 0; when an
observer perceives that Entrance Edifice may influence the Institutional Campus Image, the dependent variable takes on the value of 1; when an observer perceives that Entrance Edifice does not influence the Institutional Campus Image, the dependent variable takes on the value of 0, and the multinomial logit model is formulated as follows:

$$P(Y = m) = \frac{e^{\beta m + \sum \beta_i X_i}}{1 + \sum e^\beta_i X_i}$$

Reference category is

$$P(Y = 0) = \frac{e^{\beta 0 + \sum \beta_i X_i}}{1 + \sum e^\beta_i X_i}$$

In the equation:

- $P$ is the probability that an observer perceives that Entrance Edifice influences the Institutional Campus Image;
- $\beta$ represents the regression intercept, a constant term;
- $\beta_i$ is the coefficient value for each independent variable that contributes to the occurrence.

### 3.2. Variable Setup

The dependent variable considered through this logit model is whether or not an observer would perceive the Entrance Edifice influences the Institutional Campus Image. The physical features and the characteristics of the Entrance Edifice are indicated by its Physical features. The Physical features of the Entrance Edifice are categorized as follows:

**Form Identity**

The extent to which the form in the built structure illustrates uniqueness to the observer. Goodman & Elgin (1988) argues that the buildings which are possessed the property of metaphor and commonly called as “Expression”. The form of the Entrance Edifice sometimes represents the cultural identity of the community and acts as the symbols. Lynch states that the identity and form are the formal components which illustrate a special reference of evoking strong image to the observer. Sometimes the exotic shapes also peered by visual attention.

**Architectural Elements**

The architectural elements like arches, decorated cornices, barrel vaults, pediment, etc., are the unique details to represent the architectural style of the built structure. When the architectural elements are associated with coherence, they afford a distinct effect (Lynch, 1960). Lynch also said that the dominance of the element strengthens the Visual perception. In this study, the architectural elements of the entrance edifice like its arch, pediments, cornices, ornamented columns, etc., has been evaluated through the observer’s perception.

**Scale and Proportion**

The scale and proportion of the built structure are considered as the significant element in the environment/to the observers. Usually, the large scale object can be experienced through few observers and convey some meaning to the public. Likewise, the architects concentrated in the portion of the built structure to strengthen its expressive characters. Thus, the observer perceives the image from the scale and proportion of any built structure.

**Color and Material**

The building material displays the presence of aesthetic value and enhances the visual quality of the structure. Also, the materials used in the structure represents the architecture style. Color and material of the structure have considerable impact on the observer’s perception.

The data description of four independent variable and the dependent variable is shown in Table 1. The data analysis is done by using SPSS.

### 3.3. Data Source and Descriptive Statistics

**Data Source**

The data in this study got from the direct questionnaire survey of Engineering Institutional Campuses in Tamilnadu by the researcher. A random sampling method was chosen to select the Institution campuses. 12 Engineering institutional campuses (shown in the Fig 1) were selected according to its familiarity and its location (see Table 2). At each Engineering Institutional Campus, 10 to 15 observers were randomly selected; they was asked to answer the set of questions as yes/no; there were a total of 176 valid data collected from the observers.

**Descriptive Statistics**

Among the observers, 82.4% of them were students...
and 17.6% were employees. For visual aspects, 51.2% of observers noticed Form Identity of the Entrance Edifice and 47.8% not noticed; 92.6% of observers noticed Architectural Elements of the Entrance Edifice and 7.4% not noticed; 88% of observers noticed Scale and Proportion of the Entrance Edifice and 12% not noticed; and 65.9% of observers noticed Color and material of the Entrance Edifice and 34.1% not noticed. The result of the Physical features is described in Fig 2 and the summary of the Physical features is in Table 3.

3.4. Variables Selection
The identified variables are considered to be analyzed are Form Identity, Architectural Elements, Scale and Proportion, and Color and material, using statistical method. The significant value of all variables is taken from the Pearson chi-square by cross tabulation. The significant values for Form Identity, Architectural Elements, Scale and Proportion, and Color and material are 0.001, 0.001, 0.089 and 0.136 respectively. Table 4 shows the p-values of each variables. The significant values of the variables, equal or greater than
0.2 is correlated among other variables. The variables that had significant value of less than 0.2 are Form Identity, Architectural Elements, Scale and Proportion, and Color and Material. Thus, these variables are taken into the Multinomial logistic regression analysis.

3.5. Validation

The data of 176 samples were spliced into two and the one set of data 130 is used to design the Multinomial logistic regression model. From the coefficient values, the logistic regression of each category for 46 samples is determined. The logistic regression is as following: For ‘Yes’ category:

\[ P(Y = 2) = \frac{e^{2.067}}{1 + e^{2.067}} \]

For ‘May’ category:

\[ P(Y = 1) = \frac{e^{2.067}}{1 + e^{2.067}} \]

For ‘No’ category:

\[ P(Y = 0) = \frac{1}{1 + e^{2.067}} \]

Likewise, the logistic regression of each category is calculated. Then, the percentages of correct classification of two set of data are correlated. The first set of data (130 samples) have 86.7% correct classification and the second set of data (46 samples) have 64.3% correct classification respectively. In which, the percentage of correct classification for first set of data is higher than the second set of data. Thus, the validation test are cleared and the data are fit for the logistic regression model.

Results and Discussion

For this study, the reference of the dependent variable is ‘Entrance Edifice does not influence the Institutional Campus Image’. ‘Entrance Edifice may Influence the Institutional Image’ is relative to ‘Entrance Edifice does not influence the Institutional Campus Image’ and ‘Entrance Edifice Influence the Institutional Image’ is relative to ‘Entrance Edifice does not influence the Institutional Campus Image’ are used to estimate the parameter of the model. In the multinomial regression model, the parameter estimates are relative to the reference category. In which, the result of the logistic regression is expected to change its respective parameter estimates, that is, the log-odds units of the other variables in the model are kept constant.

For Entrance Edifice with Form Identity, the log-odd value, B, for ‘Entrance Edifice may Influence the Institutional Image’ relatively to ‘Entrance Edifice does not Influence the Institutional Image’ is increased by 3.067. Table 5 shows the Parameter Estimates. The odd ratio for the ‘Entrance Edifice may Influence the Institutional Image’ relatively to ‘Entrance Edifice does not Influence the Institutional Image’ is increased by 20.773. The log-odd value, B, for ‘Entrance Edifice Influence the Institutional Image’ relatively to ‘Entrance Edifice not Influence the Institutional Image’ is increased by 1.809. The odd ratio for the ‘Entrance Edifice Influence the Institutional Image’ relatively to ‘Entrance Edifice not Influence the Institutional Image’ is increased by 5.621. The odd of Observer perceive the Institutional Campus Image is 5 times increase when the ‘Form Identity’ is noticed in Entrance Edifice.

For Entrance Edifice with Architectural Elements, the log-odd value, B, for ‘Entrance Edifice may Influence the Institutional Image’ relatively to ‘Entrance Edifice does not Influence the Institutional Image’ is increased by 3.823. Table 5 shows the Parameter Estimates. The odd ratio for the ‘Entrance Edifice may Influence the Institutional Image’ relatively to ‘Entrance Edifice does not Influence the Institutional Image’ is increased by 26.63. The log-odd value, B, for ‘Entrance Edifice Influence the Institutional Image’ relatively to ‘Entrance Edifice does not Influence the Institutional Image’ is increased by 2.124. The odd ratio for the ‘Entrance Edifice Influence the Institutional Image’ relatively to ‘Entrance Edifice does not Influence the Institutional Image’ is increased by 8.786. The odd of Observer perceive the Institutional Campus Image is 8 times increase when the ‘Architectural Elements’ is noticed in Entrance Edifice.

For Entrance Edifice with Scale and Proportion, the log-odd value, B, for ‘Entrance Edifice may Influence the Institutional Image’ relatively to ‘Entrance Edifice does not Influence the Institutional Image’ is increased by 1.022. Table 5 shows the Parameter Estimates. The odd ratio for the ‘Entrance Edifice may Influence the Institutional Image’ relatively to ‘Entrance Edifice does not Influence the Institutional Image’ is increased by 4.958. The log-odd value, B, for ‘Entrance Edifice Influence the Institutional Image’ relatively to ‘Entrance Edifice does not Influence the Institutional Image’ is increased by 1.395. The odd
ratio for the ‘Entrance Edifice Influence the Institutional Image’ relatively to ‘Entrance Edifice does not Influence the Institutional Image’ is increased by 4.037. The odd of Observer perceive the Institutional Campus Image is 4 times increase when the ‘Scale and Proportion’ is noticed in Entrance Edifice. For Entrance Edifice with Color and Material, the log-odd value, B, for ‘Entrance Edifice may Influence the Institutional Image’ relatively to ‘Entrance Edifice does not Influence the Institutional Image’ is increased by 0.838. Table 5 shows the Parameter Estimates. The odd ratio for the ‘Entrance Edifice Influence the Institutional Image’ relatively to ‘Entrance Edifice does not Influence the Institutional Image’ is increased by 2.312. The log-odd value, B, for ‘Entrance Edifice Influence the Institutional Image’ relatively to ‘Entrance Edifice does not Influence the Institutional Image’ is increased by 0.78. The odd ratio for the ‘Entrance Edifice Influence the Institutional Image’ relatively to ‘Entrance Edifice does not Influence the Institutional Image’ is increased by 2.108. The odd of Observer perceive the Institutional Campus Image is 2 times increase when the ‘Color and Material’ is noticed in Entrance Edifice.

**Conclusion**

In the Logistic regression, the independent variables of Physical features of the Entrance Edifice such as Form Identity, Architectural Elements, Scale and Proportion, and Color and Material were analyzed. The Architectural Elements in the Entrance Edifice has high influence for the observers to perceive the Institutional Image. Form Identity of the Entrance Edifice also has strong influence on the Institutional Image in the physical landscapes. And, the other Physical features of the Entrance Edifice also conspire in the influence of the Institutional Image. Thus, the observers perceive the institutional Campus Image based on the Entrance Edifice with Physical features. This study provides the understandable analysis on how observers perceive the Entrance Edifice and how the Physical features of the Entrance Edifice induces the Institutional Campus Image. The study suggests that the Entrance Edifice of Built Environment can be structured in ways that could develop and enhance the physical landscape. Nevertheless, the entrance design could be a powerful element to build up the image of the physical settings it serves. However, this could offer the opportunity to desirable change in the built environment.

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DETERMINATION OF OPEN GREEN SPACE USAGE IN HOUSING ESTATES.

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Abstract
In parallel with industrialization and population growth, the need for housing areas in developing countries has also increased. Diminishing green areas in cities due to unplanned urbanization led people to search for new residential areas where they can meet with green and can satisfy their social and cultural needs.

Trabzon city is located on the East Black Sea coast of Turkey. By virtue of the concentration of settlement in the city center and the problems it has caused, the residential areas have been directed to the eastern parts of the city. Kaşüstü is one of Trabzon’s new and popular residential and commercial areas. As the study area, 3 different site areas in Kaşüstü region located in the Yomra district in the east of Trabzon were determined.

In this study, it was aimed to determine the outdoor facilities and opportunities of different housing estates in Kaşüstü region. Outdoor activities, types of usages, preferences and requests of users in these areas were identified. Thus, outdoors in different housing estates in the same region and the usage types of these places were compared. In addition, new suggestions and alternatives for outdoor usage have been developed.

Keywords: Housing Estates, Open Green Space, Residential Landscape Architecture, Urban Landscape

Introduction
Cities are, in general, spaces where individuals with different socio-cultural and economic backgrounds live together and interact with each other. Contemporary cities receive migration due to several many reasons, mainly due to industrialization, agricultural policies, mechanization in agriculture, unemployment and education (Şensoy and Karadağ, 2012). Urbanization in Turkey has accelerated since 1960s due to population growth, migration from rural areas and industrialization. The globally increasing trend of urbanization as well as in Turkey became a very significant factor in the change in land use and land cover in urban areas. This trend would undoubtedly continue with the increase in urban population (Acar et al., 2007). New concepts such as sustainability and environmental protection policies were introduced within the context of contemporary landscape design to adapt to the increasing urban population and deteriorating environmental conditions in Turkey (Yücedağ et al., 2017).

The concept of housing estate
The act of housing emerged as one of the basic necessities of the individual and the family since the existence of humans. As a matter of fact, in Maslow’s Hierarchy of Needs model (housing, security-protection, comfort, sociality, self-actualization, aesthetic satisfaction) the concept of housing is a primary need (Öznam, 2013). Housing is a multifaceted system that includes functions beyond providing a shelter. Housing plays an important role in the user’s life as a symbol of safety, comfort and individuality. It has important meanings in both socio-cultural as well as physical dimensions. Several activities that were not included in the simple definition of housing and change from one culture to the other and from one region to the other reflect human needs and relations. Residences convey significant information on several topics such as the community and the prevailing culture, lifestyle, wealth, human relations in that community. Thus, this multidimensional content of housing makes it difficult to make a standard definition (Zorlu and Sağsöz, 2010). The conditions that increase the housing value are the recognition of the environment, the natural relationship between the housing and the outdoor space, actively used open spaces, the private environment, active urban environment, a quiet natural environment, the landscape, the orderliness of the housing environment, availability of full furniture, and unpolluted air. Conditions that reduce the housing value could be listed as the presence of stairs, lack of visual contact with the land, lack of emotional relationships with the land, anonymous neighborhood, lack of garden and housing maintenance, residential-green area disconnection, noise permeability, unpleasant environment, an environment that do not enable mobility, and noise and air pollution (Girtlioglu, 1991).

The rapid increase in the urban population around the world and in Turkey due to migration and
propagation resulted in a quantitative increase in housing needs. One of the models created with state investment to resolve the housing deficit was housing estate development. Housing estates include all buildings that meet the needs of the people who inhabit a certain area, which is of a size that would include a neighborhood unit based on certain measurements or intersection of such a unit, and related social facilities (Keles, R., 1983). Housing estates should be considered as an adequate and productive spatial application instrument for the new urban policy to prevent urban conglomeration in the big cities, to provide a balanced distribution of industries and industrial population, to prevent the increase in interregional differences, and to preserve historical and natural values in and around the urban spaces during urban growth.

The objective of housing estate is to provide affordable, economical, easily and quickly constructed housing to big masses. Housing estate that is built for economic, social and political reasons could be considered as an important application instrument for the planned urban development, balanced distribution of population, elimination of the imbalance between districts and prevention of the elimination of open spaces (Polat, 2010). Housing estates could help healthy urbanization when equipped with social and technical facilities that would provide the highest level of housing and environmental satisfaction for the residents, and integrated with other functional urban areas and social-technical infrastructure (Kellekçı and Berköz, 2006). Housing estate is significant in creating healthy urban spaces that respond to the act of housing in urban texture to provide healthy, organized answers for needs and requirements. Housing estates constitutes a civilized system of housing where urban housing needs are met and healthy, organized needs are identified and fulfilled. These are housing groups that are also significant for the construction of a healthy society that includes proper technical and social infrastructures.

**The importance of near environment and open green spaces in housing estates**

One of the most important parts of urban tradition is urban open green spaces. These spaces provide the city a distinct value as they are the most important element of urban architecture, help social development in a social and psychological sense, and serve the whole city ecologically. The contributions of urban open green spaces to the city could be listed as prevention of air pollution, balancing the oxygen and carbon dioxide in the atmosphere, regulation of the microclimate, prevention of erosion and floods, screening noise and wind, providing spaces for recreational activities, and contributing to individuals’ physical and mental health (Gel et al., 2015). People need a spatial unit that they would belong to. Satisfying this requirement with housing, which is the closest unit, reinforces the feeling of belonging and security. Establishment of relationships between individuals and their near environment, creation of such a bond and internalizing the environment as a component of their identity are directly related to the spatial design. The housing and its immediate vicinity are two integrated concepts that differentiate based on their functions, albeit complementing each other. Housing and its vicinity should be organized to remove the tensions of modern people and provide peace, security and familial happiness for the individual (Yeşil and Yılmaz, 2007). For the housing areas to acquire identity and character, housing should be designed together with its surroundings, not as a single unit (Rapaport, 2000). The presence, size and design of the open green spaces around the house are prominent criteria that affect the preference of the users, housing sales economically and increase the housing prices (Li and Chau, 2016; Yiğit and Velioğlu, 2015; Düzenli, 1988).

Housing vicinity is a basic living area in terms of satisfying the user needs and satisfaction and development of individual/social relations. The housing and housing vicinity that are included in the physical, psychological and socio-cultural environment affect the satisfaction and behavior of the residents with various needs that arise from the environmental problems prevalent in the location. Also, it affects the general health, happiness and well-being of the individual/family and the community (Şensoy and Karadağ, 2012). In the development of social interaction, it is necessary to form interaction areas. The most important social interaction areas at the neighborhood level are housing gardens and outdoor space utilization. Residential gardens may not be the first or the primary factor in social interaction, but they might facilitate or complicate communications. Thus, housing designs could be developed within the framework of neighborhood relations, house vicinity open green spaces could be developed to create a community awareness and to improve the social interaction between the individual and neighbors (Şensoy and Karadağ, 2012). The housing environment that develops towards the neighborhood scale in the residential area is defined as the smallest part of the urban space. Due to its nature, the housing environment includes the house, housing area, the transportation system, playgrounds, parking lots and open green spaces. The housing environment, thus, is structured from the private to the semi-private, to semi-public, to public spaces (Gökçe, 2007).

**Landscape design in housing estates**

Landscape design is the most effective means by which one could embrace the environment in which one lives, acquire a sense of belonging, and create an
image of the environment. Thus, housing vicinity landscape design should adopt a holistic and functional design approach that would develop a sense of community without breaking up from the upper scale the housing area. Social interaction areas around the housing such as physical activity areas (i.e., walking paths, bicycle paths), parks, gardens, symbolic elements, streets, housing entrances, common spaces, balconies and terraces are the elements of landscape design and contribute to the formation of an identity around the housing and a community awareness. Individuals prefer a private and personal living environment. The environment defined here is a well-organized housing and vicinity that is without distress, noise, crowds, dangers, air pollution and other negative characteristics (Kellelcki and Berköz, 2006). A qualified housing environment and quality of life are parallel. Thus, a qualified residential environment is one that provides and enhances the quality of life of its users. Well-planned housing environments enhance quality of life and improve satisfaction (Polat, 2010).

