

Interaction of Topography & Design in the case of Appreciation of Nature: Karmi village case

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Abstract

Today, with growing the population the need for accommodation is growing up so architecture has big role in this case. During this process the most important issue is nature. There has been a problematic issue in the whole world which is about finding a solution for saving the nature. Therefore, this research is about the interaction of topography and design in the case of appreciation of nature. Also it is based on the problem which is lack of sufficient concern in usage of natural topography in North Cyprus. So this paper clarifies that how architecture can affect the environment surrounded in order to appreciate the natural environment in North Cyprus, Kyrenia, and Karmi village. In this research, lack of sufficient concern in usage of natural topography in contemporary architecture is going to be achieved by comparing the new and old construction building in the Karmi village. According to this problem the paper is including analysis of the buildings in Karmi village. Main goal of this paper is to bring this construction way to architecture and somehow solved the lack of sufficient concern in usage of natural topography problem in North Cyprus.

Keywords: Topography, Architecture, Nature, North Cyprus, Karmi village.

1. INTRODUCTION

1.1 Focus

The focus is interaction of topography and design in the case of appreciation of Nature in North Cyprus.

1.2 Definition of the problem

In whole world with growing the population the needs of accommodation is growing up, in this case architecture is the big point and nature plays the big role in this procedure. One of the issues in the case of appreciation of nature is designing with respond to the climatic issues and site analysis. In sloppy land it's important to use the natural topography; somehow architect didn't consider the natural topography. In Karmi village it's observe the lack of sufficient concern in usage of natural topography.

1.3 Objectives

Aim of this paper is to show Lack of sufficient, concern of usage natural topography problem. The issue is the role of architecture in the case of appreciation of nature so one of the important issue in design is usage of natural topography, in this paper with comparing good and bad examples of usage

of natural topography, explain how the architecture can affect the environment surrounded in order to appreciate the natural environment in North Cyprus, Kyrenia, Karmi village? How architecture can be employed as a mean for appreciating the nature?

1.4 Method of the study

The data collection methodology is casual- comparative and literature surveys. Also this research is based on qualitative and quantitative researches method. The techniques for collection data are observation and taking photo of building in Karmi village, documentaries surveys and the most important part are face to face and close ended questionnaires also face to face interviews with building owner.

The most important part of data collection method is observation and analysis 10 existing buildings, 5 new construction buildings and the other 5 old construction buildings. Moreover, face to face, closed ended questionnaires with 30 buildings owner's and face to face six interviews with residents of Karmi village, 3 of them are old construction building owners and the other 3 are new construction building owner's, face to face six interviews are considered to become aware of their ideas and attitudes about usage of topography in their built environment. Physical analyses are based on maps of location, plans, section, and elevation to achieve the relation of buildings with context. Document survey is other part of this research which includes the books and articles which are related to the research objective.



Figure1: the location of Cyprus Island on the world map



Figure 2: location of Kyrenia in North Cyprus

Source: Google earth, Access (30.11.2013).

2. Karmi Village

2.1 Geography of Kyrenia and Karmi village

Location of Karmi village

Cyprus is located to south part of Turkey. Field study of this article is located in Kyrenia city in North Cyprus (Figure1, 2). Figure 3 shows the boundary of Karmi village in Kyrenia. Also the figure 4 is shown the field study areas which are two boundaries of old and new construction in Karmi village.



Figure 3: location of Karmi village in Kyrenia
Source: Google earth, Access (30.11.2013).



Figure 4: location of field study in Karmi village
Source: Google earth, Access (30.11.2013).

2.2 History

Karaman village is located on the top of the west mountain of Kyrenia was left by Greek-Cypriot during the war in 1974. During the wartime the village houses were left alone and became the ghost village. The council of minister renovated the village in 1979 for tourism purposes the remaining part of the village was renovated. The ministry of housing and interior started to lease the houses to foreigners in long-term loans. In 1983 the village was under the acquisition of tourism ministry. The ministry started with the infrastructures, rebuild the road and pathways, many parking lots were built and improved. Village renovations continued with telephone boxes installed, street lighting completed and water pipes and joints modernized. In seven years the most parts of village and 150 houses were renovated. When the need of modern accommodation was necessary they decided to keep the character of village untouched. (Girne Tourism Company, 2013).

