Journal of Contemporary Urban Affairs

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International Journal of Contemporary Urban Affairs (IJCUA)

Volume 1, Issue 2, December 2017

IMPRESSUM

International Journal of Contemporary Urban Affairs (IJCUA)
Volume 1, Issue 2, December 2017

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EDITORIAL

<u>International Journal of Contemporary Urban Affairs (IJCUA)</u> is an open access international peer-reviewed and open-access journal, which provides a platform to brings together current manifestoes and methodologies on urban affairs to raise the understanding for the future of urban planning within some specific subject fields which are: Housing Studies, Emerging Cities, Urban Ecology, Infra Habitation, Revitalization Strategies, Conflict, Divided Territories and contemporary urban issues about above mentioned subject fields. Thus, it reports on the latest research findings and innovative approaches, methodologies for creating, assessing, and understanding contemporary built environments.

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This issue has 8 articles. The editors seek to publish articles considering contemporary urban affairs in the specific field of: Housing Studies, Emerging Cities, Urban Ecology, Infra Habitation, Revitalization Strategies, Conflict, Divided Territories; they are looking forward to substantial improvement of educational processes and outcomes.

With kind regards,
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Selected paper after successful review process will be consider for publication in Vol. 1, No. 3.
Sixth International Conference on Climate Change Adaptation 2017

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Oeuvre vs. Abstract Space:
Appropriation of Gezi Park in Istanbul

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A B S T R A C T

The Gezi Park incidents of summer 2013 in Istanbul have marked a turning point in the political life and democracy in Turkey. The peaceful environmentalist protestations in central Gezi Park have turned into a countrywide upheaval against the neo-liberal and conservative policies of the government, pouring millions of people into streets in different cities. It was a time that Turkey witnessed the formation of a new type of public sphere that encompasses a variety of counter publics, and its spatial incarnation –the Gezi Commune-, reclaimed, created, shaped and inhabited by the free will of people. This was the instant creation of oeuvre through appropriation of the urban space, and a spatial manifestation of reclaiming the right to the city. This article is a reflection on possibility of creation of oeuvre in contemporary society, and a new way of architectural thinking and practice that can pave the way for it.

CONTEMPORARY URBAN AFFAIRS (2017) **1**(2), 1-10.

https://doi.org/10.25034/ijcua.2017.3643

1. Introduction

There is a strong relationship between city spaces, the way they are produced and social relations taking place in those spaces. Spaces are adapted by people through their diverse economic, political, social and cultural activities. All personal or common lived spaces make place for these dwelling practices of people (Sadri & Zeybekoğlu Sadri, 2012). The way that spaces are formed determines how we access to those spaces, how we use them and how we exist in them. Under the domination of state, capital, and institutional knowledge, spaces are produced as commodities (Sadri & Zeybekoğlu Sadri, 2012). Accordingly they reflect the order of a ruling power, and they start to cause exclusions of certain groups of people and their diverse dwelling practices, which do not fit into the norms defined by the ruling power.

Henri Lefebvre distinguishes between space as "*oeuvre*" and space as "*product*". Space as

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oeuvre occurs as a result of collective creation, praxis. The French word *oeuvre* refers to lifetime "works" created by an artist. Since space as *oeuvre* is an outcome of collective creation of different generations during a long period of time, it is the accumulation of all works done by inhabitants of a city during its city's history. Thus, space as *oeuvre* embodies peace and co-existence. However space as *product* is produced by forces of production such as nature, labour, division of labour, and instruments of labour. Nature is commodified, labour is exploited, division of labour is organized and instruments of labour such as knowledge and technology are estranged and controlled by power. Furthermore designed and produced spaces have been invaded and organized by the state, capital and institutional knowledge, particularly architecture and planning. While space as *oeuvre* is formed in accordance with the needs of different generations, through a collective of lives over a lot of people during a long period of time; space as *product* is designed and constructed within the domination of ruling power and as an outcome of collaboration between the state, capital and institutional knowledge (Lefebvre, 1991).

Lefebvre defines designed and produced spaces as abstract things and commodities. He associates the abstract space with social hierarchical order, social norms and social factions. Abstract space creates social hierarchical order through limiting the access to and use of space. Abstract space also dictates social norms through homogenizing the potential uses of space by limiting those uses to particular functions inside defined architectural forms and accordingly restricting the everyday life of people. And finally, abstract space renders social factions as the systematic method for controlling daily life and its practices through fragmenting the collective and cooperative practices of people (Lefebvre, 1968; Purcell, 2003; Lefebvre, 1991; Gottdiener, 1993).

Against hierarchical order, social norms and social fragmentation, intrinsic to the abstract space, Lefebvre celebrates the idea of «right to the city» to protect diverse dwelling practices of people and promote oppressed groups. The right to the city is the right of inhabitants of the city to dwelling, existing and co-existing within the space during the process of formation and use of space. Consequently Lefebvre divides the right to the city into two interdependent rights: the right to *oeuvre* and the right to *appropriation.* While the former is more related to the praxis of creation of space, the latter is more concentrated on free life and co-existence in space (Lefebvre, 1968).

During Gezi protestations, Taksim Square and Gezi Park in Istanbul were appropriated by Istanbulites, and the park was transformed into a communal space through a collective praxis of protestors. With several dwelling practices that it housed, such as protection from police attacks, political discussions, artistic production, health services, eating and cleaning, the commune was the instant creation of oeuvre, which was made according to its inhabitants' visions and desires. It was representing the free will of people co-existing inside the commune, against social hierarchical order, social norms and social factions dictated by abstract space of ruling power and capital. This article aims at unfolding the spatial history of Gezi Resistance as a right to the city movement, through evaluation of spaces of resistance that emerged and disappeared throughout the days of protestations and reflecting on a new way of thinking with practice that can pave the way for a new architecture of resistance.

2. Production of abstract space in Istanbul

Starting from the mid-1970s, world cities have been changing under the impacts of neo-liberal economic developments, which have been manifested in new spatial organization of production, developments in communication and transportation technologies, and the declining control of nation states over economic activities (Van Kempen & Marcuse, 1997; Sassen, 1998; Giddens, 1999). World cities started to

restructure themselves and compete with each other in order to attract a highly mobilized capital which started to travel around the world in the form of high technology industries, new employment forms, new administrative institutions, international events and tourism. Within this competitive environment, creating a marketable city image became a priority for city administrations. Urban transformation projects which aim at creating new and marketable images for cities started to be implemented at different scales and with different contexts (Harvey, 1989; Goodwin, 1993; Paddison, 1993; Evans, 2003).

Istanbul is also under the effects of this marketing based production of urban space. The commencement of implementation of neoliberal economy policies in Turkey dates back to the year 1980, concurrent with the military coup d'état of 12 September (Öktem, 2011). From this year on, Turkey's economy started to grow on consumption, depending on production of consumer goods rather than industrial and agricultural production (Sönmez, 1996). Istanbul was the centre of this economic growth and its imagination as a world city paralleled to its position in the global competition of cities (Keyder & Öncü, 1994; Robins & Aksoy, 1995; Keyder, 2000). This imagination transformed the urban space into a commodity, replacing the use value of urban land with its exchange value.

Within the last 15 years, to be able to foster urban development and economic growth at the level of other global cities, urban regeneration has been used like a magic wand by the central government and city administrators in big Turkish cities (Zeybekoğlu Sadri, 2017). Although urban regeneration is described as ideas and activities to improve the economic, physical, social and environmental conditions of an area (Roberts, 2003), its application in Istanbul is not following this multi-layered approach. The focal point of the projects in Istanbul are mostly physical with economic priorities and are applied with several motivations such as earthquake prevention,

renewal of historical neighbourhoods and creation of tourism attraction, re-functioning of former industrial or historical buildings, rehabilitation of *gecekondu* (squatter) districts, and last but not least economic development through huge-scale prestige projects. Within the last 10 years or so, the scale and content of urban interventions have also evolved into enormous scale infrastructure, transportation, and new urban development projects such as 3rd Bridge over Bosphorus, 3rd Airport, and Kanal İstanbul.

Preparation of the urban infrastructure for a potential earthquake, development of the economic conditions of people, preservation of the historical-cultural assets of the city, and improvement of poor living conditions and declined physical environments are crucial for a more safe, liveable and resilient city. However, the urban regeneration experience of Istanbul shows that, in most cases, the above mentioned motivations are only used as guise for transforming the urban land into commodity for investors and city management, and even earthquake has become a marketing tool during this process. Through enforcement of new planning laws and regulations, or amendments to existing regulations, the legal framework of urban regeneration is also manipulated (Günay, 2013).

Usually, what is being applied as regeneration is construction of high rise, high density gated communities, with residential, commercial and hospitality functions for higher income groups (Yalçıntan, Çalışkan, Çılgın, & Dündar, 2014). These projects are implemented with the decision of central or local governments and investors, without maintaining the participation of local people who are going to be affected by the projects. In most cases, the implementation of regeneration projects includes destruction of an existing poor neighbourhood and eviction of the inhabitants of that neighbourhood, followed by other problems such as unemployment, exclusion from social services and health and education facilities and loss of social networks

established in the neighbourhood (İslam & Enlil, 2010)

As a result of such market oriented transformation of the city, the abstract space is produced through hierarchical division of the urban space, enforcement of social norms and social factions. The nature is destroyed and environment is polluted in an irreversible way. Public spaces are privatized and closed off to the use of the public. The urban space is fragmented into pieces through gated communities, and any encounters with differences are avoided for security reasons. Consumerism is celebrated and shopping has become the new urban recreation. Urban poor is marginalized and displaced. History and memory of the city is demolished while being re-written. The decisions regarding the urban space are given by central government, city administration and contractor firms without any public consent. The projects are implemented with an ignorance of scientific research and humanitarian values, with laws and regulations manipulated in order to eliminate any legal barriers in front of the projects.

3. Taksim Square and Gezi Park

Taksim Square and the adjacent Gezi Park in the center of Istanbul constitute a major public space not only in Istanbulites' lives but also for the whole of Turkey. The square and the park are located in Beyoğlu district of Istanbul on the European side of the city (Figure 1). Beyoğlu can be considered as one of the most central locations of the city, with a high number of cultural activities, and ease of access through over and underground systems connecting at the square. The square lies on a hilltop which overlooks the Bosphorus on the east and Haliç on the southwest, at the intersection of İstiklal, Sıraselviler, Cumhuriyet, İnönü and Mete Streets and Tarlabaşı Boulevard (Figure 2). The most significant structure giving the square its characteristic is Taksim Republic Monument completed and opened in 1928 (Figure 3). Other major urban elements surrounding the square

are Maksem Building on the west, Atatürk Culture Center (AKM) on the east (Figure 4), the Marmara Hotel on the southeast and Gezi Park on the northwest which lies between Cumhuriyet and Mete Streets (Figure 5). The square takes its name from the Maksem building, a big water reservoir, built in 18th century as a part of a bigger water distribution network that served to Beyoğlu and its surroundings (Akın, 2011). As the water distribution center, Taksim (an Arabic word meaning distribution) took its name from this new function of distribution (Kuban, 2010).
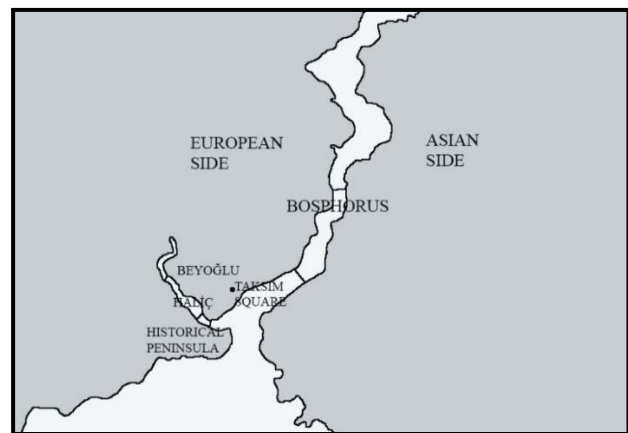
Figure 1. Location of Taksim Square in Istanbul, map reproduced by the authors from Istanbul Greater Municipality's City Map (Istanbul Greater Municipality, n.d.).
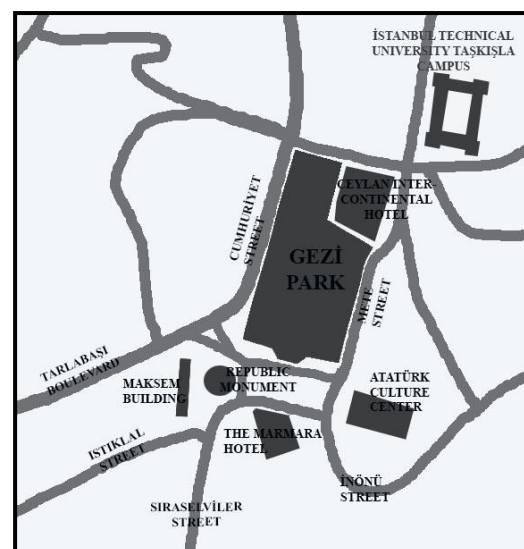
Figure 2. Taksim Square and Gezi Park, map reproduced by the authors from Istanbul Greater Municipality's City Map (Istanbul Greater Municipality, n.d.).

Figure 3. Taksim Republic Monument (authors' archive, May 2013).

Figure 4. Atatürk Cultural Centre (authors' archive, May 2013).

Figure 5. A view from inside the park, with the Marmara Hotel on the background (authors' archive, October 2013).

4. Appropriation of Gezi Park

In June 2011, the Prime Minister of the period announced the Taksim Square Pedestrianization Project (Demirkan, 2011). The project which envisioned the pedestrianization of the square by directing the traffic flow of streets surrounding Taksim Square towards an underground, through huge tunnels, removing bus stops from the square, and re-constructing the Artillery Barracks building over the location of Gezi Park (Figure 6) was approved by the Istanbul Greater Municipality Council in September 2011, and 1/5000 and 1/1000 scale Preservation Master Plans of Beyoğlu including this the project were amended (Council Decisions, 2011). Additionally, the non-existent Artillery Barracks was announced as a registered building by the decision of Istanbul 2nd Directorate of Cultural Heritage Conservation District Board on 09.02.2011 (Taksim Dayanışması Güncesi, 2015).

Figure 6. A scene from the video of Istanbul Greater Municipality's directing Taksim traffic underground and redesigning the square project (Yapı Haberleri, 2012)

The project aroused several objections among civil society organizations due to its top-down application process (Bayhan, 2012; Özkarkal, 2012). It was seen as a neo-liberal urban intervention project imposed by the government, combining all the above mentioned aspects of urban transformation in Istanbul. From destruction of nature, to loss of public space, from commodification of space to manipulation of laws and regulations, this project was a representation of what has been going on Istanbul, and in other big cities in Turkey for years (Figure 7).

Figure 7. A view from Taksim square during the pedestrianization project works. Gezi Park remains in its place (Taksim Meydanı Çevre Düzenleme İnşaatı, 2015).

Demolition of the park, which commenced on the night of 27 May 2013, was challenged by protestations of a group of activists including architects, planners and artists. Although the demolition of the park was the moment that the protests began, this environmental protest shortly evolved into huge scale unrest against the government. Discontent caused by the ruling party's political pressures and interventions in daily life over the last 10 years was cried out during the protestations. The crowds were marching with slogans as "government resign", "shoulder to shoulder against fascism", "everywhere Taksim everywhere resistance" (Her Yer Taksim Her Yer Direniş, 2013).

As the police interventions, paralleled with the statements of the Turkish Prime Minister of the time regarding the government's determination with the construction of the mall and humiliating and marginalizing the protestors continued (Taksim'e cami de yapacağız..., 2013), the resistance grew, both in number of people attending and in geographical distribution. People from different political ideologies and groups, civil society organizations, football support groups, special interest groups and individuals who were not attached to any political ideology or group came together in Gezi Park, supporting each other (Postvirtual, 2013, Bulut, 2013). People who were not on the streets were supporting from their homes through home-scale protestations like banging pans and pots at their windows (Post Modern Protesto Gezi Parkı Olayları, 2013), or leaving food, water and medicine outside of their doors and windows for protestors.

During this period, the mainstream media was ignorant to what was happening in Gezi Park. While many of the local TV channels were keeping their silence regarding the protests, international media organizations were broadcasting the protests live. The most reliable communication and news media turned out to be the social media and citizenship media (Zileli, 2013). Social media was effective in organizing and orienting protestors instantly, and calling out warnings related to upcoming police attacks too.

The biggest weapon of the resistance was the critical humour that was produced and shared by millions of people on the streets and through social media. The pressure and humiliation coming from the prime minister was subverted into a satirical acceptance, and was used as a weapon of critique against repression, and police violence. Caricatures, graffitis, different forms of art works, and creative ways of demonstrations were used as a way of resisting, which lifted the spirit of the protests, and created a strong solidarity among protestors and supporters (Avcı, 2013).

As demonstrations continued and the number of protesters increased, police was expelled from Taksim square. Gezi Park was appropriated by protesters and a sort of commune was established in the park, with tents, temporary kitchen, library, pharmacy, garden and other amenities for people to live in (Figure 8). The Gezi Commune, with free and voluntarily provided services, autonomous decision making system, coexistence of different people and groups and freedom of expression, was the spatial expression of the resistance and evolution of oeuvre against the forces of abstract space produced by political power, capital and security forces.
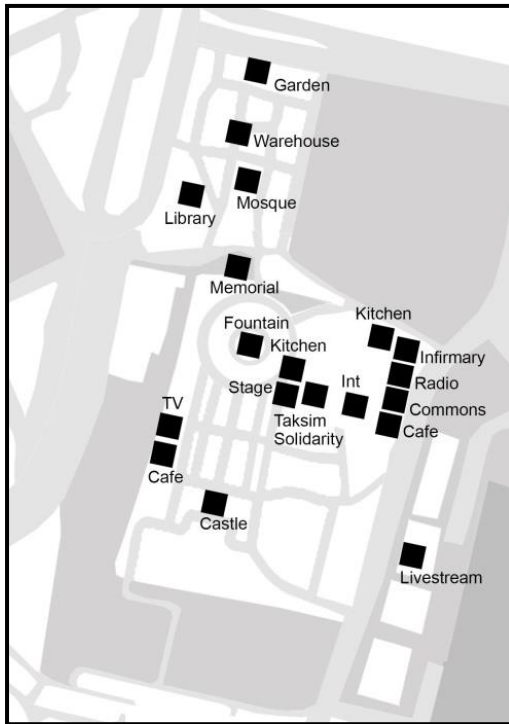
Figure 8. Facilities inside Gezi Commune, map reproduced by the authors from Istanbul Greater Municipality's City Map (Istanbul Greater Municipality, n.d.) and sketches in Historical Atlas of Gezi Park (2013).

5. Gezi Resistance as a Right to the City Movement

The Gezi Resistance was a large scale uprising for the right to the city in its two aspects: right to oeuvre -a claim for democratic participation in the making of the city- and right to appropriation -a demand for peaceful co-existence in the city. First, it was a claim for right to oeuvre which was realized in the self-autonomous character of Gezi Commune, a voluntary, participatory, temporary habitat, where all inhabitants had a voice and contribution in the creation and re-creation of the spaces of the commune. As a temporary settlement, this communal space provided diverse dwelling practices for people from sheltering to social gathering, from health services to education, from worshipping to artistic production, and all the services and maintenance was provided voluntarily on a regular basis as a part of communal living. Although there was no city administration and no ruling class to ensure order and security, solidarity

among people created harmony and safety inside the commune area. This was the realization of oeuvre through collective praxis of inhabitants of the city.

The Resistance was also a demand for right to appropriation, for peaceful co-existence in the city without exclusion and discrimination. The Gezi Commune provided an arena of visibility and co-existence for various groups and individuals representing different (sometimes opposing) political views, cultural/ethnic/religious identities, and social interest organizations. Those differences did not become a matter of discrimination and inequality, but led to mutual respect and solidarity among different groups. Rather than being a unifying and homogenizing public sphere, Gezi Commune became an arena of dialogue, mutual understanding and trust and a public space where all differences could peacefully co-exist, without exclusion and discrimination. In addition to gathering different groups and identities together, Gezi Resistance provided "a spatial and bio-political ground of existence for those groups and identities that lost their visibility in the public sphere" (Türkkan, 2013). The Gezi commune, described as a temporary autonomous zone with reference to Hakim Bey (Altay, 2013), was physically short lived, but its impacts endured much longer. With the police attacks on the 11th of June 2013, the commune was ceased. After the massive protestations ended, the resistance has continued in different spatial forms and scales at different locations: painting the city staircases with different colours; gatherings in neighbourhood park forums (Özlüer, 2013); occupation of an abandoned house as a neighbourhood solidarity home, and formation of umbrella organizations bringing together several urban and ecological resistance groups.

Throughout the protestations, two important questions were raised: first, what kind of a city we want to live in? second how we can make it? and the Gezi Commune was one answer to both questions. The commune was a claim for a city

of democracy, peace and co-existence and illustrated **"what kind of social ties, relationship** to nature, lifestyles, technologies and aesthetic **values we desire"** (Harvey, 2008). It was claimed, instantly created, maintained, and re-created again by collective efforts of protestors and the technical knowledge of production of abstract space was replaced with the common sense of collective praxis of place making. At this point, architectural thinking and practice, and the roles of architects need to be re-considered. As Çetin **frames it clearly, "architecture as a professional** field of practice, which serves macro-scale cities planned in a monopolistic manner, can transform into a field of knowledge which provides spatial devices of a micro-scale, **organic city"** (Çetin, 2013; 8). **This transformation** is possible through a re-definition of architects as well. Rather than master builders who design abstract spaces for capitalist reproduction, architects also need to transform into social agents contributing to place making through sharing their expertise on construction and building.

6. Conclusion

As much as Taksim Square and Gezi Park were abstract spaces with the ways they were imagined, designed, organized and produced by power and capital, they also gained an identity of oeuvre in the sense that they were owned, used, lived and appropriated by people through various dwelling practices ranging from daily life activities to massive protestations taking place in them like a Gezi Resistance. Gezi incidents created a new language of resistance, solidarity and mutual trust among people, and it opened the discussion for possibility of new ways of making politics, and architecture as well. As much as Gezi Resistance was an uprising against conservative, discriminatory and oppressive policies of the government, it was also an opposition against the new spatial order dictated by the neo-liberal production of space through architecture. The Gezi Resistance was also a discontent with this architecture which is

under the service of power and capital, dictating social hierarchy, norms and fragmentation and transforming the history, nature and culture of the city into commodity. Therefore, The Gezi Commune was created as the spatial reflection of the common will of the protestors, who desire peace and co-existence. The creation of Gezi Commune could not be possible with the architecture of power, which is based on consumption, discrimination and fragmentation. The Commune was a challenge against architecture as an abstract entity, defined by sharp disciplinary boundaries as a profession and under the hegemony of architects. The making of the Commune as an oeuvre was only possible through collective praxis of all people participating in the resistance, and its construction was based on a collective field of knowledge on place making which was created, shared and then re-created again by protestors. Rather than an architectural product, the Commune was the physical manifestation of the soul of resistance. Therefore, it was a resistance against the production of abstract space which is the embodiment of hegemony, hierarchy, norms and orders, and was a call for right to the city.