In housing estates, landscape design is associated with open space design and utilized design elements. Open areas and spaces in housing estate developments could be grouped under 3 categories (Alpagut, 2003):

1. Organized areas
   • Children’s playgrounds
   • Leisure areas
   • Entertainment areas (chess, performance areas)
   • Sports fields (facilities for volleyball, basketball, tennis, squash, swimming)
   • Parking lots
2. Transition areas
   • Transportation channels
   • Meeting areas
   • Squares
   • Urban courtyards
3. Design elements
   • Urban furniture (furniture design)
   • Green elements (landscape design)
   • Material (material design)
   • Traffic communication equipment (traffic design)

In residential and housing estate gardens that are considered among urban open green space units, there are different aesthetical and functional approaches as well as the utilized plant material. Currently, it is known that these gardens have important aesthetic and functional problems due to social, economic, cultural and legal factors (Özyavuz and Dönmez, 2016). Among the most important factors that improve the quality of the housing environment are green spaces and the principles of their organization. Thus, planting should have aesthetic and functional characteristics. The characteristics that should be considered in housing estate planting are listed below (Dönmez, et al, 2015):

- Determination, support and enforcement of the building design
- Creating spaces
- Connecting objects and spaces
- Changing the scale
- Surrounding, enclosure, bordering
- Providing privacy
- Screening undesired noises
- Emphasizing, underlining and focusing on beautiful views
- Guidance
- Symbolization
- Mobilizing the space, creating interesting details
- Creating a background
- Light, temperature, precipitation and relative humidity and wind control
- Noise control
- Air pollution control
- Erosion control

**Materials and methods**

Today, residential gardens are prominent in fulfilling the longing of individuals for green areas, increasing their contact with nature, and concurrently providing an aesthetic value. In Turkey, the standards for the planning and design of housing gardens are often ignored and, unfortunately, there are no legal encouragements or controls in Turkey on these matters. Often long after the occupants settle in the house, generally non-functional and unqualified housing gardens are constructed. Furthermore, there are significant problems with both aesthetic and planting materials utilized in residential and housing estate gardens, which are among the urban open green spaces. In fact, for the residents to conduct a comfortable, safe and happy lives in their homes, both the house and residential gardens need to be well planned and designed (Yücedağ et al., 2017). The aim of the present study is to examine the open and green spaces located in certain housing estate developments in the city of Trabzon and evaluate these spaces based on the landscape design criteria.

**Study area**

The population of the study area, the city of Trabzon was 765,127 based on the 2009 data. The population of urban areas was 408,103 (53,34%) and the population of the rural areas was 357,024 (46,66%). The Central District population was 292,254. According to the results of the General Population Census, Trabzon is in the second most populated province after Samsun among 14 provinces in the Black Sea Region. A total of 10,000,000 people lives in the region. This population is 12.44% of the total population of Turkey (URL-1). In the Eastern Black Sea
Region, Trabzon is located at the beginning of the transit route to the Caucasus and Iran. Other countries that border the Black Sea are connected with maritime routes between the ports (Fig. 1). Trabzon is an important tourist city that could be visited in four seasons and prominent with its historical and natural assets. Trabzon remains an important commercial, cultural and artistic center, despite its geographical and strategic location in the Eastern Black Sea, its port with intense maritime traffic, its changing physical structure that is of significant difference compared to its past with its colleges and universities (Dursun, 2002).

Trabzon province has 17 districts, out of which 9 are on the 114 km long Black Sea coastline. These are Besikdüzü, Vakfıkebir, Çarşıbaşı, Akçaabat, Yomra, Arsin, Araklı, Sürmene and Of in order from the west to the east. The other districts are Tonya, Düküey, Şalpazarı, Maçka, Körprübaşi, Dernekpazarı, Hayrat and Çaykara and are not on the coastline. The housing estate developments that were designated as the study area are located in the Kaşüstü neighborhood of Yomra district, located in eastern Trabzon. Kaşüstü is one of the new and popular residential and commercial centers in Trabzon. In recent years, several units such as housing, shopping centers, hotels, hospitals and government institutions were constructed and still continue to be built in Kaşüstü. As housing estate developments, Cumalıpark Housing Estate Development (1), 3M Houses Development (2) and Akasya Residence Development (3) were selected (Fig. 2). These developments were preferred because they were the only ones located consecutively on the same street and constructed with similar properties and status.

The open and green areas in the housing estate developments that are the subject matter of the present study were examined and evaluated based on the landscape design criteria. The evaluation cards assigned to each housing development were filled out and the design weaknesses and strengths were established with visual material. Furthermore, interviews were conducted with the housing estate residents and staff to determine and assess their expectations from the housing estates open green spaces.
Methodology

1st Stage: Preliminary Survey: All housing estates in Trabzon Yomra district Kasüstü neighborhood were visited and suitable areas were determined as a result of the preliminary survey.

2nd Stage: Data Collection: “Evaluation cards” were designed to collect and evaluate the data on the determined housing estates in an orderly manner (Table 1). The criteria on these cards were considered as the criteria that housing estate developments should possess. The criteria that were included in the evaluation cards were as follows (Özyavuz and Dönmez, 2016):

- Number of building blocks
- Number of flats
- Security
- Parking lots (count and adequacy)
- Sitting-leisure areas and units
- Children’s playground
- Sports fields
- Planting design (functional and aesthetical)
- Landscape furniture

3rd Stage: Assessment: Interpretation of the completed evaluation cards about the related spaces, establishment and assessment of the current structural and vegetal status of these spaces supported by visual elements.

Results

As a result of the research conducted in housing estate developments in the study area and the interviews conducted with the residents and personnel in these developments, evaluation cards were completed for each housing estate development (Table 2).

Cumbalıpark housing estate results

The Cumbalıpark housing estate (Fig. 3) is the largest public housing in the study area based on the surface area and the number of apartment homes. There are 108 flats and 6 building blocks in the development. The security facilities were located at the main housing entrance (a). It includes an indoor car park (b) for 110 cars and an additional outdoor car park for 5 cars next to the main entrance. There is also an outdoor guest car park for 15 vehicles at the side entrance of the development. An outdoors social facility is also present for use by housing residents (c). Activities such as table tennis and table football could be conducted on outdoor terrace located in the social facilities. On the south-west, there is a children’s playground and volleyball-basketball fields with soft ground (d-f). There is also an outdoor swimming pool for children and adults (e). While there are seating-leisure units in the square created in the open green area (g), there are furniture that could be used for eating, drinking and sitting activities at different locations (h). Landscape furniture is quality and adequate to meet user needs. There are several available furniture such as umbrellas, sun beds, coffee tables, and border elements around the pool, as well as lighting fixtures, litter boxes, long ashtrays, pots, direction signs, etc. Several broad-leaved and evergreen plant species were used in planting, and the planting design was supported with groundcover plants and seasonal flowers (i). The most important weakness in planting is the lack of planting around the pool that could function as a separator and provide privacy.

3M Sana houses results

3M Sana Houses (Fig. 4) includes 6 building blocks and 98 flats. There is a security unit next to the housing entrance (a). There is a parking garage for 100 cars and an additional outdoor car park for 5 cars next to the main entrance. There is also an outdoor guest car park for 15 vehicles at the side entrance of the development. An outdoors social facility is also present for use by housing residents (c). Activities such as table tennis and table football could be conducted on outdoor terrace located in the social facilities. On the south-west, there is a children’s playground and volleyball-basketball fields with soft ground (d-f). There is also an outdoor swimming pool for children and adults (e). While there are seating-leisure units in the square created in the open green area (g), there are furniture that could be used for eating, drinking and sitting activities at different locations (h). Landscape furniture is quality and adequate to meet user needs. There are several available furniture such as umbrellas, sun beds, coffee tables, and border elements around the pool, as well as lighting fixtures, litter boxes, long ashtrays, pots, direction signs, etc. Several broad-leaved and evergreen plant species were used in planting, and the planting design was supported with groundcover plants and seasonal flowers (i). The most important weakness in planting is the lack of planting around the pool that could function as a separator and provide privacy.
cars on the development (b). There is also an additional outdoor parking area for guest cars at the area entrance. There is open green area on the development, and a seating area near the entrance (g). There are also two pergolas in different areas (i). In the southern section of the housing, there is a children’s playground and seating units in this area (d). The children’s playground furniture varies based different activities available, however certain units are incompatible with the child ergonomics. In the open green space, there is a walking track (f) around the buildings, while there are no other available sports fields places. The landscape includes conceptual water channels and bridges (c-e). Furthermore, waterfall arrangements were made using an artificial rock (h). But the water flow in the waterfall and the water channels were not well-maintained, and the channels were empty and dirty. Various types of species were used in planting, and functional arrangements such as screening, orientation, focusing and bordering were implemented. However, it was observed that no pruning and maintenance work that would ensure the sustenance of the planting were conducted. Thus, the present planting design is expected to turn into a complex land and a meadow in the future. There are landscape furniture in the area but they are inadequate. There are lighting elements, bridges on the canals located in front of the building, long ashtrays on the open green spaces, while the lack of litter boxes in the area was significant.

Akasya residence housing estate results
Akasya Residence development (Fig. 5) consists of 6 building blocks and 72 flats. There is a parking garage for 106 cars (b). There is an additional outdoor parking area for guest cars at the side entrance of the complex. A security unit (a) is available at the housing entrance, but it was discovered in the interviews that the security was inadequate. While there are no sitting units in the open green area, landscape furniture is used. There are 2 pergolas in the area (e). In a small section, there is a children’s playground unit (d), but playground furniture was insufficient and inadequate. The only sports field in the open green area is the outdoor swimming pool and the size of the pool is inadequate during the intense capacity of the summer.
season (h). The development’s open green area does not possess a planting design character, but rather individual plants are used and lacks plant compositions. Also, landscaping areas are neglected and dull (i). In interviews conducted with housing residents, it was observed that they considered the lack of plant use to create privacy, particularly around the pool, as a major shortcoming (g). There are deck chairs, lighting units and long ashtrays as landscape furniture elements (f), however their numbers are inadequate.

Discussion
Several international and domestic studies were conducted on design and improvement of residential open green spaces. Kamarulzaman, et al., (2016) determined that plants in residential gardens do not only contribute to the urban aesthetics, but also reduce the heat flow transfer, thereby reducing heat and radiation uptake by the buildings and thus improving the quality of urban environment. McPherson et al. (2003) determined the contribution of planting to residential energy and water use in areas with different landscape characteristics. Furthermore, it was found that the green spaces in the immediate vicinity of housing developments minimized indoor temperatures (Kamarulzaman, et al., 2016). In addition, several studies in the literature revealed positive contributions of open green spaces around residents to the ecosystem and human health (Warner et al., 2016; Loveday et al., 2017; Goddard et al., 2017; Belaire et al., 2016).

In addition to the ecological benefits of residential open green spaces, these also bear economic significance. In studies conducted by Leech and Campos (2003) and Luttik (2000), it was determined that open green spaces around housing developments affect housing prices. Furthermore, Tryvainen and Miettinnen (2000), McPherson (1992), Morancho (2003) and Geoghegan (2002) found the proximity of housing developments to green spaces also affects housing prices.

As a result of the present study that aimed to determine the use of open green spaces in public housing developments, various data were obtained...
from different developments in the study area. Based on the data obtained from the evaluation cards and interviews and the comparison of Çumbalıpark Housing with other developments (Akasya Residence and 3M Houses) based on open green space use and diversity of outdoor space activities, it was found that Çumbalıpark Housing was rich and sufficient in all criteria (parking lot, security, sitting/leisure areas, children’s playground, sports fields and landscape furniture) except the planting design. The reason for the failure of the development on planting design criteria was that there was no plant composition for privacy and space creation around the pool.

The outdoor green space use in 3M Houses demonstrated significant shortcomings such as the lack of outdoor sports fields, which is an important shortcoming based on the requirement of diverse activities that should be present in public housing. Particularly in these type of public housing developments, sports fields such as swimming pools, basketball, volleyball and tennis courts offer significant opportunities for the users to fulfill their activity needs. Furthermore, the problems with ergonomic design in the children’s playground located on the housing area were identified. One of the important criteria concerning children’s playgrounds is that the equipment should be suitable for the children's size. Thus, children’s playground was found to be inadequate when compared to other housing developments. The furniture located in the open green space in the housing were also inadequate in terms of diversity and number.

Akasya Residence was the most inadequate and poor housing estate development in open green space use when compared to others. As a result of the conducted assessments and interviews, it was determined that only the parking lot was sufficient in that development and other criteria (security, sitting-leisure areas, children’s playground, sports fields, planting design, landscape furniture) were inadequate and poor.

Overall, study results demonstrated that all study criteria were present at Çumbalıpark housing
development and all criteria except planting design were satisfactory. In 3M Houses, all criteria except sports fields were present and it was determined that the parking area, security, sitting areas and furniture, planting design criteria were satisfactory, however children’s playground and landscape furniture were inadequate. In Akasya Residence development, all study criteria were present, however only the parking area was satisfactory.

Conclusions
Public housing developments, which are built to compensate the quantitative deficit and provide housing for the masses especially in metropolitan cities, are of great importance for urban identity due to their magnitude. Individuals’ desire to live in modern developments that include private open-green spaces led to the widespread construction of public housing developments. However, such intensive urban construction also resulted in the users’ inability to fully meet their desires. With increased urbanization, reduction in open green spaces caused individuals to long for nature and the limited number of open green spaces in the city became even more important.

Today, public housing is preferred due to the presence of private landscaping spaces, as well as fulfilling the housing requirement of individuals. Landscape designs in the vicinity of public housing are a significant factor with an impact on satisfaction with housing. One of the most important functional features of public housing open green spaces is that it aims to provide the recreational needs of the urbanites. Individuals tend to use closest open green spaces to save time and transportation costs. Thus, especially families with children prefer public housing developments that include private open green spaces.

The most significant criteria for the evaluation of open green spaces in public housing developments and in determining the possibilities and the potential of open green spaces are the parking, security, sitting and recreational areas, children’s playground, sports fields, landscaping furniture and planting design criteria. In the present study, the sample areas identified in the city of Trabzon were examined to determine the use of open green spaces in public housing developments based on the predetermined criteria. Conducted research and interviews demonstrated that the most satisfactory public housing development area was the Cumbalıpark housing based on the above-mentioned criteria. This development was followed by 3M Houses and Akasya Residence, respectively. In the current study, the current conditions of the open green spaces were detailed, and the insatisfactory and inadequate aspects of these spaces were determined. Since criteria such as parking, security, recreational areas, playgrounds, sports fields, landscaping and planting design are the most important factors in the selection of public housing developments by the users, developers of future public housing should prioritize these criteria in their design efforts. The present study served as a pioneer and a guide for future studies to determine the nature and functions of the open green spaces in public housing projects that would be constructed in Trabzon and other urban centers in the future.

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Abstract
Single-family houses are a common form of housing in Europe. Most were built in the context of the suburbanization after World War II and are now facing challenges arising from generational changes as well as increasing living and energy standards. According to the hypothesis of this paper, in several EU regions, single-family houses may face future challenges arising from oversupply and lack of adaptation to current demand. To examine this, the paper analyses the present situation and discusses the challenges described above regarding the three neighbouring countries Belgium, Germany, and the Netherlands, based on available data and a review of country-specific characteristics of housing markets as well as national policies. Despite an impending mismatch between demand and supply, planning policies still support the emergence of new single-family houses. The comparison of Belgium, Germany, and the Netherlands shows the growing polarization between shrinking and growing regions and central and peripheral sites apparent at different stages in the three countries. While a high rate of vacancies is already registered for some regions in Germany, in the Netherlands this phenomenon can only be seen near the borders and in villages within the Randstad conurbation. In Belgium also, this phenomenon is not yet widespread, but in some suburban neighbourhoods dating from the 1950’s and 1960’s more and more single-family houses are becoming more difficult to sell, indicating an emerging mismatch between supply and demand. This article proposes some instruments which enable municipalities to intervene in single family housing neighbourhoods which are largely dominated by private ownership. These instruments are not yet widely established in single-family housing neighbourhoods but that may become important in the future.

Keywords: Single-Family House, Oversupply, Demographic Change, Planning Policies.
cussed in scientific works in Europe.

Based on the German findings, this paper aims to examine whether the bordering countries of Belgium and the Netherlands are experiencing developments similar to those in Germany. These three countries were selected because of their trilateral border. They have implemented viable cross-border relationships since decades. The authors analyse both demography-driven factors of supply and demand and influential policies in the three countries. The analysis was guided by the following questions: how do demographics shape the single-family housing market? How did (and do) planning and fiscal policies influence living preferences and the emergence of single-family housing? Can regions be identified where shrinkage is already an obvious challenge, and can instruments and policies to address this problem be identified? What are the differences and commonalities among the countries? Are approaches used in one country that would be appropriate for adoption in the others?

Section 2 provides a general overview of the demographic situation based on Eurostat data. Section 3 describes the national policies and characteristics of the housing stock; in section 4 the mismatch challenge between supply and demand against the background of different legal frameworks is discussed.

The demographic situation in three European countries: Belgium, Germany and the Netherlands

Demographic and social changes, living preferences, and the economic situations of potential buyers influence the market – and especially the demand – for single-family houses. In the following subsections, calculations mainly based on Eurostat data outline the country-specific situations related to these factors. Most of the data are compared at the national level and thus allow only nationwide conclusions. Only one factor could be compared at the regional level (NUTS-3).

Population status 2000-2015 and projection

The market for pre-owned detached and semi-detached houses is mainly influenced by natural population changes and migration. Below, overall population changes until mid-2015 and the population outlook until 2060 are outlined in more detail for the three countries included in this case study.

Population changes in both the EU and the studied countries are characterized by a slight downward trend since 2005 (Fig. 1). Based on a census conducted in Belgium and Germany, the figures for these countries show significant amplitudes. For example, in Germany, the census registered 1.5 million people fewer than estimated by official population statistics. In the following analyses, this bias has been smoothed (Engeler, 2013). Until the middle of 2015, a slight upward trend is seen in the studied countries (Eurostat, 2014). This trend is likely to be surpassed given current immigration.

The following map (Fig. 2) displays population development in three countries at the NUTS-3-level: the “Landkreise und kreisfreie Städte” in Germany, the “Arrondissements” in Belgium, and the “COROP regions” in the Netherlands. The NUTS-3-level clearly illustrates the different population developments at the Regional level.

A detailed analysis of the spatial distribution of population development at the NUTS-3-level reveals, particularly in Germany, a patchwork of growth and decline despite the overall growth in population. Between 2010 and 2014, a rather dramatic population decline (to almost 9.8%) can be verified for most East German regions as well as several West German regions, such as Waldeck-Frankenberg (Hessia, Germany) and Unna (North Rhine-Westphalia, Germany). At the same time, there are growth cores such as Munich and Hamburg. In the Netherlands, a similar pattern can be observed, but on a smaller scale. The population of the peripheral regions, especially Parkstad Limburg, Eemsdelta and Zeeuw-Vlaanderen, is shrinking while the Randstadt is growing. One reason for this phenomenon is that young people are moving to the Randstadt due to its better job opportunities (Verwest and van Dam, 2010). Belgium is characterized by generalized population growth and pressure on urban development in prosperous regions, such as the Brussels-Namur-Arlon axis in Wallonia and the Brussels-Ghent-Antwerp triangle in Flanders.