2.3 Effect of the natural data to housing design

Habitual, in-habitual and interests practices, or in the other word climate, season and time are three components of outside operations on the building. The building total function depends on these three components change and interaction together. (Leatherbarrow. D, 2009:58)

Environment is described as: human live in the middle of something that will affect our lives. The environment makes us be together, describes who we are and how we feel. On the other hand the environment depends on how we manage its component of resources. It also has an impact on our

civil life and sanity, this is essential to survival human life such as clean air and water (Leatherbarrow. D, 2004, p 96). The focuses parts of site analysis in sloppy land are topography analysis, analyzing the proximity between buildings and also the view of the horizon line in topography and the sun direction (Table 1).

<i>Category</i>	<i>Attribute</i>
Hydrology	Depth to water table
	Drainage patterns
Geology	Depth to bedrock
	Fault lines
Soils	pH
	Porosity
	Structure and texture
Topography	Slope gradient
	Slope aspect
	Elevation
Climate	Wind direction
	Solar access

Table 1: Selected physical factors to consider in site.

Sources: (James A., LaGro Jr, 2001:124)

Site analyzes:

Understanding the potential of area and defending proper material and absorb the less effect from unfavorable part of area. The first step in design or renovating the structure understands the site. It should be in a way that has the minimum impact on environment and maximum comfort ability and absorbing the trace of human life.. All the effective environment components such as topography, landscape and even weather continent should be considered. There is not an absolute model to design the paths and because all the paths presented in the site repeatedly, in the topographical art this is something fundamental. Time is the cause that can make landscape memorable and recognizable. (Leatherbarrow. D, 2002:200- 202).

The rule is to extract and develop all the hidden quality in the site and surrounding. For this purpose creativity is necessary because care of latent quality, if the site can free the specter from preconceived formulas. Changing the order of site with grading and terracing will disorganize the site; the landscape should be understood as a kind of soil, dirt, decayed life, stardust and admixture of disintegrated stone. When the matter is the shape of land, geometry, profile or form only; grading can cause the problem of the division of surface only. But because the land has tangible body the rise and downs of land is more complicated aspect. (Leatherbarrow. D, 2004: 66).

2.3.1 Topography:

The topography of the land is great importance in settlement of houses. Positioning of the houses, streets created on the land are the best places allowed by the land. Nature is something that combined with climate. In architecture it should keep in mind that all of the equipment used in building must be prepared for ambient condition changes. (Leatherbarrow. D, 2002:200). Topography is like background for both architecture and landscape. Just like silence that precedes speaking or pause that anticipate movement. The topography can prepare place for further architecture. By piety of topography landscape and architectural sites assume as historical basis for appearing the ephemeral image. This allowed them to be remembered and discovered. (Leatherbarrow. D, 2002:205).

For the flat site topography did not concerned too much effect on the location and layout of construction, but the topography is hardly necessary on the sloping site and it can affect the location and layouts. Access to natural elements directly depends to slop of site. For example access to sun or view is dependent to the topography of site. The aim is to show the impact of building operation on structure contexture. (Leatherbarrow. D, 2009:44). The topography of the land is great importance in settlement of houses. Positioning of the houses, streets created on the land are the best places allowed by the land. Nature is something that combined with climate. In architecture it should keep in mind that all of the equipment used in building must be prepared for ambient condition changes. (Leatherbarrow. D, 2002:200).

Topography's latency is considering the natural evidence like weather urban, landscapes but not the potential consideration of physical area. Topography is not just the physical appearance of the build or un-build area, it concerns the use of material to raise the potentials. This is the reason that in the early stage of construction the condition should be described and understood well. If the situation or condition doesn't known well, given condition is not clear for further usage. Because of that design should attempt to exhibit the potential and concerns about the given condition that believe to offer expressive display. (Leatherbarrow. D, 2009:64). The building size matters in skylines. Ascending

the ladder meant increasing height; “the subjugating force to which Le Corbusier referred was Magnitude.”(Leatherbarrow. D, 2009: 213).