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Identity in Changing Context: Factors of losing Identity in new developed part of the city of Famagusta, North Cyprus

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A B S T R A C T

Historical cities due to its magnificent building in its context have tremendous influence on formation of city identity, which is created through the interaction of natural, social and built elements. Unfortunately modernization after the industrial revolution couldn't adapt itself to vernacular area, owe to the fact that cities began to lose their identity and sense of belonging to the environment. New technology of construction lets the cities to expand itself outside, but in this transformation, some factors which have an influence on the identity of the city have been forgotten. In this research it is aimed to analysis Physical and social factors which are causing the loss of identity in the city of Famagusta (Gazimagusa). Both qualitative and qualitative methods have been used in this research and the adopted techniques are personal observation, sketches, and comparing new development part of the city with traditional part. The research will try to answer the question of why urban sprawl could not maintain the identity of the city of Gazimagusa?). This research revealed that Globalization by neglecting historical housing principles is the main factor which threatening identity of the city.
CONTEMPORARY URBAN AFFAIRS (2017) **1**(2), 11-20.
https://doi.org/10.25034/ijcua.2018.3661

1. Introduction

"City identity is a strong concept or conditions that differ cities from other locations. The city identity creates images in people's mind even that haven't seen it before. It is an essential **characteristic for creating better environments**" (Fasli, 2010). Unfortunately in the new development part of cities there is not any potential to attract people to place. These places converted to lost spaces due to lack of **mixed use functionality. The new places don't** have meaning to its users. In this area the role of Globalization in the new development part of the city should be considered, it seems that the Globalization by changing in social and cultural structure changes meaning of identity of cities. Understanding which factors have more effect

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on the changing identity of the city of Famagusta in new development part of the city related to its traditional housing environment, will be the main issue in this research. In this study, the city identity related to its Physical, socio-economic, socio-cultural structures and historical factors will be explained.

1.1. Literature review

1.1.1 Globalization and its effect of urban context

By considering the meaning of Globalization "the act of globalizing, or extending to other or all parts of the world and Worldwide integration or development" (Dictionary, 2012), it's obvious that the process of globalization is against the cultural and regional identity of a city. It means that "globalization has resulted in the loss of some individual cultural identities" (Kutsal, 2012). The context of urban area in these recent decades has been radically changed. Similar patterns of housing construction rapidly expanded itself all around the world. Unfortunately the process of Globalization and similar construction ruined city's historical icons which had influence on the identity of the cities. Socio cultural, social physical changes in the context of the city changes fashion and lifestyle of the peoples. It's obvious that during the past decades the world has been changed because of technological innovation and global restructuring. Since the first decades of the twenty century. Nowadays the processes of Globalization affect all countries, thus this led to effects on social and cultural lives. "The globalization process leads the cities to be in a uniformed type; eventually, influences the living spaces, architecture and urban identity. The economic changes take place as a result of the development process of the cities, where urban image differs and changes" (Kutsal, 2012). "Globalization is now an unstoppable historical process led by technological change and involving the dissemination of science and new technologies" (Eldemery, 2009).

1.1.2 The effect of Globalization on Urban sprawl

Because of the essence of technology, and rapidly increasing population of the city and due to dynamic of urban growth the city has to be expanded itself to outside. Mass housing construction without attention to its surrounding and Environmental and Social Identity (e.g., Socio-Cultural, Socio-Political, Socio-Economic) for this reason scholars called this phenomena as urban sprawl. In the literature of urban planning or urban economics, "there is a big debate on even the definition of urban sprawl itself, let alone its causes and impacts" (Gordon and Richardson, 1997; Ewing, 1997; Fischel, 1999; Brueckner, 2001). Generally, the definition of urban sprawl appears that, "First, it has to be an inefficient or an excessive urban expansion, which certainly involves some benchmark of 'normal' or efficient urban structure; second, if determined inefficient or excessive, the spatial pattern may be in leapfrog development, low density, or some other forms" (Deng, 2004). This discussion revealed that global technology of construction lets the city to expand itself outside, but in this transformation, some factors which have an influence on the identity of the city have been forgotten. For this reason it's obvious to say that Globalization by neglecting icons of identity of a city in transformation period create images of unsustainable city.

2. Methodology

Famagusta (Gazimagusta) city in North Cyrus has a problem of urban sprawl with two types of free standing villas and cubic form of four or five story buildings which don't have any relationship with its surroundings. In this era, understanding why urban sprawl could not maintain the identity of the city will be the main issue in this research.

2.1. Case study: The City of Gazimagusa

Gazimagusa, the second largest city of Northern Cyprus with a population of 35.000(URL4. 2013), is situated on the eastern coast of the island of Cyprus in the Eastern Mediterranean Sea. "The city reflects a long and unique history in the form of a rich cultural, urban and architectural heritage in its older core, the Walled City, a

fortified medieval city dating back to the 15th century" (Oktay, 2001). Medieval walled city of Famagusta due to its port and magnificent historical building with human scale narrow streets (organic pattern) and its traditional context have a tremendous identity which works in global scale. As Önal et al. (1999), in her paper of "The urban problems of Gazimagusa (Famagusta) and proposals for the future" discuses about urban growth of Gazimagusa by reflecting the fact that after the industrial revolution from 1960 rapid urban growth started to expand itself in the suburb but in this rapid urban growth it seems that something have been forgotten from vernacular housing construction point of view.
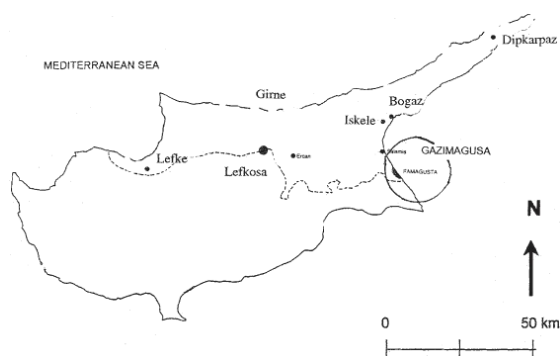
Figure 1. Location of Gazimagusa in North Cyprus (Onal et al., 1999).
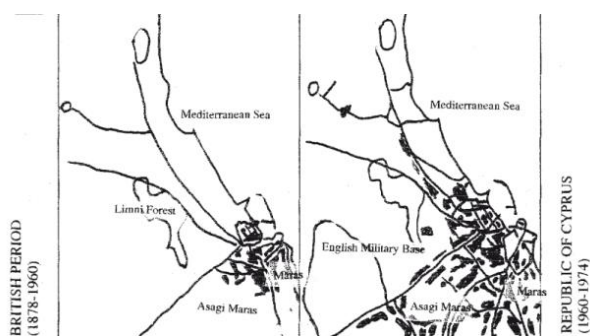
Figure 2. Urban explosion in Gazimagusa from 1960 till know (Onal et al., 1999).

2.2. Factors which have an influence on the identity of the city of Gazimagusa (Famagusta)
Identity of cities is acquired with their original characters. "By passing the time, some cities lost their original architecture and urban characteristics, thus the settlement fall into a confusion of identity. In the case of Gazimagusa, economic structure, urban culture, reflection of climate factors to the physical structure and lifestyle of urban dwellers, construction techniques can easily readable"(Kutsal, 2012). As a result, physical environment, socio-economic conditions, cultural and historical characteristics are the main factors in identity of the city of Gazimagusa.

2.3. Analyzing the identity of the historical part of the city of Gazimagusa with its new developed parts
2.3.1 Physical Structure of the City
In the walled city of Gazimagusa houses are usually one or two story buildings with the courtyards at the back. "Horizontal lines dominant on facades as in traditional Turkish houses, projections, Cikma or Cumba, give a unique character to the house as well as to the street long which they are located.

Figure 3. *Cumba* (facade protuberance) was a notable architectural expression of the Ottoman culture. (Walled City, Famagusta .Photo by author. 9th Januar 2016).

Unfortunately in today's housing in gazimagusa in the outer part of walled city there is no evidence to show usage of Cumba in the building. Also this element of the city is from the past but it's part of traditional Turkish housing which has influence on identity and sustainability of historic urban cities. "In vernacular Cypriot houses, there are a rich variety of open and semi-open spaces, such as open-to-sky courtyards, verandas at the front and Sundurmas at the back, all with access to greenery. In a courtyard, Avlu in Turkish, and Havli in local Cypriot Turkish, compared to other kinds of open terrain, the

sense of enclosure and small scale is easily manipulated, and given a mixture of hard and soft treatments"(Oktay, 2002).

Figure 4. Havlı as the elementary spatial cell of the urban fabric (Retrieved from URL1. 30th December 2016).

Figure 5. Organic pattern, together with the presence of some historic monumental structures and a definite center, greatly contribute the image ability and identity of the walled city of Famagusta.

Figure 6. Typical traditional urban layout in the Cypriot town. Walled city, Famagusta (Oktay, 2002).

2.3.1.2. Streets in urban context

Medieval cities in North Cyprus with its narrow streets which works in human scales. This compact form works properly with its context, streets are integrated into each other to helps

the context of the city to be in a sustainable way. After modern construction in cities by entering cars in context, the meaning of cities has been changed. The street dos not mean much for attaching people to the urban environment. Straight streets with its cares are threatening the city's sustainability in North Cyprus. Due to dynamic of urban growth the city expanded itself to the exterior part of the city. Streets as vital glue, sticks all variables of context with each other. Unfortunately the modern form of the streets couldn't work properly for this reason the context of the cities are in danger of unsustainability.

Figure 7. Street in the traditional quarter of Gazimagusa (Photo by author. 9th Januar 2016, Walled Ctiy).

Figure 8. street in recently development part of Famagusta(Photo by author, 30th Decebmer2016).

2.3.1.3. Square in Context

"The square is the most distinct element of the urban structure, determined by the same formal factors as the street, with the difference being that the buildings should form a continuous boundary around the space" (Oktay, 2006). Fortunately squares in historical part of the city of Gazimagusa in North Cyprus are steel maintain its own characteristic. Most successful squares in

these parts of cities have mixed us functionality to attract a different type of people into it. Such this kind of Square is in the Walled city of Famagusta called Namic kemal plaza with its monumental church and different type of functionality. On the other hand the functionality of squares in new development part of the city could not attach itself with its surround. The square has been designed just for automobiles.
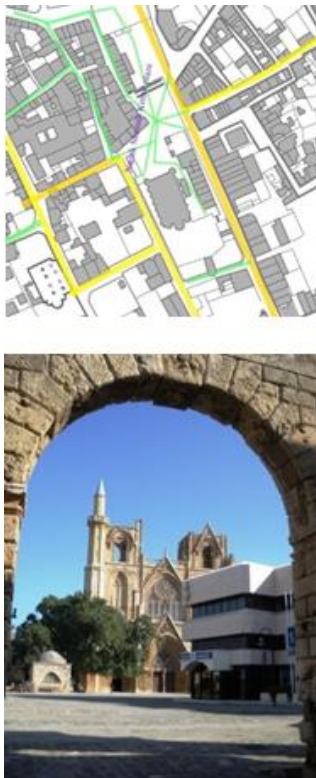
Figure 9. Namic Kemal plaza;by integrated all people and functions with each other has important characteristic on identity of the city of Famagusta. (Retrieved from URL3. 30th December 2016).

Unfortunately in this era the meaning of square has been changed. The squares are just for cars, there is no any activity or functionality to invite people into it. Thus here we can say that modern **squares couldn't work properly with its** environment

Figure 10. A view from the modern city center of Famagusta (Photo by author 20th December, 2016).

2.3.2. Social-spatial patterns
2.3.2.1. Context of Mahalle (Neighbourhood)
According to Jacobs (1961) in the context of the neighborhood, **"urban space should be conceived as an outdoor room, somewhere to relax and enjoy from the urban experience".** "When local urban context is considered, the district or quarter (neighborhood) is the identifying symbol both for the evaluation of city and for the new urban extension, it is also **essential for sustainable development"** (Oktay, 1998). To create a memorable place it seems that we need creative design in context of the neighborhood. Mahalle is an important unit in Turkish society, neighborhoods were not just a physical relation among each other; also works as a social and economic collaboration.

Figure 11. Mahalle in walled city of Famagusta (Retrieved from Oktay, 2001).

Unfortunately in new development part of Famagusta (e.g. Karakol neighborhood) the traditional meaning of Mahalle has been **changed. This place doesn't have any place to 'relax and enjoy'. (It doesn't have mixes use** functionality almost 90 % of the building are for **residential purposes). The place doesn't**

integrate properly with each other, there is no any place for social activity these factors are important which have influence in the identity of the city.

2.3.3. Socio- Economic Structure of the city
2.3.3.1. Financial benefits and the problems in urban identity

"The economic structure of the city causes changes in the physical entity of spaces. Therefore changes in economic structure have an influence on the social structure and changes physical spaces. As a result these changing processes are effective in changing the urban identity" (Kutsal, 2012). To make rapid production; in global scale the modal housing construction started execution without consideration of local elements in the city so, that all cities have fallen into the danger of losing their identities in the process of similarization. Such this kind of similarization is everywhere in the city. By critical analysis of new development part of the city with Socio- Economic point of view, it seems that the main reason in today's mass construction came back to the idea of globalization to earn more money. Unfortunately in this proses of construction there is no any effort to highlight the historical identity of the city it seems that financial purpose are dominant for mass housing constructors.

Figure 12. karakol neighborhood in North Cyprus. (Photo by author and site plan retrieved from URL3)

2.3.4. Socio-Cultural Factors

Multistory apartments in the outer part of the walled city of Famagusta are the yield of globalization. Previously, the houses had been constructed horizontally, and later on were designed vertically due to increasing in population. Therefore "the families had to live together, thus different type of culture occurred due to the residential development. Lifestyle, neighborliness, identity, and the terms of belonging were provided for sharing, participation and consensus were adopted. Generally, the lifestyle of the people who live in apartments changed, and this changing process provided for changing in the urban identity" (Kutsal, 2012). The apartments have, also, led to weakening the concept of social relations in the city. Today, one of the most important factors of losing the identity of the city is that the elimination of cultural icons; as a consequence people lost the sense of belongings to the environment.

However, when the rates of consumption were increased, today the "fashions" are changing rapidly. This changing accelerated the process of changing the urban identity. Living in an apartment became a new trend that comes from the west. In this process people left of their traditional houses and started to live in apartment buildings. Whereas the historical towns were left to ruin or to low income migrants to the cities. It's obvious from this part that Socio-Cultural factors in the new development of the city have been changed; globalization is the main factor in the changing of lifestyles of people with new trends and fashions.

Figure 13. Financial benefits is the main aim in housing in global scale (photo by author, 20th December, 2016) .

3. Discussion

The research on Evaluation of the new housing schemes in Northern Cyprus done by Oktay (2001) reveled that "contemporary dynamic movement of urban growth couldn't attach itself with its surround". Critical evaluation of the historical part of the city with new development part of it revealed that the definition of neighborhood, street, and square in urban context have been changed.

As figure 14, 15, and 16 revealed Apartment-Type Social Housing Complex in Gazimagusa (Famagusta) doesn't have any Cohesion with its surroundings, it means that the entity of place is in poor condition. The Quality of public space (e.g., Design, shape, and scale) don't work properly with its surroundings. So we could say all factors which have influence on identity of place are in poor condition. Figure 14, 15, 16 describe these poor conditions in new development part of cities in North Cyprus.

Figure 14. Apartment-Type Social Housing Complex-Gazimagusa (Famagusta). (Oktay, 2001).

Figure 15. **Doctors' Housing** Complex Gazimagusa (Famagusta). (Oktay, 2001).

Figure 16. Haji Ali Apartment Complex, Gazimagusa (Famagusta). (Oktay, 2001).

Figure 17. Strongly integration in historical part of Famagusta and week integration in new development part of it.

As figure 17 revealed lack of environmental integration with each other without using traditional housing principles in new development part of the city are the main factor in loosing feeling attachment with the environment and consequently these factors had an influence on loosing identity of the city.

By critically analysis of new housing schemes in Gazimagusa (Famagusta) it's obvious to say that new housing environment in Gazimagusa follows the scheme of Globalization without respect to its historical context the result of this kind of urban expansion are;

-Lack of Relationship between development and wider urban context

- There is no any cohesion whit its surround

- Quality of public space (e.g., Design, shape and scale) is in poor condition

For these reasons as Oktay (2002) mentions new housing construction could not achieve its goals to create a place with its own identity to attract people into it. Therefore the Identity of settlement and sense of Place in new development part have been disappeared. In figure 18 the author tried to compare the factors which have influence in the identity of the city of Gazimagusa. The method is to compare historical part of the city with new development part of Famagusta (figure 18) reveals factors which reducing identity of the city, is somehow related to the globalization to earn more money. For this reason they could not use historical Pattern which shows urban identity.

		Walled city of famagust(Historical part of the city)	New development part of famagusta
1	Walkability and its compact urban form and human scale	√	-
2	Well integrated with the environment and background	√	-
3	Flexible-grid urban pattern	√	-
4	Presence of a powerful symbol	√	-
5	Presence of a highly identifiable civic room	√	-
6	Presence of a highly identifiable place to go	√	-
7	Presence of great unity in the townscape, despite the diversity in forms, colours, and functions	√	-
9	Tourist-oriented functions	√	-
10	A hierarchical network of well-defined/well-enclosed outdoor spaces	√	-
11	Surprising effects	√	-
12	Vitality in public spaces due to the range of mixed-uses including residences	√	-
13	Similar age range of buildings	√	√
14	The opportunity of having contact with local people in all areas including the main public spaces	√	-
15	Similar building materials and textures	-	-
16	Residents' direct contact with the street:sitting/socializing in their front balconies	√	√
17	The common image of the place perceived by residents, visitors, and tourists	√	-
18	Locally appropriate urban context	√	-
19	Mixed-used quality in central parts where houses and tourist facilities are mingled	√	-
20	Easy access to all parts of the town despite the level changes	√	-

Figure 18. Urban context and sense of attachment to the environment in new and historical part in city of Gazimagusa (Famagusta).

According to an Oktay's report of theoretical evaluations and findings of the analysis of Taormina and Kyrenia (Oktay, 2006) describes following housing principles (figure 19) for urban designers and planners to enhance the urban identity by attracting people into the context.

The city should be well integrated into the topography, and planned as a compact settlement to reduce the walking distances.
New symbols, landmarks or focal points should be introduced into the urban townscape.
The identifiable 'civic rooms' in the city should be highly valued.
The major streets should be designed or redesigned as places to go and spend time.
The identifiable 'civic rooms' in the city should be highly valued; in newly developed urban districts, similar concept should apply to new squares in order to bring people together
Unity in diversity should be the major challenge
Green elements that are characteristic of the region, such as olive trees of Kyrenia region, should be protected or, in newly developed districts, introduced in the new townscape.
The city center should have a mixed-use character including the residential integrated with the commercial areas.
Public spaces should form a venue for a range of diverse activities, from outdoor eating to street entertainment, from play areas to a venue for civic or political functions and most importantly of all as a place for walking or sitting outside.
The presence of history and old elements in the urban scenery should be sustained through the appropriate reuse of the built resources.
Building elements that are characteristic to the area should be valued and used in new designs.
Local lifestyle should be enhanced.
Similar patterns of ownership should be provided.

Figure 19. Housing Principles for enhancing the identity in the urban context.

4. Conclusion

Walled city of Gazimagusa with its historic magnificent building, human scale narrow streets, Cul De Sacs and monumental buildings have its own identity which works on a global scale by its port and tourists. Unfortunately after 1960 because of globalization purposes, urban explosion by expanding it to the outer part of the city could not adapt with historical patterns. It means that the factors of Man-made Environme in city scale, district scale, and space scale have been changed. Urban fabric characteristic of the new development part of the city is different from the historical part of it. Related to this research question (Why urban sprawl could not maintain the identity of the city of Gazimagusa?) this survey revealed that globalization by neglecting historical housing principles is the

main factor which threatening identity of the city.

In the era of transformation from traditional to globalization, redefinition characteristics of the walled city of Famagusta which have influence on the identity of the city (e.g., Avlu or Havli, Cumba etc.), and principles of vernacular housing, would be useful to redefinition of identity of the city. As a conclusion for housing in urban context related to city identity the best urban expansion is those designed with a sensitive understanding of their urban context, valuing the characteristics of the place including the character of the area and by respecting to its physical context, and the local pattern of physical objects, landscape, public space and topography.

The question of how it's possible to polarize mass housing constructors to use vernacular trends in new housing schemes? Proposed from author as future study.

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The inspiration of Bauhaus principles on the modern housing in Cyprus

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A B S T R A C T

Modern architecture developed more than a century ago to find solutions suitable to solve the new concerns of the industrial revolution that changed the social idea of the world in all aspects. Bauhaus school which established by Walter Gropius in 1919 adopted too many principles and ideas that were totally new to the architecture concept and theory at that time; their principles started from Simplicity, Angularity, Abstraction, Consistency, Unity, Organization, Economy, Subtlety, Continuity, Regularity, and Sharpness. Those principles affected the architectural world and found its way through many applications in different parts of the world. The unlimited space or the international space that had a significant influence on the architecture space and form as well as the introduction of the new material, the anti- decorating, and Platonic forms had worked to reconstruct the architecture in the world. Cyprus as an Island close to the sources of the movement got the influence from the modern movement. The study will concentrate on Efruz Housing which designed by Ahmet Vural, who developed the project in the 60th of the last century. The aim of the research is to find the relationship and effects of Bauhaus school in Cyprus through studying and analyzing some of Ahmet vural works. The methodology will depend on a comparison with the traditional housing that preceded Mr. Vural work and how the Modernism changed the main features of the housing on the Island.

1. Introduction

Modern architecture developed more than a century ago to find solutions suitable to solve the new concerns of the industrial revolution that changed the social idea of the world in all aspects. Architecture experienced crucial shifts in that era; there were new attitudes in Architecture and Urban Planning, and although the movement made breaks with the past and sometimes denied the whole tradition it also allowed the fundamental principles of architecture in new ways. The movement came

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with too many features and structures that societies were not familiar with, the new architecture carried many concepts from the industrial revolution most of them stood on the notion of the machine, new Technology, and science.

Some of the Modernism characteristics and structures becomes so internationally wide-spread that it works as signs of the movement everywhere in the world.

One of the main institutions that established the Modern movement in Europe was the Bauhaus school which established by Walter Gropius in 1919. Bauhaus adopted too many principles and ideas that were totally new to the architecture concept and theory at that time; their principles started from Simplicity, Angularity, Abstraction, Consistency, Unity, Organization, Economy, Subtlety, Continuity, Regularity, and Sharpness. **Those because the" physical public space is a** result of struggles between different ideologies, discourses, political decisions and daily activities taking place at personal, interpersonal, local, national, supranational and global **scales"** (Sadri, 2017). Those principles affected the architectural world and found its way through many applications in different parts of the world. So it becomes difficult to think about the modern movement without taking into account those principles and social forces that formalized those principles. The unlimited space or the international space that had a significant influence on the architecture space and form as well as the introduction of the new material, the anti- decorating, and Platonic forms had worked to reconstruct the architecture in the world. Cyprus as an Island close to the sources of the movement got the influence from the modern movement; the Modern Architecture propagated all over the Island with its neat, clean and functional forms.