As far as projections are concerned, according to Eurostat 2012, the population will increase on the EU27-average until 2035. In Germany, population stagnation is predicted until the year 2040, after which a slow decline is expected. In the Netherlands, the population will grow until 2040 and subsequently decline.
slowly (up to -2.5%) (PBL, 2014). In Belgium, continued population growth is expected until 2060 (FBP and ADSEI, 2013).
Share of elderly (age 65+) and of family formation
The 65+ age group is expected to be the generation that will sell single-family houses as they replace their larger homes with smaller houses, owner-occupied flats and apartments in small city centres, (Harou, 2015; Brück et al., 2001; TNS-SOFRES, 2007) nursing homes or bequeath them to their heirs. In Germany this age group is growing steadily with a slow decline after 2040 (Fig. 3). The Netherlands have a similar course, but on a higher level. For Belgium a continuous growth until 2060 is predicted.

The age group between 20 and 34 represents the generation that is starting families. Therefore, they represent the main potential buyers of single-family houses (Brück et al., 2001). According to the Eurostat 2014 forecast (Fig. 4), the population of this age group will decline to approximately 85% of its 2015 size in the EU27 (with a minimal interim increase by approximately 2040).

The following developments are predicted. In Germany, the population in this age group will decline to 70% of the current level by 2060. It will decline continuously and clearly more than the EU27 average. In the other countries, the size of this generation is predicted to stagnate until 2030, after which it will decline in the Netherlands to almost 94% of its 2015 level. At the same time, in Belgium, a slight increase – up to approximately 110% – is expected. Due to declining birth rates, which are beneath the replacement level (except for Belgium), in addition to a constant increase in life expectancy, which is referred to as the “demographic turnaround” (Birg, 2005), extensive impacts on the settlement structure are expected. In particular, the composition of the populations in cities and regions will be influenced by these changes (Wiechmann, 2015).

Number of households and persons per household
According to Eurostat (2014), the number of households increased between 2005 and 2014 in all countries included in this case study, as did the EU28 average. The EU28 average registered an increase of 11% for this period. Regarding the included countries, Germany shows the lowest increase of 3.1%, followed by Belgium with 6.1% and the Netherlands with 8.3%. Corresponding to the increasing number of households (based on the EU28 average), the number of persons per household fell from 2.4 to 2.3 between 2005 and 2014 as a result of a shift towards smaller households. In Germany, the number of persons per household declined from 2.1 to 2.0 and is at its lowest level compared with the other studied countries. Belgium has the highest value with 2.4 people per household, which has not decreased since 2005. In the Netherlands the number of households decreased from 2.3 to 2.2 during this period.

The social trend towards smaller households is caused by changes in society, such as the diversification of lifestyles accompanied by the declining relevance of traditional family models. This change is manifested in the increasing number of one-person households, single-parent households, and patchwork families and has a negative impact on the demand for single-family houses. Members of these types of households and family models are often unable or unwilling to compensate for the poor infrastructure of single-family-home neighbourhoods by performing pick-up and delivery errands using a personal car. As a result, they tend to favour central locations with good infrastructure and mobility provisions and are not the demand group for single family houses (Häußermann, 2007; Siebel, 2008).

The effects of the highlighted trends differ according to country-specific preferences. However, demographic factors as well as economic factors and cultural preferences shape the housing market. These will be considered in more detail in the following sections.

Economic situation of the population
In addition to demographics, the economic situations of households have a great impact on the acquisition of property. In particular, the decline of stable employment relationships, the rise of fixed-term and precarious employment, and the lack of integration in social security systems (Häußermann, 2007; Fina, Planinsek, and Zakrzewski, 2009) have a negative impact on the disposition and financial viability of acquiring property. Instead of a detailed analysis of the economic situation of each country, the gross output per capita as an indicator of purchasing power parities over an interval of 14 years (2000 to 2014) is adduced.

The economic situations of the three countries in relation to the year 2000 are presented above (Fig. 5). Taking into consideration the entire period since 2000, Belgium displays a slightly higher rate of growth of the gross output in 2015 than in 2000 despite an intermediate growth. In Germany and the Netherlands, the gross output per capita has continued to rise since 2012 and was significantly higher in 2015 than in 2001.

Unemployment rates (Fig. 6, base year 2000) also allow for conclusions about the ability of households to acquire property. In EU28, unemployment increased from 9.6% to 10.2% from 2010 to 2014. The national and regional rates differed sharply. In Germany, unemployment decreased significantly from 7.1% to 5.0%, with some regions displaying only 50% of the 2010 rates. In Belgium, unemployment remained more or less stable with a change from 8.3% to 8.5%. The Netherlands faced the highest increase by far in its unemployment rate, from 4.5% to 7.4%. This is the country’s highest rate increase in thirty years, with a doubling in some provinces.

Share of dwelling types
The shares of settlement and building types of the entire
Figure 7 shows the share of the population living in different dwelling types in the three countries and on the EU28 level. Dwelling types are distinguished by different forms of densification, from detached houses to semi-detached houses (which include duplex houses, row houses, and two-family houses) to apartments (flats). The highest share, with approximately 80% of single-family homes (detached as well as semi-detached), can be found in Belgium and the Netherlands. This share is 45% in Germany. The EU28 share of detached and semi-detached houses amounts to 58%.

With regard to only detached single-family houses, Belgium represents the highest share with 36.9%, followed by Germany with 28.8% and the Netherlands with 16%. In contrast, the Netherlands has the highest share of high-density semi-detached houses (61.2%), followed by Belgium with 41.9%. Germany ranks at the bottom with 16.1%.

National policies and characteristics of the housing stock that shape the supply

Because demographics influence the market (cf. section 2, McFadden, 1978), the location within the regional context of single-family housing is crucial to its saleability or risk of falling vacant. In addition, both quantity and object-related factors shape the supply. The following sections describe the national policies and planning models that foster the emergence, country-specific characteristics, and vacancy ratios of single-family housing.

Characteristics of housing policies in the three countries

Although the influence of demographics on the housing market is similar in all three countries, the development of housing – in terms of quantity and location – is shaped by very different housing policies.

In addition to the development of individual mobility (Newman and Kenworthy, 1996) and individual preferences of households for single-family houses with a garden, the development of the single-family housing market in the three countries was and remains influenced by various types of political actions: fiscality, on the one hand, and the urban planning regulatory framework that supports this type of development, on the other hand (Halleux, Brück and Mairy, 2002). Programmes such as financial facilitation and offers to regions and municipalities with location-related deficits (such as poor accessibility or inadequate infrastructure within neighbourhoods) can affect the market mechanism. This phenomenon is discussed below.

Fiscal policies, financing and funding

Historically, home ownership was encouraged in all three countries through fiscal measures (direct financial
costs are subtracted from the income of the commuter. residence (cf. § 4 German Income Tax Act), and these in kilometres between the workplace and the place of standard costs are calculated according to the distance Netherlands and Germany is the commuting allowance. (Grziwotz, Battis and Krautzberger, 2008). or supported financially when purchasing a plot by the municipality for a time period (pre-emption right) in both Belgium and Germany, locals can be privileged urban and rural regions (Job, 2006; Siedentop, 2002). family housing areas on a large scale, especially in sub- this was one of Germany’s largest government subsidy homeowners obtained direct funding (Eigenheimzulage). It was one of Germany’s largest government subsidy programmes. It promoted the construction of single-family housing areas on a large scale, especially in urban and rural regions (Job, 2006; Siedentop, 2002). In both Belgium and Germany, locals can be privileged by the municipality for a time period (pre-emption right) or supported financially when purchasing a plot (Grziwotz, Battis and Krautzberger, 2008). Another (indirect) funding instrument in the Netherlands and Germany is the commuting allowance. Standard costs are calculated according to the distance in kilometres between the workplace and the place of residence (cf. § 4 German Income Tax Act), and these costs are subtracted from the income of the commuter. This lump sum promotes suburbanization and thus the construction of single-family houses as it makes the longer journey to the workplace financially more attractive (Deutsches Institut für Wirtschaftsforschung (DIW), 2007). In Germany, the property tax imposed on real estate (cf. Basic Law for the Federal Republic of Germany) differs between urban and suburban areas. Consequently, cities with high tax rates (e.g., Munich) compete with less expensive locations on the fringe (e.g., Freising) (Dieckmann, Linke, and Köhler, 2013).

The situation in the Netherlands is characterized by the so-called “Hypotheekrenteafrek” (tax deduction of mortgage interest), a fiscal instrument described as an engine for the general development of the housing market. With this instrument, private homeowners are able to deduct the interest on their mortgages from their personal tax payments. Consequently, owners do not attempt to reduce this credit by covering the cost of the house with equity capital but instead take a credit, which is as high as the price of the property. The total amount that can be invested depends on personal income. Recently, it has been possible to borrow five times one’s yearly income. This range was much higher in the past; however, due to the crisis, it is currently limited by political and financial authorities (de Hen, 2012).

In Belgium and the Netherlands, the 2008 crisis prompted banks to tighten their credit standards, which significantly affected households’ borrowing capacity (Pararius.nl 2015). These developments are expected to have a negative impact on the demand for single-family houses as they increase risk and thus complicate the purchase of a property. In addition, in Belgium, the financial crisis has not had a positive effect on housing prices (which remain significantly overvalued). As a result, particularly in Belgium, the segment of the population with access to home ownership is expected to decrease (Laurent 2016). In Germany, banks offer extremely low interest rates, but the market is divided. Properties in rural and remote regions are declining sharply in value, whereas in some metropoles (such as Munich or Hamburg), extreme price increases are leading to fear of a new housing bubble (Schieritz, 2015). This situation is occurring in the Netherlands in a similar way. Particularly in cities such as Amsterdam and Utrecht, house prices have increased more than 7% in recent years, whereas the rate of increase in remote and rural provinces has been less than 3% (Centraal Bureau voor Statistiek, 2015).

Urban planning policies and legal framework

In Belgium and Germany, the availability of land continues to stimulate the construction of new houses that – compared to ageing single-family houses – better fit the preferences of contemporary young households (see sections 2.3 and 2.4). An unpublished online survey conducted in 2015 in Germany by the ILS (Research Institute for Regional and Urban Development) showed that 30% of municipalities (36 out of 119 responding municipalities that were currently losing residents) had designated new building zones despite decreasing populations.

Concerning the lack of spatial planning policy in Belgium until 1962, “the post-war private housing construction boom occurred almost without any spatial planning” (De Decker, 2011). The result is an expansion of a dispersed building structure and ribbon developments along roads. After the adoption of the “Organic law on urban planning” in 1962, the definition of building areas was determined in sector plans on a regional level established in the 1970s. In the Flemish region, the dispersed realisation of early allotment plans and related fears of financial compensation for depreciation as...
well as “the idea of a single-family house for every household” (De Decker, 2011) led to a reservation of a huge amount of space for building areas. (De Decker, 2011) To support access to private ownership, the definition of building areas in Wallonia is generous as well. The law has not been significantly revised because changing the designation of numerous private areas into non-building areas would as well as in Flanders require a discussion of financial compensation for depreciation. This would create significant costs for the Walloon region (Dubois et al., 2002). This situation explains why a large part of the Walloon territory remains available for building new houses. Despite a number of modifications (from a top-down to a strategic and participative planning model), the recent evolutions of the Walloon Planning Law primarily aim to support urban (re-)development in urban cores (van den Berg and Braun, 2016, Halleux and Lambotte, 2008).

In Germany, reserves of building zones are still available even in localities where the population is declining despite the so-called “target-30-ha”. This target aims to reduce land usage in Germany to 30 ha per day. The national sustainability strategy of 2002 stipulated that this aim should be achieved by 2020 (Bundesministerium für Umwelt, 2015). The instruments of implementation are established in the German Building Code, namely, the land-use plan for inner urban development (§13a BauGB). This plan offers a simplified procedure and the measures of Special Urban Planning Legislation (§§136 ff.), which comprise urban redevelopment, urban restoration, the preservation statute, and urban development enforcement orders. Urban redevelopment and urban restoration target multi-storey dwellings or historical centres and are difficult to transfer to single-family housing. In addition, some Federal States demand measures to reduce the land usage of municipalities, such as by estimating the available building land in terms of brownfields (§4 IV LPG).

Since World War II, the Netherlands have developed different types of building and planning programmes to reduce the housing shortage. After the introduction of the second planning programme (Tweede Nota Ruimtelijke Ordening) in 1966, especially in the provinces of Utrecht, Gelderland and Brabant, semi-detached family houses were built in large numbers (van der Cammen and de Klerk, 2003). Different programmes, all of which had the same aim, followed; the last was the VINEX programme in 1990. More than 800,000 houses have been built under this programme, most as row houses. Based on programmes such as “Investering Stedelijke Vernieuwing” (Investment in Urban Renewal), the Netherlands also funded the refurbishment and reconstruction of their housing stock at a cost of more than 4 billion Euro between 2000 and 2014 (van de Wal, 2015). This approach to urban design is integrated and improves the social issues of neighbourhoods without differentiating between shrinking and prosperous regions (Musterd and Ostendorf, 2008).

**Country-specific characteristics of the stock of detached and semi-detached houses**

The following explanations illustrate national differences in the single-family housing stock. They are intended to provide impressions and should not be taken as thorough examinations of different building types or the influence of location on demand.

**Belgium**

In Belgium, urban planning is managed by regions. The development of single-family houses in the suburbs reached its peak in the middle of the 20th century. From the 1950s to the 1970s, numerous low-density single-family housing neighbourhoods were built throughout the territory. In Walonia (south French-speaking part of Belgium), detached single-family houses represent 52% of the regional residential building stock. These detached houses are built on large plots (1,000 sqm) (see Fig. 8) and are typically very poorly insulated (Kints, 2008; Marique and Reiter, 2012). From the 1970s to the 1980s, the development of these types of dwellings slowed due to the economic situation. Since the 1990s, the suburbs have continued to grow slowly.

In Flanders (north Flemish-speaking part of Belgium), single family houses are the predominant housing type with a share of 79 % of the housing stock (Bervoets et al., 2013). Detached single family houses represent 36 % of the housing stock and approximately 40 % of them are considered as underused. The definition of under-usage is determined by surface, number of bedrooms and number of inhabitants. Reasons for this are family members moving out, especially adult children, or generously cut houses regarding the relatively high size of Belgian houses. Under-usage of single family houses in Flanders is not only a phenomenon in the outskirts but especially in rural areas. (Bervoets et al., 2014).

In Belgium, in some suburban neighbourhoods dating from the 1950’s and 1960’s more and more single-family houses are becoming more difficult to sell, indicating an emerging mismatch between supply and demand (Chambre des Notaires de la Province de Liège, 2015). However, the lack of proven data on vacancies in single-family houses makes it necessary to take a closer look at the housing stock, the specific risk of abandonment and opportunities to future redevelopments. Marique and Reiter (2012) defined a typology of single-family neighbourhoods and houses that included four main types. Based on a random selection of single-family houses, the following data were extracted to highlight four generic types of single-family neighbourhoods: The linear district, which is composed of houses located on both sides of a road linking former villages or towns.

- The linear district, which is composed of houses located on both sides of a road linking former villages or towns. This type represents 21% of the suburban building stock.
- The semi-detached district (8%), which consists of detached and semi-detached houses.
- The “plot” district (20%), which is based on a private developer’s division of a large site into individual plots and internal roads.
- The mixed district (30%), which is more heterogeneous and consists of individual houses combined with older buildings (e.g., farms, old houses).

Buildings built before 1930 are mainly located in mixed districts (64.8%), whereas those built after 1960 are mainly found in plots and, to a lesser extent, linear districts. The linear districts are mostly located in rural very low density areas, very poorly connected to the public transportation network and infrastructure. Their monofunctionality increases the risk of abandonment in comparison with other types, especially the mixed one, which can benefit from the proximity to services, shops or existing cores.

This typology allows highlighting different opportunities for the future redevelopment of single-family houses, regarding the type of neighbourhoods in which they are located. It gives also the possibility to develop strategies dealing with similar houses.

Regarding thermal comfort and energy consumption, the first regulations that imposed minimal requirements date from 1984 and were reinforced progressively in 1996, 2008 and 2015. It is worth mentioning that in Belgium, as in France, the renewal rate of buildings is quite low (1%-2% each year) (Labeeuw et al.)
Germany

Generally, vacancy indicates an oversupply. It is important to consider that a vacancy ratio of between 2% and 3% is regarded as a “reserve for fluctuation”, which is necessary to facilitate a change in occupancy or to conduct renovation work. Based on census data (Statistisches Bundesamt, 2013), the vacancy ratio for single-family houses on the federal level in Germany has been estimated (Effenberger, 2015). In 2011 (the year the census was recorded), 236,000 detached single-family houses (not counting semi-detached houses), or approximately 2.2% of the single-family housing stock, were registered as vacant. Due to slack demand, Eastern Germany, especially the Federal States of Saxony, Saxony-Anhalt, and Thuringia, is particularly affected by vacancies of more than 4%. In Western Germany, five ‘Landkreise’ (districts) register this vacancy ratio. They are located in Saarland as well as Rhineland-Palatinate.

Below, some specifics of the German single-family housing stock are described. A characteristic of single-family houses of the 1950s is comparatively small living areas (see Fig.9). The plots are usually quite large as they were intended to allow vegetable gardening for self-sufficiency.

In the 1960s, rising prosperity levels resulted in large housing estates at the edges of cities. From the middle of the 1960s, the rise in average living space per capita and the growing demand for houses led to a rise in prices for building plots, which consequently led to a more efficient use of the plots. As a result, the average plot size decreased, and mainly row houses were built (see Fig.10).

In the 1970s, “cost- and space-saving” construction methods became increasingly common. Beginning in the mid-1970s, tax advantages (cf. chapter 3.1) took effect, and semi-detached houses and houses with granny flats were built frequently. Various constructional deficits (e.g., thermal bridges) led to high energy consumption. Only buildings constructed after the introduction of the first Ordinance on Thermal Insulation (Wärmeschutzverordnung) in 1977 complied with higher insulation standards. The aim of the housing policy of the 1980s was to offer high-quality alternatives to apartment complexes by providing cost-efficient solutions for single-family houses in compact neighbourhoods (Jessen and Simon, 2001).

The Netherlands

Nationwide, the vacancy of houses in the Netherlands currently seems to be a serious problem, especially in rural areas, along the borders or in villages within the Randstad conurbation (Hospers et al., 2015). The rate of vacant semi-detached houses is quite low at 4%, but in some rural areas and provinces such as South Limburg or Groningen (Centraal Bureau voor de Statistiek, 2013), it is significantly higher. In these regions, the
number of detached houses is higher overall. The following map (Fig. 11) illustrates the fact that vacancies in the Netherlands occur mainly at the border regions alongside Germany, Belgium and the coast.

However, vacancy problems are usually concentrated locally. Townships such as Ede in Gelderland (12.7% vacancy rate), De Marne in Groningen (12%) or Sluis in Zeeland (19.2%) are affected, whereas other towns in this province remain unaffected. In general, the provinces of Zeeland and Limburg are most affected, with vacancy rates of almost 8%. These provinces also have a problem with depopulation (Centraal Bureau voor de Statistiek, 2013). With regard to detached and semi-detached houses in the South of Limburg, 9,000 out of a total of 200,000 houses (4.5%) are currently uninhabited.