In architecture topography the site described as what is really is. The depth of vertical topography is objective in both aesthetic and scientific views. Topography is not just show what is seen in site, it allow to what might yet occur and what is happened some time ago. The first step in architecture design can be recognizing the site, the reason is: the buildings and structures will have a giant connection with foundation, the ground is affecting the design endeavors to modulate. With the help of topography and understanding is as a fundamental element in design, can interpretation of what can be seen and what cannot be seen. By respect to topography it can be clear that the building is allowed to slip into the horizon. This means the persistence of visual aspects. Topography is coming with the action of people and its history and it is complementary performance. (Leatherbarrow. D, 2002:202-210).

The role of ground shows more in definition of sections rather than plan. (Leatherbarrow. D, 2002:29).

The topography should be adhesive as a part of horizon, it must be allowed as resignation of its well-known form. One of the way that help architectures to identical the building and nature is the use of site compositions. It means that for example using the lines of the hills were the line of the roofs. In the other world Konstantinidis suggest the similar argue in this case: “Modern building should look as if they had been build long ago, as if they were as old as the hills.”” Meanwhile Wright mentioned the interaction of roof lines with the hillside. Konstantinidis mentioned that these are necessary differed. He maintained that instead of parallelism between landscape and adjustable architecture triangle, it should be strong contrast between art and nature and the fact should keep in mind that they should be understood as one. Konstantinidis stands that building outline should be in tune with both construction and location, but this is not get the meaning the “same”, tune should be in variety of voice, polyphonically. He believes that in an old village the structure should stand sharply in the slop of site and the color can be in stronger contrast. He said that “The village and mountains reciprocated one another.” He also defines architecture as geographic and the site has an impact on use of material. He mentioned earth as trees, bushes and flowers ...; the building grows as self-evident natural element. The modern material can use harmoniously way to the landscape.

The view of building and placement of the in the site form the entry portico, from that point the arrangement of located building accrue in the site. Many of authors believe that building should be rooted in the soil. Konstantinidis cited Leger “Architecture is not an art, in a natural function; it grows from the ground, like animal and plants or trees that unfold and develops.” The landscape

comes closer than when we watch it from wide opening in the wall. When we see the landscape from large openings such as great sheet of glass, or glass walls, it's not easily recognizable that we are in or outside, within or without, the landscape become closer to us not because of we see it more with our eyes, but because we know that exist. (Leatherbarrow. D, 2002:185-196).

The topography is not defines as the form of architecture or landscape. Form characterized as a complex symbolism in architecture and landscape. The current conception of form is allocation of profile and volume. The use of material aspect of things is not the part of the form in architecture. The angle and line of design are subsumed by concrete quality, as he define again that the topography is not either form or land. The topography has manifestly latent, this latency will recursive in characteristic of material used in structures (D. Leatherbarrow, 2004: 251). In both architecture and landscape architecture, topography is working with nature. On the opposite it is not work or is not object of making, it cannot designed, shaped, produced or fabricated. Architectures and landscape architectures understand topography as "not protectable" material. (Leatherbarrow. D, 2004:254).

2.3.2 Adjacent buildings:

The remaining buildings on the site that called adjacent building may impact the layout. In designing the layout these factors should be considered:

- Do not shading neighbors building
- Do not loss of privacy of neighbors and occupations
- Weather consideration of restrict area of adjacent building for accessing the sun
- Locate the building as far from the adjoining boundary as possible.
- The best place for locating the building should be chosen in the matter of view and access to sun.
- Consider enough space for trees growing up in adjacent site.

In climate condition the wind has an important role to effect the construction. One of the drawbacks can be the lack of special equipment in meteorological offices at all locations. It is suggested for hill ridges with the slop of 3 to 10 degrees with the wind speed of 5000 to 10 000 m/s, designer should add 50 to 60% in wind speed maybe observed on the windward. The wind flow patterns may have different in terms of direction and velocities, a topographic shelf on the wind ward will often be sheltered. A line in the distance where the sky meets the land it called horizon in common meaning in all over the world (Leatherbarrow. D, 2004: 248).

