A study on the ecological quality of housing environments: Cypriot settlements

D. Oktay

Department of Architecture, Eastern Mediterranean University, North Cyprus

Abstract

Since an understanding and an appreciation of ecology is central to the discipline of landscape architecture, implementing policies for ecological development would not simply mean the sensitive location of urban development in relation to landscape features. Of equal importance is respect for the ecological function of green spaces. In the context of housing, which seems to act as a container of changing circumstances, where individuals and groups play an important role in the creation of their habitats, ecological development deals with improving the quality of life of the local community through the prudent use of local resources. The aim, therefore, is for a high degree of local self-sufficiency, which is related to the ecological site design.

Acknowledging these ideas, this paper, reviewing the literature in the field, firstly discusses the role of green spaces on the ecological quality of housing environments, and secondly evaluates the green spaces of Cypriot settlements by highlighting the typical characteristics of the older settlements which provide valuable clues for the ecologically sensitive developments.

1 Introduction

The biggest challenge in today's contemporary developments seems to be the quantity, nature and location of green spaces within those environments. However, as agreed by many authors, 'quality' has been put up against 'quantity' and the green spaces have been associated more with quantity and less with quality. Green spaces in a city contribute to human activity, climate amelioration and ecological diversity, without separating and isolating people from each other,
which is necessary for human interaction and community development. The understanding of the quality of nature in each place, expressing it in the design of communities, integrating it within our towns, and respecting its balance are essential ingredients of ecological site design as a determinant of 'urban ecology'.

In fact, the need for ecologically sensitive settlements was first addressed by Ebenezer Howard 102 years ago, who proposed the Garden City (1898) as an ideal community of 30,000 inhabitants surrounded by a green belt. Howard intended the Garden City as a refuge from the alienating character of the big city and a compensation for the deficiencies of country life. In this new type of entity, the social advantages of the city were combined with the healthy conditions of the countryside. As such, creation of true, complete urban units enabling a productive relationship with the surrounding countryside was possible [1, 2].

There are three major benefits of creating developments taking open spaces into consideration in terms of energy saving:

- They help reduce storm-water infrastructure and increase aquifer recharging by creating more permeable surfaces in urban settings.

- By promoting a greater presence of trees and other vegetation, urban spaces assist in carbon sequestration, taking carbon dioxide pollution out of the air, which reduces green house gases and climate change, etc.

- By having open spaces scattered throughout the urban setting, pedestrian traffic is encouraged.

Plants may enhance our environment through protecting water quality, reducing soil erosion, improving air quality, lowering summer air temperatures, conserving natural resources and screening busy streets. Good soil is the basis for healthy plants and the optimum use of water. The key to good soil is the addition of organic material, such as compost.

It is not just human demands that need to be satisfied in the provision of open space. Networks of open space must also be considered in terms of wildlife requirements, with the aim of increasing the habitat range for other species. Parks and gardens cannot satisfy all these needs. Less formal areas such as greens and commons, local nature reserves, small woods, wetlands, and multi-use wildlife corridors, all need to be considered; because, each has a different influence, some defining the larger context of the region, some focusing the identity of a small neighbourhood. Accordingly, a planning strategy should consider the defined range of open space in order to establish a green network, which is important to secure bio-diversity and a sustainable ecology [3].

Landscape design plays a critical role in establishing a balance between nature and the ecology, and the needs and requirements of contemporary urban life. Landscapes and built forms can modify microclimates on both greater and lesser scales. Plantings can be used to control microclimates in three ways. The
first is by absorbing and reflecting solar radiation, creating cool shades beneath, reducing ambient summer temperatures and allowing radiation to pass through in the winter. The second is by creating a zone of calm air under the canopy and the third is the cooling function provided by trees by the release of cooling water vapour from their leaf surfaces through evaporation and transpiration.

On a larger scale, as an amenity and provider of comfort in urban spaces, trees, plants and sometimes, water are valuable assets. Where wind is a problem at the edge of the city or around high buildings, trees can provide valuable shelter.

2 Why are trees important?

The recent studies make one thing abundantly clear; urban trees, at least those in public projects, should be considered more than just 'amenities'. These trees should be considered necessary parts of the urban infrastructure, just like streets, electric lines, water and sewer facilities. Street trees, for example, are important not only because they absorb noise and air pollution, lower utility costs, and provide a habitat for birds and other wildlife, but also because the street and its frontages are a community's major public arena. Therefore, tree lined streets are more than just shaded passageways linking buildings. They give us a chance to bring nature into the heart of our communities, while linking us to our past. Today, a growing number of homebuilders, developers, and other businesses are embracing landscaping and tree protection measures because they realize protecting trees also makes economic sense. What they found was that landscaping and green space increased profits for developers while providing numerous other benefits to both the user and the community.