Up to 60% of the housing of the post-war era was built by public initiative due to the Dutch government’s strong role in urban planning and housing. Less than 20% of the total stock was built before 1945, and more than 40% of all houses were developed between 1945 and 1980 (Blijie et al., 2013). Nevertheless, the number of newly built single-family houses is large. In 2014, almost 60% of all newly built houses followed this typology. Most of these buildings were developed in the rural areas of the Netherlands outside of the Randstad (van de Pas, 2015).

Overall, the Netherlands are a densely populated country with a high rate of urbanization. However, the large number of detached (see Fig. 12) or semi-detached houses (see Fig. 13), accounting for more than 70% of the total stock, makes the Netherlands a country with low density in relation to its floor space index. Since 1994, the number of newly built detached houses compared to all new developed houses has declined from approximately 70% to approximately 50%. The focus of the newly developed housing stock has shifted to apartment houses or high-rise buildings (Blijie et al., 2013).

Discussion
The previous sections described main characteristics of the situations in Belgium, Germany, and the Netherlands. Due to differences in the available data, a comparison is not categorically possible, but some trends can be generalized.

The mismatch challenge between supply and demand can be explained by a combination of causes that are observable in most of the studied countries. First, the ageing of populations significantly increases the availability of ageing single-family houses. Second, a significant number of these ageing single-family houses do not fit the demands and lifestyles of contemporary young households due to various factors, such as their typology (e.g., size of the dwelling or of the plot, out-of-date architecture), their location (lack of local amenities, distance to jobs) and their poor energy performance. Third, young households’ financial power has decreased considerably due to growing unemployment, higher uncertainties related to job positions and the tightening
of credit conditions. Due to changing economic conditions, access to home ownership will be increasingly difficult for young households. Fourth, the fiscal and planning regulation framework encourages the development of new houses on greenland while older estates are increasingly underused.

However, the significance of these different causes varies across the three studied countries. In Germany and the Netherlands, the growing mismatch problem occurs mainly because the population is ageing in general and is shrinking in some peripheral territories. In Belgium, the population at the age of family formation is not shrinking. Thus, the emerging mismatch problem is mainly due to fiscal and planning policies as well as to the continuing preferences of households for single-family houses newly built on large plots in the suburbs (Marique and Reiter, 2014b; Dumas, 2015).

In all countries, the legal framework has not yet been adapted to possible declines but instead concentrates on growth. In Belgium, renewal focuses on urban cores but not on single-family houses. In the Netherlands, urban development pursues an integrated approach with a social focus. In Germany, the existing legal instruments supporting inner development are not mandatory, and some require the approval and cooperation of homeowners.

Generally, the maintenance and adaptation of single-family housing are assigned to private homeowners, so the municipalities’ influence is small. Nevertheless, a wide range of policies and intervention measures can be identified. Helpful measures have been compiled in a German research work detailing recommendations for action to support the future use of post-war single-family housing (Wüstenrot, 2012). As a first step, the monitoring and analysis of the state of older single-family estates is needed to assess their significance for the local housing market, to forecast vacancy rates and to manage the decline strategically. Municipalities should categorically focus on policies that support existing estates, such as limitations on new development and the activation of vacant lots or brownfields for new development.

Overall, it is important to stimulate demand for existing buildings and gap sites. Therefore, general information about funding possibilities for housing renewal and refurbishment and the funding of expertise for retrofitting measures (to estimate the necessary costs and to ensure that the costs remain within budget) could lower the threshold for buying old houses.

Sometimes a division of dwellings or a densification makes sense as a way to match the large plots of the stock and to adapt older single-family houses to households that differ from the classic nuclear family. In addition, this densification contributes to implementing a more sustainable land use pattern in terms of preventing the utilization of green space for housing. These possibilities have been examined in a French research project called “BIMBY” (build in my back yard). However, previous research (Marique and Reiter, 2014a) has shown that collective actions could be a better solution to reconfiguring existing neighbourhoods and adapting them to new standards.

Conclusions and prospects
In the long term, the main common feature of the three studied countries is the growing spatial polarization between shrinking and growing regions and central and peripheral sites. Single-family housing estates in central urban areas and suburban locations will follow very different trajectories: on the one hand, growing demand and rising prices characterize central urban areas; on the other hand, falling property values up to unsaleability characterize remote and shrinking regions.

Historically, home ownership was encouraged in all of the studied countries through fiscal measures (direct financial funding or incentives). Even today, the fiscal framework encourages new developments in rural or peri-urban settings. These models promote the construction of new single-family houses, even in municipalities with declining populations, which in turn strengthens the competition between the existing stocks and newly constructed single-family houses.

A comparison of Eurostat data and empirical findings from earlier studies confirms the assumption that the greatest mismatch challenge between supply and demand in the three countries can currently be observed in Germany. However, some (strategic) instruments can be applied in all countries, such as the rising attractiveness of the housing stock or the densification of existing neighbourhoods to attract different household types. Belgium, which is supposed to be the least-affected state, can begin to adapt its housing stock at a very early stage and thus can avoid problems such as building new housing in regions that will lose population in the long run.

For municipalities that anticipate the negative consequences of shrinking populations, it is necessary to avoid a vicious circle of economic, demographic, and symbolic downward transformation. Instead of exploring new construction zones, municipalities should focus attention on the existing building stock. To forecast and manage the vacancy rate, the building stock should be categorized according to its risk of falling vacant. This approach requires cooperation among municipalities, planners, and experts on the real estate market, such as estate agents and banks.

In summary, pathways for action can be distinguished on three levels: municipalities should raise awareness to initiate local-specific adaptation measures early and to reduce support for new buildings off the existing building land; the political tier that makes planning laws should support mandatory instruments for the development of single-family....
housing stock; and homeowners must be involved in all planning to ensure their support.

To explore additional solutions, further research is needed. As a whole, a regulatory and financial framework is needed that supports sustainable solutions.

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FROM REDEVELOPMENT TO GENTRIFICATION IN HONG KONG: A CASE STUDY OF KWUN TONG TOWN CENTER PROJECT

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Introduction

The terminology “gentrification” was firstly coined by Ruth Glass (1964) to describe the phenomenon in downtown London where middle class replaced the low-income class in upgraded neighborhoods. The process of gentrification is supposed to reshape urban social networks, which has side effects on urban morphology. For a long time, urban redevelopment in Hong Kong has been a complicated problem that is subject to the high-rise high-dense urban form with highly dependence on real estate-related economic growth. Since 1960s, the booming economic growth and a large number of migrants from mainland China stimulated increasing demands for more affordable housing stocks. Thus a great deal of private multi-family and multi-storey apartment buildings known as “tong lau” in Cantonese, had been constructed during 1960s and 1990s. These neighborhoods served with cheap services and lower rent make them affordable for mass working class as well as sandwiched class who are not eligible for public housing. By 2010, about 10% among 41,000 private apartments are built more than 50 years, 30% between 30 and 50 years and 60% less than 30 years (Development Bureau, 2010). More and more aging housing stocks with poor living conditions requires redevelopment. However, the fragmentation of multiple-ownership in these buildings makes it difficult for private sector to conduct redevelopment projects. Hence these projects are always conducted by URA who is authorized by government for property acquisition through cooperating with private developers. However, driven by profits from appreciation real estate, developers tend to redevelop dilapidated housing into high-end residences. In this situation, booming housing price will force original habitants to be crowded out from their neighborhoods, through which, URA-led redevelopment projects are always actually transmuted into gentrification projects.

To find out the occurrence mechanism of transformation from redevelopment to gentrification in...
In Hong Kong context, this research is going to examine a redevelopment project named Kwun Tong Town Centre Project (KTTCP) located in east Kowloon area, one of the largest urban redevelopment project conducted by URA. It is an ongoing redevelopment project consisting of five phases which is expected to take about 12 years to complete entirely. Although only the first phase (residential estate “Park Metropolitan”) finished in 2014, it has already triggered gentrification to some extent: the average housing prices of Park Metropolitan as well as its surrounding properties have increased far beyond the compensation standard made by URA for those affected households; meanwhile some residents and business operators are no longer to afford the increasing housing prices and rents, and displacement of original residents has emerged. Although URA claims that their mission is to improve the living environment in Kwun Tong, in fact, these up-market commercial premises and booming housing price present that KTTCP turns out be a gentrified neighborhood.

Theoretical framework: growth machine and urban regime

The “rent gap theory” initiated by Neil Smith (1987) explains that occurrence of gentrification is facilitated by capitalist production. The process of gentrification in housing market is transmuted to an urban strategy that connects circuits of global capital and cultural circulation (Smith, 2002). With the proliferation of neoliberalism during late 1980s, more and more governments of cities (or countries) in global east tended to abandon welfarism in urban governance and rely more on real estate market to promote economic growth. Urban land parcels are increasingly associated with commercial interests; and it is reshaping the relationship between governmental sectors and private sectors. Commodification of land based on land value generates urban growth, which has been defined as “city as growth machine (Molotch, 1976)”. Various actors and organizations constitute a growth machine that shares common interest in financial benefits on local growth of land values, and meanwhile it attempts to obtain governmental supports for such urban growth (Rodgers, 2009). And the machine is driven by those actors (e.g. developers, investors, rentiers and government) who have abundant resources to get involved in urban politics, as well as those who have interests in policy decisions on property rights of land (Rodgers, 2009). Actors in growth coalition are interdependent with each other, which further remodels relations of social reproduction (Cox & Mair, 1989). Based on the empirical study of KTTCP led by URA, this research will explore the occurrence mechanism of neighborhood gentrification through growth machine approach based on urban regime theory (Stone, 1987) in Hong Kong context. This approach is a dominant paradigm to explain the relationship between public and private sectors that involves various interest groups under urban politics (Mossberger & Stoker, 2001). Urban regime acts as a coalition involved in both public actors, private actors and civic organizations, while no entity possesses all resources to achieve its own goals (Shipps, 2008). The regime forms a stable collaboration based on both formal institutions and informal networks, which creates an access to institutional resources (political and economic resources) and manipulate policy-making procedure (Stone, 1989). Through governmental actors in collaboration with private actors, collective action is likely to be avoided, and it secures participation in the coalition by selective incentives (Mossberger & Stoker, 2001). The development regime defined by Stone (1989) is an explanation the change of land use to promote urban growth. The process of urban redevelopment is not only an index of economic growth but also a sign of public interests in urban political engagement.

In Hong Kong context, the connotation of gentrification was rarely concerned before establishment of URA, and interpretation of gentrification was often confused with “urban regeneration” or “urban redevelopment”. However, so called “state-led gentrification (He, 2007)” is deemed as a derogatory term since emergence of large-scale urban redevelopment projects with displaced social class. After establishment of LDC (replaced by URA in 2001), some redevelopment projects led by both LDC or URA (e.g. Jubilee Street Project, Wing Lok Street Project, Langham Place Project and Lee Tung Street Project) were actually gentrified (Ley & Teo, 2014). Multiple-ownership of property rights that hinders redevelopment in old apartment buildings, which requires administrative measures to be get involved in projects. As a quasi-public agency, URA plays a significant role to promote urban redevelopment in Hong Kong because it is vested authority through Urban Renewal Authority Ordinance (URAO) for acquiring property rights by compensation schemes (Mo, 2006). And it also has a long-term partnership with some private sectors including real estate developers, mass transit railway corporation (MTR) and architectural firms to conduct redevelopment projects in cooperation (Wong, 2003). On the other hand, since the taxation base of Hong Kong government highly depends on land-related revenues, government monopolizes all land supply and it has to augment fiscal revenues through large-scale land leasing. Developable land becomes a significant political-economic foundation for urban growth in Hong Kong. Therefore, the growth machine comes into being and it is driven by the coalition of URA and private developers based in terms of their common interest on land value. Through the framework based on growth machine, it offers a bet-
er approach for us to understand the reason why urban redevelopment projects always trigger gentrification in Hong Kong.

Methodology

3.1 Policy review and in-depth interview

Through reviewing the Urban Renewal Authority Ordinance (URAO) legislated by HKSAR government, it is found that URA plays as a quasi-redevelopment agency that is self-financed for redevelopment projects, which is an incentive for URA to run their projects profitably. By reviewing some local media reports on URA-led projects, critiques often focus on housing price increase caused by redevelopment and its damage to social networks of neighborhood. Media critiques provide a strong evidence that redevelopment is always transmuted into gentrification in Hong Kong. In addition, to find out how URA works in redevelopment projects and how it gains benefits from those projects, the in-depth interview was used as a research technique. The former managing director of URA, Ms. Iris Tam Siu-ying was interviewed, through which it unravelled the relationship between government, URA and developers. Specifically, those questions designed for the two-hour interview mainly focused on: how to implement urban strategies made by government; how to acquire property rights from original owners; how to meet the various interests among property owners; how to make and carry out compensation schemes; how to relocate affected households after redevelopment; why does housing price booms after redevelopment. And then Ms. Iris also explained the assessment for selection of potential redevelopable neighborhoods or buildings. Finally, she elaborated the way that URA cooperates with developers to conducts projects.

3.2 Data collection in case study

The case of Kwan Tong Town Center Project (KTTCP) will be used to examine the occurrence mechanism of gentrification in the process of redevelopment. Data of displaced inhabitants and fluctuations of housing price before and after redevelopment were collected. Those data on neighborhood analysis were collected from 2007 since promulgation of KTTCP, which indicates that how the target neighborhood will be affected by redevelopment and what potential outcomes may be produced. Furthermore, data on fluctuation of housing prices were collected from 2014 since the completion of the first phase (Park Metropolitan). The data on housing prices cover both the Park Metropolitan (Table 3) and other four housing estates nearby the redeveloping area, which shows a dramatically upward trend of housing prices driven by the redevelopment. By comparing the compensation standards made by URA, households’ income and the increasing housing prices, it can be generally concluded that a majority of residents cannot afford the housing and the displacement of neighborhood has been occurring with the ongoing redevelopment.

Redevelopment regime: agency, government and developer

4.1 Redevelopment agency: nature and motif

In order to accelerate urban redevelopment and facilitate participation of private sector, the British colonial government established the Land Development Corporation (LDC) in 1988 through joint venture. The LDC played as an agency to select aging buildings as a comprehensive development area. According to Crown Lands Resumption Ordinance, LDC had legal rights for land resumption and changing land use. Once a building was set as comprehensive development area, LDC had to submit a master plan and get approval from the Urban Planning Board. By 1998, the LDC had accomplished 12 redevelopment projects covering Wan Chai, Sai Ying Pun, Sheung Wan and Mong Kok. To deal with speeding-up aging buildings in Hong Kong, LDC planned to redevelop 25 projects during 1998 and 2001 which covered 11.6-hectare land including 600,000 m² for commercial purpose, 529,000 m² for residence and 90,000 m² for public space, and the whole plan involved 10419 households with expected budget of HK$ 8 billion (Zou & Xia, 2012). In 1997, a great financial crisis in Asia swept Hong Kong’s real estate market, and caused huge losses for private developers. By 2001, fiscal deficit of LDC had accumulated about HK$2.1 billion (La Grange & Pretorius, 2011); and great financial burden made it incapable to finance redevelopment projects. As a result, the LDC model failed due to great financial deficit and lack of sustainable social-economic benefits, and eventually the Urban Renewal Authority (URA) replaced it in 2001.

Authorized by the Urban Renewal Authority Ordinance (URAO) in 2001, URA can acquire and hold rights of land use by leasing from government; and its board members are directly appointed by chief executive of HKSAR. Hence it has been actually defined as a land development agency in self-financed operation. URA had been financed with HK$1 billion of startup capital by government in following 5 years since establishment. Furthermore, it can borrow money from Hong Kong Monetary Authority to support redevelopment projects under the approval of financial secretary; and its borrowings are guaranteed by governmental authorities (URAO, Part IV, Sec11). And the Legislative Council can authorize Financial Secretary to grant guarantees in respect of the repayment of loans and paying off debt, interests and premium under the name of URA (URAO, Part IV, Sec13). In fact, URA monopolizes all redevelopment projects that is under control of government. By 2015, URA had managed to accumulate fiscal sur-
plus of about HK$ 2.5billion generated from redevelopment projects (CSFP, 2015). Seen from the table 1, there were 7 major projects completed by URA during 2008 and 2013, each of which had generated net profits, especially the First/Second Project and Cherry Street Project gained net profits at 2.9 and 1.8 respectively. These property rights were purchased by URA before economic downturn in 2008, after which housing market of Hong Kong encountered a great boom, and those redeveloped housing stocks experienced a long-term price hike. Land appreciation and housing price booming made great benefits for both developers and URA.

4.2 Government: taxation dependent on land revenues
Due to low income tax rates and without duties and taxes on imports, exports and sales, the tax base of Hong Kong is very narrow, which leads government to highly depends on the land-related revenues. It estimated that in recent 5 years, land-related revenues including stamp duties and land premium accounted for up to 45-50% in total revenues (Koh, Wissink & Forrest, 2017:229-252). HKSAR government is the legal owner of all land under leasehold system. It monopolizes supply of new land for urban development through “high land value” policy, by which most of fiscal revenues are generated from land leasing at a high price level in restriction of land supply (Poon, 2011). Land transactions or leases has been sustainable and stable tax base because the reversion of land, selling renewed rights and any changes of leasing conditions will produce fiscal revenues for government. Since a higher development density generates higher financial revenues from the same plot of land for both government and developers (La Grange & Pretorius, 2016), government tends to extent its revenue sources through urban redevelopment. Hence the status of URA has been legalized by URAO, which becomes an essential foundation for collusion of government and URA to acquire land property right.

4.3 Developer: driving force of regime
Urban regime acts as an “informal yet relatively stable group with access to institutional resources that enable it to have a sustained role in making governing decisions (Stone, 1989:4)”. However, private developers play as a driving force in redevelopment regime. Some local tycoon developers that won the bids from URA have reaped super profits from redevelopment projects. Monopoly of tycoon developers in Hong Kong’s housing market has produced so called “developer hegemony” that bounds local economic vitality. It is estimated that seven major developers dominate around 70% of private housing market, and four tycoon property corporations including Cheung Kong Holdings, Sun Hung Kai Properties, Henderson Land and New World Development have monopolized 55% private housing supply (Koh, Wissink & Forrest, 2017:229-252). Since high-rise high-density urban morphology leads to redevelopment projects highly concentrated in Hong Kong’s inner city nearby business circles (e.g. Langham Place in Mong Kok, Lee Tung Street in Wai Chai and Kwun Tong town center), the commodification of place feeds back to upgraded housing estates that attracts professionals and other middle-class groups to settle in. Notably, URA with selected developers has formed a redevelopment regime where the exchange value of housing stocks is an absolute priority over its use value (Tang, 2008). To speculate for hike of property value, developers tend to redevelop dilapidated buildings into up-market residences that cater to preference of urban middle class (Ley & Teo, 2014). As a result, these gentrified housing estates with high-end services come to be an urban space for consumption upgrade and capital reproduction.