The paper will study the effect of the Bauhaus modernism principles on changing the housing layout and architecture in the Island and how the modern movement changed the traditional way of building on the Island with a particular concentration on Nicosia. The study will concentrate on Efruz Housing which designed by Ahmet Vural, who developed the project in the 60th of the last century. There will be a comparison with the traditional housing that preceded Mr. Vural work and how the Modernism changed the main features of the housing on the Island.

2. The Historical View

In this section, there will be a brief discussion about the advent of the modern movement in Art and Architecture. Too many factors and worked together to formulate new ideas and expression in different fields of science and architecture. Within this century, the concept that the Greek culture has high values and should emulate in all life possibilities (Ballantyne, 2004). **The very point for Modernism is that "the** nature of what constituted beauty and the beautiful was undergoing revision, as was the idea of utility. The connection of beauty to a moral and ethical dimension was passing into a new phase, in which beauty identified, neutrally, with sensation and experience. Thus, beauty was no longer a moral entity or the embodiment of a higher truth; it associated with individual taste and individual striving (Karl, 1985, p. 117). There were a new taste and attitude that needed new approaches and manipulation translated and interpolated in the modern movement in art and architecture.

2.1. Modernity and Modern Architecture

The concept of Modernity conveyed in the eighteenth (Heynen, 1999) or the mid of the eighteen centuries by the Philosophers of the Enlightenment in their efforts and seventeenth century (Mallgrave, 2005, p. XV)as an attempt to develop Objective science, universal morality and law, and free art according to their inner logic. The words theory and modern both first came to prominence in the late seventeenth century. The analyst of architectural modernism must consider the relationship of architecture and architects to three key epistemological positions: history, theology, and politics (Hvattum & Hermansen, 2004, p. 44). The main goals for

the Enlightenment philosophers were stayed to the point "to utilize this accumulation of specific culture for the enrichment of everyday life that is to say, for the rational organization of everyday social life" (Heynen, 1999, p. 11). The most significant effects happened after the industrial revolutions and especially after the second industrial revolution with the beginning in the nineteenth century (Benevolo, 1977). As a result, the architectural world adopted new methods and claimed new methodology for their final outputs, Technical, material innovation and Functions of the buildings and compatibility with the environment was one of their goals. Therefore, Architecture is not a spectacle but a service security fitness and convenience.

2.2. The Second Industrial Revolution 1856

The Industrial Revolution, which started in England in the middle of the eighteenth century and extent across the globe by the beginning of World War II, shaped a new world (Outman & Outman, 2003, p. IX). Moreover, give rise to building factories and new industry. The industrial revolution had a marvelous influence on nineteenth century Society "Productive efficiency, immigration from the country to the city was explosive, and living conditions in industrial cities were worse than at any other time in history" (Hvattum & Hermansen, 2004, p. 224). Cities were faced new technology, and there were intentions toward quantifications and reliable standardizations (Ballantyne, 2004).Changes in patterns of movement with the expansion of inexpensive mass transport in made possible the growth of cities to sizes which was not possible before (Hvattum & Hermansen, 2004). It was the advent of the mass community (Pevsner, 1968)or the machine age that demanded a response from art and architecture (Ballantyne, 2004). As a result, "Architecture and design for the masses must be functional, in the sense that they must be acceptable to all and that their well- functioning is the primary

necessity" (Pevsner, 1968, p. 9). The new technology and materials increased the sense of Modern and Modernism which "flourished in the nineteenth century, especially in England, when the 1851 Exhibition in the Crystal Palace was the epitome of technological genius" (Karl, 1985, p. 9). The other invention in this era was the spread of Bessemer process1 in the iron industry which led to replacing the cast Iron with steel the iron in all-purpose (Pevsner, 1968). The result was in Crystal Palace (Figure1). Later, in France there were the "triumphs of iron architecture at the exhibition of 1889 had still been the triumphs of engineers, even if the Eiffel Tower (Figure 2). By Its very height and Position became at once one of the chief constituents of the architectural scene of Paris.

Figure 1. Crystal Palace (Pevsner, 1968).

Figure 2. Eiffel Tower (Britannica, 2016).

3. The emergence of Modern Movement.

In the late nineteenth and early twentieth centuries, Europe was replete with many schools and direction in "Art and Architecture Cubism, Futurism, Expressionism, Constructivism, and De Stijl was fired by the belief that the Creative techniques of the past had to be overturned" (Ballantyne, 2004, p. 34). The Modern Movement

insisted upon the strictness of the Machine Aesthetic. Also, insisted on the vision that was of the universal design solutions, universal standards of living, and universal aesthetic (Ballantyne, 2004). Historians such as Siegfried Giedion and Nicolaus Pevsner came to this conclusion that Modern architecture was the outcome of Mass Production, World View (weltanschauung) associated with industrial technology, Methodological bias in making history, focus on form and Material and Pay lip service to process that generates them. (Lefaivre & Tzonis, 2004). The Modern movement "explained against a background of social, economic, technological, and artistic changes, and these must be duly acknowledged" (Ballantyne, 2004, p. 34). In the first quarter of the twentieth-century schools established and started to work in Europe, those schools and establishments shared similar principles united under the Modern Movement, Bauhaus in Germany and Le Corbusier in France, While De Stijl was working on similar principles in Netherlands. Later, on 1928, CIAM Congrès internationaux d'architecture modern worked to spread the modern Movement principles through working on landscape, urbanism, and industrial design. "The second C.I.A.M conference, held in Frankfurt in October 1929, was hosted by May and focused exclusively on the issue of housing" (Mallgrave, 2005). The era formed a "highly provocative standards and suggested the acceptable minimal housing square demands" (Lejeune & Sabatino, 2010, p. 69). New attitudes toward standardization in housing and uses the module in the design to achieve and provide the units to most of the people all around the globe. Housing advocates argued that low-cost construction would best be served by the normalization and the standardization of the existing production to conserve the traditional systems of production.

4. Characteristics of Modern Movement:
1. The absence of the ornament (Figure 3) (Ballantyne, 2004).

2. The Aesthetic Values based on creating simple, straight Shapes and forms, the whole Compositions stand on square forms, (Figure 4) (Pevsner, 1968).
3. Continuity of the space in all direction (Benevolo, 1977) .
4. Modern materials interpreted as steel and glass as well as Concrete Columns in their design and flat white colors (Figure 5) (Benevolo, 1977).
5. Functional design, especially in the Housing fields (Figure, 6) (Pevsner, 1968).

Figure 3. photograph, taken by Ise Gropius in 1926, became one of the most iconic images of the House Gropius after the building's destruction in 1945. (Pevsner, 1968).

Figure 4. Großsiedlung Siemensstadt 1929 Gropius. (Pevsner, 1968).

Figure 5 . Ludwig Mies van der Rohe Weissenhof Housign Project. (Pevsner, 1968).

Figure 6. Garrit Rietveld, Schr¨oder House, Utrecht, 1924–5. (Pevsner, 1968).

5. Characteristics of Modern Housing Architecture.

1. Prefabrication, there was a belief during the nineteenth century in prefabrication where the manufacture of buildings in basic form in workshops for transport to and final assembly on a remote building site developed from modest beginnings into an industry of quite substantial proportions (Lane, 2007).

2. Mass production spirit which was applicable through the standardization of both the technical and aesthetic sense with an ongoing search for standard types. Le Corbusier was a supporter of this idea as he said (Lane, 2007).

3. Module or Prototypes for industrial production (Benevolo, 1977).

4. Continues Space or the multiple uses of completed plans (Benevolo, 1977).

Figure 7 . Ernst May and staff, Bruchfeldstrasse Housing 1926, The utopian ideas implied in modernist housing can be seen even more clearly in Ernst May's Siedlungen in Frankfurt ,May's emphasis on the centrality of the community facility is clearly illustrated. (Lane, (2007).

6. Bauhaus role in Architecture.

The Bauhaus had a significant effect on formalizing the body of the Modern Movement, it is usually true to say that "The Modern Movement was embodied, aesthetically and pedagogically, when the Bauhaus moved to its new building and syllabus at Dessau in 1926. Within its irregular plan, glass curtain walls and steel and reinforced concrete frame beat an interdisciplinary heart so that all the departments furniture, theater, architecture, textiles, and so on – collaborated" (Ballantyne, 2004, p. 34). So in this section, we will review the main features and principles of the Bauhaus school.

6.1. Establishment of Bauhaus in German

Undoubtedly no other school in Germany was so closely connected to the cultural, political and socio-economic developments of the Weimer Republic as the Bauhaus. The Bauhaus established on the 1st April 1919 (Siebenbrodt & Schobe, 2009). "Bauhaus based on the idea that the term Bauhaus (literally, construction house) invokes the metaphor of a medieval guild" (Mallgrave, 2005, p. 249).Bauhaus object was to "renovate art and architecture in line with other similar efforts, from which it drew numerous ideas for its work" (Siebenbrodt & Schobe, 2009). Gropius saw the Bauhaus as a part of "reform ideas typical of the time and as a new kind of school, whose fundamental pedagogical

concept based on reform ideas (Siebenbrodt & Schobe, 2009). Bauhaus founder Walter Gropius affected by many people and schools in Germany like Ruskin, Olbrich, Behrens, **(Darmstadt Artists' Colony) and others in Germany and The Dutch artists' group De Stijl** which founded in 1917 with constructivist design principles that were propagated in Weimar by painter Theo van Doesburg. Walter Gropius repeatedly emphasized that the Bauhaus generate from the spirit of the Deutscher Werkbund. Founded by Hermann Muthesius (1861-1927) in Munich in 1907 as an association of artists, architects, businesspeople and experts.

6.2. Bauhaus Workshops and Contributions

Bauhaus composed of many workshops and departments that affected the different parts of art and architecture with its principles. It was possible to enter those workshops after the successful accomplishment of the preparatory **course which was "necessary for** acceptance **into one of the Bauhaus workshops"** (Siebenbrodt & Schobe, 2009, p. 39). There were many workshops in the school to participate in the field that it related.   The main workshops in Bauhaus were:

1. Pottery Workshop.
2. Stained Glass Painting Workshop.
3. Graphic Print Shop.
4. Typography/Printing and Advertising Workshop.
5. Mural Painting Workshop.
6. Stone Sculpting and Woodcarving/Plastic Workshop.
7. Weaving Workshop.
8. Carpentry/Furniture Workshop
9. Metal Workshop
10. Metal Workshop.
11. Architecture/Building Studies Building Department.
12. Photography/Photo Workshop.

6.3. Bauhaus Philosophy and Principles

1.   Reunification of all artistic principles in the building, in combination with manual trades and workshop as educational fundamentals, were the focal point of its aims and objectives (Siebenbrodt & Schobe, 2009) (Figure 8).

2.   Deny the History and create a modern architecture without concern for location or history (Siebenbrodt & Schobe, 2009).

3.   Abstract shapes stand on square and rectangles that include all items used in the field of art in architecture (Siebenbrodt & Schobe, 2009).

4.   The module in Mass production, in housing and town planning (Pevsner, 1968) (Figure 9).

5.   New Technology and Material, Especially the glass and Steel with Flat Concrete planes (Siebenbrodt & Schobe, 2009).

6.   White colors for the Architecture as the main colors (Craig, 1999).

7.   Open plan and Flowing Space in the plan (Craig, 1999).

8.   Standardization of the Elements used in the architecture and furniture Design. These were of standard design, but with modifications from year to year, and were constructed of reinforced concrete and cinder blocks (Figure 10) (Lane, 2007, p. 243).

Figure 8. **Walter Gropius, Masters' houses in Dessau,** 1925/26, condition in 2005.
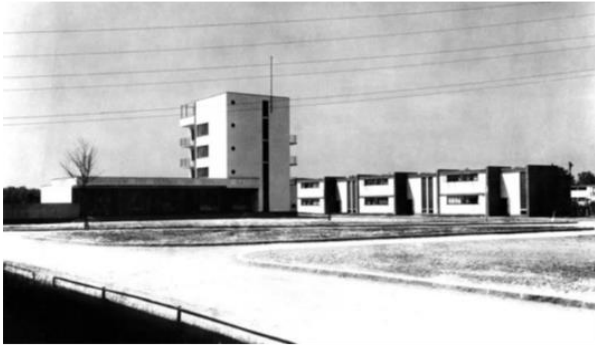
Figure 9. Walter Gropius and the Bauhaus, mass-produced houses at Siedlung Törten-Dessau.

Figure 10. Hannes Meyer, Syndicate school of the ADGB in Bernau, aerial view by Junkers, 1928-30.

Figure 11. Efruz Massing housing in Nicosia Source (Image by Author from CartoDB GIS system)

7. The Case Study

In this section we will focus on modern movement effects on the North Cyprus and in particular on the Nicosia city, as a case study, we selected the Efruz Mass Houses or Müdüroğlu designed by Ahmet Vural Behaeddin in between the 60th and 70th of the last Century.

7.1. **History of "the Case** Study

Efruz House,(Figure 11), "constructed in 1970 at Kumsal Quarter in Nicosia by Ahmet Vural Behaeddin, who was well known Turkish Cypriot architect in the island" (Esentepe, 2013, p. 76). Efruz project designed for "high-income households who has high-quality life standards" (Esentepe, 2013, p. 76). The whole project of a housing composed of are two-story row houses with three diverse design organization, the project designed on 10000 m² (1 Hectare)², with 34 units, the units area varies between 250 m² to 300 m².

7.2. Analysis of the Projects.

The Efruz housing impression indicate that the modernism imprint and the Bauhaus principles adopted by the architect with the urban and the stand alone units. The project is just 1450 m³ away from the old walled city, Ahmet Vural adopted straight and sharp line in his design to reflect the soul and insert the impression of the modern age, the straight space stand on the modernism philosophy of space as it was the main element that combined all the units around it in a direct way. Most of the units directed to the north (Figure 12), so it will be possible to open a large enough terrace to the south (Figure 13). The terraces are an enormous function in the daily life of the Cypriote people as they normally gather there to spend their evening. Some units oriented to the east therefore those units dealt with in a different way. The designer used some other manipulation like a natural stone for the east and closed the west elevation keeping some small windows or shutters for ventilation.

Figure 12. Efruz Mass House, Orientation toward North (Image by Author from CartoDB GIS system).
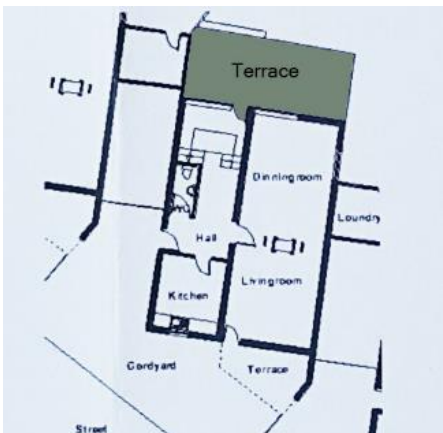
Figure 13. Terraces of Efruz Houses oriented to the south (Esentepe, 2013).

7.3. Analysis of the Bauhaus Principles in the Project

7.3.1 Space

Ahmet Vural used the continuous space in the internal design of Efruz units; there is a reflection of the (Open Plan) adopted from Bauhaus principles in the design, in his design for Efruz mass House he adopted three house types. All types shared a common characteristic which was the open plan and connection between the living and dining from one side and the kitchen with the entrance from the other side. In the (Figure 14, 15 and 16) we could see clearly the clear strategy plan between the different parts of the house. The compound of Efruz contains more than three different design that has a direct message for the open plan and the continuous space. In Macit Ferdi house 1961 (Figure 17), Bahhadin adopted the same

philosophy for the open space and accepted the same principle although the project was private and the site was accessible from all sides. Apparently, there is a sharp insistence on combining some space together then connect the group of the spaces by third space so that kind of mixing will achieve the maximum flexibility.

Figure 14. Efruz House Type 1 Open Plan (Esentepe, 2013).
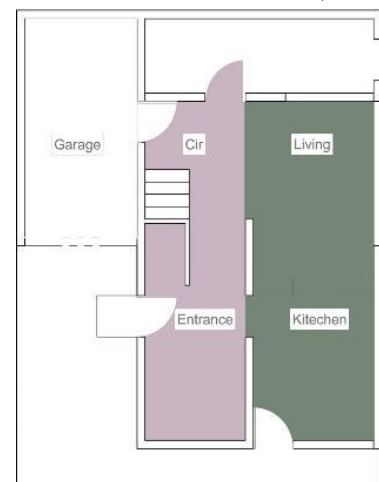
Figure 15. Efruz House Type 2, Open Plan (Drawing by Author).

Figure 16. Efruz House Type3, Open Plan (Esentepe, 2013).

Figure 17. Macit Ferdi House, Open Plan (D.Celik, without date).

Figure 18. Decoration in Walled City of Nicosia (Image by Author, 2016).

Figure 19. The Clean, abstract and White surfaces for Efruz Housing (Image by Author, 2016).

7.3.2. Form

Although Efruz house built in an area that is very close to the old city of Nicosia, which is rich in a unique history and full of architecture (Figure18) . Efruz house, designed according to the Modernism philosophy of denying the history and adopted Bauhaus philosophy in using simple square shapes to compose and generate the final form. The design is clean from ornament and decoration in all its features. Square used for creating the ornament parts in the project as it appears in the (Figure 19)

7.3.4 Orientation

Ahmet Vural affected by Walter Gropius work of mass-produced houses at Siedlung Törten-Dessau where all the units created with the same module and oriented to the south by Gropius to create the maximum functionality and how to get the best from the sunlight. In Efruz, Ahmet Vural went one step more when he decided to design each elevation in a different way to reflect the direction of the oriented elevation. All the units oriented toward the north, but the architect created balconies and open area in the south orientation so the family could spend their time in that part of the house and enjoy their time in the winter while avoiding the direct sunlight in summer. The

manipulation of the elevation is very clear in the (Figure 20, 21, 22 and 23), where Vural designed each elevation according to the sun direction, terraces to the west and the open windows to the east while he almost close the west elevations with white plastered walls.

Figure 20. North Elevation of Efrus House (Image by Author, 2016)

Figure 21. West Elevation of Efrus House (Image by Author, 2016).

Figure 22. East Elevation of Efrus House (Image by Author, 2016).

Figure 23. South Elevation Efrus House (Image by Author, 2016).

7.3.5. Colors and Materials

The Bauhaus principles is evident in Ahmet Vural work. the whole project colored in the white colors (Bauhaus style) and used the concrete as the main structure for the mass units as a reflection of the modernism in the project. there were some local materials utilized by the architect in the elevation (Figure 24) and (Figure 25), also he used the brick tiles on the pitched roof. The same principles had adopted by Ahmet Vural in 1961 when he designed Macit house in Nicosia (Figure 26) and (Figure (27).
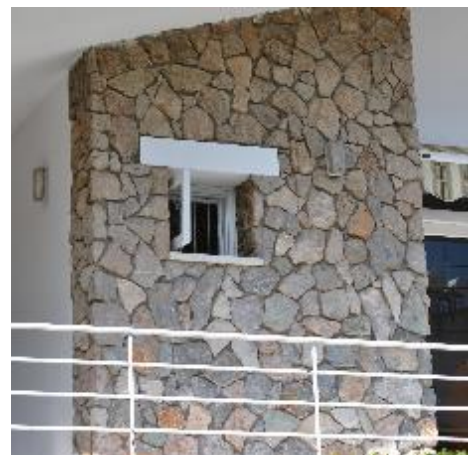
Figure 24. Details of Efrus House (Image by Author, 2016)

Figure 25. Efrus House (Image by Author, 2016)

Figure 26. Ferdi Macit House MACIT FERDI HOUSE, NICOSIA 1961 (D.Celik,without date).

Figure 27. Ferdi Macit House MACIT FERDI HOUSE, NICOSIA 1961 (D.Celik,without date).

7.3.6 Module, Prefabrication and Standardization

There are four types of the housing in the project, the reason behind that stand on the idea that the project has designed for the wealthy or hi income people and not for the low income as the philosophy adopted by Bauhaus school. Same reason prevented the use of the prefabrication in the project, all this lead to the idea that the project was not with the main

compatibility with the Bauhaus principles within this point.

8. Conclusion

There is the influence of Bauhaus principles in the Ahmet Vural work in Efruz housing; some principles were totally adopted and followed the open plan policy and orientation with function while some like Module and standardization were not accepted because of other local effects and factors. Although Cyprus is replete with rich heritage with the prominence of the old walled city of Nicosia, Ahmet Vural denied the whole history of the town in his designs keeping white abstract wall instead of the wealthy and dynamic influence of the old town. Vural type stand on creating two group of spaces then connect those group with third space as it is shown in the (Figure 26).
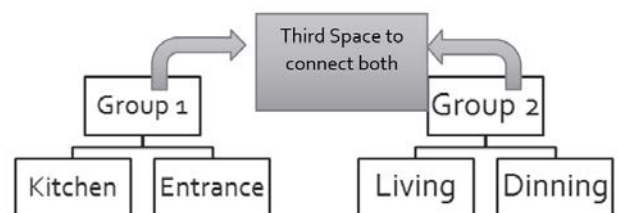
Figure 28. Ahmet Vural prototype that existed in Efruz housing and Macit Ferdi house. (Developed by Author).

The result from Table (1) shows that Ahmet Vural accepted the different principles of the Modernism as it cited by Bauhaus except the Module and standardization which might behave count achieved according to some social reason.

Table 1. Comparison between Bauahus and Ahmet Vural work (Developed by Author).

BAUHAUS PRINCIPLES	EFRUZ HOUSING	MACIT FERDI HOUSE
OPEN PLAN	1	1
FORM	1	1
COLORS & MATERIALS	1	1
MODULE AND PREFAB.	0	0
TOTAL	3	3

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An agenda for the Management of contemporary Sustainable houses

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A B S T R A C T

The evolution of sustainable design and Construction Management over the past ten years has produced a lot of literature on environmental sustainability and development. But despite this progress in the last ten years it is still a big challenge to designers, architects, landscape designers, etc. and all other professions that are related to the field of environmental science. . The goal of this paper is to simply create a framework for more accurate approach towards sustainable planning, design and development. The Objective of this paper includes to architecturally defining energy sustainable design in our sustainable Buildings; it is also to stress the concept of green building through design guidelines. This paper outlines, recommend and also create architectural design for sustainability and eliminate unsustainable elements in our building.

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1. Introduction

1.1 Sustainable Construction and Architecture

Sustainable building could be defined as an environmentally designed building aimed to limit the effect on our natural environment. These could be achieved through the use of renewable resources or elements from the environment to build (construct) the building (Dawson, 2006). Our built environment involves many holistic approaches and this can be termed as a green approach. A green building could simply be defined as a building constructed on sustainable basic principles (Guy & Farmer, 2006). This system of approach, in other words "Green Approach" is designed to measure and control the interaction between our man-made (Built Environment) and the environment. Therefore various elements of the building, for example, windows, floors, roofs etc can substantially increase or reduced the level of impact in our environment. In other words, the more sustainable they are, the less the negative impact on the building and the environment and vice versa (Ofori, 1998).Every element that are integrated together to make a building should

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always be considered in other to achieve a sustainable building (Steemers, 2003).

An energy efficient building lays its emphasis on the health of the environment, dwellers and the future effect on other environmental factor like the climate. This study aims to use existing **building elements in William's Ecovillage to** create a framework for developing and evaluating the sustainability of buildings in Ecovillages in general, through research experiments on the building elements.