2.3.3 View

The view in the pleasuring and enjoyable part of hosing. It has to be chosen between the hills or threes. To get the maximum advantage of viewing these factors should estimated:

- The building should be placed in the higher level of site.
- To have an additional storey or part storey to allow a view that is otherwise out of sight
- To get the max benefit from solar effect and reuse the wind effect.
- The windows should be place in the best place for maximize visual effect while also maximizing the effect of solar and minimize the wind effect.

The factors that can affect the building placement, size of windows, entrance placement, roof shapes and cladding selection and weather tightness is the direction, speed and frequently of wind.(BRANZ Ltd, 2013).(Figure5).

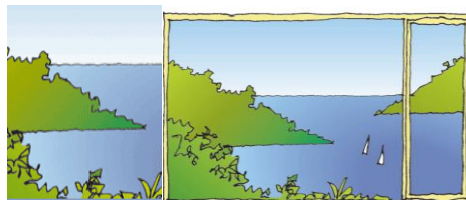


Figure5: importance size of building.

Sources: (BRANZ Ltd, 2013).

In Guthrie Theater, Jean Novel tried to bring some natural components to structure. The beauty of outside surfaces and structure totally is not just comes through the design or construction technique, he use the ambient lightning to saturate the surface with oscillation of quality. The natural light should be essential to the building, working in this case shows the evidence of engaging what is or what is not the part of the building or it necessarily shouldn't be. (Leatherbarrow. D, 2009:62).In these days architecture design and drawing which based in our knowledge going in the way that the by increasing the performance we scarify the useless mater in the area of lightning, loading and insulation. To ignore this possibility, the solution is to scuttle the reality of current condition. To come back to the natural word we should renew our contract with nature. The absence of thing means to do not hinder the presence of environment. In the new architecture using the materials such as glasses rebuilt the connection of inside and outside. We can mention the window wall that is the most obvious evidence that is frequently discussed of the achievement. Jose Luis Sert mentioned on the short text called "On Windows and Walls" that the windows are the new construction that made the opportunity of making connection between inside and outside of the building. From the far past windows are used for the three important functions such as lighting, ventilation and view simultaneously. For the lighting itself and the use of the big glasses, architecture are able to made the "picture window", this established the concept of view and lighting function more than ventilation (Leatherbarrow.D, 2009:85). The achievement of all glass walls can be the start of the serious problem in these days. As curtains wall get the acceptance for offices. "Facades of anonymity" starts to gain around the world. You cannot

found cities without their crowds these days. Here the need of using new materials and methods appears. But in the architecture vocabulary is there a possibility for variety of material available? The solution is to reintroduce the materials that can use before the window wall, the element that can keep the views that modulate the intensity of light or creates the shadow, from regulation of flowing air to interior. The new ideas coming in this way to use of glass wall but not all of the pieces, aggregate or composite. Novel believes that the “Nature” is not just the view, but it can shape the construction of buildings, He take more care of interaction of inside and outside, his target is to make building and nature work together and perform as one in their tasks(Novel,2002). This make the assimilation and performance join together and architecture becomes the part of life. (Leatherbarrow. D, 2009:85- 86).

4. RESULTS

4.1 Results of Site-inspection survey (Physical Characteristics of Karmi village)

4.1.1 Analysis Topography in Karmi village

One of the important natural factors that should be accounted in design is ‘Climate condition’. Architectures should keep in mind the relation between structure and surrounding environment. We can divide these factors to wind, solar, rain, soil and the slop of site and more. As an example slops should be kept away from the direction of rain-bearing winds. For the solar radiation the south facing more sun light, but for wind, the condition may vary from site location. (Shellard, H.c, Lamb, H.H, .1968:823-827). In the site with high degree of slop such as high density hillsides, designers should benefit the site without the obvious disadvantages. The Atelier 5’s Halen at Berne is one of the good samples in this position. (Richards J.M, 1966: 414_415). In karmi village with according the topography all traditional building suited up to mountain and the big important issues is the relation between old constructions buildings with their context, there are positive highlight relation with them. (Figure 6, 7, 8)



Figure6, 7: Karmi village which is located on the mountains, the west of Kyrenia



Figure8: Relation between, building and sloppy land

Source: Author

4.1.2 Analysis Adjust building in Karmi village

Unfortunately in the new construction building architects didn't concern the proximity between buildings (Figure9-13). On the other hand in according to figure 14, 15 it's perceive the good consideration between the distance of building, each building is located in the one horizon line of Karmi villag.