Case study: Kwun Tong Town Center Project
5.1 Background and masterplan
Historically, Kwun Tong is one of the poorest districts in Hong Kong. Since 1950s, a large number of refugees and migrants from the mainland China had flocked into this area, most of whom were engaged in low-paid jobs or even without jobs. In 1954, to develop Kwun Tong area into an industrial center, British colonial government set 34-hectare land for residential estates, 15 hectares for resettlements and 5 hectares for commercial premises (Kwun Tong Vision, 2006). The Yue Man Square and its surroundings were constructed as a town center where connected the industrial area at south and the residential area at north. The MTR Kwun Tong line had been completed to connect Kwun Tong area and Yau Ma Tei (center of Kowloon peninsula). This metro line further accelerat-
ed urban development around Kwun Tong district. Since late 1980s, with the economic reform in mainland China, attracted by cheap labor and low land rent, more and more Hong Kong entrepreneurs moved their factories northward to the Pearl River Delta in Guangdong province. Nowadays, only a few factories remain in these obsolete industrial buildings; and a great deal of residential units constructed during 1960s and 1970s that served with extremely time-worn living conditions has solicited URA to conduct redevelopment projects in this area. Thus, the redevelopment project for Kwun Tong town center was initially announced LDC in 1998, but it failed to be implemented; and then this project was put on URA’s agenda in 2005.

Kwun Tong Town Centre Project (KTTCP), one of the largest urban redevelopment project conducted by URA, covers a total area of 570,000 square feet. The project includes two parts: Main Site encompassed by Mut Wah Street, Hip Wo Street, Kwun Tong Road and Hong Ning Road, Yuet Wah Street Site at northeast of Main Site (see Figure 1.). It will affect approximately 5000 people, 1653 residential units and 523 shops (URA web, 2007). The Town Planning Board had approved the master layout plan of Yuet Wah Street Site and Main Site in December 2008 and January 2009 respectively. According to the master plan, Yuet Wah Street is the first site to be redeveloped (had been completed in 2014). This site had been redeveloped into a residential estate accommodating 300 units; and the space of Kwun Tong Jockey Club Health Centre was expanded more than 40% for providing better medical services (URA web, 2007). While the Main Site is a long-term project including 5 phases that are estimated to take 12 years to complete in 2021. This site will be redeveloped into a downtown of Kwun Tong district with private housing estates, commercial premises, office space and public facilities, and total size of public open space occupies more than 8,700 square meters with gardens and green land (URA web, 2007). And the landmark in this site will be constructed into an oval-shaped multi-purpose commercial center with a public transport interchange underground that is connected by footbridges to MTR station (see Figure 2).

5.2 Property Acquisition
5.2.1 Compensation scheme
In general, according to the Principles of Property Acquisition Scheme (PPAS) for KTTCP, the compensation of property acquisition adopted by URA is based on three approaches: Home Purchase Allowance (HPA) Ex-Gratia Allowance (EGA) and Supplementary Allowance (SA), each of which has been approved by the Finance Committee of the Legislative Council.

1) For owner-occupiers
Owner-occupier refers to those property owners who use their properties as self-residences. URA would like to provide a sum of compensation for owner-occupiers based on the market value of their properties plus EGA or HPA. The market value is based on a cur-
rent seven-year-old property value with similar size and locality; while the assessment of EGA or HPA is based on the value difference between the market value of the acquired property and the value of a notional counterpart property with similar quality (PPAS, 2008).

2) For tenanted or vacant domestic properties
Those property owners who leave their residential units vacant or being leased out will be compensated at current market value of their properties (valued on vacant possession basis) plus a sum of SA (between 25% and 75% of the HPA). And owners of tenanted and vacant properties will be offered SA for on more than two properties in this scheme (PPAS, 2008).

3) For joint owners
If a property is owned by multiple owners or by a company, each shareholder of the property or the company will be compensated as same principles as individual owners above-mentioned. Only the assessment of HPA or SA is based on the proportion of shareholdings held by each joint owner or each shareholder in the company (PPAS, 2008).

4) Non-domestic properties
Non-domestic property refers to those properties used for commercial purposes. URA will provide owners with the compensation in cash that equals to current market value plus EGA. However, the EGA for tenant-
ed or vacant non-domestic property is 10% of the market value or the rateable value; whichever the assessment is based on the higher one. By contrast, the self-occupied non-domestic property refers to those owners who run their businesses in their own properties. EGA for self-occupied non-domestic property is 35% of the market value or 4 times of the rateable value depending on the higher one (PPAS, 2008). Additionally, if owners had occupied properties for running business before the freezing survey of the scheme on 30 March 2007 and accepted the acquisition agreement unconditionally, URA would like to offer an Ex-gratia Business Allowance (EBA). The amount of EBA is based on the 10% of the yearly rateable value (maximum 30 years in total). The maximum amount of EBA is HK$500,000, while the minimum is HK$70,000 (PPAS, 2008). Furthermore, those owners of self-occupied non-domestic properties are also possible to claim for a compensation as an alternative EGA or EBA to make up their business loss.

5) For tenants
According to the Principles for Tenants Rehousing and Ex-gratia Payment Scheme (PTREPS), those domestic tenants living in properties acquired by URA are eligible to be rehoused in public housing units offered by Hong Kong Housing Authority (HKHA) or Hong Kong Housing Society (HKHS). Those eligible domestic tenants without alternative accommodation for rehousing must meet the requirements of public rental housing prescribed by HKHA or HKHS; meanwhile they are required to be living in the properties before the dead-

Figure 2. Constance Region based on the intensity of network connectivity.
5.2.2 Acquisition process

Through URA’s financial assessment, it estimated to cost about HK$14 billion for land acquisition, which accounts for 47% in total budget (HK$30 billion). According to the decision made by the Land, Rehousing and Compensation Committee (LRCC) attached to URA board, the purchasing price was HK$5937 per square feet that was subject to the market value of a notional 7-year-old flat was HK$5937 per square feet; and the total compensation package (about HK$2.5 million) would cover around 70% of property owners (URA Press Releases, 2008).

There were 1653 property rights in KTTCP, 621 of which were involved in Yuet Wah Street Site, presented in Figure 3, including owner-occupiers (58%), tenants (22%), sub-tenants (10%), principal tenants (2%) and others (7%). Before the deadline of first-round acquisition, all affected households including both owners and tenants had 90 days to consider whether accept the compensation scheme. If owner-occupiers of domestic properties accepted the purchase offers within 90 days, a sum of Incidental Cost Allowance (ICA) would be offered (ICA: HK$111,900 for each owner-occupier, HK$87,700 for each tenanted or vacant property). By the end of first round on 30 March, 2009, URA had managed to acquire 1,088 property rights, accounting for 97% in owner-occupiers of domestic properties (URA Press Releases, 2009). By the end of 2014, about 95% of residential units had been acquired, a few owners refused com-
By 2014, URA converged all property rights and financed HK$ 1.8 billion for following phases of KTTCP. The threshold was set at minimum funding of HK$ 8 billion for private developers to participate in the bidding held by URA. The bid winner would be responsible for constructing residential blocks in the Main Site. In September 2014, URA promulgated that the consortium made up by Sino Land Company Limited (90% shares) and Chinese Estate Group (10% shares) won the bid (Yvonne, 2014). Surprisingly, the total bidding price was only about HK$70 million with less than HK$5000 per square feet. However, URA was going to set the average selling price at HK$13,000 per square feet, which indicated that each unit was expected to sell at least HK$ 7.8 million after redevelopment (Albert, 2014).

Emerging gentrification in redevelopment

5.3.1 Hike of housing price and displacement

Once a redevelopment project promulgated by URA, housing prices around the project will be speculated higher and higher and it goes far beyond affordability for original residents. The Yuet Wah Street Site had been completed in 2014 and redeveloped into an upmarket residence named as “Park Metropolitan” accommodating 299 units (see Figure 4). URA is the legal and beneficial owner of residential properties, while Sino Land Company Limited is the developer as well as the holding company of Park Metropolitan. Before selling, Sino Land promulgated its opening price (entry price) at HK$11,417 per square feet (HK$5,297,200 per unit) in Oct 25, 2013 (see Figure 5). To exam hike of price after redevelopment, data based on register of transactions of Park Metropolitan were collected from Nov 2014 to Feb 2017. Table 2 shows that 295 units had been sold by Aug 2016; the average transaction price increased dramatically since 2013, which far exceeded the standard of compensation made by URA at HK$ 5937 per square feet based on the market value of a notional 7-year-old flat.

In fact, as a historically impoverished district in Hong Kong, the monthly income of household in Kwun Tong is generally less than the average level of Hong Kong. To examine the household income in the redeveloping area, the data were collected from Detailed Social Impact Assessment Stage II (DSIA). Seen from Figure 6, a large group of household (about 35%) earned less than HK$10000 per month; and among the 1401 surveyed households, 145(10%) of whom had been receiving the Comprehensive Social Security Assistance (a kind of social relief in Hong Kong). However, increasing housing price has actually triggered displacement of residents. By Aug 2016, 295 of units in the Park Metropolitan had been sold at average HK$ 8.2 million per unit. By contrast, according to URA’s compensation scheme, about 70% of owners-occupiers had received the compensation package between HK$ 2.3 million and HK$ 2.5 million including ex-gratia allowances that hardly enough to cover the housing cost in this redeveloped area. As a result, those home owners, tenants, shopkeepers and other small-business operators who cannot afford accommodation will be displaced from their neighborhood after redevelopment; meanwhile new middle class as well as speculators of real estate will soon occupy the gentrified neighborhood.
5.3.2 Reshaping neighborhood morphology

Historically, Yuet Wah Street is a traditional settlement for Hakka and Teochew immigrants (Chao-Shan area, east of Guangdong Province, mainland China). The neighborhood has formed special kaifong associations based on Chao-Shan culture and traditions, such as Obon festival, pigeon racing and Teochew music that have been an indispensable part of their daily life. And family-operated businesses around Yuet Wah Street are largely supported by acquaintances. Hence kaifong associations and commercial activities have come into being a neighborhood network and interaction among these inhabitants for a long time. However, through in-depth interview for the former managing board of URA, the cultural preservation strategy only targets on those traditional cultures accredited by authorities, while those minor cultures and informal traditions are likely to be demolished in the process of redevelopment.

Before redevelopment, family-operated businesses and hawkers were main commercial activities that preserve a relatively low level of living costs; and lower rental expenses dependent on old apartment buildings also supported affordable accommodation for low-income groups in in Yuet Wah Street (Li, 2007). After redevelopment, relocation associated with displacement of inhabitants will break this kind of neighborhood interaction to a large extent. Figure 7 presents places of relocation or rehousing for those home owners originally living in redeveloping area. 46% of property owners (including shopkeepers) will be relocated in Kwun Tong and Kowloon east areas and other 54% will be relocated somewhere far away from their original neighborhoods.

Furthermore, multifarious social networks based on neighborhood (see Figure 8) will be inevitably disorganized. First of all, 44% of those who living on family-operated businesses, such as restaurants, barbershops, handicraft shops, clothing stores, groceries and food stores are the most vulnerable group to be forced out because of loss of old customers and sensitivity to increasing operational cost. Although URA promised to offer assistance to shopkeepers for searching alternative premises, the primitive aboriginality of urban neighborhood will be hardly recovered. Secondly, about 20% are elderly and disabled residents who rely on medical care near their homes for their daily life. Once have been relocated to other places, nursing care attached to community clinics have to be deallocated and transferred. Thirdly, children’s education is also one of the most worrisome network; and 13% of parents have to transfer their children to another school. Besides, other social networks, such as employment, social services, cultural and religious activities will be also sabotaged to a varying extent. The redevelopment project led by URA with private developer comes to be concurrence of hike of living cost and displacement of residents, that is, a synergy eventually triggers neighborhood gentrification. Critically, urban regeneration fragments neighborhood and erases cultural memories; while something rebuilt are more profitable buildings (Abbas, 1997:80).

Conclusion

Hong Kong, labeled with a global city, is guided by the renewal strategy “create iconic landmarks and build hyper buildings’ introduced by URA in expression of post-colonial urban spectacles. However, either hyper buildings or iconic landmarks shown in URA’s master plan is merely a reflex of capital flow from middle class to land developers, which reshapes urban morphology for both political and economic ends (Ong, 2011:205). To put it bluntly, URA-led redevelopment is not simply a face-lift neighborhood; it is actually profitable gentrification driven by the redevelopment regime. In general, URA-led redevelopment always
produces displacement of residents that reshapes neighborhood morphology and further triggers gentrification. The typical case of KTTCP evidently represents the transformation from urban redevelopment to neighborhood gentrification.

Analysis through growth machine approach indicates: driving force from consumption side is the residential preference of gentrifiers including new middle class and speculators (Zukin, 1990:37-56); another driving force from production side is the capital circulation across the rent gap (Zukin, 1998:825). In Hong Kong context, the redevelopment regime based on redevelopment agency (URA) and land developers assembles these two driving forces from both supply side and demand side to facilitate gentrified neighborhood. Given the fact that tax base of Hong Kong highly relies on land-related revenues, government monopolizes land supply through “highland price policy”. In addition, fragmentation of property ownership widely existing in a large number of old apartment buildings, particularly in “tong lau” impeded private developers to redevelop aging residences. To clear away obstacles in front of urban redevelopment, URA, a quasi-public agency, has been authorized for land expropriation and property resumption through legislation of Urban Renewal Authority Ordinance (URAO). Hence URA actually becomes a redevelopment agency that enforces property assembly through compensation scheme for relocation and rehousing. After property acquisition, URA-led projects will be financed by land developers. Participation of private capitals obfuscates the boundary between residential refurbishment and upgrading. Driven by profit gaining from real estate market, redevelopment projects always tend to upgrade aging buildings to upmarket high-end residences. This synergy upon land appreciation is a basic foundation to form the redevelopment regime that transmutes residential redevelopment into neighborhood gentrification. By examining the compensation scheme made by URA for KTTCP, the compensation package with Ex-Gratia Allowance and Housing Purchase Allowance based on general market value of 7-year-old analogous apartment buildings does not take future increase of property price into account. The indemnity standards are generally unable to support local residents to purchase a replacement flats in redeveloped areas. Hike of housing price squeezes aboriginal residents out from their neighborhoods, and then high-income middle class flock into. The displacement derived from urban redevelopment is an evident sign of gentrification. To conclude, these ongoing urban redevelopment projects in Hong Kong will produce more and more gentrified neighborhoods that are reshaping morphology of urban neighborhood continuously.

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THE EFFECT OF USER PARTICIPATION ON SOCIAL SUSTAINABILITY: A COMPARISON OF TWO POST-EARTHQUAKE SETTLEMENTS IN TURKEY

Hasan Taştan, Ayşen Ciravoğlu

Abstract
In order to meet the housing need that emerged in Turkey after the devastating earthquake of 17th August 1999, new residential areas were established in various regions. This has led to the questioning of how social sustainability of new settlements can be achieved and to a search for solutions. In this context, participatory approaches are among the first to come to mind. This study starts from the hypothesis that enabling user participation in the construction process of the housing units would contribute to the social cohesion and satisfaction levels of the neighborhood in question. In the study, the impact of user participation on the social sustainability of the construction process of residential projects developed following a disaster has been tested. In this context, the research was conducted in Caritas houses built near Gümüşpinar Village in the Province of Düzce and Umcor houses constructed on the same land with user participation to meet the needs of the victims for shelter after the 17th August 1999 earthquake. The study is comprised of the observations, questionnaires and face-to-face interviews conducted after the literature review. Questionnaires and interviews were conducted to measure the satisfaction with the housing, the immediate housing environment and the neighborhood as well as the feeling of belonging were tested regarding the two settlements which differed in terms of their construction methods and physical characteristics despite having been constructed side by side by two different charities. The results of the Likert type questionnaires were evaluated with the "Independent samples T test" using the SPSS program. As a result of the research, it has been found that there is no significant relationship between user participation and the criteria of social sustainability; namely, satisfaction with the housing, satisfaction with the neighbors and that of the residence neighborhood. Another result of the research is that the physical and psychological comfort is of priority for the individuals compared to relationship with neighbors or participation in the establishment of their residential environment. Furthermore, the research findings also revealed that disagreements among users increased which had a negative impact on social cohesion in cases where the physical characteristics of the residential neighborhood and the housing did not satisfy the users.

Keywords: Social Sustainability, User Participation, Post-earthquake settlements, User satisfaction.

Introduction
After disasters such as earthquakes, it becomes imperative to produce a high number of housings in a short time. The post-earthquake permanent residences produced as a result of the processes in which various actors are involved often end up being social housing projects produced in the form of repetition where the needs and opinions of users are ignored. These projects, which are usually developed at a neighborhood scale in a new area, cause various problems and the social problems experienced make it impossible for users to develop a feeling of belonging. The projects, which do not take into consideration the life style, habits and socio-economic condition of the people who will use the housing, cannot fully meet the needs of users and deteriorate their quality of life. In this context, the social sustainability of the settlements established after disasters constitutes a major question. It is ideal in the context of social sustainability that permanently built houses to be constructed after an earthquake should contribute to the identity of the city, should be designed according to the needs of users to make them feel peaceful and comfortable and increase their quality of life. In this context, in today's architectural environment, approaches including user participation are seen as a solution to the problem. The experience of permanent residential production with user participation plays a significant role in the improvement of living conditions and ensuring social sustainability after a catastrophic disaster.

Social sustainability means that future generations have to maintain same or better conditions compared to the present generation in terms of important life quality indicators such as human rights, education, health, democracy and social cohesion WCED (1987). The formation of physical and social environment where individuals constantly interact has an...
impact on maintaining a high quality of life. User participation, which means the involvement of individuals in the formation of their physical and social environment indicates a desirable condition in terms of providing user satisfaction. The participation of individuals in processes such as shaping their built environment and managing the city which affect their daily life and quality of life, is effective in ensuring social sustainability. The active involvement of individuals in the formation of the built environment contributes to the learning process of the society and helps the development of social criteria such as sense of belonging, responsibility and community. In this context, it can be argued that the three concepts regarding the provision of social sustainability have become prominent; namely, the built environment, social environment and user participation.

The most prominent feature of a socially sustainable settlement is the physical quality of its built environment. The physical and psychological comfort of the people in society depends on the physical conditions of the built environment. Socially sustainable settlements are the result of people’s satisfaction with their neighborhood, their housings and their physical environment. Satisfaction with the built environment enhances the sense of belonging in individuals. Chan and Lee (2008), who point out that people’s interaction would contribute to social sustainability, also state that open spaces and green spaces constitute the necessary spaces for social gathering and interaction. They also emphasize the significance of green spaces that act as a buffer among crowded areas. Porta and Renne (2005), who draw attention to the esthetic issue, state that the appearance of urban furniture as well as pavement and street layers affect social sustainability. Visually beautiful and well-designed street texture in terms of building characteristics such as density and height are more satisfying for people (Chan and Lee, 2008). Drawing attention to the street cross section, Oktay (2004) states that the pedestrian-focused street section would increase the outdoor interaction of citizens with each other. A street cross section which is shaped to facilitate the interaction of people also contributes to social cohesions. The built environment-social cohesions relationship may not only create a win-win situation but also the environmental factors may have adverse effects on social cohesions, as well (Murphy, 2012). Poor urban landscape destroys the uniqueness of cities and hinders the development of a sense of belonging in users (Chan and Lee, 2008). In this context, it can be argued that the sustainability of the community is again related to the level of satisfaction with the built environment.