This research involves a case study of the building **elements of the community house at William's** Eco Village in Colrain, Massachusetts a start-up village; which will deliver the factors for the proposed ecological guidelines.

1.1.1 Problems

The evolution of sustainable design and Construction over the past ten years has produced a lot of literature on environmental sustainability and development. But despite this progress in the last ten years it is still a big challenge to designers, architects, landscape designers, etc. and all other professions that are related to the field of environmental science. From my study, I have come to realize that great percentage of factors that degrade our environment come from building activities and design of men. Designing of our man-made environment should as much as possible realign itself to the natural system of the environment. Attempts have been made to create a system of approach for sustainable development but none has clearly been defined over the years. Many authors have tried to develop a systematic approach to the environmental challenges we are facing today but not great many achievements have been made. There has been great extent of neglect on the building element, their quality and how they react to the environment.

1.1.2 Design

Differences in design also bring about difference in sustainable approach, most times sustainable developments in buildings are defined in general, without due to consideration to the different building types (Bonnette and Kirsten, 2004). For example sustainable approach for a residential building type might not be sustainable for commercial building type. Therefore, sustainable development should be defined individually as it affects each building design type (Hill, & Bowen, 1997).

1.1.3 Building

Every building is made up of elements or building parts. These elements are integrated to form a building. Each element of any building is whole and has its own distinct capability and reaction to the same environmental factor. Throughout my literature review, I rarely came across literatures that dealt on the issue of building sustainability around its different element as this paper will do. Insulation, thermal massing, orientation are elements considered during building design so to neglect their relationship individually to sustainable design guidelines is tantamount to failure in creating design frame work for building sustainable development(Van Buerenn & Priemus, 2002; Arenibafo, 2017; Alizadehsalehi et al., 2015). The relationship between design building element and sustainable frame work will be developed in the course of this paper.

1.1.4 Case Study: The Community Building
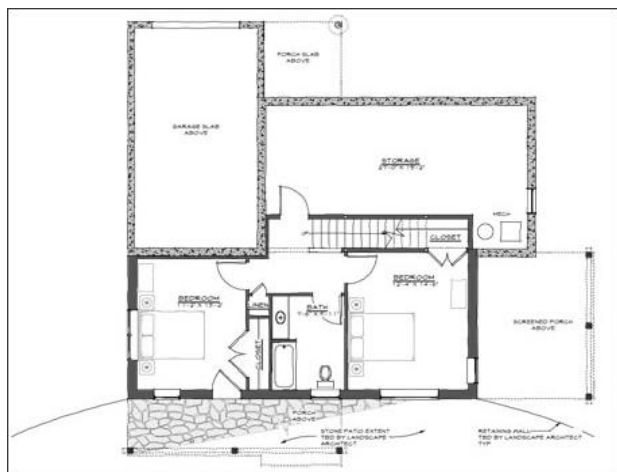
Figure 1. The Community Building, Ground Floor.

Nestled into the hillside will be 17 south-facing houses in two clusters. The lower cluster of 12 three-quarter-acre lots will comprise Phase I along Crosier Lane; Phase II the upper five-lot cluster along Stowe Farm Lane. Between the two clusters is the existing house, a large redwood home built in 1972 with five guest rooms, a large party or meeting space, kitchen, library, and workshop. This building will serve, at least for the time being, as the community house.

Figure 2. The Community Building, Upper Floor.

First (upper) floor: In the floor plan above, note that the north (top) wall has fewer windows than the south (bottom) wall, which overlooks Stone Mountain and the valley. Note also the differences in wall thickness: the thicker walls are a foot of blown-in, dense-packed cellulose, with an R-value of 45. Ceilings throughout are R-55. Note the ramp from the garage into the panty and kitchen, the first floor of each house is designed using ADA (Americans with Disabilities

Act) standards and approved by a consultant from Independent Living Resources. The entrance is ramped; doorways are wide enough for wheelchairs, and there are no thresholds. The first-floor bathroom is handicapped accessible. Each house has one garage space, a mudroom, a screened porch, and storage space.
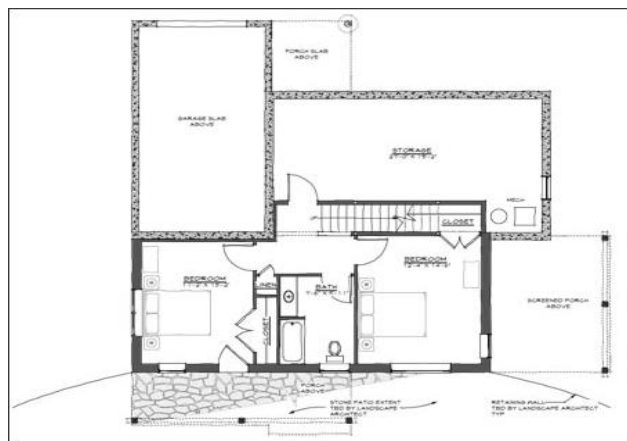
Figure 3. Comunity House, Lower Floor.

Second (lower floor): The lower floor has two guest bedrooms, one of which might be used for an office, and a bath. At the rear, there is a large storage and utilities room. For those who might need it, this floor could also be used as separate living space for a caregiver.

Figure 4. Mini House Floor Plan.

The Mini House echoes the design and planning of the Essential House on a smaller scale. A garage is optional.

Most of the challenges faced by different Ecovillages are their inability to follow the dynamic progress of sustainability in our buildings and environment in general. Over the last decade, various findings have brought into existence new principles and recommendations for eco-community development, suddenly already established eco-communities (Ecovillages) find themselves inadequate to meet up with the recommendations and standards set out for Ecovillages due to:

- Financial restraints,
- Environmental imbalances Example the topography is such that cannot be altered.

These factors I also found in the building at **William's ecovillage built in 1972. The community** house which will be the case study for this paper due to some environmental imbalances could not be improved upon to meet the new trend or standard in sustainable planning and design. The logic behind these general problems of various Ecovillages in the United States is that these eco-community buildings were designed on outdated sustainable principle. Seasonally new materials and principles of sustainable environment are developed. Experiments are done in various ecological labs to pursue better applications towards sustainability in our building and environment. Most of the problems encountered in **William's ecovillage Community** building are mainly on the various elements of the building. These elements were designed on previously acceptable sustainable design principles.

These problems are:

1. Orientation: I found out that the existing living build**ing in William's ecovillage was not** properly oriented. That is to mean a better part of the living area was located at the northern façade of the building, rather than the south façade of the building for better solar reach into the living areas.

2. Roofing: I found out from the complaint of sudden loss of heat energy in the building especially at night by the building occupant that the roofing materials not only that they are old but lack sufficient insulation against heat loss.

3. Wall Insulation: During my various researches **at William's ecovillage building under** construction, I easily noticed that the foundational walls were being constructed without an external insulation. These could easily lead to wetness of the basement wall.

4. Façade: During my research case study, I found out that the angle of the building to the sun path is improperly designed in that the building could have solar access into its interior spaces only when the sun is rising **and at twelve o'clock noon during summer** period

5. Window Design and Shapes: In my case study I found out that the windows on the building **at William's ecovillage were designed using** sliding window which are inefficient window design for passive cooling.

6. Thermal Mass**: In a typical William's ecovillage** building, I found out that the interior of the house are of wood which is not the best material for the kind of weather the ecovillage is situated in. Extremely cold winter and moderately hot summer weather.

1.2 Solutions and Conclusions

Sustainable buildings are not perfect buildings, because none exists. Sustainable building could be defined in line with the consumer culture of the occupants and also the climatic requirement of the region (Gilman, 1991). All through my study and research, I came to understand that various elements in a building could be used to measure out the sustainable level of any building under study. The achievement of sustainable development on our environment should be born in mind on the initial stage of conceptualization of design techniques. Various elements common in all buildings could be used

as a yardstick to measure the sustainability of any building under study all over the world. These elements like:

A. Roof

B. Facade Design

C. Thermal mass

D. Windows shapes and sizes

E. Building orientation and design.

These factors mentioned above could be used as criteria of measuring sustainability in building. These elements are common to every building, so could be universally used as a yardstick in sustainable development and design. In this paper, experiments, Hypothesis, methodology and results on these elements of building, at **William's were used as litmus for testing the** sustainability of the common community house **on William's** eco-village Colrain, Massachusetts.

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Courtyard Housing in China: Chinese Quest for Harmony

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A B S T R A C T

The Chinese have lived in single-extended-family courtyard houses in many parts of China for thousands of years. The earliest courtyard house found in China was during the Middle Neolithic period (5000-3000 BCE). The courtyard form signifies Chinese quest for harmony with nature and in social relationships. However, the 20th century was a significant turning point in the evolution of Chinese courtyard houses; this paper provides an overview of this transition. It starts by briefly introducing traditional Chinese courtyard houses and their decline since 1949, it then examines the emergence of new courtyard housing in Beijing and Suzhou since the 1990s, and then it evaluates the new development of Chinese-style courtyard garden villas in/around these two cities since the 2000s, such as Beijing Guantang and Suzhou Fuyuan villa estates. They are explorations of a new way to honor Chinese architectural history and philosophy, meanwhile, incorporating Western interior design principles to meet modern living requirements. This architectural acculturation represents Chinese sustained quest for harmony in their art of living. The paper finally proposes four designs of new courtyard garden houses for future practice.

1. Introduction

This paper is a chronological overview of the transformation of Chinese courtyard houses over the last 60 years (1950-2010). It briefly introduces traditional Chinese courtyard houses from ancient times and their decline since 1949, it then examines the rise of new courtyard housing in Beijing and Suzhou since the 1990s, and the focus is on the growth of Chinese-style courtyard garden villas in/around Beijing and Suzhou since the 2000s. The original contributions are in the discussion of the two generations of new courtyard house types based on the author's onsite and online surveys, as well as the four designs of new courtyard garden houses for future practice.

Two historic and cultural cities in China, Beijing and Suzhou, have been chosen as the case-study sites because they have followed the city planning principles set in the *Record of Trades* in *Rituals of Zhou* (*Zhou Li Kao Gong Ji*) and *Feng Shui* theory. Their traditional courtyard

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houses embedded in their urban fabric are representative of traditional Chinese urban culture despite their climatic differences. Beijing is a northern Chinese city with a rich history of **3000 years, and as China's capi**tal for 800 years; its famous *siheyuan* (courtyard houses) with strict axial, bilateral, symmetrical, and hierarchical planning embody the Confucian **ideal of "harmony in social relationships."** Suzhou is a southern Chinese city with a prosperous history of 2500 years, and was a regional capital renowned also for its private gardens enclosed within courtyard house compounds, whose spontaneous layouts reflect **the Daoist principle of "harmony with nature."** They were thought to offer a good comparison of their traditional courtyard use and the contemporary new courtyard housing.

2. THE QUEST FOR HARMONY THROUGH COURTYARD HOUSES

The courtyard house is one of the oldest types of human habitat, spanning at least 5000 years and occurring in distinctive forms in many parts of the world across climates and cultures, such as China, India, the Middle East and Mediterranean regions, North Africa, ancient Greece and Rome, Spain, and Latin-Hispanic America (Blaser, 1985, 1995; Edwards *et al.*, 2006; Knapp, 2005; Land, 2006; Ma, 1999; Pfeifer and Brauneck, 2008; Arenibafo, 2017; Polyzoides *et al.*, 1982/1992; Rabbat, 2010; Reynolds, 2002).

Archaeological excavations unearthed the earliest courtyard house in China during the Middle Neolithic period, represented by the Yangshao culture (5000-3000 BCE) (Liu, 2002). Ancient Chinese people favored the courtyard form because it offered light, air, and views, as well as defence, security, family privacy, and control of noise and dust. Moreover, the courtyard functioned as a place for cultural activities and festivities when weather permitted (Knapp, 2005; Ma, 1993, 1999; Zhang, 2011, 2013/2016, 2015a).
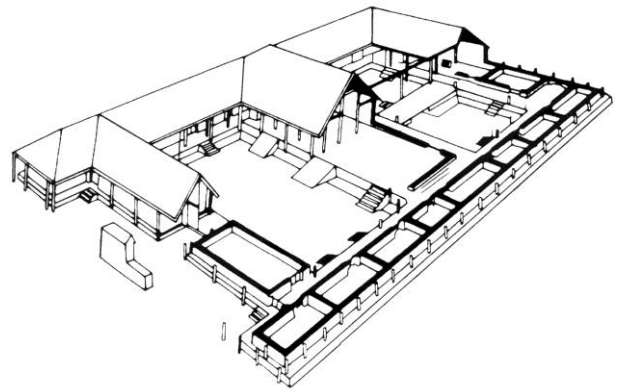
Figure 1. Reconstruction drawing of a large courtyard house compound at Fengchu, Qishan, Shaanxi province, Western Zhou period (1046-771 BCE). Source: Liu, 2002, p. 27.

A traditional Chinese house would normally host an extended family of three or four generations, and courtyards or lightwells (*tianjing*) were important features in the layout of a fully built Chinese house. The shape and size of the courtyards are determined by the amount of sunlight desired in the space. For example, in southern China, the courtyards are smaller, called *tianjing* (lightwells), to reduce the summer sunlight; whereas in northern China, the courtyards are relatively large to allow abundant sunlight in the winter.

Philosophically, the courtyard is the soul of Chinese architecture; it acts as a link between Heaven and Earth. During the Han dynasty (c.206 BCE-220 CE), the Chinese regarded Heaven and Earth as a macrocosm and the human body a microcosm to reflect the universe (Chang, 1986); offering sacrifices to Heaven and Earth in the courtyard was considered crucial to bringing harmony and good fortune (Flath, 2005). **Ronald G. Knapp's** book *Chinese houses: The Architectural Heritage of a Nation* (2005) is a masterpiece on the subject.
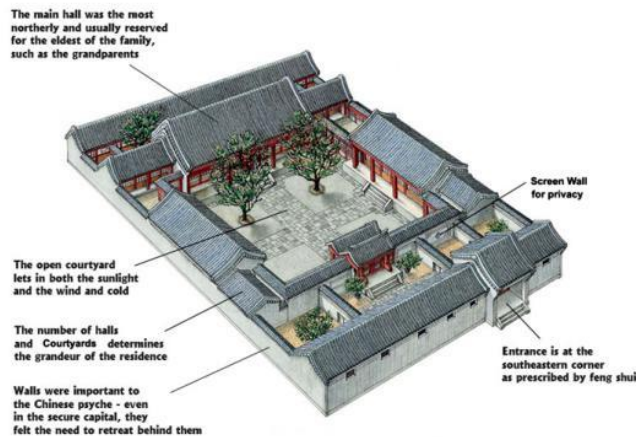
Figure 2. A standard/typical Ming (1368-1644) or Qing (1644-1911) Beijing courtyard house (*siheyuan*) with three yards: front, central, and back. The central courtyard is where most family activities would take place. Source: chinaspree.com, 2014.

Figure 3. Model of a small riverside courtyard house in Suzhou Folk Custom Exhibition Center. Photo: Donia Zhang 2007.

Although **China's population has more** than doubled (2.3 times) between 1953 and 2010 (Census 1953; Census 2010), the family structure has decreased from extended to nuclear families, a trend echoed elsewhere in the world (Amato, 2008; UN, 2002; Van Elzen, 2010). Statistics show that until recently, the average household size in China had remained relatively constant at about 5.2 persons (Jervis, 2005); it reduced to 3.96 persons in the 1990 Census, 3.44 persons in the 2000 Census, and 3.1 persons in the 2010 Census. The drop is either due to the state-**imposed "One Family One Child" policy implemented since 197**9 (and began to be formally phased out in 2015), or free choices under circumstances of rapid

modernization. The vertical, parent-son relationship typically found in traditional Chinese families is being replaced by the horizontal, conjugal tie as the axis of family relations in contemporary China (Yan, 2005). Thus, Chinese family structure evolved from a complex corporate organization to a relatively simple conjugal unit, in which family life revolves **around the couple's pursuit of financial** independence, privacy, and personal space (Cohen, 2005; Yan, 2005; Zhang, 2010).

3. THE FALL OF TRADITIONAL COURTYARD HOUSES IN CHINA

The change in Chinese family structure demands a subsequent change in the housing form, which has implications for new housing design (Cohen, 2005; Jervis, 2005). The modern housing units are frequently built with extra rooms for the future married son and his wife, and in anticipation of the later development of a stem family (Jervis, 2005). Similarly, in the multifamily courtyard house compounds of Beijing, the grown-up children required additional rooms in the courtyards, which made the courtyards filled with impromptu extensions. This situation has led to the physical decline and **massive demolition of Beijing's** *siheyuan* (traditional courtyard houses) and *hutong* (lanes) (Table 1).

Table 1. Destruction and conservation of Beijing *Siheyuan* and *Hutong*.

Year	Beijing *siheyuan* (courtyard houses)	*Hutong* (lanes)
1949	100 percent (of 62 sqkm of inner-city land area)	7000
1990	1.9 percent (805 courtyard houses *in relatively good condition* in the conservation zone)	3900
2003	1.5 percent (658 courtyard houses *in relatively good condition* in the conservation zone)	1570
2004	1.3 percent (539 courtyard houses *in relatively good condition* in the conservation zone)	1200

Sources: The author's summary based on Abramson (2001), *Beijing City Planning Chart* (2007), Collins (2005), Kong (2004), Ornelas (2006).

Table 1 shows a drastic decline of *siheyuan* between 1949 and 2004. There is no current data on the number of *siheyuan* still remaining in Beijing, as it is increasingly more difficult to count them due to their impoverished conditions. One can expect the number has further decreased since 2004.

4. THE RISE OF NEW COURTYARD HOUSING IN CHINA

To sustain traditional Chinese architectural culture, two new courtyard housing projects were built in inner Beijing: the Juer Hutong ("Chrysanthemum Lane New Courtyard Housing Estate," b. 1990-1994) prototype in the Nanluogu xiang area (Wu, 1991, 1994, 1999; Zhang, 2013/2016, 2016a); and the Nanchizi ("South Pond New Courtyard Housing Estate," b. 2003) experiment on the east side of the Forbidden City (Lin, 2003, 2004; Zhang, 2013/2016).

In inner Suzhou, similar projects to modernize traditional housing forms include Tongfangyuan ("Aleurites Cordata Fragrant Garden Housing Estate," b. 1996) and Shilinyuan ("Lion Grove Garden Housing Estate," b. 2000) by the Lion Grove Garden, and Jiaanbieyuan ("Excellent Peace Garden Housing Estate," b.

1998) in walking distance to the Master-of-Nets Garden and the Canglang ("Surging Waves") Pavilion (Zhang, 2013/2016).

These projects have attempted to reinterpret classical Chinese courtyard houses while resettling multi-families in 2-storey row/town/terraced houses or 2-4-storey walk-up apartments surrounding communal courtyards. The author's doctoral study (Zhang, 2006-2012) investigated the above five new courtyard housing prototypes (Table 2) on their architectural, environmental, spatial, constructional, social, cultural, and behavioral aspects, to see whether they are culturally sustainable, and whether they facilitate residents' traditional cultural expressions. Four key themes in Chinese philosophy that have influenced imperial city planning and classical courtyard house design were identified: Harmony with Heaven, Harmony with Earth, Harmony with Humans, and Harmony with Self. This information became the benchmark against which change and continuity were measured.

Based on data collected through a number of research methods, including onsite surveys (N=290), interviews (total N=93) with residents (n=82), architects (n=6), planners (n=3), and real estate developers (n=2), time diaries (n=22), architectural drawings, photos, planning documents, conversation and observation notes, journals, real estate magazines, brochures, and related material, the findings suggest that due to the high population density and a lack of land in the inner cities of Beijing and Suzhou, the new courtyards are generally too small to admit enough sunlight. The architectural drawings show that the new courtyard proportions are no longer preserved as in tradition (Zhang, 2013/2016, 2016a).

To achieve the same amount of sunlight as in traditional Chinese courtyard houses, the ratio of building height to distance should be at least 1:3 for Beijing (Zhang, 2006, 2011, 2016a) and 1:1.3 for Suzhou, which means a minimum of 18 m distance for 6 m high surrounding

buildings in Beijing, and a minimum of 12 m distance for 9 m high surrounding buildings in Suzhou. However, the two Beijing cases and two of three Suzhou cases have not met these criteria, which have seriously affected their environmental quality (Zhang, 2013/2016).

The findings further reveal that the interior spaces of new courtyard housing are generally small in Beijing Juer Hutong and Nanchizi, they are larger and more satisfactory in Suzhou Jiaanbieyuan and Shilinyuan. These results may be related to less restrictive planning regulations but more rigorous construction requirements set by the Suzhou municipal government. Interior space of 120-180 sqm per unit for a 3-4-person household is generally satisfactory. The findings also indicate that most residents prefer to live in low-rise housing of 1-3 storeys for practical reasons, and living close to the earth is still preferred. Residents have expressed a preference for pitched roofs than flat ones because they have experienced better thermal performance of pitched roofs. These outcomes reflect their desire to be in harmony with nature as in traditional Chinese culture. Moreover, 40 percent (n=67) of residents still value traditional Chinese-style furniture for their interiors (Zhang, 2013/2016).

The findings likewise suggest that communal courtyards foster social interaction and private courtyards facilitate self-cultivation. Residents still regard courtyards/gardens as important spaces for establishing harmony with their neighbors and with themselves. Nevertheless, neighborly relations are only partly influenced by the form and space of the courtyard housing, and are perhaps influenced even more so by a changing and polarizing society, socio-economic differences, housing tenure, modern lifestyles, community involvement, common language, cultural awareness, and the cultural background of the residents (Zhang, 2013/2016, 2015b, 2016a).

The findings also show that the communal courtyards help sustain some traditional Chinese cultural activities. The primary function of a communal courtyard is to maintain health/natural healing. However, many cultural activities are much less or no longer partaken in the communal courtyards, likely due to such factors as time, climate, courtyard ownership, yard size, facilities, and so on (Zhang, 2013/2016, 2016a).

These results indicate that the new courtyard housing projects are only culturally sustainable to various degrees and in different contexts; they have not achieved this harmonious state of being due to a multitude of issues mentioned above and discussed in depth and detail in the book *Courtyard Housing and Cultural Sustainability: Theory, Practice, and Product* (Zhang, 2013/2016) published by Ashgate/Routledge.

Table 2. First-generation Chinese-style new courtyard housing estates constructed in China since the 1990s.