Figure9: New construction in Karmi village



Figure10: Analysis the Relation of New construction building in Karmi village from top view



Source: Author Figure11: Analysis the Relation of New construction building in Karmi village from façade. Source: Author



Figure12-13: Analysis the Relation of New construction building in Karmi village from façade. Source: Author

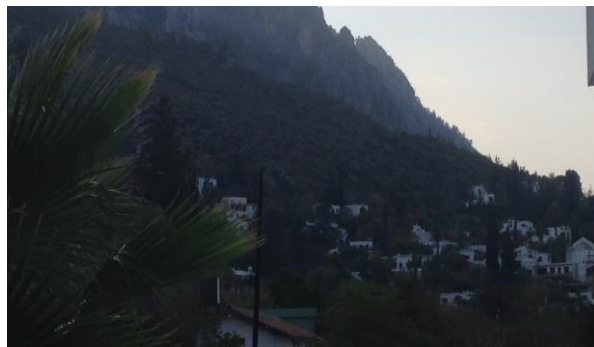


Figure 14: old construction building in Karmi village. Source: Author

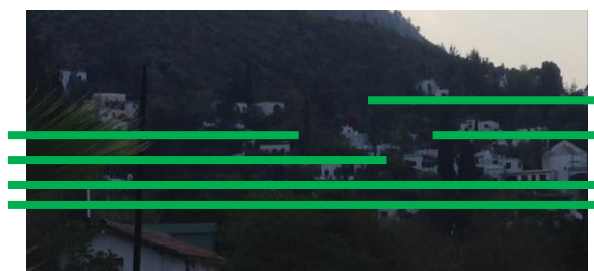


Figure 15: Analysis the Relation of old construction building in Karmi village from façade Source: Author

A line in the distance where the sky meets the land it called horizon in common meaning in all over the world. (Leatherbarrow.D, 2004: 248)

4.1.3 Analysis view in Karmi village

in old construction building its achieve the high quality of usage of windows in according to appreciation of nature, so to all old building in Karmi village the good view is perceive (Figure16-19). On the other hand in according to fewer dimensions between new construction building the view from windows is poor (Figure20-21).



Figure 16, 17 and 18: View of Old construction building in Karmi village

Source: Author

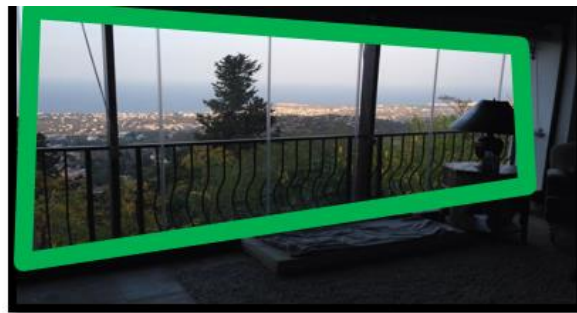


Figure 19: View of Nature from interior space of Old construction building in Karmi village

Source: Author

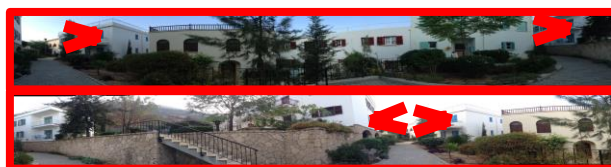


Figure 20, 21: Lack of good view of Old construction building in Karmi village

Source: Author

4.2 Results of questionnaire survey

Four thin closed ended, face to face questions are in this research, which are divided in two parts, also the last two questions are including six part .In total the questionnaires included 20 closed ended questions. First part is the personal information of house owner , And also the second part is in related to climatic analysis of building .The achievement from answers of these questions, is the understanding the relation of building with its context , so the result show the effect of architecture in nature .