People who interact in a settlement, in other words, neighbors, are part of the social environment of an individual. In this context, an individual's relationship with their neighbors and their satisfaction affect the quality of life. Ensuring social cohesion, building a sense of community and social harmony indicates how social sustainability is directly related to social environment. Karuppannan and Sivam (2011) who point out that social interaction helps the development of a sense of community and also brings other social benefits, state the necessity of people working together and interacting with each other in order to make the community socially sustainable. Similarly, Bramely and Power (2009) state that individuals forming the community must interact with each other and act together to ensure social cohesion for the sustainability of the community. Social cohesion opportunities such as participation in social activities, security, sense of belonging, a feeling of trust, collective norms and values also contribute to the quality of life of the community (Porta and Renne, 2005).

In order to ensure quality of life, there is a need for social interaction and social cohesion in a community. Social cohesion can be measured through individuals’ interaction with each other, the frequency of meeting with neighbors, getting to know neighbors and making friends, attachment to their housing and the frequency of behaviors such as greeting neighbors and pausing for a talk. In this context, the level of satisfaction people have with their neighbors and the social environment in their neighborhood is related to the societal sustainability of that neighborhood.

The concept of participation in the context of social sustainability can be addressed in a wide range of sub-topics including participation in community-based activities, participation in democratic governance, participation in decision-making mechanisms or participation in the design process of the residential environment. Chan and Lee (2008) emphasize that participation in design, which means that the opinion of users is also taken into consideration throughout the shaping process of the built-in environment, has a positive impact on social sustainability. In addition to creating low-cost and beneficial spaces for users, participation in the construction process also enables users to take up a profession, thus creating employment opportunities in the community. Furthermore, the implementation of various practices with participatory approaches ensure that the individuals forming the society interact with each other. The division of labor also increases social cohesion by creating a spirit of unity and solidarity in the community.

1.1. Aim and Method of the Research
A devastating earthquake occurred on August 17, 1999 in Turkey, a country which is situated on active fault lines. In order to meet the need for housing that emerged after the earthquake, permanent earthquake housings were constructed in 27 separate locations by the Project Implementation Unit affiliated to the Ministry of Public Works and Settlement and the Prime
Ministry (Kömürlü and Öztekin, 2007). Despite their few number, participatory projects have also been conducted by various organizations. Of the housing projects which followed a participatory approach, Beyiciler, Gölyaka, Caritas and Umcor projects have been completed. There are also projects such as the Beriköy project, which have not been completed due to various reasons. Another housing site following a participatory approach, the Beyköy project has not yet been completed (Table 1).

This paper aims to reveal the role of social sustainability in the implementations conducted to meet the urgent housing problem that emerges after a disaster. In this paper, social sustainability was discussed as a comparative analysis of social housing examples either involving or not involving participation. Participation processes were assessed in terms of participation in the construction process and samples were tested in terms of user satisfaction (satisfaction with the housing, satisfaction with the settlement, satisfaction with the neighbors).

As case studies, Umcor and Caritas houses which were built on the same land in Düzce, Gümüşpinar village were selected. The reason why these two samples were selected was that they were built side by side on the same land by two different charities with different settlement plans, architectural projects and material selections, and that only one of them involved user participation. In the first stage of the four-stage study, data about the projects were collected and necessary information was obtained from the internet sources as well as people who took part in the projects such as the village headmen of the period and civil engineers. In the second stage, preliminary work was done in order to determine the questions to be posed to the users by making observations. In the following stage of the study, questionnaires and face-to-face interviews were conducted with the users. As for the final stage of the study, the findings obtained were evaluated.

The group that would represent the residents in the houses was determined by the stratified random sampling method. The research was conducted on the basis of the household number in the settlements which consisted of a total of 151 households; 40 being in Caritas and 111 being in Umcor. The target group of the study consisted of the individuals who had been living in the housing since the day of its construction, who were above 20 years of age, a parent of the household and in case of residing in Umcor, individuals who actively took part in the construction process.
process. A total of 32 people, 10 of whom were in Caritas and 22 of whom were in Umcor, were interviewed on a Likert scale and 8 questionnaires were administered.

Through the closed-ended questionnaires, the users’ satisfaction with their housings, neighborhood and neighbors was measured. The study was supported by open-ended questions and face-to-face interviews.

Gümüşpinar Village Post-Earthquake Settlements: Umcor and Caritas Projects

Caritas and Umcor houses were built in Gümüşpinar village, located at a seven-kilometer distance from the center of Düzce Province to meet the sheltering needs of 151 earthquake victims who were left homeless after the 17th August Marmara earthquake (Figure 1).

Transportation between the settlement and Düzce city center is provided by public transportation at certain intervals throughout the day. There are units located near the settlement for meeting basic needs such as market, village clinic, health center and primary school. There are also green areas reserved for residents of Umcor and Caritas in the settlement, and parks for children to spend time (Figure 2). Umcor and Caritas houses show similarity in many aspects such as the socio-economic condition of the users and the construction story of the settlement.

On the 8.6 acre land belonging to the Gümüşpinar Village, Caritas houses were built from reinforced concrete in the form of 10 blocks and 40 apartments consisting of two houses, about 90 m², on each storey, and distributed to the users by lot (Figure 3). Next to the Caritas houses, Umcor houses were built on an approximately 125-m² parcel planned as a total of 111 detached housings. The houses, which have an indoor space of approximately 65 m², were constructed with brick fillings between wooden carcasses (Figure 4). While Umcor houses have their own private gardens, Caritas houses have common use areas and playgrounds for children. Prior to the beginning of the construction, beneficiaries were determined by lot and each beneficiary was invited to assist the construction of their own houses with tasks that would not require any mastership (Table 2).

The decision to start the construction and the determination of the land started with the application of two international aid agencies named Umcor (United Methodist Committee on Relief) and Caritas to the governor of Düzce. As a result of the studies, the designated land within the boundaries of Gümüşpinar Village was selected for the projects and the necessary legal procedures were completed. Both organizations implemented the design and construction of their projects on the adjacent lands provided to them. The users of the projects were determined by lot before the construction process started.

The plans of the projects which were conducted independently on the same land were drawn...
by the charities undertaking the construction. The construction process which started in 1999 was completed within 3 years and the houses were delivered to their users. All the construction works of the Caritas project were covered by the Caritas organization and the necessary materials were obtained from the region. The housing units of the Umcor project were realized with the material provided by the Umcor charity. The builders brought by the organization during the construction process helped the users build their own houses. The construction of the road between the houses and the necessary infrastructure works were undertaken by the state. The residential settlements have been inhabited by the users for 14 years since their construction. This research discusses the relationship between satisfaction with the housing and user participation in the context of social sustainability regarding a 14-year user experience.

3. Results of the Field Study: A Comparison of Two Post Earthquake Settlements

In the research, the impact of user participation on social sustainability has been tested. The extent to which the idea of participatory construction affects social cohesion and sense of belonging among the settlers has been discussed. In this context, the satisfaction level of the users with their housing, their settlement and their neighbors has been measured.

Users were asked questions on a 5-point Likert-type scale. With the responses given to the questions, the users’ level of satisfaction with their housing, neighbors and their neighborhood was determined. To the positive items, users were asked to mark only one of the options among:

1. I strongly disagree, 2. I disagree, 3. I am neutral, 4. I agree, 5. I strongly agree. The responses were analyzed by the SPSS package (Table 3). The average of the responses given indicate the general tendency. An average value above “3” indicates that the user is satisfied with the situation specified in the item.

It was seen that the users who did not participate in the construction process (Caritas residents) were more satisfied with the physical characteristics of their houses and their neighbors when compared to those who participated in the construction process (Umcor residents) (Figure 5). Contrary to the expectations, users who participated (Umcor residents) had a lower rate of feeling safe in their houses when compared to the Caritas residents. It was seen that the emergence of this condition was rather caused by the insecurity related with the construction system and materials of the house than the neighbors. The study also revealed that those who were not satisfied with their housing were also not satisfied with the general condition of the settlement and their neighbors.

The results of the questionnaire showed that the earthquake victims residing in Caritas houses were generally more satisfied with their housings and their relationship with the other residents of the settlement...
compared to the Umcor residents although they did not have any participation in the construction process. In the study, it was seen that the Umcor residents were less satisfied with the distance of their housings from the neighboring buildings compared to the Caritas residents. The fact that Umcor houses were built smaller and compact had an impact on the emergence of this condition. During the interviews, participants from both settlements indicated that their housing was not big enough for them. It was observed that residents of Umcor made various additions to increase the usable space of their houses thanks to the advantage of their detached housings (Figure 6), (Figure 7). The questionnaire also revealed that the Umcor residents were less satisfied with their neighbors compared to the Caritas residents which might be the result of the impact of the close position of the houses. Densely arranged housings increased problems and disputes with neighbors.

The semi-structured in-depth interviews on the area intended to determine the general opinion about the settlement. The interviewees were asked their opinion about the physical characteristics of their housing, the distance of the settlement from the city center, and their relationship with the other residents. The face-to-face interviewees were also identified according to the same criteria as the respondents to the questionnaire (Table 4).

The Umcor resident (Interviewee-1), who worked at the factory near the settlement stated that the house was very small and impractical, but since their children were university students, they were two people in the household and continued to live there. According to Interviewee 1, transportation was not a problem. An Umcor resident (Interviewee-2) who expressed that the settlement was far from the center and that they preferred to be closer also stated that the settlement was mostly inhabited by people dealing with hazelnut agriculture who could meet most of their needs and did not have to go as far as the center of Düzce. Interviewee 2 was neither satisfied with the physical characteristics of their housing nor with their neighbors. Another interviewee (Interviewee-3) stated that two housings from the Umcor houses were completely burnt out after a fire broke out and that the residents were insecure and critical about the wooden structure of the housings. An Umcor resident
(Interviewee-4) who stated that their housing was not big enough for the family and that they made expense to expand the house but in the end, the houses were so cramped and did not allow further expansion because of their initial construction. Although Interviewer 3 and Interviewer 4 were not happy with their housings, they were satisfied with their neighbors. A Caritas resident (Interviewee-5) stated that they did not have any insecurity regarding their neighbors or other people while living in their housing; however, they became worried because of the cracks that appeared in the buildings throughout the past 14 years. A resident from the Caritas houses (Interviewee-6) stated that they had very good relations with their neighbors. They also stated that the distance to the city center did not affect them much as they could meet all their needs in the town.

As a result of the interviews conducted, it was determined that residents of the Umcor houses, which were constructed with wooden structures, were feeling uneasy because of the fire experienced previously. This condition had an impact on the development of a feeling of security in the users. Although Umcor houses were constructed with user participation, it was seen that the rate of satisfaction with the neighbors and the neighborhood was generally higher in Caritas houses where there was no user participation. In the study, it was determined that those living in Umcor houses were more satisfied with the position of the settlement which had a seven-kilometer distance from the center of Düzce when compared to those living in Caritas houses. When the users’ level of satisfaction with the settlement is considered, it was seen that the Caritas residents were more satisfied with the physical characteristics of their neighborhood when compared to the Umcor residents.

It was found that interviewees living in both settlements were generally satisfied with the distance of their housings from the city. Of the interviewees, the Umcor residents were not satisfied with the physical characteristics of their housings such as size and material while the Caritas residents were found to be satisfied with their housings. When the results of the questionnaire and the semi-structured in-depth interviews are compared, it could be argued that the results are parallel.

Conclusions
From the data obtained in the study, conclusions have been drawn which are considered to be beneficial to post-disaster housing production as well as the implementation of new construction projects at a neighborhood scale.

Destructive disasters such as earthquakes cause sudden housing needs which makes it necessary to establish new residential areas within the built-up urban fabric. Ensuring the social sustainability of new settlements is of vital importance for increasing the level of social prosperity and minimizing the devastating effects of disasters on the social structure. A socially sustainable settlement means that conditions such as environmental quality, accessibility and urban landscape necessary for physical and psychological comfort are fulfilled and that criteria including the basic needs such as education, health, transportation, and housing as well as the regulation of community life such as equality, justice, social cohesion and participation in the community are met. Socially sustainable settlements are places where people have a high level of satisfaction with the relationship with their neighbors, the physical characteristics of their housings such as size and material, and where individuals develop a sense of belonging. A socially sustainable settlement should not only provide comfort for individuals in the first place but also enable them to become a part of society. Ensuring social cohesion among the settlers and increasing the interaction between individuals is necessary for the settlement to be socially sustainable. An individual who is satisfied with their sociopolitical and physical environment will develop a sense of belonging and security which are some of the elements that hold a society together. In this context, participatory approaches which increase social cohesion and allow interaction between individuals such as taking into consideration the opinion of users for the design of the built environment or enabling solidarity and co-production while constructing projects are one of the solutions proposed by today’s architectural understanding.

If the samples discussed in this research are evaluated, it could be possible to argue that user participation in the construction process does not have a dominant impact on social sustainability. Especially, regarding the samples varying in terms of the physical environment and quality of housing, it is possible to argue that user participation is not effective in ensuring social sustainability and that the design of the physical environment is more effective than participation processes in terms of user satisfaction and social solidarity.

It has been expected at the beginning of the research that offering detached housing, houses built from local materials and construction systems and user participation in construction process would lead to user satisfaction and therefore a step to social sustainability. However from the results of the case studies it can be concluded that stereotypes may not fit in local conditions. Therefore, even in emergency housing processes the local dynamics and needs have to be clearly understood before the design phase of the permanent housing settlements.

Enabling user participation in post-disaster housing production is a desirable condition. However, the primary target should be projects that would fully
meet the needs of users. When human psychology is considered, the physical quality of their housing and settlement have priority over establishing good relations with neighbors or participating in the construction of neighborhood they live in. For, physical and psychological comfort constitutes a primary and a compulsory need of a person while intervention in the living environment is a high-level need like self-realization.

User engagement in the construction process is an approach which not only reduces the costs, but also speeds up the completion of a project. In developing countries, it might also be an opportunity for users to take up a profession. However, user participation in building production processes in Turkey should be considered as a whole. The crucial point in this process is the participants’ socio-economic level and the conditions under which the project is to be implemented. In this context, while the level of participation is being determined, the benefits that the participation process would bring to individuals should be well analyzed. Meeting the housing needs after a disaster is an emergency. While user participation speeds up the construction process, it is not possible in the planning and design processes. As revealed by the research, only ensuring participation in the construction process does not increase user satisfaction. With flexible designs developed for post-disaster housing production, users might be offered different options. In this way, even if active participation may not be ensured, individuals’ level of satisfaction might be increased thanks to their right to choose.

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TOURISM INITIATED CHANGES ON THE SUSTAINABILITY OF HISTORICAL TEXTURE: YENİ CUMA MOSQUE TRABZON.

Funda Kurak Açıcı, Şebnem Ertaş

Abstract
Since the first periods of humanity, the reflections of emerging cultures have created the living texture and architecture. The continuing accumulations from older periods transfer a history by layering at certain environments. These environments which appear as the evidence of development and advancement present the artifacts of previous generations; they create a common language by creating a link between past, today and present. The necessity for protection and transfer of architecture which is the physical reflection of this accumulation, history and culture continuing through ages to the future generations is a clear fact. Preventing the disappearance of historical buildings which show the difference of a geography, country or city from others and create its identity is an important issue for sustainable architecture. When sustainability unites with history and tourism, it can achieve the protection, development and transfer of natural and cultural resources from one generation to the other. For this reason, in the scope of this study, Cami-i Cedid/St Eugenios Church (Yeni Cuma Mosque) transformed into a mosque after the conquest of the city of Trabzon, which has an important historical texture within its geography, will be examined in terms of the sustainable development it created in the region and the changes it went through.

Keywords: Historical Texture, Historical Environment, Sustainability, Sustainable Tourism, Trabzon Yeni Cuma Mosque.

Introduction
Historical environments, which are the environments of natural and cultural values that carry the traces of the past to present, are of great importance in the sense that they reflect the social, cultural and economic structure, lifestyle and philosophy of the past periods, and in terms of the validity of the relationship they establish between nature and building and building and human relations. These values transfer the architectural, social, economic, technological, cultural, etc. data belonging to the communities, and emotions, thoughts, tendencies, social life, experiences and accumulations of the periods in which they were built, thus provide us with all kinds of information about the economic conditions, artistic sensitivities, and lifestyles of the community (Ahunbay 2004).

Throughout history, there have been constant differences in the physical structures of cities due to social, cultural and economic reasons. The historical buildings, which are among the most important urban spaces, come together to create streets and squares, which later come together to create a historical texture. Historical textures are both a bridge between the past and the future, and an important source of tourism as long as they are preserved, sustained and made functional. Thus, the deterioration of historical textures is prevented and it is an important source of income for the local people (Kan, 2009, 1). In this context, in order to ensure the survival and sustainability of historical environments in the world and in our country, both street improvements and protection measures at the construction level have been increased. This awareness requires for conservation and restoration works for local architectural objects and environments, which are an important cultural resource.

Today, tourism has attained a place in the complement of activities that improve the social awareness and create an important economic resource, which enables the cultural assets to be repaired and reused for future centuries. For this reason, a dynamic and sustainable relationship and interaction between cultural assets and tourism should be established. Parallel to the rapid economic, political and technological developments in the world, tourism activities have been changing in recent years. All these changes cause these studies to increase further, while it can be said that Turkey aims to increase its share of tourism by developing tourism alternatives within the protection-utilization balance of our country’s natural, cultural, historical and geographical values with the phrase “tourism sector main plan will be prepared in order to ensure long-term and healthy development of the tourism sector” included in the 9th Development Plan, Turkey-Tourism Strategy-2023 (URLs-1, 2017). In this context, within the scope of the study, the changes that the Yeni Cuma Mosque, built as a church in 13th
century by Alexios I and used as a mosque in 1461 with Fatih Sultan Mehmet’s conquest, has undergone will be examined, and its contributions to tourism for the historical texture of Trabzon province will be discussed.

**Historical Texture and Sustainable Conservation**

Cultural assets should be conserved in terms of their historical, artistic, documentary, educational, functional and economic values. Historical environments make a great contribution to the urban identity because they are different from the cities which consist of the ordinary community of similar structures. It is necessary to preserve, maintain and repair old cities due to their values and them becoming old (Kan, 2009, 16). In this context, the aim of conservation is to protect the historical environment from harm and to ensure the integration of current life with the cultural heritage. The conservation and sustainability of historical urban texture can be realized when the sustainability of life in these environments is taken into account. It’s because the needs of lifestyles and the form of human actions are changing. All these facts should be taken into account and reflected in spatial solutions for the sustainability of historical environments (Çelikyay vd. 2007).