City	Name of Estates	Year of Completion	Number of Units	Number of Floors	Size of Units	Size of Court-yards	Volume Ratio[a]	Greening Ratio[b]
Beijing	Juer Hutong (菊儿胡同 "Chrysanthemum Lane New Courtyard Housing Estate")	1990-1994	210	2-3-storey walk-up apartments	40-120 sqm	13m × 15m; 6.5m × 7.5m	2.5	26%
	Nanchizi (南池子 "South Pond New Courtyard Housing Estate")	2003	301	2-storey row/town/terraced houses	45-75 sqm	7-9 m (distance between buildings)	2	25%
Suzhou	Tongfangyuan (桐芳苑 "Aleurites Cordata Fragrant Garden Housing Estate")	1996	220	2-storey row/town/terraced houses, 2-storey courtyard garden villas, and 3-storey walk-up apartments	70-200 sqm	10-12 m (distance between buildings)	1	30%
	Jiaanbieyuan (佳安别院 "Excellent Peace Garden Housing Estate")	1998	600	2-storey row/town/terraced houses, and 4-6-storey walk-up apartments	90-180 sqm	Ratio of building height to distance is 1:1.3	1	35%
	Shilinyuan (狮林苑 "Lion Grove Garden Housing Estate")	2000	232	3-storey row/town/terraced houses, and 3-4-storey walk-up apartments	90-180 sqm	8-13.5 m (distance between buildings)	1.39	30%

Note: ([a]) In China, Volume Ratio=Built-up Area/Site Area. Ideally, the value should be less than 1.5 for a low-rise, comfortable residential environment. ([b]) Greening Ratio=Green Area/Site Area. Ideally, the value should be no less than 40% for a low-rise, comfortable residential environment. Sources: the author's onsite and online surveys of Beijing.anjuke.com (2014a, 2014b), Lin (2003, 2004), Suzhou.anjuke.com (2014a, 2014b, 2014c), Wu (1991, 1994, 1999), Zhang (2006, 2011, 2013/2016, 2016a).
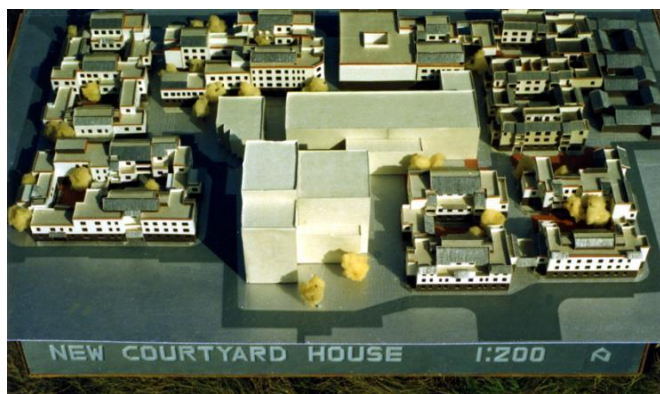
Figure 4. Model of Beijing Juer Hutong new courtyard housing estate. Source: Information Center (previously Resources Center) of the School of Architecture at Tsinghua/Qinghua University 1994.

Figure 5. A new courtyard at Beijing Nanchizi Chinese-style new courtyard housing estate. Photo: Donia Zhang 2007.

Figure 6. The Chinese-style new courtyard housing at Suzhou Jiaanbieyuan. Photo: Donia Zhang 2007.

5. THE GROWTH OF COURTYARD GARDEN VILLAS IN CHINA

China's rapid economic development since1978 coupled with other factors have resulted in some creative housing forms, one of which is the Chinese-style courtyard garden villas constructed since the 2000s. The author's onsite and online surveys have found superb examples in the suburbs of Beijing, such as Yijun ("Yi Villa Estate," b. 2005-2011) in the Shunyi County, Guantang ("Cathay View Villa Estate," b. 2005-2008) near Beijing International Airport, and Beijing Wan ("Beijing Bay Villa Estate," b. 2006-2009) in the Changping County.

In the inner city of Suzhou, such projects include Jiangfengyuan ("River and Maple Garden Villa Estate," b. 2003-2008) and Hanshe ("Humble Homes Estate," b. 2003) by the Hanshan Temple, Lantingyuan ("Blue Pavilion Garden Villa Estate," b. 2004-2005) near the Lion

Grove Garden, Hongqiaoshijia ("Rainbow Bridge Aristocratic Family Villa Estate," b. 2004-2005) along the thoroughfare of Ganjiang Road, Shijialiuyuan ("Aristocratic Family Lingering Garden Villa Estate," b. 2005-2007) next to the Lingering Garden, Zhuozhengdongyuan ("Suzhou Garden Village," b. 2005-2012) adjacent to the Humble Administrator's Garden, and Suzhou Tingyuan ("Suzhou Courtyard Garden Villa Estate," b. 2006-2008) near the North Temple Pagoda, among others. There is also the Jindichengshibieshu ("Golden Empire City Villa Estate," b. 2005) in the New District whose phase one is in traditional Chinese style.

In the outskirts of Suzhou, similar projects include Tianlunsuiyuan ("Family Garden Villa Estate," b. 2004-2005), Xishantianyuan ("Western Hill Tranquil Villa Estate," b. 2004-2009), Dongshanjingyuan ("Eastern Greenhill Villa Estate," b. 2005-2006), and Gusu Taohuayuan ("Suzhou Peach Blossoms Garden Villa Estate," b. 2009-2011), all in the Wuzhong district, and Suzhou Fuyuan ("Suzhou Fortune Garden Villa Estate," b. 2007-2008) in the Town of Guangfu by the Lake Tai.

It is noted that the number of Chinese-style courtyard garden villa estates constructed in/around Suzhou (n=13) is much higher than that of Beijing (n=3) (Table 3), possibly due to the more advanced economic development in southern regions of China than that in the north.

Table 3. Second-generation Chinese-style courtyard garden villa estates constructed in China since the 2000s.

City	Name of Estates	Year of Completion	Number of Units	Number of Floors	Size of Units	Volume Ratio	Greening Ratio
Beijing	Yijun (易郡 "Yi Villa Estate")	2005-2011	330	2½	200-300 sqm	3	40%
	Guantang (观唐 "Cathay View Villa Estate")	2005-2008	329	2½	300-450 sqm	0.47	70%
	Beijing Wan (北京湾 "Beijing Bay Villa Estate")	2006-2009	334	2½	350-440 sqm	0.34	60%
Suzhou	Jiangfengyuan (江枫园 "River and Maple Garden Villa Estate")	2003-2008	614	2-3	150-1000 sqm	0.37	53%
	Hanshe (寒舍 "Humble Homes Estate")	2003	510	1-4	200-350 sqm	0.85	44%
	Lantingyuan (兰亭苑 "Blue Pavilion Garden Villa Estate")	2004-2005	68	3	200-250 sqm	1	26%
	Hongqiaoshijia (虹桥世家 "Rainbow Bridge Aristocratic Family Villa Estate")	2004-2005	76	3	220-280 sqm	1.2	35%
	Tianlunsuiyuan (天伦随园 "Family Garden Villa Estate")	2004-2005	46	2-3	350-460 sqm	0.25	70%
	Xishantianyuan (西山恬园 "Western Hill Tranquil Villa Estate")	2004-2009	60	2-3	230-300 sqm	0.26	51%
	Dongshanjingyuan (东山景园 "Eastern Greenhill Vista Villa Estate")	2005-2006	165	3	190-340 sqm	0.37	62%
	Jindichengshibieshu (金帝城市别墅 "Golden Empire City Villa Estate" Phase One)	2005	125	3	180-280 sqm	0.7	35%
	Shijialiuyuan (世家留园 "Aristocratic Family Lingering Garden Villa Estate")	2005-2007	64	3	250-700 sqm	0.7	60%
	Zhuozhengdongyuan (拙政东园/润园 "Suzhou Garden Village")	2005-2012	30	2	320-380 sqm	0.35	59%
	Suzhou Tingyuan (苏州庭园 "Suzhou Courtyard Garden Villa Estate")	2006-2008	257	2-3	210-280 sqm	0.64	36%
	Suzhou Fuyuan (苏州福园 "Suzhou Fortune Garden Villa Estate")	2007-2008	142	2½	290-500 sqm	0.7	45%
	Gusu Taohuayuan (姑苏桃花源 "Suzhou Peach Blossoms Garden Villa Estate")	2009-2011	1089	3-4	175-250 sqm	0.96	40%

Sources: The author's onsite and online surveys of doc88.com, 2008-2014; esf.focus.cn, 2014; house.focus.cn, 2014; Suzhou.focus.cn, 2014

5.1 CASE STUDIES

5.1.1 Beijing Guantang Chinese-Style Courtyard Garden Villa Estate (b. 2005-2008)

Guantang (观唐 "Cathay View Villa Estate," b. 2005-**2008**) is located in Beijing's Chaoyang district, adjacent to the Riviera Villa Estate, and west of Xiangjiang bei lu (Riviera Road North). It is in the heart of high-end villa zone surrounded by highways radiating in all directions, about 3 km from the northern 5th ring road, and 10.5 km from Beijing International Airport. It is the closest villa estate to the inner city.

Occupying a land area of 48 hectares with a built-up area of 115,000 sqm, Guantang has 329 units of 2½-storey (with semi-basement) single-family luxury homes classified into five plan-types and three unit-sizes: 300 sqm, 350 sqm, and 450 sqm, with two courtyard-/garden-sizes: 290 sqm and 320 sqm, all of which have incorporated traditional Chinese architectural features, applied conventional craftsmanship in the building of enclosing walls, gates, grey-color pitched-tile roofs, elements in traditional façades, and equipped with modern interior facilities. The frontyard, central courtyard (sometimes sideyard), and backyard within each property boundary generate a gradual privacy and a series of activity spaces as in traditional Chinese houses. Meanwhile, these outdoor spaces allow sunlight/daylight and

fresh air to enter indoors. The author's site visit of the estate in 2014 found that the design of some private courtyards has borrowed elements in classical Suzhou gardens, such as fish pond, pavilion, and so on, generating a sense of "harmony with nature."

Inside the Guantang villa estate, the width of the roads and alleys is 6 m and 4 m, respectively. These widths have nostalgically imitated traditional Beijing's *hutong* (lanes), and functionally, 6 m is wide enough for fire engines to pass through in case of emergency. Moreover, the design is compatible with Beijing's cross axes and ring-road system, forming a clear spatial sequence from wide streets, to narrow lanes, to private courtyards/gardens.

Guantang is a poetic approach to contemporary Chinese housing design, and a picturesque setting for both visitors and residents. Walking or driving through the estate, one can sense the lingering charm of old Beijing, while the residents can enjoy the comfortability of modern living. However, the verandas – a traditional transitional space between indoors and outdoors, are eliminated, which is a loss of a protective zone for enjoying the courtyard in different weather conditions.

Guantang has attempted to modernize classical Beijing courtyard houses, meanwhile, incorporating the interior circulation systems in Western villa designs. Its layouts meet ecological design principles of having large space with small room-depth and using perimeter to link interiors to afford more sunlight/daylight and thermal insulation. It represents not only a return to Chinese courtyard life, ideology, and spiritual realm, but also to absorb foreign architectural culture to create a housing product that is both unique and beneficial. The buildings are all at human-scale; they establish a balance between privacy and community, and a link between nature and culture. They are concrete embodiments of Confucian "harmony with humans" and Daoist "harmony with nature"

continually present in contemporary China, and archetypes of architectural acculturation of the East and the West.

However, only very rich Chinese households can afford such luxury homes. Some of the owners only use their villa as a weekend and/or holiday retreat, it nevertheless showcases their wealth and serves as a symbol of their social status.
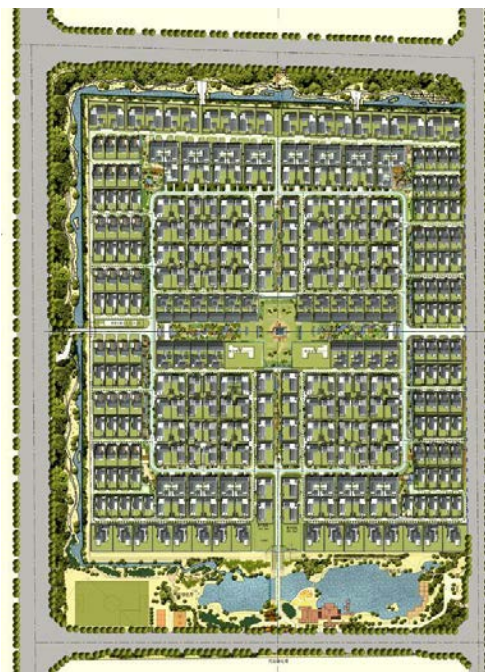
Figure 7. Site plan of Beijing Guantang ("Cathay View Villa Estate," b. 2005-2008). Source: Beijing Institute of Architectural Design 2014.

Figure 8. Computer-rendered axon of a Beijing Guantang courtyard garden villa. Source: house.focus.cn, 2009.

Figure 9. Plans of Beijing Guantang courtyard garden villas, presenting the courtyards/gardens and Western interior circulation system. Source: Beijing Institute of Architectural Design 2014.

Figure 10. Computer-rendered façade of Guantang courtyard garden villas, showing traditional Beijing architectural features and colors. Source: Beijing Institute of Architectural Design 2014.
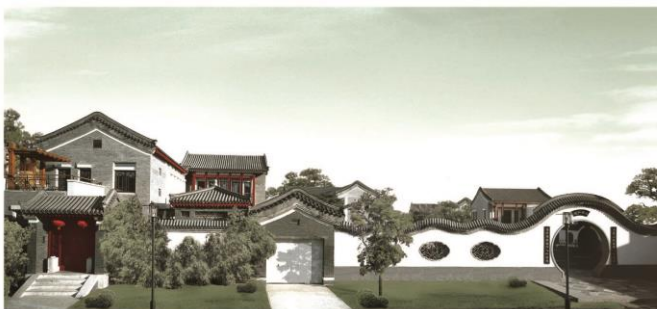
Figure 11. Computer-rendering of Guantang courtyard garden villas, incorporating traditional Chinese moon gate and lattice windows. Source: Beijing Institute of Architectural Design 2014.

Figure 12. Snow scene of a Guantang alley, reminiscent of a traditional Beijing's *hutong* (lane). Source: Beijing Institute of Architectural Design 2014.

Figure 13. A closer view of a Guantang courtyard garden villa with traditional enclosing walls, gate, and modern garage. Source: Beijing Institute of Architectural Design 2014.

Figure 14. Courtyard/garden of a Beijing Guantang villa with classical Suzhou-style garden elements of fish pond and pavilion. Photo: Donia Zhang 2014.

Figure 15. Living/dining room of a Beijing Guantang courtyard garden villa, designed, built, and furnished in classical Western architectural style. Photo: Donia Zhang 2014.

Figure 16. Family room of a Beijing Guantang courtyard garden villa, designed, built, and furnished in Western architectural style. Photo: Donia Zhang 2014.

5.1.2 Suzhou Fuyuan Chinese-Style Courtyard Garden Villa Estate (b. 2007-2008)

Suzhou Fuyuan (苏州福园, "Suzhou Fortune Garden Villa Estate," b. 2007-2008) was built in the Town of Guangfu near the Lake Tai, about 25 km west **of Suzhou City Center. The estate's** name has used the familiar Chinese character

fu (福), which can be translated into English as

"good fortune," "good luck," or "happiness." Its name conveys that the designer or developer wished to bring harmony and prosperity to this residential environment.

Occupying a land area of 6.94 hectares with a built-up area of 63,372 sqm, Suzhou Fuyuan has 142 units of 2½-storey (with semi-basement) Chinese-style single-family luxury homes, with the interior space ranging from 290-500 sqm, and private gardens from 150-200 sqm. Each unit has a two-car garage and two gates, one gate at the front and the other at the back. Each household has a frontyard/garden, a sunken central courtyard/garden, and a sunken backyard/garden, forming a series of three-dimensional gardens connecting to the interiors, and separating the lively spaces from the quiet ones. These courtyard garden villas combine the style and features in traditional Suzhou houses and gardens, meanwhile, providing an

8000 sqm communal garden (塔影园, Tayingyuan) in the elegance of classical Suzhou gardens at the forefront of the estate. Simultaneously, it creates a setting that one can rest his/her body, mind, and spirit (Suzhou Guardian Real Estate Development Co., 2007).

The author's field tour of the estate in 2007 revealed that there is no longer a central axis or bilateral symmetry as in traditional Suzhou houses, the spaces are more dynamic. Suzhou Fuyuan has attempted to combine the advantages of Chinese vernacular architecture of different regions with those of modern interior design approaches (*Explore*, August, 2007, pp. 21-22; *Times China*, September 2007, pp. 30-31). However, like Beijing Guantang, Suzhou Fuyuan only serves a small number of the growing rich; the middle-income households cannot afford such lavish homes.

Figure 17. Model of Suzhou Fuyuan courtyard garden villa estate, Suzhou 7th Housing Exhibition. Photo: Donia Zhang 2007.

Figure 20. Villas, alley, pavilion, and corridor at Suzhou Fuyuan. Source: Suzhou Guardian Real Estate Development Co. 2007.
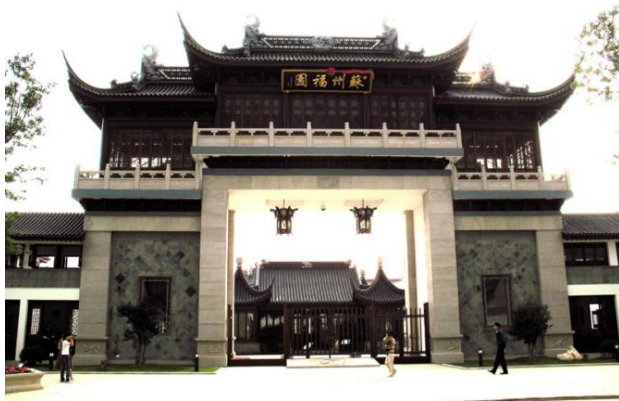
Figure 18. Suzhou Fuyuan courtyard garden villa estate gate in its vernacular architectural style. Photo: Donia Zhang 2007.
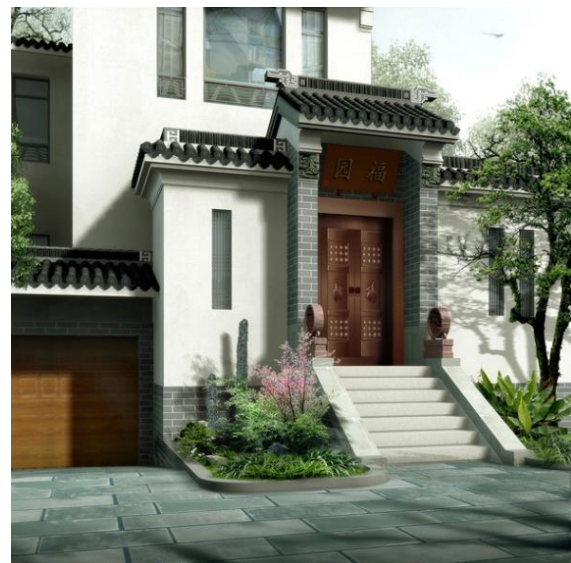
Figure 21. Traditional gate attached with modern garage at Suzhou Fuyuan villa estate. Source: Suzhou Guardian Real Estate Development Co. 2007

Figure 19. Suzhou Fuyuan communal garden (塔影园) in its classical style at the forefront of the villa estate. Source: Suzhou Guardian Real Estate Development Co. 2007.

Figure 22. Model of a Suzhou Fuyuan traditional courtyard garden with fish pond and circulation corridor, Suzhou 7th Housing Exhibition. Photo: Donia Zhang 2007.

Figure 23. Courtyard with veranda in its vernacular style at Suzhou Fuyuan villa estate. Source: Suzhou Guardian Real Estate Development Co. 2007.

Table 4. Comparison of the Chinese-style first-generation new courtyard housing and second-generation courtyard garden villa estates built in China in the 1990s-2000s.

Generation of New Courtyard Houses	Size of Units (average)	Volume Ratio (average)	Greening Ratio (average)
First-Generation Chinese-Style New Courtyard Housing Estates in Beijing and Suzhou	70-150 sqm	1.6	±30%
Second-Generation Chinese-Style Courtyard Garden Villa Estates in/around Beijing and Suzhou	240-410 sqm	0.76	±50%

Source: The author's estimates based on Tables 2-3.

6. DISCUSSION

Table 4 shows that compared with the first-generation new courtyard housing built in Beijing and Suzhou, the second-generation Chinese-style courtyard garden villas in these two cities are much more enhanced. The average unit size has increased more than three times, from 70 sqm to 240 sqm. The first-generation new courtyard housing estates have an average volume ratio of 1.6, but it should be lower than 1.5 (a standard value of measurement for a comfortable living environment in China). This outcome is caused by the two Beijing projects whose volume ratio of 2.5 and 2 have brought up the figure while the three Suzhou projects all have a satisfactory volume ratio under 1.5. Whereas the second-generation Chinese-style courtyard garden villa estates' average volume ratio of 0.76 is much lower than 1.5. The first-generation new courtyard housing estates' average greening ratio is ±30%, which is lower than the 40% minimum requirement for a comfortable residential quarter in China; while the second-generation Chinese-style courtyard garden villa

estates have an average greening ratio of ±50%, which is higher than the 40% benchmark.

Arguably, the first-generation new courtyard housing estates were all built in the inner cities of Beijing and Suzhou where the land is scarce and population density high, it would be very difficult to meet current design standards for volume ratio and greening ratio. The second-generation Chinese-style courtyard garden villas are all located in the suburbs of Beijing where the land is not so constraint. In Suzhou, although some of the courtyard garden villa estates are located in the inner city, Suzhou seems to have less restricted planning policies that have allowed more ideal design solutions. It **may also be true that to meet China's newly-rich marketers' demands, the designers of the** courtyard garden villas have learned the lessons from the first-generation new courtyard housing experiments, and have taken comfortability and sustainability into their design considerations, which in turn, have afforded more harmony with nature and with humans than the first-generation projects.

Compared with traditional Chinese courtyard houses of timber-framed structures, the new courtyard housing and courtyard garden villas are all of steel and concrete constructions equipped with modern facilities, which should be more enduring. Moreover, the second-generation Chinese-style courtyard garden villas all have private courtyards/gardens where more self-cultivation may happen than the first-generation new courtyard housing with mainly communal courtyards. However, there would be less social interaction to occur in the courtyard garden villas than that in the new courtyard housing estates' communal courtyards.

Chinese-style courtyard garden villa estates were also built in other parts of China, such as the Qinghua Fang (清华坊, b. 2002) in Chengdu and the Number Five Garden Villa Estate in Shenzhen (深圳第五园, b. 2005-2009), among others.

The planners, architects, and builders of these villa estates wanted to test the possibility of realizing a dream of traditional life in contemporary Chinese society. They used modern materials and technologies to explore a new way to construct a residential environment in honor of Chinese architectural history and philosophy, but also to meet modern living requirements. The above projects demonstrate a more sensitive approach to Chinese housing development to better fit into its cultural landscape; they make a stark contrast to some European- and North American-style suburban villa estates constructed in China since the 1990s.

For example, in the suburbs of Beijing, there built the American-Canadian-style Dragon Villa Estate (龙苑别墅, b. 1995) in the Shunyi County, and the European-style Rose Garden Villa Estate (玫瑰园, b. 2007) in the Changping County (Beijing.anjuke.com, 2014c,

2014d). They are single-family homes advertised as "Just like Beverly Hills of California," "Just like Richmond of Vancouver," "Just like Bayview Hill of Toronto," and "Just like Long Island of New York" (King, 2004). These transplanted villa estates may be a result of housing demands from an influx of foreign expatriates working in Beijing, but may also reflect some Chinese citizens' aspirations for exotic tastes.

Similarly, in Shanghai's Songjiang County, nine European-themed towns were erected: Thames Town in Georgian/Victorian style imitating the Olde England, German New Town modeled on their cultural capital Weimar, Nordic Town in Scandinavian style, Barcelona Town where people can walk along a Chinese Las Ramblas, and Italian Town in the suburb of Pujiang by Venetian-style canals. Shanghai Thames Town was built around a medieval market square, with red phone boxes and village greens (Coonan, 2006). The author's field visit of the estate in 2014 showed that it is a mixed-use, low-rise development with pedestrian-centered residential quarters. The site has induced many tourists, wedding-photo-takers, and film-makers for its exotic sceneries.