4.2.1 Part 1 personal information:

The part 1 of questionnaires is personal information of building owners.

1. Sex:

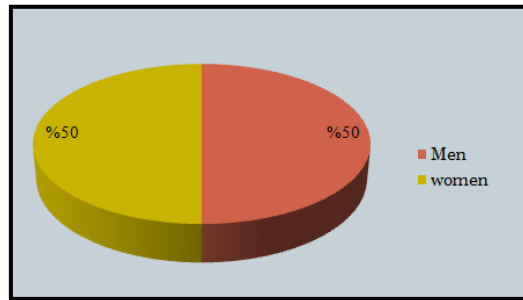


Figure 22: Gender of involving people

Source: Author

2. Age:

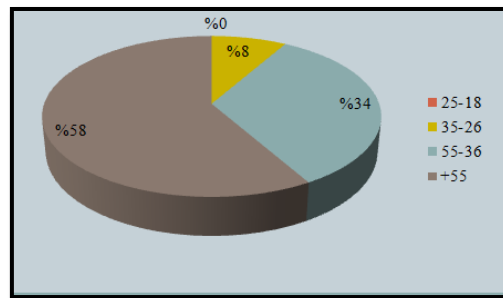


Figure 23: Age of involving people

Source: Author

3. Marital status:

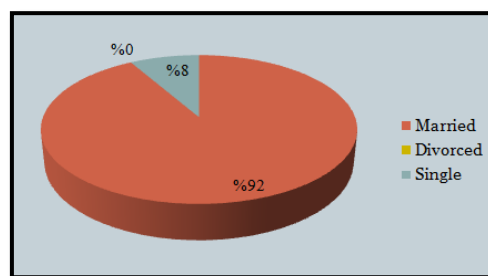


Figure 24: occupation of involving people

Source: Author

4.

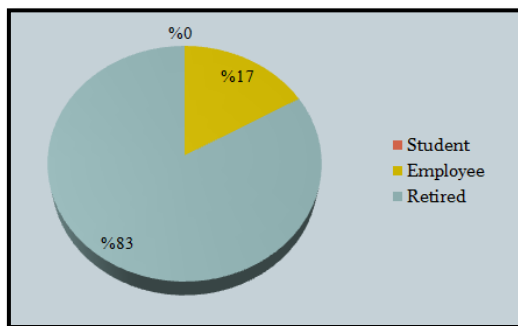
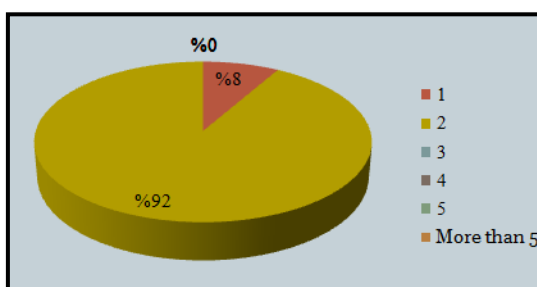


Figure 25: occupation of involving people

Source: Author



5.

Figure 26: Number of living people in one house

Source: Author

With according to part 1 question, the age of 58% buildings owner are more than 55 years old, also 83% of them are retired. And 92% of them lived as couple.(Figure22-26).

4.2.2 Part 2 climatic analysis on building:

6. The satisfaction evaluation of sun light in housing shows the 92% of building owner satisfied ,and 8% of them unsatisfied, it shows the in some location of building has some problem which gives the sun problem to inside them.

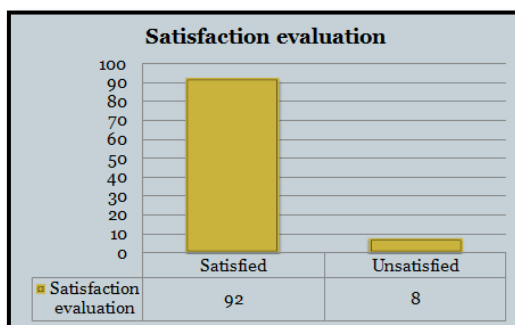


Figure 27: Satisfaction evaluation of sun light in interior space of housing.