In the framework of sustainability principle, historical environmental protection, active use of old texture, and changes in the environment need to be designed with planned changes to meet the needs of present-day life (Kuban, 2000).

The main objective of the planning of the sustainable life of the historical environments is to protect, utilize and develop cultural heritage and transmit it to future generations. There are very large dimensions of the conservation planning that can be seen in detail throughout the country, on a single building scale, and even in urban furniture. There is a close relationship between the conservation planning covered by country, region, environment, city, neighbourhood, street, square and building groups and urban planning as well as urban design in terms of covering the gap between restoration and planning (Çelikyay 1995). For this reason, communities can reflect their identities to the extent that they can protect their historical and cultural values and combine these values with contemporary lifestyles. In order to prevent these values from disappearing, it is necessary to make the historical environments functional with necessary functional changes and to incorporate them into the community life (Kan, 2009, 26).

Re-functioning means that the historical asset and its value is understood, and this value is given back to itself, its history is revealed, made readable, visible and perceptible. It is to repair and gentrify the traditional space values, equipped to meet the needs of today. All these expressions can be made possible by carrying out the necessary conservation work of each structure which makes up the historical texture. The structures are used today both with their existing functions, and being re-functioned. In this way, both the texture can be preserved and the city can be contributed with different purposes in an economic sense. Among these, the tourism sector has come to the forefront in recent years. In many cities of the world, cultural elements are both protected and become objects that add value to diversified tourism activities.

**Tourism and Historical Environment Relationship / Historical Texture and Sustainable Tourism Relationship**

For the protection of the historical environment, the accumulated heritage from the past to the present day should be preserved, and the existence of human beings, their accumulations and the future that constitute the society should be closely monitored. (Özdemir, 2005).

The identity documents, which are evidence of the traces left by the civilizations that have existed throughout history, can prove the civilizations of the countries, which is the essence of the concept of conservation. As a result, development comes to life with accumulation. The historical heritage must be in the service of the whole humanity, not only of the people of that place. In order for people to be aware of this knowledge and to be able to benefit from it, cultural remnants should be shared. Tourism forms the basis for the realization of this action, and in this context, there is a relationship that cannot be ignored between conservation and tourism. However, with the perception of tourism as a sector that provides only economic input, there is a risk that it will lead to the destruction of natural, cultural and historical values, and self-feeding resources.

Loss of these non-renewable values will lead to loss of tourism in the short run. Within this dilemma, conservation-tourism relationship makes up two inextricable phenomena providing input reciprocally (Uçer, 2011, 42).

Cultural assets, if possible, should function as original or as close to original as possible, if not possible, should be used as a tourism tool in new models which are developed by taking architectural features into account. In this context, both the monumental structures, the conventional houses, and the archaeological sites should be utilized in terms of their potential for use in tourism, with a certain conservation-use balance in different forms, that is, in the context of a sustainable environmental development (Erdoğan, 2000, p.554). According to Erdoğan, the cultural assets can be basically used for tourism purposes in two ways:

- Use of structure for tourism-oriented accommoda-
tion, with service, education, entertainment, culture or social functions, or

- Providing the cultural asset with a reflection of culture and life style of a certain period as a source of tourism or letting the structure exhibit itself without any changes (Erdoğan, 2000, p.555).

In conserving and recreating historical environments, it is aimed to ensure historical and cultural continuity, to recreate the historical environment in line with contemporary living conditions without any changes its identity, to utilize the structure in the form of building stock, and to preserve the conventional settlement plan. For this reason, it is of great importance to conduct conservation works in order to protect the sustainability of the physical and social structure in historical environments, which have undergone change and transformation (Kan, 2009, 1). Tourism is also an important resource in these studies. The integration of historical and natural values in tourism is one of the important and strategic targets adopted for our country. Thus, there is a relationship between tourism and the historical environment in terms of conservation. However, tourism has an indirect conservative effect through the charm of the environment because it does not have any direct conservative features (Kara 2005).

Materials and Methods

In the first phase of the study, a literature study was conducted about the concepts that constitute the subject. Historical environment, historical texture, conservation, re-functioning, sustainability and tourism concepts have been examined and the main themes have been mentioned. In the second phase, methods such as documentation studies in the light of literature review, research of historical sources, field maps, references such as old photographs etc., have been used in relation to the environment to be studied. Structures selected and documented in the scope of the study have been documented with drawings and photographs. The effects of tourism, on structure and historical texture have been observed. Lastly, brochures have been prepared with the data obtained, the changes determined in the structure and its surroundings have been presented, and the structure has been examined based on 2 basic ideas which determine the use of cultural assets for tourism according to Erdoğan (2000). In these processes, graphics have been prepared by designating the additions in green color and the removal in blue color on the plan.

Results: Case Study

Trabzon Province and Trabzon Yeni Cuma Mosque

One of the significant assets that Turkey possesses in terms of tourism resources is historical and cultural resources. There are innumerable assets on the territory of Turkey, which has hosted many civilizations. One of these is the city of Trabzon, which has been home to people of different cultures for many years and which has served as an important city in all periods owing to its historical location.

Trabzon province, which is regarded as the capital city of the Black Sea Region, has maintained its historical and social and cultural significance as well as administrative and economic aspects as a metropolitan city. The historical formation of the city and the cultural identity of the urban people have continued in relation to each other. The city where different civilizations have been harboured is synthesized with the common heritage of civilizations and urban culture. As a result of these cultural accumulations, the places giving meaning to the city have been formed (Kurak Açıcı, 2013). The most important of these places are the places of worship that exist in the city. The churches, which are one of the places that bear the traces of different civilizations, retained their existence in the city but turned into mosque within the scope of Islamization attempts (Figure 1).

The structure, examined in the scope of the study, was built as a church in the beginning of 13th century by Alexios I. The building’s plan is a cross placed in a rectangle with 3 naves and 3 abscessas. The absissa in the middle is rounded inside and polygonal outside. There is a dome carried by pendants on naos in the middle nave. It is mentioned in various resources that it has frescos inside. However, with its use as a mosque by the conquest of Fatih Sultan Mehmet in 1461, it was so named as it was located in Yeni Cuma Neighborhood. The building was registered on 16.08.1979 (Inventory of Conservation of Cultural and Natural Property, 1979) (Figure 2).

Yeni Cuma Mosque (St. Eugenios Church / Cami-i Cedid) and The Changes It Has Underwent

Yeni Cuma Mosque, which was converted from a church into a mosque, has been registered as a monumental structure by decision of the Higher Council of the Immovable and Cultural Nature Region on 04/09/1985 and numbered 1426. It is not located in any archaeological site. In the resolution of the Trabzon Regional Cultural and Natural Heritage Conservation Board (taken in order to repair the mosque minarets due to the danger of collapsing to the ground), dated 31/05/2006 and numbered 681, the following is written: “It has been decided by General Directorate for Foundations that, due to the danger caused by the mosque minarets, they can be repaired as indicated in the attached technical document dated 15/06/2006, and that the minaret balcony and the relievo of the golden minaret balcony will be removed, and that the inventory vouchers of artistic pieces and crafted parts that will not be used...
for repair shall be prepared and they shall be record-
ed, and to take further action for conservation pur-
poses.’’ In the same year, the building was restored. In
2013 and 2017, decisions were made to repair the
building due to various reasons. As a result of these
studies carried out in this context, it has been found
out that the characteristic stone jambed-profiled door
is an Ottoman addition, and the inscription on it was
placed with the closing of half of the original window.
There is a wide, Ottoman addition kind of window in
the place of the western door which is known to be
contained in the original piece, and opening to the
middle nave. The traces on the surface of the wall sug-
gest that there is a southern entrance equal to the
northern entrance, before it was transformed into a
mosque. This entrance space of 150 cm was closed by
the mihrab niche during the Ottoman period. Also on
the eastern wall surface of the northern entrance por-
tal, there is a round-arched gap closed afterwards
(Figure 3).
A minaret is added to the western edge of the northern portal merging with the wall. The whole northern nave is used as women’s gathering place with wooden gallery floors added during the Ottoman period (Figure 4).

Today, the muezzin’s gathering-place is located next to the northwester none of the feet carrying the dome on the transept. The ambo (Vaaz Kürsüsü) is now on the left of the mihrab. The north portal is used as the last community gathering-place (Figure 5.1, 5.2, 5.3).

It can be said that the naves and the abscesses are all turned into a closed place of worship. The western end of the northern nave is used today as the imam’s chamber. Today, with no traces left, Uspenski speaks of the presence of a medresa around the structure (Uspenski, 2003, 32).

There was not any ornaments left over from the church structure before it was turned into a mosque indoors. The ornaments known to have been added after it was turned into a mosque were found today in the dome pendants in the herbaceous hand-carved techniques and in the mid-nave vault, and the herbaceous ornamentations were also found in the mihrab. (Tuluk et al., 2010, 105). J.P. Fallmerayer has stated that there are various frescoes in the interiors.
Later, the frescoes were plastered (Inventory of Conservation of Cultural and Natural Property, 1979), (Figure 6.1 & 6.2).

On the facade, there is an ornamentation of Byzantine character on the northern wall facing the eastern side the northern portal on a single stone block containing eagle motifs as well as herbaceous motifs, and there are cross motifs along with geometric motifs in the fringe level of the nave abscissa. The only ornamentation that could be said to have been added in the Ottoman era is the hedgehog fringes in the southern abscissa. (Tuluk et al., 2010, 105).

When all the studies are examined, two important dates for the structure are noteworthy. One of them it the date of its use as a mosque and re-functioning with the conquest of Fatih Sultan Mehmet in 1461 and the other is the date of its exhibiting itself with its current function with the restoration works in 2006. In this context, according to Erdoğan (2000), it is possible to see in this structure two different ways of using culture assets for tourism. The conquest of the city in 1461 led to the re-functioning process, which, however, did not prevent it from becoming a resource for foreigners nowadays because of its construction as a church. It can be said that it has been gone under many changes with its use as a mosque as of 1461. In 2006, its present function continued and the repairs made as a result of restoration process have contributed to the structure’s tourism value and its artistic value.

Discussion

Historical and cultural values, which are regarded as common property of mankind, are identities for the environment in which they are located or for the nations they harboured. The fact that inherent nature of development contains accumulation in itself requires that generations should not break their ties with their roots based on the past to continue their lives. In this context, in order to transfer the historical and cultural values that reached the present day to the future, that is, to ensure their sustainability, it is neces-
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The historical and cultural heritage of our country constitutes an important potential for sustainable cultural tourism. It is important to note that in order to transfer the cultural heritage of the country to future generations, the conservation and development of the historical environment and the utilization of the values in the historical environment for tourism purposes and giving the necessary importance to cultural assets accordingly should be taken into consideration. The structure was originally built as a church and converted to a mosque after the conquest. In the literature review, it has been found out that additions were made to the structure during its use as a church and after it was converted to a mosque. While making use of the existing information about photographs and the structure in the formation of this study, the most important resource is the reports on Trabzon Yeni Cuma Mosque obtained from the archive of the General Directorate for Foundations.

Yeni Cuma Mosque, located in Yeni Cuma District of Province of Central Trabzon, in block 1146, on lot 32, is one of the most important structures which were converted from church to mosque in Anatolia. Yeni Cuma mosque was known as St.Eugenios Church before it was converted to a church. Today's mosque is in the shape of a cross placed in a rectangle and was built as a cross in the 14th century. The entrance to mosque is provided from the northern and eastern front. Entrance in rectangular form, with cut-stone jamb and wooden wing is opened in the middle of the main abscissa. There is a wooden porch covered with corrugated tiles on the entrance. The western and southern doors of the structure, which had northern and western entrances as a church, were closed after it was converted to a mosque. Entrance to the mosque from the north portal which is used as the last community place after it was converted to mosque is provided through a wide gap made of a flat arch and woodwork. The minaret, which was built later on the northern facade of the mosque, has single minaret balcony, and its building material is stone. The mihrab built after it was converted to mosque is made of the stone, and of baroque character. The northern facade of the sanctuary provides access to the gathering place with wooden stairs. There are baroque-style ornaments with gold leaf trimmings in the structure's mihrab, which is in rectangular form, has grooved niches, sliced dome, and is made of cutstone.

With its alternative tourism activities, historical environment and natural architecture, Yeni Cuma Mosque (St. Eugenios Church / Cami-i Cedid), located in Trabzon / New Cuma neighbourhood in Eastern Black Sea Region, is a living structure. It is located in an important position for the city as a sustainable tourism resource, reflecting the history of the city, establishing a link between the past and the future, and bearing the traces of periods when it served different beliefs. With periodic changes it has undergone in time, it will continue to be valuable for cultural tourism.

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THE PRIVATIZATION OF PUBLIC STREETS AND URBAN SPACES IN MALAYSIA.

Peter Aning Tedong, Wan Nor Azriyati, Wan Abd Aziz, Noor Rosly Hanif

Abstract

In the last two decades, Malaysia has embedded good neighborhood principles in its planning plans that promote diversity and accessibility in urban residential areas. However, the emerging trends of the privatization of public streets and open spaces in urban residential areas in Malaysia offer the opportunity to study complex urban governance processes in a democratic and developing country. Using empirical evidence, this article recounts the fascinating saga of how various actors—urban planners, resident associations, residents of open neighborhoods and residents of guarded neighborhoods—responded to the privatization of public streets and open spaces in Malaysia. While planners described Greater Klang Valley as a diverse city in Malaysia, they sometimes tolerated the privatization of public streets and open spaces through neoliberal policies.

Keywords: Privatization, Urban Spaces, Public Streets, Enclosure, Neoliberalism, Malaysia.

Introduction

More than twenty years ago, Loukaitou-Sideris (1993, p.139) wrote, “Privatization has become a popular mode of supply for many previously public services in the last decade for a number of socio-political and fiscal reasons.” Some scholars argued that privatization of urban spaces can be tracked to several changes in urban development phases from “industrial” to post-industrial and modern to post-modern cities (Mitchell, 1995; Cybriwsky, 1999; Madanipour, 2003; Kohn, 2004). In particular, a substantial literature has emerged focusing on the privatization of spaces through the proliferation of private neighborhoods in urban areas (Blakely and Snyder, 1997; Caldeira, 2000; Low, 2003). Several studies also have documented the reasons of privatization of public spaces from various reasons such as rising sense of fear in urban areas (Davis, 1992; Ellin, 1997), the decline of welfare state (Marcuse, 2009) and the fortification of residential areas (Marcuse, 1997: XX, 2015). For instance, Kohn (2004) documented the conflict between public and private spaces is a trend in commodification of public open spaces that allows local government to rent out these spaces for the sake of commercial purposes.

Privatization of urban spaces has been claimed to be a powerful force that often rapidly transforms the physical, economic and social characteristics of a city. Madanipour (1998) explained that privatization of public spaces of a city have always had political significance and symbolizing the significance power of the state to control urban spaces. This is routinely viewed as a fragmentation of the city (Le Goix, 2005), separation between poor and rich (Caldeira, 1996; Flusty, 1997; 2004; Low, 2001; 2003) and reduce cost on urban management in neoliberal era (Genis, 2007; Hackworth, 2007; Rosen and Razin, 2009). Privatization of urban spaces normally involved clearly delineated spaces and control access of residential developments that can only be entered and used by invitation (Low, 2006). In short, these emerging private spaces are seen as a reflection of new patterns of urban development in neoliberal cities where more affluent group retreat from urban public life by producing a splintering urbanism (Townshend, 2006).

While previous scholars have identified the “end of the public space” (Sorkin, 1992) or “the emergence of private cities” (Glasze et al, 2005), the privatization of public streets and urban streets in developing countries such as Malaysia received little attention. Although detailed work has described the privatization of urban spaces in developed countries (Amin, 2008), wider governance processes producing private streets and urban spaces—especially in urban residential areas in Malaysia—remain under-documented. Addressing governance practices and processes in Malaysia offers insights on how public streets and urban spaces in residential developments are not equally accessible in the same manner and the same freedom as traditional public spaces. As we examine the experience of Malaysian cities, we will consider the ways that a range of actors co-produces the privatization of public streets and urban spaces in residential areas. The next sections examine the production of private and public spaces.
Theorizing the Private and Public Spaces

The discourse on the nature of the public and private spaces has been the subject of intense debates in recent decades. Although it is possible to find general definition of urban public spaces, some scholars defined public spaces as a place that is accessible with no fewer restrictions to everybody and where difference is encountered and negotiated in face-to-face interaction (Young, 1990; Amin, 2008). Urban private spaces, on the other hand, can be defined as protected places where strangers cannot enter without permission or negotiation (Madanipour, 2003). Although interpretation of these concepts has changed over time, the basic definition presents an understanding of space as both products, producers and outcomes and interplay of living and everyday lives of people as Jacob and Hellsstrom (2010) argued that the argument of public spaces lies between the production and construction of space. Public spaces are expected to be accessible to everyone, where strangers and citizens alike can enter with few restrictions (Low, 1997; Makagon, 2003).

While urban public space offers the promise of social integration and diversity, in practice the production of urban public spaces have often dominated by political and economic agenda. We see some evidences that the production of urban spaces has significantly declined in recent years as urban public space is threatened by massive privatization and commercialization in the neoliberal era (Mitchell, 2003; Hackworth, 2007; Genis, 2007; Amin 2008). Many scholars argued that the deterioration of public space is closely related with determination towards privatization (Sorkin, 1992), the withdrawal of public realm (Sennett, 1974), growing inequality between poor and rich (Caldeira 2000; Genis, 2007) and the most prevalent is neighborhood fragmentation known as gated communities (Blakely and Snyder, 1997; Webster et al., 2002; Nelson, 2005; Le-Goix, 2005). Other scholars also argued that the erosion of public space worldwide was due to massive privatization in neoliberal era (Keil, 2002; Harvey, 2005; Hackworth, 2007), the fight of middle class into gated communities (Landman, 2004; 2006; Pow, 2007) and rising incidence of crime in the city. In addition, Mayer (2007, p. 95) argued that the privatization of public spaces has been a central mechanism of “neoliberal localism”: the privatization of public services and urban infrastructures.

Previous scholars argued that the privatization of public streets and urban spaces using physical barriers as in the case of gated communities were expressions of spatial construction in the city (Atkinson and Flint, 2004; Kohn, 2004; Atkinson and Blandy, 2005; Hackworth, 2007). For instance, in Istanbul, Bodnar and Molnar (2010) linked the gated communities and private urban spaces and called this as privatization of urban spaces. Bottomley and Moore (2007) saw privatization of urban spaces as the fortress city in which city rulers use both physical and human surveillances to block movement. Low (2006) stressed the privatization of public open spaces by the means of redesigning, closing, and policing such spaces. Explaining the changing status of public space to the private identities is complex and may be explained by a number of factors including footloose capital investment, decentralizing governance, the rearrangement of welfare, fears of others and socio-economic inequalities (Marcuse, 1997; 2009; Atkinson, 2003). The changes in demand for public spaces such as public parks, public streets and amenities may turn it into controlled spaces (Kirby, 2008) and thus, restricted the wider society to enter an area that was once as public spaces.