An analysis of the reasons people gave for liking trees on their street is revealing: [4]

- They provide shade.
- They make the street more alive by their movement and richness.
- They are soothing to the eyes.
- They purify the air and increase the oxygen content.
- They hide buildings.
- They add a sense of privacy.
- They provide contact with nature and give warmth as opposed to the hardness of cold concrete.
- They cut down on noise.
- They can make the streets look neat.
- They provide an identity if they are unique.

Scientists also have discovered a rational beauty in trees. Trees can significantly reduce temperatures in town and city centers, countering the 'urban heat island' effect. This is accomplished not only through the shading effect of trees, but also through the trees' ability to store large quantities of carbon, a key factor in global warming, [5].
In terms of the social quality of housing environments, trees are thought to be effective on the formation of stronger communities. This could be the reason why trees might contribute to better relations among neighbors could be explained by the fact that outdoor spaces with trees are used significantly more often than identical spaces without trees. In urban areas, trees create outdoor spaces that attract people. When people are drawn to spaces with trees, they are more likely to see and interact with their neighbors, and so they are more likely to get to know each other and become friends.

Further, a natural environment with a range of vegetation offers children the best opportunities for free play. When we make neighbourhoods and towns without nature we destroy the places of fantasy and autonomy that children need. Leftover lands, small and large parks, preserved riverbanks, and open shorelines are places that become the refuges of the young. The man-made environment is dominated by adults, but the natural world, however small, should be a fundamental right of childhood. Children need enough wilderness to make their own places, and live out their own fantasies.

3 Green dimensions of Cypriot settlements

The Cypriot town was well known for its fruit gardens in the early years. These gardens were an important component of the hierarchy of exterior spaces, extending from public square to semi-public street, semi-private courtyard and/or private garden.

Referring to the urban texture in old Nicosia (Lefkosa), Saalman [6] indicated that “scattered houses stood here and there amid fields and vegetable gardens, a kind of country within the city”. In the end of 1300s, Niccolo Martini, a notary from Campania, found parts of Nicosia (Lefkosa) sparsely inhabited noting that “within the city were many gardens, orchards, and fields” (in Cobham 1969, 26). More than two centuries later, in 1553, another traveler, John Locke stated that “it is not only thoroughly inhabited, but had many great gardens in it, and also many date trees, plenty of pomegranates and other fruits” [7]. These features continued into the Ottoman period. As proved by the writings of Alexander Drummond, who visited Nicosia (Lefkosa) in 1750, the town provided room for a great number of gardens, planted with orange, lemon, cypress, mulberry, olive, and almond trees. These trees exhibited a delightful variety to the eye of one who walks upon the ramparts [8].

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. It is the courtyard house that offers unique opportunities for landscape design, [9].

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. The courtyard, with its fruit trees, flowers and small vegetable plot, is the closest relation the house has to nature; and thus it also provides the inhabitant with direct access to nature. Greenery is especially desirable for the shade it provides, the heat gains
that it prevents and the relief it gives to the eye. Dixon [10] described that in the past, every family in Nicosia (Lefkosa) had a courtyard with a date palm, a pomegranate, a lemon tree and water. They also had a fruit garden, growing mostly oranges, located in their neighbourhood. These orange gardens were unique features of the city and perceived as borders between districts.

The other types of houses which are very characteristic in the towns are those with front and side gardens with local fruit trees and flowers. These outdoor spaces are well integrated with the house by means of semi-open spaces, such as verandas.

In this context, the study of Lefke, a coastal town situated between two valleys and in the mountains of Northern Cyprus, provides useful clues in terms of sustainable landscaping. First of all, in respect of the town, the use of locally appropriate plants helps to create areas of different themes. Second, they are used as bordering elements, as a common characteristic of vernacular Turkish settlements. For instance, orange trees define one district, whereas date-palm trees, olive trees, orange trees and eucalyptus trees define others. The trees serve both as shading elements and fruit sources (Figure 1).

In some districts, aqueducts are used as dividing elements in addition to their watering function, and aesthetic contribution to the landscape (Figure 2).

On the smaller scale, the hierarchy of open spaces in the residential areas provides a variety of uses of vegetation. The private front yards are well defined and 'air-controlled' by cypress trees and grapefruit vines (Figure 3). The semi-private back yards are for growing vegetables. The watering function is successfully done in these spaces with the use of wastewater collected from the kitchen and distributed via the simple canals created by the residents. The

Figure 1: Green environment in Lefke.
semi-public spaces between houses are defined by the vegetation as well. In these areas there are many fruit trees from which the residents of the district benefit from.

On the other hand, Lefke Ataturk Park, the central common space of the town reflects a sustainable quality too, with some fruit trees such as loquat and pomegranate combined with flowers. People use this public space both for leisure activities and picking fruits.