Figure 24. Shanghai Thames Town residential quarters in the Songjiang County imitating the Olde England. Photo: Donia Zhang 2014.

In April 2011, the State Council issued a new guideline entitled *Catalogue for the Guidance of Foreign Investment Industries*

(*Waishang Touzi Chanye Zhidao Mulu*) to ban foreign investment in villa construction in China (International Business Times, 2011; Reuters, 2011), to cool the real estate market, to prevent further urban sprawl, and to save arable land for agriculture.

Moreover, according to *The Guardian* of August 20, 2014, Chinese homeowners' tastes are evolving: they are no longer as enchanted by developments with lavish homes marketed by shiny brochures as "modeled on the sumptuous and classical US West Coast villas." Instead, "health and livability are now major, major factors that developers are taking seriously into account for how they promote new developments" (Bosker, 2014).

Furthermore, in a press conference on March 16, 2014, which concerned the *National New Urbanization Plan 2014-2020*, the Vice Minister of the National Development and Reform Commission, Xu Xianping, stated that China's new modernization should be people-oriented, and that "it should be ecologically friendly and carry forward cultural traditions" (China.org.cn, 2014). The speech sends a message that the courtyard form of housing will likely be rebuilt in China's new cities and towns.

An international symposium entitled "Reclaiming Identity and (Re)materialising Pasts: Approaches to Heritage Conservation in China" was held at Xi'an Jiaotong-Liverpool University (XJTLU) in Suzhou on April 6-8, 2016, which invited academics and practitioners worldwide to offer case studies and critiques on China's current practice of cultural heritage conservation (XJTLU, 2016).

China's villa estate development is confined by its current socio-economic conditions; only those "on the top of the pyramid" can afford such high-end homes, with developers cognizant of losing money if they aim at middle-class citizens.

7. PROPOSALS FOR NEW COURTYARD GARDEN HOUSES

The author has proposed four designs of new courtyard garden houses for ordinary citizens or middle-income families in China or elsewhere, as illustrated in Figures 25-28. These schemes are meant for a discussion on the future housing development direction for Beijing and Suzhou, and for other historical and cultural cities in China, or elsewhere in the world.

Detailed designs of the four schemes are presented in the books *Courtyard Housing and Cultural Sustainability: Theory, Practice, and Product* (Zhang, 2013/2016), and *Courtyard Housing for Health and Happiness: Architectural Multiculturalism in North America* (Zhang, 2015c).
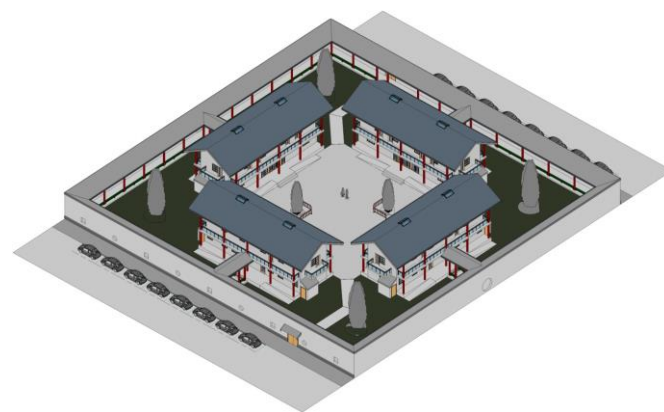
Figure 25. Beijing new courtyard garden house compound based on a system of 60 m × 60 m standard block size, a communal courtyard of 26 m × 26 m shared by eight nuclear families, with each household enjoying a private garden at the back. Each housing unit measures 6 m × 10 m (total 180 sqm) with a semi-basement and 2 ½ storeys. Design and computer model by Donia Zhang 2016b.

Figure 26. Beijing new courtyard garden house compound based on a system of 78 m × 78 m standard block size, the

communal courtyard is 26 m × 26 m shared by eight nuclear families, with each household enjoying a private garden of 12 m × 6 m at the front and the back. Each housing unit measures 10 m × 12 m (total 240 sqm) with a semi-basement and 2 ½ storeys. Design and computer model by Donia Zhang 2015c, 2016b.
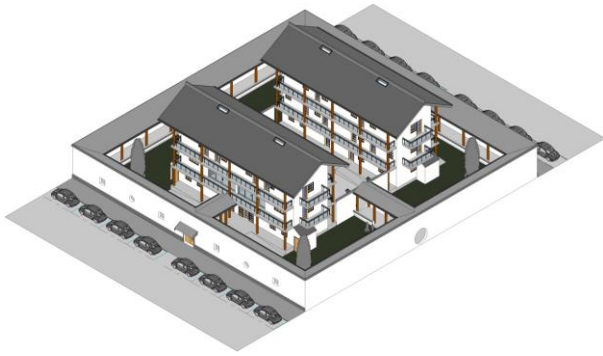
Figure 27. Suzhou new courtyard garden house compound based on a system of 40 m × 40 m standard block size, the communal courtyard is 12 m × 20 m shared by four nuclear families, with each household enjoying a private garden on the side. Each housing unit measures 6 m × 10 m (total 180 sqm) with 3 storeys. Design and computer model by Donia Zhang 2016b.

Figure 28. Suzhou new courtyard garden house compound based on a system of 40 m × 66 m standard block size, the communal courtyard is 14 m × 40 m shared by four nuclear families, with each household enjoying a private garden of 12 m × 6 m at the front and the back. Each housing unit measures 10 m × 12 m (total 240 sqm) with a semi-basement and 2 ½ storeys. Design and computer model by Donia Zhang 2015c, 2016b.

ACKNOWLEDGEMENTS

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Density, Energy and Metabolism of a proposed smart city

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A B S T R A C T

This paper reports on a detailed analysis of the metabolism of the Island City of Mumbai should the Indian Government's proposal for 'smart' cities be implemented. It focuses on the environmental impact of increased population density achieved by demolishing existing medium-rise (3-5 storey) housing and replacing it with the proposed high-rise (40-60 storey) towers. The resulting increase in density places a burden on the demand on such things as electricity and water and simultaneously increases the output flows of drainage, solid waste and greenhouse gas production.

An extended urban metabolism analysis is carried out on a proposed development in Mumbai (Bhendi Bazaar) that has been put forward as an exemplar case study by the Government. The flows of energy, water and wastes are calculated based on precedents and from first principles. The results of the case study are then extrapolated across the City in order to identify the magnitude of increased demands and wastes should the 'smart' city proposals be fully realised.

Mumbai is the densest city in the world. It already suffers from repeated blackouts, water rationing and inadequate waste and sewage treatment. The results of the study indicate, on a per capita basis, increasing density will have a significant further detrimental effect on the environment.

CONTEMPORARY URBAN AFFAIRS (2017) **1**(2), 57-68.

https://doi.org/10.25034/ijcua.2017.3648

1. Introduction

In the study of the relationship between urban form and resource consumption, there are differing conclusions concerning the impact of dense urban form. For example, reduced transport energy consumption has been shown to correlate with increased urban density (Newman & Kenworthy, 1989), household space heating energy consumption reduces with compact house forms (Rode et al, 2014) and more general unsupported claims are also made (Leung, 2016; Albino et al, 2015; Nia, 2017). However, other studies have indicated that CO_2 emissions from transport and electricity consumption per capita show little correlation with the density of urban areas (Hammer et al, 2011) and there is evidence that dispersed urban forms are more energy efficient when disruptive technologies such as photovoltaics to charge electric vehicles (the more likely technologies of the future) (Byrd et al 2013) are widespread and there is empirical evidence demonstrating that compact residential building forms are less energy efficient (Myers et al, 2005; Byrd et al 2012).

However, policies on urban form tend to favour compaction but there is little evidence of what densities urban form should target to optimise resource consumption (Steadman, 2015). While some studies have indicated an optimum density of about 18 dwellings per Ha (Gosh et al, 2006) most policies advocating increased density (Sridhar, 2010) stay clear of a density target which

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can result in the impression that the denser; the more efficient. If that is the case, the consequences of urban forms of very high-density need to be understood and the implications back-casted to inform cities with policies of increased compaction.

This research concerns the densest city in the world, Mumbai, and the environmental impact of the proposed redevelopment proposals that are likely to increase densities from about 3,500persons per hectare to about 5,000, achieved by demolition of existing 3-5 storey height buildings and replacing them with towers averaging 40 floors. What has become known in Mumbai as 'vertical with a vengeance' (Rathod, 2012).

The study investigates the environmental impact of a proposed redevelopment of a 16.5-acre site. Of the many redevelopment proposals in Mumbai, this is in the most advanced stage and is an exemplar for both Mumbai in its ambition to become a 'global city' and the Indian Government who have identified it as a key development in their proposal to achieve 100 'smart' cities (Government of India, 2015).

The study firstly compares the existing urban form with the proposed form. For example, numbers and heights of buildings, density of dwelling and population, parking provision, open space, landscaping and street frontages. It uses the extended urban metabolism model (Newman et al, 1996) as a basis of analysis and predicts the flows of water supply (reticulated and rainwater harvesting), drainage, solid waste, electricity supply, potential for solar energy, fuel for transport, carbon dioxide production and sequestration.

From the results of the 16.5-acre site, the analysis is then extrapolated to the overall impact if similar developments were to be carried out, as is proposed, across all of the Island city of Mumbai. The results indicate that metabolism does not increase linearly (on a per capita basis) with density but accelerates instead. The results also indicate that the compact urban form increases dependence on infrastructure security and that the increased demand of water and electricity is unlikely to be supplied in a reasonably reliable and secure manner. Furthermore, the outputs (waste water, solid wastes, and carbon dioxide production) would increase disproportionately resulting in both health and accelerated climate change issues. The Indian Government (2015) has claimed this type of development to be

sustainable, environmentally friendly and 'smart'. This research indicates the opposite may be more likely.

2. Background to the development Proposals

The Island City of Mumbai trebled in population over a period of about 50 years (1931-1981) mainly due to rural-to-urban migration (Census of India, 2011). The population peaked and has subsequently experienced a marginal decline as the suburbs have grown. The migrants into the City were protected by the Mumbai Rent Restriction Act (1939) limiting returns on landlord's investments and resulting in disrepair of the housing stock. As a result, in 1969, the "cess" tax was introduced and a levy placed on landlords by the municipal authorities who took over property repairs. Regulated rent levels combined with the 'cess' tax made redevelopment financially unattractive. Added to this were limitations on the ratio of site area to floor area of developments (FSI). In the first Development Plan of Bombay (1964), FSI was limited to 1.66. But with few new developments and, in order to try and encourage developers, this was eased to 2 in 1984 and then 3 in 1991 and 4 in 2009. These inducements had little impact and relatively few high-rise housing was built. The 'cessed' property (generally 3-5 storeys) predominated (Bertaud, 2013).

The cessed properties did not conform with the image that the municipal authorities wanted to see of the City that was the financial capital of India. In 2011, Mumbai hosted the Tall Building conference and announced its proposals to redevelop the city by demolition of cessed property and replacing it with towers with the intention of being perceived as a "global" city (CBTUH, 2010). Further FSI incentives were again introduced in 2009 by Development Control Rules (DCR 33(9)) provided developments were of a significant scale. This triggered new development proposals and one of the first and largest developments was proposed at Behndi Bazaar, Ward C in the Island City. A 16.5 acre site containing 247 buildings (typically 3-5 storey) are due to be demolished and replaced by 30 towers of between 40 to 60 floors (a built-up area of almost 11 times greater than the site area).

3. From global to smart city

In 2015, the Indian Government proposed 100 "smart" cities (Government of India, 2015a) and named Behndi Bazaar as its exemplar development that was a flagship of 'smartness'. Although the definition of a 'smart city' can be

vague (Albino et al, 2015) the Government has clearly defined their intentions (Government of India, 2015b)) that are summarised below:

i. adequate water supply
ii. Assured electricity supply
iii. Sanitation, including solid waste management
iv. Efficient urban mobility and public transport
V. Affordable housing, especially for the poor
Vi. Robust IT connectivity and digitalization
vii. Good governance, especially e-Governance and citizen participation,
viii. Sustainable environment
ix. Safety and security of citizens, particularly women, children and the elderly
X. health and education
xi. Reduce congestion, air pollution and resource depletion

At least half of these criteria are environmental objectives, which can be measured and reasonably accurately predicted. Because, governance, health and education policies could be implemented without redevelopment, this study focuses on all the environmental elements that are a direct result of the Governments 'smart' proposals.

4. Method of analysis
In order to test the claims that the exemplar development met the 'smart' criteria put forward by the Government, the study was undertaken in three stages:

1) analyse the physical characteristics of the new exemplar development and compare these with the existing,
2) evaluate the environmental performance of both the existing and new for comparative purposes,
3) Extrapolate the results of the case study across the whole of the Island City to establish the full impact of a 'smart' city.

5. Data collection of the development
Data was collected from various primary and secondary sources including; physical surveys during site visits, from local government agencies, NGOs, the construction industry and desk-based research.

The Mumbai Transformation and Support Unit provided information and maps of cessed properties of the seven wards on Mumbai City and data for the 1,135 projects approved for redevelopment, under DCR 33(7), in the Island city. These data were used in extrapolating the result of the case study to the district level. The Building Proposals Department of Mumbai provided the master plans and area statement for the Bhendi Bazaar case study. Surveyors for the Bhendi Bazaar project provided detailed floor plans and area statements of the existing buildings on the site and a master plan of the proposed development.

This data allowed an analysis of the physical characteristics of the existing and new developments. A three-dimensional model of both the existing and proposed developments was constructed (Figures 1 & 2). This was used to establish the morphological changes (building heights, street widths, parking provision, roof areas, open space, landscaping and other aspects of built form). Demographic changes (population density, total population) were based on census data for the existing and the developer's calculations for the proposed development together with an assessment of population based on space provision.
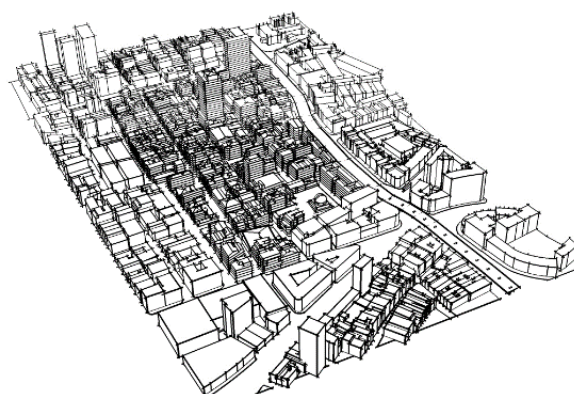

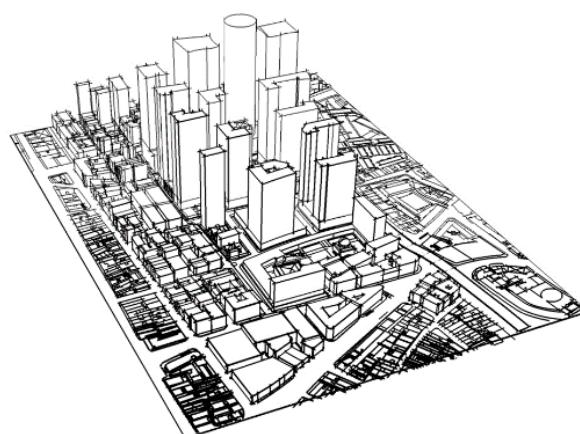Figure 1. The existing site at Bhendi Bazaar on the Island City of Mumbai.

Figure 2. The proposed development that is claimed to be an example for 'smart' cities in India.

Understanding the magnitude of the built form and population increase of the development allowed an analysis of the additional resources

required for the new development and hence and assessment of the environmental impact.

5.1 Measuring the environmental impact

The method used to predict the *environmental impact of the development proposals* was based on the extended urban metabolism model. This provides a basis for measuring flows of resources that are both consumed by and flow from the city. The study focused on the operational flows rather than embodied resources in the materials of the buildings and infrastructure. While the latter are of importance, they are relatively small over the lifecycle of urban structures and the study does not question whether or not redevelopment should occur; only the appropriateness of the proposed built form.

The flows of resources consist of water and energy as inputs and wastes and pollution as outputs. Water inputs include reticulated supplies from the various dams outside the City as well as rainwater harvesting. Energy includes electricity from the grid as well as potential electricity generated from roof-mounted photovoltaics. It also includes fuels required for transport as well as carbon sequestration by landscape proposals. The outputs include wastewater, solid wastes and carbon dioxide production.

If the Government's claims are correct, then the compaction of built form should result in a proportionate reduction (or at least no increase) of the inflow of resources and outflow of waste products per capita due to efficiencies of scale and improved infrastructure.

Since the development has not been constructed, the flows for the proposed development were predicted based partly on empirical evidence from precedents and supported by calculation from first principles. The full extended urban metabolism analysis together with the calculations and resulting data can be viewed at Mandal (2015).

For example, the predicted electricity consumption was based on the empirical evidence of energy use in different residential built forms in Sydney (Myors et al, 2005), a sub-tropical climate. This research found that metered energy use, in a sample of over 3,500 different house units, increased with the height of residential developments due mostly to energy consumed in common areas (corridors, car parks, pumping of water and wastes).

Therefore, in order to calculate the energy use in the proposed development of the Mumbai case study, all the energy use in the building was

calculated including, for example, private and common lighting, air-conditioning, air extraction in basement car parks, pumping of water, passenger lifts. The energy use was calculated based on the energy rating and hours of operation. The carbon dioxide emissions form electricity generation are calculated based on electricity consumption and the carbon emission content of the generating fuels (mostly coal in this case). Transport energy was based on the **number of private vehicles (both cars and 'two-wheelers')** in the development, their travel frequency and travel distance. While frequency and distance of travel was considered to be similar for both the new and existing developments, the number of car parking spaces in the proposed development is significantly greater. The potential of renewable energy from photovoltaics (PV) was calculated based on available roof area and typical efficiencies of PV installations. Similarly, water consumption was based on the number of occupants, type of appliances and duration of use and wastewater calculations are directly related to water supply.

5.1.1 Environmental dynamics

Increased consumption of resources and production of wastes is not necessarily linear with the increase in population. The provision of new facilities induces an increased rate of consumption. Anticipated resource efficiency from the technologies of the new development are unlikely to be achieved due to behavioural responses; an issue in Mumbai identified by Yelda (2006) concerning the dynamics of environmental problems in Mumbai.

For example, the provision of additional 3,000 new car parking spaces in a city that has few existing parking spaces, induces people, particularly in a developing economy, to buy a car. As a conservative estimate, this study assumed that only 80% of the new parking spaces would be filled. However, since car ownership in the City was restricted due to a lack of car parking spaces, the new provision has significant consequences on energy consumption and subsequent pollution.

Similarly, a significant increase in energy use is attributed to air-conditioning due to a combination of an increased size in residential units, increased cooling loads because of the loss of mutual shading from low to high-rise built form and an increasing ownership (for both status and comfort purposes) of air-conditioning units (Tembhekar, 2009). This is also apparent in the

retail areas of the development where the traditionally naturally ventilated shallow-plan retail spaces along street frontages are replaced, in the new development, by deep-plan retail outlets that are necessarily dependent on air conditioning.

In the case of water consumption, the increase will not be linear with the additional population since the new development offers significant additional means for water usage. While many of the existing cessed properties have communal washing facilities, the new development offers each individual unit outlets for toilets, showers and washing facilities. Showers and washing machines. This results in not only an increase in the number of water-consuming appliances but also offers the opportunity of increased duration of use.

In the common areas, the increased amount of container planting (used as a mechanism to comply with planning requirements for increased landscaping) demands an additional water supply, unlike trees planted in the ground. The significant increase in the number of cars also results in a proportionate increase in car washing.

5.1.2 The results; spatial and demographic characteristics.

With the exception of the existing religious structures mosque and one tower block, the whole site is to be demolished and rebuilt. Figure 3 compares the number of existing and proposed buildings on the site. The fine urban grain of the cessed buildings is lost to large individual buildings resulting in a tenfold reduction in the total number of buildings. Figure 4 indicates the number of proposed tower blocks the highest being 62 floors.
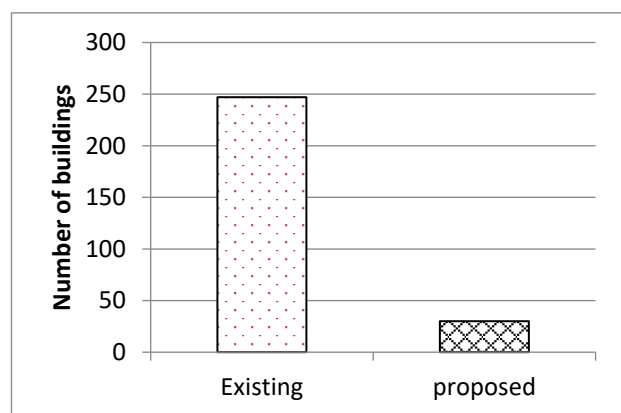
Figure 3. Comparison of the number of buildings for the existing and proposed development.
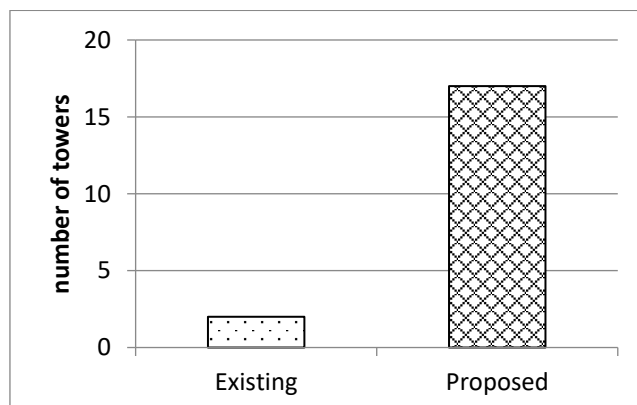
Figure 4. Comparison of the number of residential towers for the existing and proposed development.

These statistics explain why the development proposals have been named **"vertical with a vengeance"** and the increase in FSI, to almost 4.8, is indicative of the financial incentive that has been historically hampered by restrictions on the permitted FSI.

Related to this is the density of the development (Figure 5) that has increased by over 25% to almost 1000 units per hectare. However, the population density of individual units is likely to decrease as the unit sizes have increased by an average of 20%. This potentially results in more space per person in the units but assumes that the increased space standards will be realised rather than increased numbers for each tenancy to fill them up to previous standards.
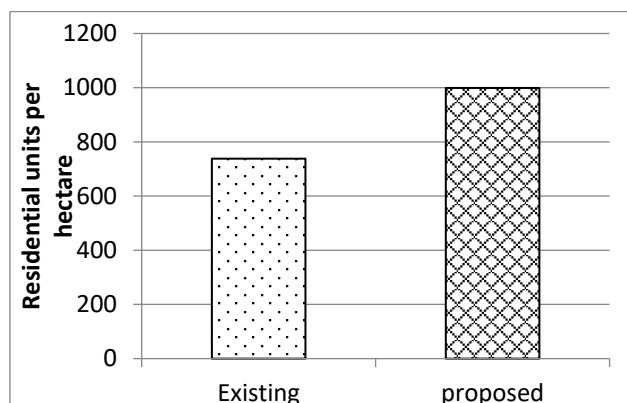
Figure 5. Comparison of the density of residential units per hectare.