Neoliberalism and Privatization in Malaysia

In the last two decades, Malaysia has experienced rapid urbanization and urban population growth with extensive transformations of urban landscapes and economy activities (Bunnell, 2002). Population density in urban areas has significantly increased and high-rise buildings and exclusive gated community developments now dominate the townscape in city center. Bruton (2007) explained that rapid urbanization in Malaysia had contributed to the urban development process that leading to the rise of large construction companies. The structural changes in socio-economic development were very much reflected in the role of government, particularly in the policy, planning and the involvement of the private sector in urban development (Yeoh and Hirschman, 1980; Tajuddin, 2012). Mason et al., (2012) argued that urbanization generated considerable social change and economic development in Malaysian cities.

In term of economic development, Malaysia saw rapid economic growth between 1980 and 1990 and social conditions had improved dramatically through various programs introduced by the government (Goh, 2008). For instance, the New Economic Policy (NEP) was introduced in 1970 to eradicate poverty and to restructure society to eliminate the identification of race with economic function in order to create the conditions for national unity (Jomo, 1986; Tajuddin, 2012). The NEP facilitated the rise of a new multi-ethnic middle class in urban areas (Saw and Kesavapany, 2006).

Malaysia’s largest destruction and restructuring effort took place since 1980s when the state reduced its responsibility as a main player of economic activities (Jomo, 1986; 1989). The transition to a free market in real estate required active involvement from government to give the private sector room to operate within a system previously dominated by the state (Siddiquee, 2002; Saw and Kesavapany, 2006).
Within the context of globalization and neoliberalism, Malaysian government has passed a series of policies that privileged neoliberal practices. For instance, a Privatization Policy was launched in 1983 to make the private sector responsible for residential developments (AbdulAziz and Kasim, 2011).

Privatization generated a sense of unstoppable wealth creation that encouraged the Malaysian middle classes to consume high-end goods in order to differentiate themselves from the working classes (Agus, 2002) by fencing their residential areas. The free market economy began to reproduce social and spatial space segregation in Malaysia (Tajuddin, 2012). By this point, we argue that reduced government intervention in the housing market privileged certain class groups that lead to the privatization of public streets and urban spaces through enclosure developments. For instance, the real estate market currently satisfies the demand for high-cost housing for the affluent people by producing more segregated communities (XX, 2015) This was done largely to enhance safety and security in urban residential areas by putting fences, walls, and guards to monitoring who enters and leaves. Thus, urban public spaces in Malaysia become more exclusive and private.

The rise of privatization urban spaces was coincided with the government policy that sought more privatization in urban management. These powers are undermined by economic and globalization, which have indirectly influenced urban development in Malaysia as ZY et al., (2016) argued that various measures of decline include the reduction state responsibility in urban areas as they transferred their responsibilities to the citizen actions. Evidently, prior to 1980s, almost all urban public spaces were accessible to general public. However, in the late 1990s, many cities in Malaysia began to transform public spaces in residential areas to more private and exclusive environment.

The Case Study of Greater Klang Valley, Malaysia
In this article we examine the privatization of public streets and urban spaces in Greater Klang Valley, Malaysia. Although we have argued somewhere that privatization of residential areas in Malaysia are product of neoliberal policies (ZY et al., 2016), the effects of privatization of public streets and urban spaces are not fully documented. Thus, this research began with extensive analysis of planning documents and policies, in-depth interviews with various respondents, and detailed investigation of five neighborhoods in various local authorities in Greater Klang Valley area. It involves analysis of the spatial distribution, characteristics and nature of the privatization of public streets and urban spaces with the aim of constructing an inventory of the phenomenon. Fieldwork and systematic observations were conducted between 2011-2016. During the period, the first author had conducted more than 40 in-depth interviews with various stakeholders such as government officers, resident associations, residents of enclose communities and last but not least residents of open neighbourhoods. In addition to the qualitative data we also have a comprehensive set of a quantitative data from more than 1500 urban residents that live in Greater Klang Valley area. However, this paper only reported the findings from the qualitative analysis.

The qualitative interviews took between 60 to 90 minutes, which were usually recorded and transcribed for thematic analysis. In-depth interviews were conducted with a broad diversity to illustrate how they talked about the privatization of public streets and urban spaces. Then we examine current policy and planning documents to understand how they governing the privatization of public streets and urban spaces. For the purposes of this paper, we review interviews with planners, resident association, residents of open neighborhoods and residents of enclose communities to consider how they interpret and talk about the privatization of public streets and open spaces.

Privatization of Public Streets and Urban Spaces in Malaysia
Malaysian urbanization revealed a complexity in managing the public streets and urban spaces. Our years observation reveals many peculiarities that occur in Malaysian cities and the ways in which the state managing the public streets and urban spaces. The Malaysian local authorities, in many ways, were indirectly tolerated with the idea of privatization public streets and urban spaces through enclave developments, in the sense that they have a power to allow urban residents to barricades their communities. As Malaysian planners worried about the idea of divided city, the privatization of public streets and urban spaces grew rapidly in rapidly growing major cities in Malaysia. Our literature reviews reveals that all local authorities in Malaysia have introduced new policies and guidelines to regulate and accommodate the demand of the privatization of public streets and urban spaces through guarded neighborhood developments. One of resident association we interviewed commented about this trend:

Originally, we created the development of guarded neighborhood with the intention to increase the security level at the neighborhood area. General public are not permitted to enter our neighborhood area and are required to go through a security check by the security guard. I am aware that the roads and the playground area in our neighborhood are public spaces however we do not permit general public to enter our neighborhood areas at their own whims. This is one of our ways to control the strangers from entering our neighborhood areas.
In talking about the privatization of urban spaces, those interviewed generally agreed that new residential development in Malaysia tends to enclose public streets and urban spaces through enclave developments. Systematic fieldworks in Greater Klang Valley reveals that older residential areas transform into a more elegant and exclusive environment by fencing their communities that subsequently leads to the privatization of urban spaces and public streets. All of respondents we interviewed explained the need to privatize urban spaces due to fear of crime in urban areas. Residents of guarded neighborhoods we interviewed see the privatization of public urban spaces as a way to ameliorate the impacts of crime in urban areas. Urban planners we interviewed noted the physical barriers and other security measures of enclave developments produce a space of exclusivity that limit access in and out of the communities. Ironically, local authorities are still responsible in maintaining the public streets and urban spaces inside the enclosure development. Urban planner we interviewed acknowledged the challenges in governing these kinds of developments.

We admit that there are many challenges in permitting development with the concept of guarded neighborhood. Technically, we gave them permission to install fences and to hire security guards. But the local authorities are still in charge of collecting rubbish and landscaping in their neighborhood areas. This means that it is an open space and the roads still belong to the public therefore they cannot restrict the public in using any of the facilities in their neighborhood. But we received a lot of complaints from the public because security guards prohibited them from entering the guarded neighborhood.

The physical barriers and manual surveillances purposefully reduce accessibility in public spaces and make it less accessible to the wider society and prevent the natural movement of people by excluding all strangers. Majority of guarded neighborhood residents we interviewed explained that the privatization of public streets and urban spaces is to ensure the orderly flow of human and motorised traffic in and out of the neighbourhood, regulating residents and visitors to produce local safety and harmony. However our respondents who live in open neighbourhood explained that the privatization of public streets and public urban spaces in Malaysia is commonly presented as the result of state’s failure to provide safe-streets, decent services and many others. In some ways, we see evidence that the privatizations of urban spaces in Malaysia are simultaneously have some impacts on the form and function of the city and subsequently producing a splintered urbanism – a world in which two groups (rich and poor) pass by each other yet barely talk to each other. Alongside the notion that the privatization of urban space is common in Malaysia, urban planners we interviewed noted that:

We have received applications from the residents to secure their residential areas. Legally, they cannot put any obstruction on the road or at public places. However, the local authority has guidelines to allow them to establish the development of guarded neighborhood through fencing and securing their community […] Even though we give permission to establish a guarded neighborhood, they do not have any right to prevent the public/civilians to use the open spaces in their neighborhood area. Even if there are fewer complaints regarding the usage of open spaces in a neighborhood areas compared to road closures, we still take this matter seriously.

Urban planners, in many instances, held strongly to the new urbanism view that planning should work towards an attractive, mixed, and inclusive public realm. One planner explained the importance of the idea of the public realm in the context of rejecting residential enclaves. However, local government we interviewed appears to find the economic benefits of actively supporting privatization of public streets and urban spaces, at least in the short term. Nevertheless, they often lose sight of the fact that, in so doing, they are transferring their municipal functions to citizen action. At this point, we argued that the local government that supports privatization of urban spaces and public streets—especially in high-growth areas—reduces the accessibility to public urban spaces as one of guarded neighborhood resident strongly believed:

“[…] strangers may or may not be criminals but I don’t see any reasons why they should enter our neighborhood area without any purposes. They didn’t pay for the maintenance fees and definitely they don’t have any right to use the playground (public urban spaces) inside my neighborhood area… and you should know that there is a playground located in every residential area and why “outsiders” would like to come and use our playground?”

Our fieldworks tend to find fewer gestures toward openness and freedom of circulation of traffic flow in Malaysia’s residential areas. Observations reveals that new residential developments in Malaysia are mostly fragmented by the well delineated private enclaves of modernist design. Public streets and urban spaces in Malaysia thus have undergone a deep transformation from open to more secure and exclusive environment. Residents of open neighborhoods we interviewed, however, believe that as citizens they are at liberty to use public urban spaces. In some ways, we see evi-
The development of guarded neighborhood has caused many public roads and development areas closed by the residents’ association. Just imagine that I had to go through quite a long way although originally, I can use the roads that have been closed by these resident associations. What right do the association have in closing the public roads? We as the taxpayers are entitled to use the public roads without any restrictions”.

Several planners interviewed noted their aspirations that they could plan more accessible and open cities and not just walled-oriented residential environment. As the discourse showed, however, efforts to apply those principles rarely survive in practice. Our fieldwork reveals that the current process of fencing up the communities affects urban spaces patterns in the city and transforms them in different ways. Although fencing up communities have diverse effects, we see evidence that walling process has affected the accessibility to the city as the community becoming more fragmented and segregated. They erecting physical barriers on public roads and consequently leave less public urban spaces in the cities. However, one local authority’s staff we interviewed explained that:

“The general public should be allowed and cannot be denied entry to utilize the public facilities/goods that are located within guarded neighborhoods such as the parks, children’s playground and various other public facilities. We just want them to register with us as the roads are public property and movement should not be impeded nor blocked off totally”

Street open for free circulation of crowds and vehicles represent one of the most vivid images of modern cities. Although our neighborhoods case studies still have nice streets full of trees and sidewalks, they are no longer accessible to outsiders as the communities have been concealed behind fences and protected by unarmed security guards. As we try to map the public streets inside the communities, the experience has become unpleasant; the security guards now dominate the public urban spaces and streets and security devices blocking traffic circulation/flow. The private security guards –or we might term them as unarmed private army – is there to (illegally) privatize what used and still to be reasonable public streets and urban spaces. Thus privatization of public streets and urban streets became commonplace in Malaysian cities.

Diversity and Publicness of Urban Spaces
This paper revealed the possibility of older residential areas privatizing urban public spaces and limiting access to urban spaces through enclosure developments. Although the privatization of urban spaces and public streets in Selangor state might not have the appearance of radical insurgency, – at least for now – it should be noted that the increasing trends of privatization of public streets and urban spaces in residential areas could reduced the accessibility in the city. The privatization of public streets and urban spaces excludes a range of social relationships and spatial dynamics; some streets are only for particular classes and group. Hence, the Malaysian cities are becoming more socially and spatially fragmented at the street level.

The privatization of public streets and urban spaces are particularly evident in Malaysian cities, where in the last two decades a considerable number of enclosure developments occurred in major cities. By this point, we suggest that the privatization of public streets and urban spaces cannot be adequately understood without an examination of the shifting patterns of residential environment. We see some evidence that the privatization of urban spaces in Malaysia exists with the strong intervention by the state. For instance, the Malaysian government produced guideline that supported privatization of public streets and urban spaces by fencing and gating residential areas.

The privatization of public streets and urban spaces in Malaysia reflects the shifting roles of urban governance from state to the private sector via citizen action. The citizen action role in contemporary Malaysian cities reflects the need in securing and privatizing ways of life in the city. The privatization of public streets and urban spaces in Malaysia not only alters the physical urban form and functions but also reconstructs social relations and traffic flows in the cities. In some ways, privatization of public streets and urban spaces in Malaysia can be seen as a logical product of an economic environment dominated by a fast-growing of real estate market. We argue that the privatization of public streets and urban spaces in Malaysia are also the outcome of the actions of weakened public institutions that have neither the fund nor the power to implement comprehensive urban-safety strategies and often tolerate with the barricades in public spaces.

So what exactly mean when majority of government officers say "we tolerate the privatization of public streets and urban spaces through guarded neighborhood forms"? The walls and gates are visible barriers that privatize public streets as guarded neighborhoods restrict access that would otherwise be avail-
able for public as urban areas. This study demonstrated that urban landscapes in Malaysia are the products of negotiated processes or fights over desirable outcomes. The contemporary political and economic processes appear increasingly to favor the privatization of public streets and urban spaces despite the planners’ commitment to create mixed and sustainable developments with urban qualities. Thus the privatization of public streets and urban spaces proved more commonplace in Malaysia.

Our study revealed that most of residential areas in Malaysia maintained its territory boundary through the reinforcement of social distinction as aspired by elites and middle class group in urban areas. Where residential enclave developments had strong political influence and intervention, our case studies shown that the privatization of public streets and urban spaces become more commonplace Malaysian cities. The physical barriers according to Low (2003), result in an image of “symbolic barriers” in fortified communities, thus contributing to physiologically –physically and mentally – separation from outsiders whom they perceived as potentially dangerous.

The state seems to accept and celebrate the privatization of public streets and urban spaces through enclosure developments by permit the citizen action to fortified urban spaces. Thus what would be a public amenities – public streets, park, playground – have become private entities.

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DEADLINES:

1 September 2018: announcement of the theme issue

30 September 2018: expression of interest with 500 words extended abstract

15 October 2018: notification on selection of abstracts for development into full papers

15 December 2018: submission of full papers

15 January 2019: notification on paper acceptance and reviewers comments

1 March 2019: submission of final revised papers

1 April 2019: submission of the issue to the journal

30 June 2019: publishing date

War has become an integral part of the political agenda. Electoral programmes are based on it, and national budgets are often framed to finance it. In the past politicians used to promise their constituencies “no more war”. Today that slogan has been replaced with “war for ever”.

A similar change of attitude also reflects the way in which those concerned with the built environment deal with the subject. War seems no longer to be something abnormal or alien to the urbanized world. Indeed, the various combinations possible between the two terms this issue of OHI is dedicated to – war against the city, cities at war with other cities, the city at war with itself (shuffled according to whether the focus is on the city as a victim of conflict or responsible for it) – are at risk of becoming mere academic disciplines, fields of specialization.

In 2002, an issue of Open House International already addressed the topic. Scholars with different backgrounds and experiences reported on a number of cities. They analysed and reflected on the situation before the armed hostilities, both in physical terms and in terms of the conflicts of ethnic and civilian character, and the role of external forces and actors; the war in its different manifestations: a never ending conflict, a succession of battles and precarious truces, bombing, the threat of bombing; the prospects (if any) of reconstruction, with particular reference to the different effects for the various groups and interest.

Today, 16 years later, the ambition of this issue is not only to provide further empirical investigation but to contribute to the broadening of the discussion going beyond the case study logic. The call welcomes papers that consider problems whose relevance is not confined to a specific situation and which are interwoven one with the other. Contributions on the following themes are especially encouraged:

- the armed conflicts driven by both internal and external forces expressing complex rivalries for appropriation and control of natural resources;
- the intentional exacerbation of hostility between groups of different ethnic and/or religious composition;
- the role of the international community that simultaneously participates in the destruction and proclaims itself anxious to provide humanitarian aid and help with reconstruction;
- the war’s profiteers (i.e. global corporate interests, financial institutions, construction companies and architectural firms);
- the forced relocation of displaced people into “special” settlements which brings to an increasing fragmentation of post-war landscape;
- the incorporation of war into the planning discourse that has perverse effects on all our cities and not only on those directly devastated by armed operations.

The papers about unarmed conflicts which also destroy environments and people in other ways than the physical wars are also welcome.
32 years of back issues. Available on DVDs as well as online. This digital collection consists of 128 issues with approximately 1,024 articles dealing with settlement, planning and housing design, education, adaptability, open building, sustainability, affordability, user participation, design roles and many other aspects of housing and settlement design. Many case studies from around the world are included. Open House International is covered by EBSCO Publishing, Thomson ISI and Elsevier Scopus databases.

University References:-

“One major contribution of Open House International is its ongoing emphasis on open-ended design as an important attribute of environmental quality of built environments. Through this, Open House International has ensured that this topic has not been forgotten and has continued to develop." Prof. Amos Rapoport, University of Milwaukee, Wisconsin, USA.

The high academic level of the journal is an example to be followed. We are privileged by our affiliation with you and the journal. I think that our disciplines are hungry for the level of academic rigor that OHI demonstrates on a sustained basis.” Guillermo Vasquez de Velasco, Dean, College of Architecture and Planning, Ball State University.

“Open House International provides a unique, international forum for presentations of the multi-dimensional nature of housing with illustrative examples from all continents around the globe. Today this perspective is rare in mainstream academic and professional publications.” Dr. Rod Lawrence, University of Geneva, Switzerland.

“This is a journal with a long-standing history of exploration into issues of development, built environment and housing. It distinguishes itself in the unselfconscious way it invites writings reflecting people, work and thinking not yet part of the mainstream.” Prof. Nabeel Hamdi, Oxford Brookes University, Oxford, Great Britain.

“As an educator, I use many of the articles published in Open House International as supplementary material for my courses since the information is well researched and quite often state-of-the-art in its field.” Dr. Avi Friedman, McGill University, Canada.

“Since its beginning in 1976 Open House International has been the only journal to cover the extremely important ground between the traditional and the "new" concerns of architects and builders and those of development studies. This is of increasing significance in the context of the international agendas for the next millennium.” Prof. Pat Waksley, Emeritus, Development Planning Unit, University College London, UK.

Among the journals focused on the built environment, Open House International (OHI) has always stood for the possibility of informed discourse on cross-cutting, global and local issues linking methods, the culture of building, built form studies, technology, pedagogy and user-centred public policy and planning. Thank goodness it is there for students, teachers and practitioners. Prof. Stephen Kendall, Ball State University, USA.

“...in recognition of the high quality and relevance to the scientific community of Open House International we are pleased to inform you that your publication has been selected for coverage in the Elsevier Bibliographic Database Scopus as of 2007.”

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