It is widely recognized that the presence of vegetation around housing has positive effects. In low-income housing e.g. in Lefke, the CMC Workers’ Housing, trees and vegetation were found to attract residents outdoors and to foster neighbourhood ties (Figure 4). In comparison those living next to more barren areas, residents had increased social activity, knew more about their
neighbours, had stronger feelings of belonging, and reported that their neighbours were more concerned with helping one another.

However, after the closing of CMC mine, the vacated land, which is approximately 100 ha caused great environmental problems in the area (Figure 5). Firstly, because of the remaining toxic copper elements in the soil, it is no longer possible to develop the land for new functions; new housing development is not possible because copper contaminated soil destroys the building materials used in buildings; the planting of trees or other greenery is not sustainable because of the toxicity of the soil. Secondly, the deteriorated soil has created water pollution in the area, as can be clearly observed by the sea colour near the coast in this area.

The existing housing fortunately is separated from the toxic land by means of a 'buffer zone' created by the planting of eucalyptus trees. This 'buffer zone', however, provides a purely visual separation from the unusable land.

![Figure 5: The view of the vacated land of CMC Mine in Lefke.](image)

Thus, this example demonstrates the importance of soil quality in the development of towns.

Lapta is another Cypriot settlement worthy of analysis in terms of sustainable landscape. It is a village on the west part of the Besparmak mountains range, where nature is an important determinant of the town's image. The residents of Lapta grow their own vegetables and fruits in their own gardens. The artificial and green environment is well balanced, and the design of the houses are sensitively integrated with the slope of the topography by means of their terraces, providing a feeling of aesthetic harmony and the possibility of social gathering.

As revealed by the author's survey-based study [11, 12], open spaces are a cornerstone in the daily life of people in Northern Cyprus, and satisfaction with their dwellings greatly depend on the quality of their private and semi-private open spaces. However, in the new developments, these spaces lack the qualities,
which provide positive meaning and availability for use by the residents. They are often built on flat sites with no trees, and stand as isolated concrete towers, missing the opportunity to create some unity through the use of landscaping. It is also unfortunate that there are no conscious efforts to green the surrounding spaces.

Residential exterior spaces lack responsiveness to the users’ needs, their lifestyle and their socio-cultural conditions. This is especially true in the case of multi-storey housing developments which contradict many social and cultural norms in Cypriot towns. In the design of these schemes, neither the physical and the aesthetic characteristics of the outdoor spaces nor their functions and uses have been considered. They appear as isolated wastelands of spaces; streets have become mere vehicular channels without any three-dimensional definition and public use. The general appearance of the housing areas do not reflect a logical balance between the open spaces and built-up spaces, rather than display a monotonous view of a group of concrete blocks (Figures 6a, b). Hence, these spaces seem to hold no meaning for their owners.

Satisfaction is lower in general with regard to apartment type housing, where private open spaces, usually in the form of balconies, are far from being an extension of the living environment. Furthermore, there is serious dissatisfaction with the provision and/or qualities of collective open spaces in all housing areas.

4 Conclusion

It is widely accepted that an ecological development should demonstrate a sensitivity to the function of green spaces in all levels of urban environment, particularly in housing environments.

Acknowledging the fact that housing not only satisfies the basic need for shelter, but also satisfies other needs required for sustainability, certain physical and social values should be considered in the design of housing environments. Access to nature and sensitivity to the natural ecology is one of the most important qualities that should not be neglected. The site should be designed in a way that it promotes the learning about nature and its process by children and adults. An attempt at integrating such features as edible landscapes of fruit trees, and highly productive gardens into site design would be beneficial for dwellers in terms of lower heating and cooling bills, lower food costs, and reduced risk of flooding and landslide damage. Trees with canopies can be used for their shadowing effect, and for the definition of spaces both in streets and ‘courtyards’. When a more flexible design is possible, the traditional concept of courtyard can be reinterpreted and modified in the multi-storey housing developments, and housing blocks can be arranged around a semi-private courtyard space. Vines, which are an essential element in the gardens of vernacular Cypriot houses, can be effectively adopted in semi-private spaces in new developments, and be utilised for shade. The presence of variety in greencery such as trees and shrubs of different kinds may help create unity in the housing, as well as providing an aesthetic quality.
Figure 6: The views of the new housing developments.

Cultivated urban land—half-private and private—may be utilised as an esthetical means to enhance and define an area. Such areas may also contribute to the establishment of ecological corridors within an urban context, in the form of a 'mosaic' of more or less densely built areas. In the case of Cypriot settlements, orange and citrus gardens would do best in the city scale.

In a smaller scale, useful outdoor living space is an undervalued resource, which can improve the quality of the built environment. Urban and planning codes often limit or condition the effective uses of these spaces, in particular when applied to social housing. In considering the very low environmental
impact of naturally conditioned outdoor spaces and the improved ‘liveability’ they provide, it is vital that these spaces are ‘discovered’ as an integral component of sustainable architecture and urban design.

References