The external open space of the proposed development is greater due to the site coverage slightly decreasing from 90% to 73% of the total site. However, the open space per person has reduced to 1.07 sq. m per person, from 1.27 sq. m per person which is only about 1/7th the recommendation of the World Health Organisation (sustainablecitiesnetwork, 2011).

The large podiums have replaced the small streets and alleyways resulting in a significant reduction (63%) in the perimeter length (active frontages) of all buildings at ground level, much of which is dedicated to small commercial enterprises in the existing development. This is likely to reduce the number of small retail businesses that spread onto the pavement and result in larger units that are spread deeper under the new blocks and become dependent on air-conditioning and artificial lighting.

The number of trees on the site has increased by over 700 with about 40% of these being in containers on the roofs of podiums. These trees will assist with planning compliance for the development, but trees in containers on the flat roofs of the podiums will offer little beneficial cooling or carbon sequestration due to their limited size. They will also require constant watering outside the monsoon period.

5.2 Environmental consequences

5.2.1 Water collection and consumption

Water demand in the new development (Figure 6) is calculated to be more than double the existing (232% increase). This is partly due to the cleaning required to the increased amount of common areas and also the amount of trees and shrubs (above ground level) that require irrigation outside the monsoon period. However, the bulk of increased water usage comes from greater use within apartments. The reduction in shared bathing/toilet facilities, increased number of private water taps (sink, basins, showers, washing **machine) and the 'take-back' effect of** potentially more efficient water control systems being offset by a change of behaviour in the use of the appliances (duration of use of bathrooms or use of washing machines).
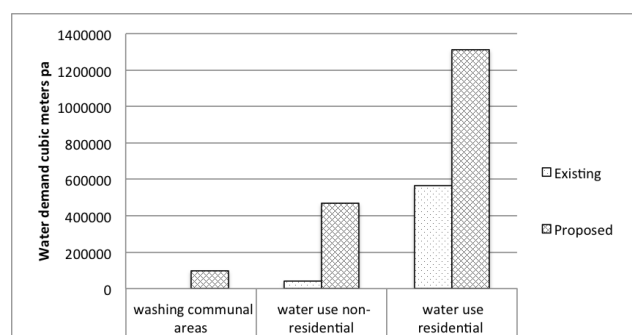
Figure 6. Comparison of existing and proposed water demand by different users.

The reduction in site coverage and the taller, but fewer, buildings results in a decrease in overall

roof area of 32% with the same decrease in rainwater harvesting potential (a mandatory requirement in Mumbai) resulting in less than half (45%) the potential amount of rainwater per person (Figure 7).
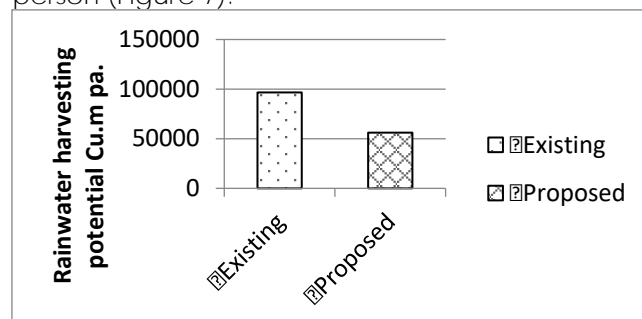
Figure 7. Comparison of rainwater harvesting potential.

5.2.2 Sewage and wastewater

Related to the additional water consumption is the sewage and wastewater generated by the new development. Sewage will be proportional to the increase in population. However, there will be significantly more wastewater related to the increased appliances and change in lifestyles.

The increased population on the site, with consequent increased wastewater and sewage, results in a sewage volume that has more than doubled (234% increase) and reached 4.64 million litres per day. At present the sewage treatment plant for the zone (Worli) manages to treat less than 20% of the sewage, the rest is pumped directly to the sea without treatment. The increased sewage volume will result in less than 10% being treated unless there is sewage treatment on site.

5.2.3 Electricity consumption

Residential electricity is the largest consumer on the site and almost doubles (196% increase) in the proposed development (Figure 8). This is combined with two new loads incurred by the development: i) lighting and ventilation to basement and podium car parks amounting to about 6% of the total residential load and ii) electricity use for other communal facilities that include; pumping water to the towers, lifts and lighting of corridors all of which amount to about 9% of the total residential load.
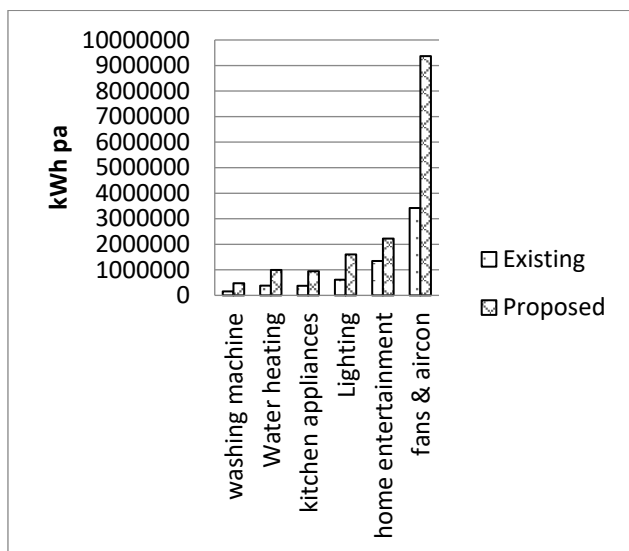
Figure 8. Comparison of residential electricity use.

Figure 9. Comparison of all electricity uses.

The increased residential electrical load is due to several factors. The average floor area of each unit has almost doubled which results in additional lighting, fans and air-conditioning use. Dedicated water heating with larger volumes of water results in increased hot water usage especially with individual use of modern washing machines. Household appliances (e.g. microwaves, home entertainment and larger television screens) are likely to become commonplace and used more frequently. However, air-conditioning is likely to become the single largest consuming item as the demand for increased comfort and status that comes with air-conditioning spreads (Tembhehar, 2011).

Electricity consumed by commercial and retail spaces will more than double (226% increase) in the new development (Figure 9). This is due mainly to the configuration of the commercial areas that, although having the same overall floor area as the existing development, have an external perimeter that has decreased by 63%. This reduces both daylighting and cooling by natural ventilation resulting in increased use of fans and air-conditioning as well as artificial lighting (Byrd, 2012). Although the light fittings may tend to be more efficient, this is likely to be offset by the opportunity for increased display lighting in retail areas.

Other miscellaneous appliances include the increased use of computers, display screens, electronic retail systems and signage. All of these not only directly increase the electrical load but also increase the cooling load within the retail and commercial spaces. Although refrigerators in retail areas may become more efficient, they are also likely to increase as the area will become more affluent and increase the demand for more pre-prepared food.

5.2.4 Carbon emissions

Considering only the carbon emissions in the operation of the development, the two main contributors are the carbon due to additional electricity generation and the emissions due to the additional private vehicles that can now be housed on the site (Figure 10). The carbon emissions in electricity generation in Maharashtra average about 0.9 tCO_2/MWh reflecting the high proportion of coal-fired generation.
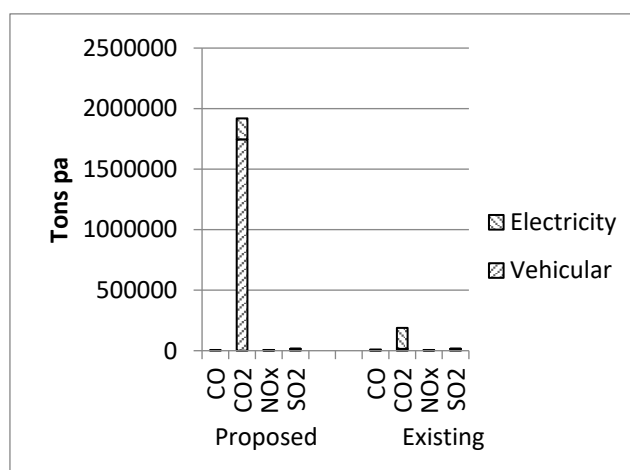
Figure 10. Comparison of Greenhouse gas emissions from electricity production and private vehicles.

The total additional electricity use for the proposed development is 18,326 MWhrs/year that equates to16, 494 tCO_2 per year. However,

only a proportion of this is directly due to the nature of the development. The operation of the car parks (extraction fans and permanent lighting), lifts, pumping, common areas, air-conditioning and lighting, for non-residential, and a proportion of air-conditioning for residential are directly attributable to the nature of the development.

This amounts to approximately half of the additional electricity load, making the development attributable to 8,247 tCO_2 per year due to the increased electricity demand.

The amount of carbon emissions as a direct result of providing car parking spaces, where there were none previously, will depend on the type of vehicles and their travel patterns. The reduction in emissions due to changes of fuel (in particular CNG) has been assumed to be offset due to an increase in congestion as car ownership grows rapidly. Assuming 16 km/litre of fuel, the average carbon emissions per vehicle are 200gCO_2/km. It is assumed that 80% of the 1400 car parking spaces are occupied and used regularly and that the average travel distance is 6km per day for recreation, occasional shopping and school drop-offs. This amounts to 25 kg per day or 491 tCO_2 per year.

5.2.5 Solid waste

The per capita generation of solid wastes in Mumbai has been steadily increasing and reached 0.63Kg/person/day in 2004 (Mahadevia, Pharate, & Mistry, 2005). It should be noted that in addition to the land required for dumping the waste, a considerable amount of energy is spent in sorting, transporting and processing the waste in addition to the

greenhouse gases released from their decomposition. The overall increase in solid waste is anticipated to increase by 30% per capita due largely to increased affluence (Figure 11).
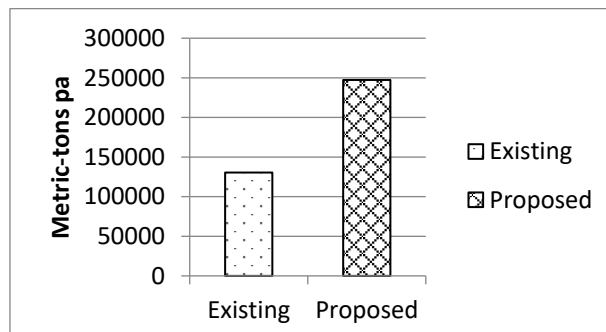
Figure 11. Comparison of solid waste generated.

6. Extrapolating the results across the Island City

The results above are for the 16.5-acre site, Bhendi Bazaar that has been named as an **exemplar development** for the proposed 'smart' cities in India. To investigate what the impact would be if the development was replicated across a city, the analysis was extrapolated **across Mumbai's Island city.**

The development potential of the City is related to **the number of 'cessed' properties that can be** demolished and redeveloped. Figure 12 indicates the increase in population in each of **the City's wards should the Bhendi Bazaar project** be replicated. The different proportions of increased growth relate directly to the proportion of cessed properties in each ward. The case study area considered above is in Ward C.
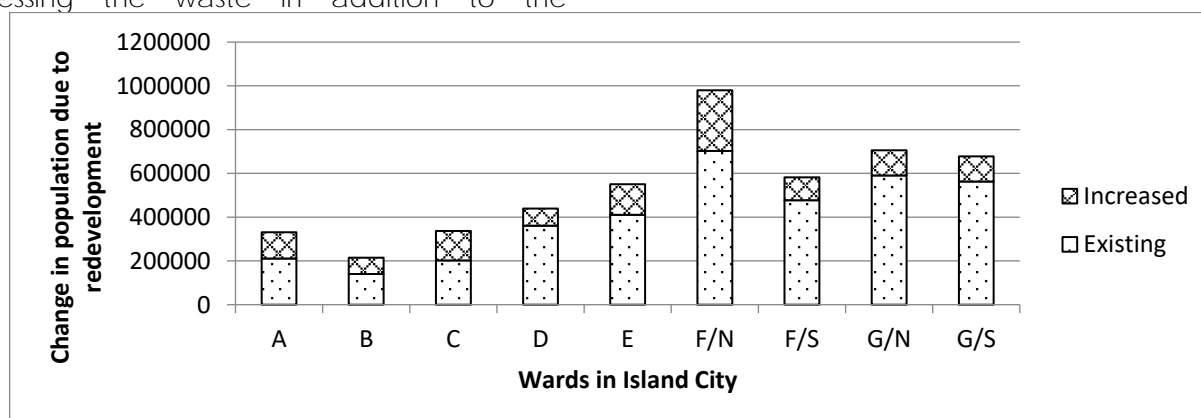
Figure 12. Increased population across the Island City if 'cessed' properties are demolished for the 'smart' development proposals.

Overall, the results indicate that the intensification policy in the Island City would result in 1677 new tower blocks averaging 40 storeys high, 51,780 additional car parking, a reduction in open space per person from 1.27 to 1.15sqm, a new 100 MW power station (probably coal-fired (Gosh, 2010)), a new 100 million litres per day dam to supply water, 160 million litres per day of sewage to be processed, 3570 tons per day of CO_2 production and many more adverse impacts. All this will be added to a City that, due to inadequate resources and difficult geography, already systematically rations electricity by blackouts (Byrd & Matthewman, 2014a), rations water to a few hours per day, and where 80% of sewage is untreated and washes up on the shoreline (Mandal & Byrd, 2013).

6.1 Per capita impact

In order to compare the environmental impact of the new development with the existing, it is useful to measure it in terms of change (increase or decrease) per capita or unit floor area.

Since the redevelopment of the site results in an increase in population of about 25% greater than the existing, the consumption per capita results in the following.

Water consumption as well as wastewater (including sewage) per capita is likely to increase by 155% and potential rainwater harvesting is likely to reduce to less than half (45%).

Residential electricity consumption per capita is predicted to increase by 30% while electricity in commercial and retail spaces will more than double per unit of floor area (226% increase)

Carbon dioxide emissions, due to total electricity consumption, more than double which results in CO_2 emissions per capita increasing by 43%. However, C02 emissions, due to transport increase by 176% per capita. Solid waste increases by about 100%.

7. Discussion

With policies of compaction and constraints on the dispersal of cities, urban form will inevitably grow vertically. With verticality grows dependence on centralised 'flows' of energy, water supplies and waste disposal. Dependency leads to vulnerability and insecurity and, while suburbia offers some degree of resilience by its ability to collect energy and water from individual roofs and food from individual gardens, vertical urban form offers little resilience (Byrd & Matthewman, 2014b).

While demand is increasing for resources to 'feed' the metabolism of Mumbai, supply from the hinterland is struggling. In the case of electricity supply, the state of Maharashtra consumes almost 12% of India's electricity, having the highest consumer base in the country, it also tops the list for more deficit compared to other states. Consumption of electricity is growing faster than production capacity. The depletion of 'easy to find' coal combined with higher energy demands from industry and air-conditioning is leading to electricity blackouts on a regular basis (BBC News, 2002; BS Reporter, 2006; Rediff News, 2007).

In the case of water supply, the city of Mumbai is facing water shortages, with parts of the city receiving direct supply of water for only a few hours in the day and water connections to any new tower, clusters or townships being suspended till the Middle Vaitarna water supply project is completed (Sen, 2009). In the case of solid waste, most of Greater Mumbai's collected solid waste is disposed of as mere dumping and levelling at the landfill sites at Deonar, Mulund and Gorai that have almost outlived their carrying capacity. Though the Government of Maharashtra has allotted a disposal site in Kanjur Marg, it is likely to be inadequate for the projected solid waste generation (MCGM, 2005 to 2025 a).

In the case of drainage, the discharge of all the storm water and treated sewage is into the Arabian Sea. Tidal variation has a major bearing in the system of storm water drainage resulting in flooding and water logging during heavy rains and high tides (MCGM, 2005 to 2025 b). This is likely to get worse with the risk of sea level rise due to climate change. The sewage system of Mumbai is inadequate, resulting in discharge of large amounts of untreated sewage into creeks, causing degradation of coastal water quality and contamination of the adjoining beaches and seafronts (Kumar, Subramaniam, & Patil, 2000).

The pursuit of cities to become 'smart', 'world-class', 'liveable', 'green' or 'eco', has been promoted alongside increased population densities and urban compaction. This planning

goal must reach a point where resources are inadequate for the fully functioning metabolism of a city. While case studies such as Bhendi Bazaar offer an exemplar for the 100 'smart' cities planned by the Indian Government in terms of increased density, improved image and urban regeneration, they do not offer an answer to the problems of providing an adequate infrastructure to support the metabolism of such developments if they were to be significantly replicated.

8. Conclusion

Using the Indian Government's own definition of a 'smart city' and the exemplar development that is put forward by them, this research has analysed the claim that the exemplar is 'smart'. The research has not only investigated the exemplar development but has extrapolated the implications should such a type of development be implemented across the Island City of Mumbai or elsewhere in India.

Data on the redevelopment proposals has been obtained from Governmental agencies, consultants for the redevelopment project and from site surveys. The environmental analysis is based on the 'extended urban metabolism' model with data based partly on empirical evidence from precedents and supported by calculation from first principles.

The results indicate that there is a significant adverse impact on the environment and that the increased metabolism, and hence detrimental environmental impact, increases at a greater rate than population increase. On this basis, this exemplar development does not support the case for calling the proposals for Mumbai 'smart' or 'sustainable'.

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Establishment of space syntax to read urban road network; the case of Sari, Iran

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A B S T R A C T

Cities have permanent changes as a living organism, where the transformation required in designing a solution for structural and social demands achieving safe and healthy human contacts. Some scholars divide city sustainable development toward two main views, as the building's set are connected by a space, on the other hand human social actions are linked by urban network interaction. The aim of this paper is to study on urban road network by the establishment of space syntax logic, this issue is divided into two main parts, as a first part, the study on already existing and the second part is bringing the new suggestions to a more qualified urban road network. Sari city of Iran is selected for this Case Study.

1. Introduction

Nowadays, urbanization has found a key role in our lifetime that the understanding of urban growth could be the ability to plan the future directions this issue caused with urbanization being a variable and complex phenomenon. Cities with permanent changes are living organisms that require this transformation design solution for structural and social demands to achieve safe and healthy human contacts (Önder, D.E., Gigi, Y. , 2010). Some scholars divide cities sustainable development toward two main views, as the building's set are connected by a space, on the other hand human social actions are linked by urban network interaction. Urban networks as a society infrastructure have a crucial role in reaching success and sufficient access to different resources (Vaughan, 2007).

The issue of predicting and providing is a base of the traditional view of transportation planning

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that in modern society has been discontinued. Recent studies have changed their design concept to numerical and computational by the establishment of mathematical and physical science. From this view, urban spaces could have the relation of a node structure. In this regards, the edge will find the main role with the complex network that has a close similarity to the other networks. (Levinson, 2006) (Cardillo, A., Scellato, S., Latora, V., Porta, S., 2006) (Yuan, P.C., Juan, Z.C., 2013).

The issue urban network analysis faces is with various issues like information, network communication and social issues but a new subject emerges as an urban road network analysis. Scientific studies on this issue bring a new view that a group of network nodes have more structural dates in comparison with a single one (Wagner, 2008) (Tischendorf, L., Fahrig, L., 2000). This subject begins from the logic of a space syntax, that urban road network are working as a body neural network where movement are employed make simple linear elements in the network that could be able to present line movement in the network system to find natural units (Jiang, B., Zhao, S., Yin, J., 2008). Space syntax emerged from the architectural view to an environment one as logic a analyze space. This fact has caused space syntax to follow both of architectural view and computational knowledge. However, this issue has theoretical base and mathematical principles in each case study (Thomson, 2006) (Hillier, B., Hanson, J., 1997) (Reveron, 2009).

The aim of this paper study on urban road network by the establishment of space syntax logic is that this issue is divided into two main parts. The first part: the study on an existing one and allowing the new suggestions to achieve a more qualified urban road network. The second part: is a study by the municipality of Sari city for future urban projects. This study is planned to examine the new projects by comparing them with the previous one to find the true results of the differences. In this regards, the first result is achieved by employment of Depthmap software and the second result is

continued by the establishment of SPSS for further research.

2. Methodology
This study has developed two methods to analyze the case study. As it mentioned, the main one is with space syntax to examine the existing conditions with the suggested one. SPSS was employed as a second method to reach a deeper analysis by using the numerical result of the first method.

2.1. Space syntax
Space syntax is an analysis method that conceived and developed by Bill Hillier and Julienne Hanson in late of the 1970s. The method could be established on urban issues, such as studying urban space, reading and prediction. While this method of space syntax is functional for urban reading, it also would be helpful for an association between physical and social structure (Hillier, B., Hanson, J., 1997) (Duan, Y., Lu, F., 2013). Bill Hillier as the leader of space syntax logic believes, mostly cities are found by general view but syntactic analysis of cities say that there are hidden physical movements and structures (Stahle, A., Marcus, L., Karlström, A., 2005). Space syntax was born based on graph theory by classifications of urban environment split into single parts to study their existing relations. In this regards, space syntax could examine different points based on space geometrical logic to reach hidden systems and structures of human environments (Steadman, 1983) (Peponis, J.C., Wineman, J., Bafna, S., 1998) (Penn, 2003).

This logic could be functional in studying urban contextual features which in this issue, axial lines establish the main role. The axial map in space syntax logic has the fewest set of straight lines that curve out in convex space (Tianxiang, Y., Dong, J., Shoubing, W., 2015) (Hillier, 2007). In a set of the convex map the axial line brings the shortest space to coating the whole space. Bill Hillier in "The social logic of Space" defined an axial line as

a pathway to move in unblocked space (Hargrove, W.W., Hoffman, F.M., Efroymson, R.A., 2004). This concept believes each link is an axial line and each connection with other lines could be as an intersection which shows the spatial relation between lines and nodes (Tianxiang, Y., Dong, J., Shoubing, W., 2015) (Hillier, B., Hanson, J., 1984). There are many axial lines in urban spaces while there are few groups of axial lines in an axial map that pass through the whole city; they could be reachable in any way on an axial map while joined with the disjoint parts just by a third axial line. The dynamic lines were born with intentions to break boundaries (Jiang, B., Claramunt, C., Klarqvist, B., 2000) (Hillier, 2007). The topological network parameters such as total depth, integration could be obtained by line connection to urban nodes with the links meeting at a junction (Önder, D.E., Gigi, Y. , 2010) (Rezayan, H., Delavar, M.R., Frank, A.U., Mansouri, A., 2010) (Hillier, B., Hanson, J., 1984).

2.2. SPSS

As is mentioned, the second method of this study is the SPSS. This method was employed to reach more a complete result by a numerical analysis of space syntax. This part of the study, same as the previous part is based on differences of two conditions, the existing and suggested ones. The SPSS method was employed based on the T-Test concept (Fritz, M., Berger, P., 2015) (Plume, 2003) (Landau, S., Everitt, Brian., 2004).

3. Result

The case of Sari city in Iran has interesting issues to study on the urban road network. As is mentioned, the municipality of Sari created new projects to add more accessibility to the whole of the city. They aim is to get more integration and reduce the depth of places. In this regards, the new projects are studied to apply for this aim, ring roads and some streets inside of the city that are following the main aim. This paper is plans to compare the existing condition with further projects.