Source: Author

7. The satisfaction evaluation of view from inside of building to outside shows the 92% of building owner satisfied and 8% of them unsatisfied of the view of windows, so that means the location and proportion of windows its quite good in old construction.

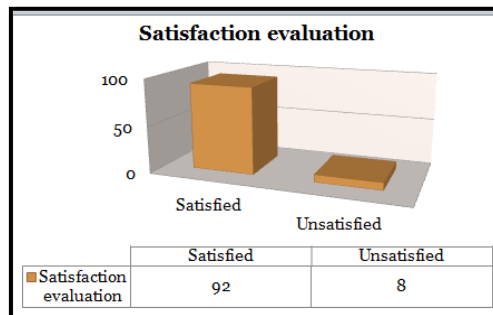


Figure 28: Satisfaction evaluation of view windows.

Source: Author

8. The satisfaction evaluation of the wind circulation (ventilation) shows most of the houses have got good ventilation, that means the location of building and also the location and proportion of opening are quite good. Also its shows the building constructed in according the climatic issues very well.

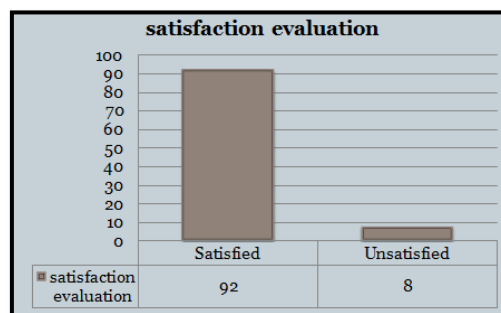


Figure 29: Satisfaction evaluation of ventilation

Source: Author

9. The satisfaction evaluation of the proximity of the owner building with neighboring (adjuts building) shows the 92% of residents are satisfied and the 8% of them are unsatisfied.

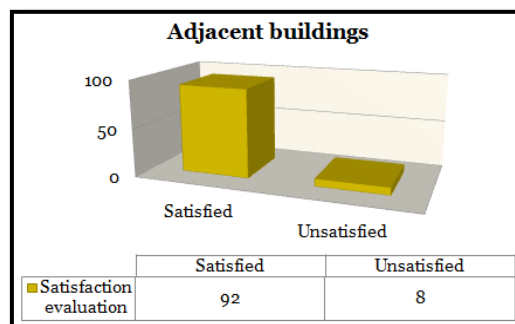


Figure 30: Satisfaction evaluation of proximity of the owner buildings

Source: Author

10. In according to evaluation of shading problem 84% of building is without the problem of shading but the 16% of them it can perceive the shading problem on it.

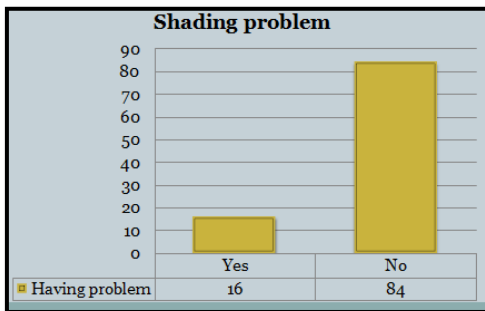


Figure 31: Satisfaction evaluation of shading problem

Source: Author

11. the chart shows the 84% of buildings hasn't the shading problem from the neighboring building but the 16% of them has the shading problem from the neighboring building and this problem is become of the not as much of proximity of buildings.

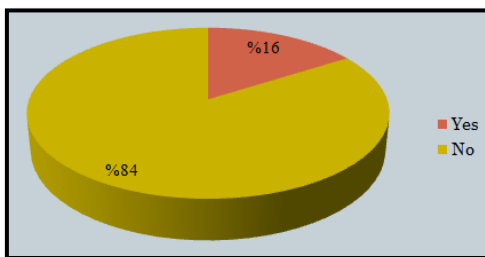


Figure 32: having shading from neighboring buildings

Source: Author

12. The 25% of building owners lose their privacy from the neighbors building. This problem is become of less proximity of buildings. And 75% of building owners have their private.