This study by the establishment of space syntax has mentioned some specific parameters, such as integration, total depth, and connectivity. These will be studied by comparing both the conditions past and future.

In existing condition the average rate of integration on a local scale (R5) is 1.38 also the maximum and minimum, respectively is 2.63 and 0.34 which in the suggested plan, the average has growth to 1.43 with 0.05 unit increase also maximum integration is 2.64 but the minimum has not any change. On the other hand, the global scale (R10) has changed as well. In the scale of R10, the average of integration is 1.08 and the maximum is 1.54 also the minimum is 0.38 with the changes, the differences is impressive. By the new plan, the average of integration is 1.43 with 0.35 units increase and the maximum is changed to 2.64, (Figure. 1), (Figure. 2).

a)

b)

Figure 1. Urban road integration of existing condition in scale R5 (a) and R10 (b)

a)

b)

Figure 2. Urban road integration of future plan scale R5 (a) and R10 (b)

a)
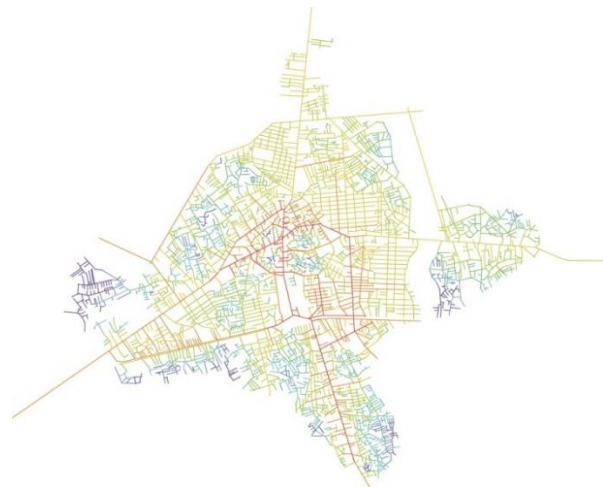
b)

Figure 3. Urban road total depth of existed condition in scale R5 (a) and R10 (b)

Connectivity is another factor for study in this paper. In existing conditions, the average of connectivity is 2.63 with the minimum rate of 1 and maximum rate of 47. But with suggested plan, just the average has changed with 0.07 unit's growth to be 2.70. The total depth of the integration and connectivity has changed in both of R10 and R5. The average total depth of R5 in existing condition is 722.61 with the maximum rate of 3426 and minimum of 15. But with the new plan, it has changed and the average of total depth is increased to 817.07 with 94.46 units increase also the maximum has increased to 3511, it means 85 units growth but in both conditions the minimum total depth has no changes, (Figure. 3), (Figure. 4).

a)

b)

Figure 4. Urban road total depth of future plan in scale R5 (a) and R10 (b)

In analyzing of the scatter plot, the R^2 in condition of connectivity and R10 is 0.10163 and with R5 is 0.18168 but with the new plan, the R10 has changed to 0.11169 also R5 is changed to 0.18430. The rate of R^2 in the condition of integration and R10 in the existing plan is 0.898719 and with R5 it is 0.7112 but with the suggested plan, it has changed in R10's scale to 0.891439 with 7280 unit decrease but for R5 there is 84 unit increase and it gets to 0.7196.

In the second part, the numerical results received go to the space syntax are established by SPSS to analyze the integration differences and total depth in local and global dimensions. The final results show the meaningful differences in how the suggested project can be useful to improve the urban accessibility condition. The SPSS study based on test significance from global integration

shows the R10 integration average is 0.870 in the existing issue which is increased to 0.922 in the second group as a new plan means the difference is shown about -0.0517. In the same way, the R5 study, integration has positive changes like R5 integration. In the existing tissue, R5 integration has the rate of 1.389, even though in the suggested plan, it is increased to 1.437. The mean of the difference in R5 integration is - 0.0476. The "T-value" index in R10 integration test is -13.508 with the free degree of 6104.432. Also in R5 integration, the "T-value" is -4.735 which shows the significant difference between the average amount of R5 integration in group one and two with 6109.397 freedom degree, (Figure. 5).
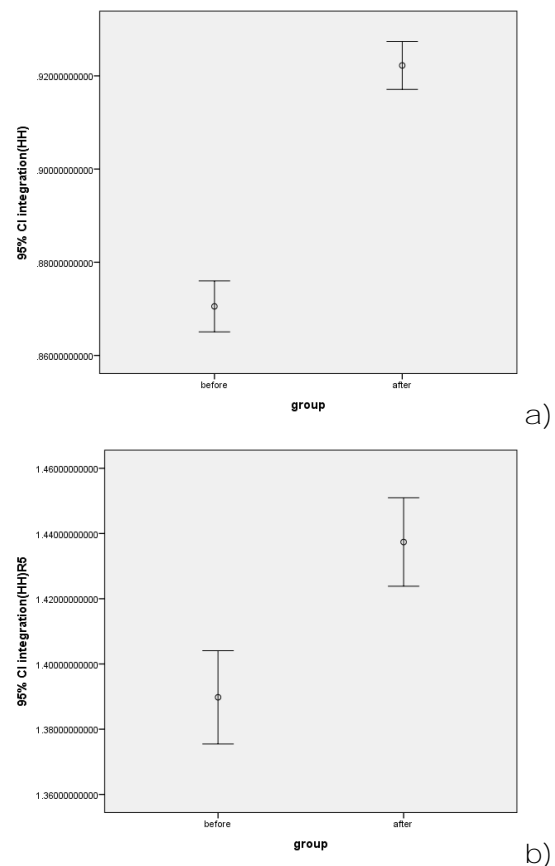

a)

b)

Figure 5. Graph of integration for existing and future condition of R5 (A) and R10 (B)

The total depth of R10 in the previous condition had the rate of 35312.89. However, by increasing the integration, it would decrease to 34424.92 in the following condition. The total R5 depth is 722.62 in the existing issue and in the suggested plan; it is changed to 811.90, (Figure, 6).
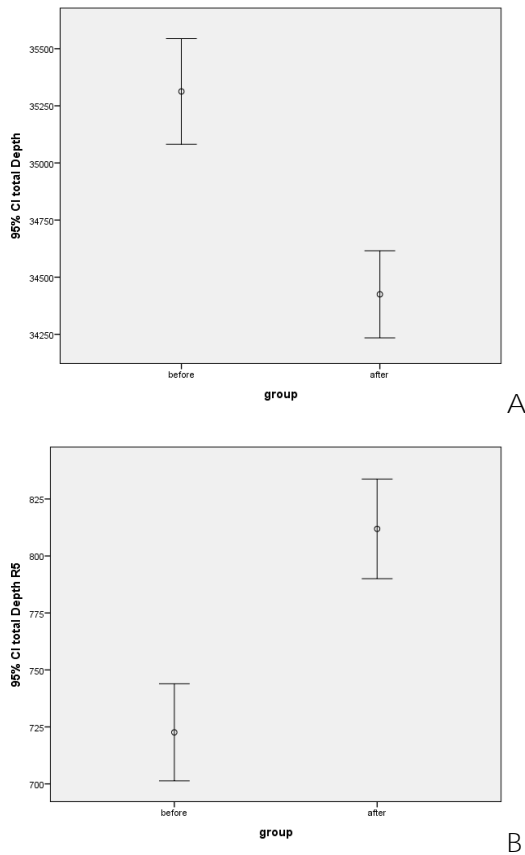
Figure 6. Graph of total depth for existing and future condition of R10 (A) and R10 (B)

By comparing the total depth in both conditions, the total depth in versus R10 has a positive result with a significant difference of -887.97. This index in the R5 scale has a negative growth around -89.28. It is shown, by the new plan when the whole integration has grown, the place's depth could be grow up but in the case of Total R5 depth, the result has a negative rate because of increasing the connection numbers. It can be said, the previous condition has lower depth than the suggested plan, (Table 1).

Table 1. Table of Independent sample test by SPSS.

Variable	Mean Difference	Degree of freedom	T-value	Sig.value
Integration(HH)	-0.0517146260	6104.432	-13.508	0.000
Integration R5(HH)	-0.0476113194	6109.397	-4.735	0.000
Total depth	887.968	5890.612	5.807	0.000
Total depth R5	-89.281	6136.284	-5.736	0.000

As mentioned, "T-value" has a negative rate in both shown integrations, the suggested plan has a good result, but by means of the total depth index, just global scale is acceptable with the positive change rate of 5.807 and in R5 scale, this rate is -5.736 which shows the place's depth is increased.

4. Conclusion

This study has established the space syntax and SPSS, to study the new projects by comparing the existing one that was defined by municipality Sari city, by the new project rate of integration it is increased in global scale (R10) also in local one (R5) but in issue of total depth, there is growth it could be a negative point, because based on the logic of space syntax, in successful projects, when the integration has growth, the total depth should shrink.

While the new projects numerical differences are not significant, the suggested designs could bring some changes which are a positive, because this method could be applicable to other subjects. This study attempted to examine the differences between the new projects and define some useful ways to improve urban infrastructure.

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Profession vs Ethics

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A B S T R A C T

This article studies the process of professionalization in general and particularly in architecture and reviews the concept of professional ethics and the codes and documents related to it. The article investigates on the motivations of the conflicts between the documents of professional ethics with the ethical values by criticizing several codes of professional conducts produces by the main professional organizations in the field of architecture. The article proposes an ethical approach which can go beyond and above professions and their limited professional interests to be able to prevent the unethical professional conducts.

1. Introduction

Harun Tepe in his book of Ethics and Professional Ethics, describes the relation between ethics and professional activities with the concept of **"capability". Namely, the power and the status** of deciding and performing professional activities generate the capabilities of different professions. According to Tepe the question of justifying and enabling these capabilities to perform or not in certain conditions, appears as the main problem of professional ethics (Tepe 2000). With the intention of finding ethical answers to this question, according to Kuçuradi professional ethics is seeking for common norms to prevent unethical attitudes and conducts in various professional fields (Kuçuradi 2000). The

norms of professional ethics identify the ethical responsibility of the profession and professionals and for this reason it must go beyond the intra-professional activities and contain the inter-professional and ultra-professional conducts. In other words, in addition to the conducts for professionals, these norms ought to consider the accountabilities of professions towards humanity based on ethical values. The capabilities of professions are not limited to the professional activities of persons and originate from outputs

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of all of the organizations and groups related to the professions including and above all states and private companies. For this reason, codes of professional ethics should cover collective responsibilities supplemental to the personal responsibilities. However studies on the codes of professional conducts indicate the fact that these documents mostly consider the minor personal responsibilities and ignore the accountability of professions and the other major actors of the related profession (Sadri 2010).

Neglecting the collective responsibilities and the ultra and intra professional accountabilities of professions derives from the entwined interrelations and interests between professions and other major actors such as states, local governments and private companies. Therefore the problem of the incomprehensiveness of the documents of professional ethics roots in the origins of professions and is their intrinsic characteristic allied to their foundation.

Magali Larson (1979) defines the processes of professionalization of disciplines and exposes the bases of the problem of professional ethics in their essences. According to Larson, professions are occupations with special autonomy and prestige. This autonomy validates their freedom of self-administrated distinctive morality and codes and regulations (Larson 1979). These codes aim to protect the exclusive statuses and autonomy of professions and precluding the involvements of outsiders. Larson explains the founding conditions of professions and underlines their guild-like structure which is the fundamental reason of their incompatibilities with ethical values. These conditions are foundation of professional associations, establishment of professional educations, definition of professional norms, their legislation and guarantee by states and achievement of public recognition (Spector, The Ethical Architect: The Dilemma of Contemporary Practice 2001).

The legitimacy of professions depends on these conditions and self-organized professional ethics are the most essential conditions of their public acceptabilities. As emphasized by Spector, professional ethics and the codes of conducts demonstrate the commitment of professions to noble morals and behaviors, and by the way attempt to sustain their market shares (Spector, Codes of Ethics and Coercion 2005).

Peter Marcuse underlines the historic role of **professionalization and introduces "social bargains" between societies and professions** and as part of these bargains he highlights the power and prestige of professions which are interrelated to professional ethics and their self-administrated distinctive moralities. Marcuse argues that these bargains support the structure of societies and their efficient functionings and basically any challenges to these structures are against the barganis. In other words, rather than defining the limits to the power and system, professional ethics attempt to maintain the system. For this reason the self-administrated distinctive moralities of what it is called as **"professional ethics", never demands or accepts** any confrontation with these structures (Marcuse 1976).

It is obvious from the literature that, the capabilities of professions derives from their societies based on their social bargains which are supportive to the roles of social structures. Even though the norms of professional ethics which are self-administrated by professions appear to prevent unethical attitudes in the professions, however their guild-like organizations, interests, market shares and their entwined structures with the societies and their power arrangements lead these norms to control the boundaries of professions more than their unethical conducts (Spector, Codes of Ethics and Coercion 2005).

Professional ethics always stay more professional than ethics. They address professional values more than ethical values and even their statements on any ethical value root in the interests and images of professions and target to protect their market shares. Professional ethics are limited to the boundaries of professions and

accordingly restricted to the structures of societies. For this reason they cannot address the unethical conducts of other actors in their professional fields and they cannot go beyond their boundaries. As it is mentioned by Marcuse, any endeavour to promote ethical values such as freedom, equality, quality of life, democracy, justice and human rights is only possible if professional ethics develop interests in the subject of power and care the changes of the system (Marcuse 1976). In other words, questioning their social bargains and the foundation of structures in societies predominantly their own professions, professional ethics can act more ethically. Breaking their boundaries, the inter-professional and ultra-professional matters and all collective responsibilities of various stakeholders and actors will be included in their visions. That is to say, they can act more ethically only and if they keep out their professional roles.

2. Professional ethics in architecture

The word architecture, in its ancient Greek form of Arkhitekton (ἀρχιτέκτων), implies the meaning of building skill and the mastery of construction. Of course in this meaning it has a long history. However what today we call as architecture, as an arm of the system of industrial production of space has shaped during the 19th Century. Architecture has been industrialized, institutionalized and became a profession and a working arm of capitalist system and modern state. With the professionalization of architecture, it was isolated from building practice, the scale of life (one to one scale), nature, ground/earth and was re-identified within the boundaries of design.

The professional actors who have been granted the title of architect and exclusively authorised to work in this field are carrying out the profession of architecture. This authority which renders architects responsible for spatial design, a forceful part of the process of creation and production of space, has been devolved to architects by the control mechanisms of modern

society, primarily the state through different legislations and regulations.

Holding the ascendancy of designing spaces, architecture achieves the capability and authority in the process of creation and production of space. Architecture gains it power from the accumulation of these capabilities. This power enables architecture to take role in the social and political transfğrmations and consequently increases the danger of misusing this power to non-humanitarian ends. The written documents in the professional ethics in architecture, as so in other professions, never contains the concerns of this possible misuses, however they prioritize the client-serving professional interests, encourage the guild-related roles of architects and ignore the humanitarian and environmental issues and ethical values.

It is understood from the documents of professional ethics in architecture that the protection of guild and market shares has been more considered than the collective responsibilities of architects towards humanity. By scanning these documents during the history of the profession, we can follow the guild oriented approach of the profession manifested in the list of bodies which architects have been assigned responsible towards them in these documents. Regarding these responsibilities, Saint refers to two historical texts; the first one, a text written by Soane in 1788 and the other one written by Arthur J. Willis and W. N. B. George in the mid-twentieth. In the both texts architects introduced as mediators. In the first one their responsibility to **intermediate between the "employer" and the "mechanic" and in the second text, between the "building owner" and "contractor" is** underlined (Saint 2005). Concisely the personal responsibilities of architects towards the other two actors in the architecture market, the one who employ and pay architects and the other one who construct buildings is mentioned in these texts. However since the architecture market in the last two centuries has been transformed from more public to more private

market, the term of "employer" which could be used for public administration was removed by the term "building owner" which is perceived more private. During this transformation of the market, contractors as a new private sector emerged and organized the building forces and the direct relation between architects and construction workers has been ended. For this reason even if the terminology of the two texts seems to be different, it is obvious that they carry the similar meanings.

Parallel to the transformation of state and capitalist system during the neo-liberal era, architecture, as all other professions, keeps losing its social mission and public intention and being privatised and distorted to a business today. The neo-liberalization of the architecture market transformed the role of architects and reorganized the list of these bodies in the documents related to the professional ethics. The major change was the unification of the roles of "contractor" and "building owner" under the role of "client" as it is mentioned in the most effective codes of professional ethics written by International Union of Architects – UIA (International Union of Architects 1999), Architects' Council of Europe – ACE (Architect's Council of Europe 2009), and American Institute of Architects – AIA (American Institute of Architects 2012).

Architects lost their mediation role and have become part of the "mechanic" actors in construction industry. Under the impacts of the neo-liberal order and alteration of the functions of professions, professional ethics, which ought to concern human values, is devalued by overrating on the image of profession and its market share. Accordingly these texts contain the responsibilities of architects towards the profession and emphasise on them coordinate to the responsibilities of architects towards the public. However even the obligations in the public interest which advises architects to act legally and avoids their inappropriate conducts, can be understood as attempts oriented to the public approval of the profession and correspondingly the interest of profession and its market share.

As it is mentioned by Spector, instead of defining the duties of the profession and the members of profession to fulfil them, the control of the boundaries of the profession has become the main goal of the codes of professional ethics. Spector also adds the fact that even when the codes deal with the accountabilities of the members of the profession, they focus on the tasks of the members of the profession towards each other more than their responsibilities in the use of their authorities and capabilities (Spector, Codes of Ethics and Coercion 2005). Accordingly, in the codes prepared by AIA and UIA, the obligations of architects towards their colleagues became one of the main headings, beside their responsibilities toward the client, the public and the profession.

All the three documents prepared by these organizations include the heading related to the general responsibilities of architects. In the document of International Union of Architects these general obligations are itemized in 10 standards. In the document of Architect's Council of Europe these general obligations are listed in 6 headings. The 10 standards of UIA and 6 headings of ACE related to the general obligations of architects address the similar issues which are related to the improvement of knowledge and skill of architects, and the field of architecture, art and capability of building industry and also general recommendations to prevent disagreements and misapprehensions in architectural works (International Union of Architects 1999), (Architect's Council of Europe 2009). The document of "Recommended Guidelines for the Policy on Ethics and Conduct" prepared by International Union of Architects as part of the "UIA Accord on Recommended International Standards of Professionalism in Architectural Practice", the "European Deontological Code for Providers of Architectural Services" prepared by Architects' Council of Europe and the "Code of Ethics and Professional Conduct" prepared by American

Institute of Architects start with explaining the general obligations of architects. The UIA Guideline introduces 5 standards related to the continual improvement of their professional knowledge, raising the excellence in architectural education and practice, contribution to the promotions of building industry, establishment of monitoring procedures and adequately supervising the employees (International Union of Architects 1999). In addition to these standards the ACE Code mentions the right of architects to resign from their unappropriated contracts and their obligation to receive full information about the projects before proposing any fee in its 6 standards of general obligations of architects (Architect's Council of Europe 2009). Distinctively in the code of American Institute of Architects, in addition to the similar advices such as the improvement of knowledge and skill and standards of excellence in architecture, the document stresses two ethical values which are the protection of human rights and concerning natural and cultural heritage (American Institute of Architects 2012).

All the three documents refer to the obligation of architects towards the public as their second principle. In the UIA Guideline and ACE Code and AIA Code this title is expounded under 6 standards. By pointing to the ethical responsibilities of architects, the first of these standards in UIA and ACE texts underlines the values of the improvement of the environment and the quality of life of inhabitants and also the natural and cultural heritages. This standard is foundationally different than the other standards. In the UIA Guideline the sixth standard and in the AIA Code the E.S. 2.2 and E.S. 2.3 refer to the collective roles of architects towards public by taking the raising of the awareness of the public on architectural issues into the attention in UIA Guideline and the pro bono services and civic activities of architects in AIA Code. However aiming the better cultural capital and market share, the other standards under the title of obligations towards the public

in these documents concentrate on the image of the profession in the public sphere. These standards are related to the avoiding of false communications, deceptive manners and representation as a misleading fashion and upholding laws and all jurisdictions in the countries of their projects (International Union of Architects 1999) (Architect's Council of Europe 2009) (American Institute of Architects 2012).

The third obligation in all three documents has the title of obligations to the client. The standards and rules related to this title in these documents are performing skill care and diligence, without undue delay, sharing necessary information about the progress of the project with the client and preparing a clear contract about the project (International Union of Architects 1999) (Architect's Council of Europe 2009) (American Institute of Architects 2012). These standards all emphasize on the personal responsibilities of architects towards their client and accordingly towards the image of their profession. In this sense these standards carry the same role as the standards listed under the fourth title in these **documents; "**Obligations to the **Profession". This** title in all of the three documents has the goal of promoting a better representational performance of architects towards the profession of architecture by their effort to **perform the "best of their ability", honestly,** without any prejudgment and discrimination (International Union of Architects 1999) (Architect's Council of Europe 2009) (American Institute of Architects 2012).

Different than the ACE Code, UIA Guideline and AIA Code has the fifth title on the obligations towards colleagues which indicates issues of intellectual property of architectural works, architectural competitions, rules regarding the critic of the projects of the colleagues, collaborations and rivalry and the work conditions of the employees (American Institute of Architects 2012) (International Union of Architects 1999).

AIA's "Code of Ethics and Professional Conduct" includes additional heading, different than the

other two documents. This topic is related to the obligations of architects towards environment and highlights the importance of sustainable design (American Institute of Architects 2012).

As it is shown in the above text, exception of citing the environmental, natural, historical heritage issues and the quality of human life in few short statements, these codes constitutes norms of conducts more than ethical values. They emerged to act as forces to control the behaviours of professional actors and **consequently make profession looks "correct"** and its image will be beautified and its cultural capital can be raised (Sadri 2010).

Codes of professional conducts as the main texts and morality charters of professional ethics, which should focus on the responsibilities of the profession derived from the ethical values, are limited to the individual tasks to support the interests of the profession. For the same reasons the inter-professional and ultra-professional moral commitments, and collective responsibilities are disregarded and these codes are reduced to the intra-professional regulations and personal responsibilities of professionals.

3. Conclusion

The intra-professional concentration of the documents of the professional ethics and their emphasise on the personal responsibilities of architects and their ignorance on the inter-professional and ultra-professional conducts and the collective responsibilities and the obligations of the other decision makers and stake holders can be introduced as the main challenge of professional ethics. Particularly neglecting the accountabilities of the profession of architecture towards humanity is not ethically acceptable.

As it is discussed in the related literature written by Larson, Spector and Marcuse, these codes have the main goals of identifying the limits of the profession, protecting its market share, upgrading its image and cultural capital and not ethical aims. For this reason they are more professional documents than ethical texts.

Investigating on the related literature and also the most operative documents of professional ethics in architecture, radically the guild like structure of the profession which is reflected in these documents is presented in this article. To prepare a more ethical document in architecture, avoiding the professional role of architecture, expanding the responsibilities beyond and over the profession of architecture and the human rights and value based approach can be proposed. Such a document will go beyond the limits of the profession, will critically deal with the profession and will include political concerns such as democracy and human rights. This document will not be limited only to a specific activity or a certain profession, will be a general ethical document and will include the universal ethical values.

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