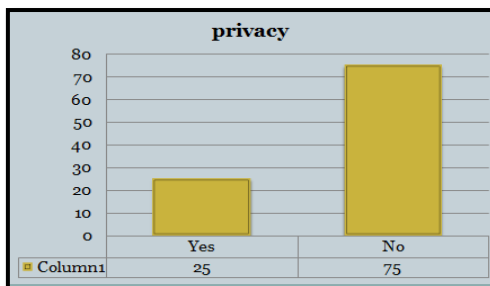


Figure 33: having privacy from neighboring buildings

Source: Author

13. The below chart shows the ventilation of interior part of buildings during the day, as shown in chart the most of building has good ventilation, there is no too cold movement and no too much warm air circulation, the circulation of air is quite good in inside of buildings.

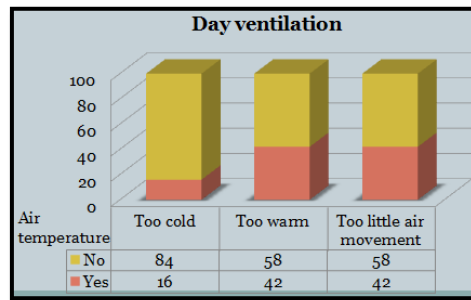


Figure 34: The ventilation of interior part of buildings during the day.

Source: Author

14. The below chart shows the ventilation of interior part of buildings during the night, as shown in chart the most of building has good ventilation, there is no too cold movement and no too much warm air circulation, the circulation of air in inside of buildings is quite good.

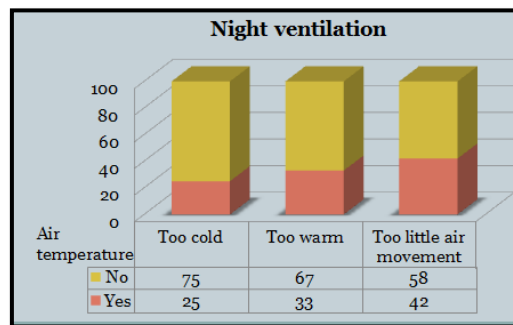


Figure 35: The ventilation of interior part of buildings during the night.

Source: Author

5. Results of interviews

Face to face six interviews are considered to become aware of their ideas and attitudes about usage of topography in their built environment. These face to face six interviews with residents of Karmi village, 3 of them are old construction building owners and the other 3 are new construction building owners. The results of these interviews shows in most of old construction building because of the location of building in different horizon the building owners feel comfortable in building they don't gave shading problem, they have their own privacy from neighboring building, on the other hand in new construction buildings its perceive that buildings have less proximity and most of them located in one horizon and this situation gives poor view and also ventilation problem to building.

6. CONCLUSION

In Karmi Village which is located in Kyrenia, North Cyprus, The houses distributed to the land one by one, sometimes within their own groupings and not interrupting the view of the each other due the slope exhibits a view of harmony with the nature. Every single house in this settlement can utilize natural sources like sun and wind without any blocking. On the other hand, new construction houses cannot utilize the natural sources or they can utilize limitedly (Table2).

Table2: Comparing old and new construction. Building in Karmi village Source: Author

	New construction buildings		Old construction buildings	
	problematical	Good quality	problematical	Good quality
Evaluation of sun light	•			•
Evaluation of view from windows	•			•
Evaluation of inside ventilation	•			•
Evaluation of proximity of building	•			•
Evaluation of shading problem	•			•
Evaluation of shading problem in according to neighboring problem	•			•
Evaluation of privacy	•			•

The architecture should be a bridge between the human and nature. Undoubtedly, it is the mission of architecture as a mediator between man and nature, also to enhance and manipulate his/her relation with nature. Since, nature embrace man and his/her architectural entities, our buildings have to be designed in regards to the natural environment surrounded. The traditional houses are located in the land separately depending on the topography of the land and few houses come together to form groups of houses.

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