

# We are IntechOpen, the world's leading publisher of Open Access books Built by scientists, for scientists

**4,800**

Open access books available

**122,000**

International authors and editors

**135M**

Downloads

Our authors are among the

**154**

Countries delivered to

**TOP 1%**

most cited scientists

**12.2%**

Contributors from top 500 universities



**WEB OF SCIENCE™**

Selection of our books indexed in the Book Citation Index  
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?  
Contact [book.department@intechopen.com](mailto:book.department@intechopen.com)

Numbers displayed above are based on latest data collected.

For more information visit [www.intechopen.com](http://www.intechopen.com)



---

# Homegardens in Landscape Architecture – A Case Study of Hazelnut Plantations

---

Engin Eroğlu, Cengiz Acar and İbrahim Turna

Additional information is available at the end of the chapter

<http://dx.doi.org/10.5772/55750>

---

## 1. Introduction

Landscape can be defined as from one point of view enter into the framework of a view that they produce a combination of natural and cultural assets (Council of Europe, 2000). At the same time, objects or land covers around us and how we perceive and how the relationship between nature and culture has the meaning established. Landscapes are the most important elements in building spatial identities. Landscapes, sometimes with their natural and cultural features can provide information about the way of life of the people. They are used in a sustainable manner for future generations and makes sense economically. The decisions to get to taken whether rural or urban landscape in the continuity, management and use of the quality of life of people are very important.

Landscapes are divided into three basic groups as natural, semi-natural and cultural (artificial) (Atik, 2009). Natural landscapes include areas that there is little or no human impact such as mountain forest, river, and lakes (Çepel, 1988). Semi-natural landscapes are dominated by the majority of the natural areas of land cover change in the form of areas that are too small. Urban, recreational, agricultural and industrial areas formed cultural or artificial landscapes.

Agricultural landscapes that are one of the four elements of cultural landscape (Karahan and Orhan, 2008) are the main land use form and the resulting high visibility leads to a widespread perception of rural farming. The importance of preserving agricultural landscapes is determined as (EC, 2012);

- traditional agricultural landscapes form part of the cultural and natural heritage,
- the ecological integrity and the scenic value of landscapes make rural areas attractive for the establishment of enterprises, for places to live, for tourism, and recreation businesses

Agricultural landscapes include fruit and vegetable gardens, livestock and flower-growing businesses, watering plants. In addition, these areas have been adapted human life as field which is a recreational, a peaceful space, spending leisure time (Gökalp and Yazgan, 2013).

Agricultural landscapes are an important field in Turkey. Agricultural activities show ranging from one-year to multi-year products (Table 1).

<b>Agricultural Landscapes</b>	<b>Areas (da)</b>
Vegetables and flower gardens (Land under protective cover is included)	5 867 005
Fruit orchards and other permanent crops (Land under protective cover is included)	23 891 026
Poplar and willow land	1 973 562
Unused and undeveloped potentially productive land	19 443 399
Permanent meadow	14 493 128
Pasture land	131 673 745
Fallow land	37 459 577
<b>Total</b>	<b>234 801 442</b>

**Table 1.** Agricultural landscape areas in Turkey (According to values of Republic of Turkey Ministry of Food, Agriculture and Livestok in 2012)

Hazelnut plantations are in fruit orchards and other permanent crops. Hazelnut plantations cover 7 138 320 da in agricultural landscapes in Turkey (Table 2). Hazelnut plantations are located in northern, eastern and middle Black Sea Region of Turkey (Turna, 2012).

<b>Cities of Turkey</b>	<b>Areas (da)</b>
Artvin	224 026
Giresun	1 322 837
Ordu	2 106 005
Rize	618 472
Sakarya	759 062
Samsun	947 738
Trabzon	607 456
Düzce	552 724
<b>Total</b>	<b>7 138 320</b>

**Table 2.** Distribution of hazelnut plantations in Turkey (According to values of Republic of Turkey Ministry of Food, Agriculture and Livestok in 2012)

In recent years, a new concept that emerged in the agricultural landscape has been the homegardens.

### What is “Homegarden”?

Homegarden is an agroforestry term for any agro-silvo pastoral activities carried out intentionally within one’s houselot primarily for food, but also for medicine, side-income and landscape (Mohan, 2004).

Homegardens are unique agroforestry systems. These intensive land-use systems involving the planned management of multipurpose trees and shrubs grown in intimate association with herbaceous species (mainly annual, perennial, and seasonal agricultural crops), and livestock, are all managed within the compounds of individual homes (Fernandes and Nair, 1986 and Mohan, 2004). Homegardens provide both economic and social advantages. They, with their various agricultural crops and trees, accomplish the basic needs of the local population. In addition, homegardens provide economic benefits while remaining ecologically sound and biologically sustainable (Mohan, 2004).

There are the relationship between homegardens and landscape architecture as ecological and visual.

- *As ecological*, socioeconomic structure, cultural behaviors and personal preferences, seem to be the main characteristics of the appearance, function, and structure of homegardens (Christanty, 1990, Mazumdar and Mazumdar, 2012). The homegardens usually have more various plant canopy types and thus they are more complex than the urban or rural gardens. The crops, ornamental plants and trees planted in a homegarden are carefully arranged to provide for specific functions and benefits, which are primarily economic in nature. The other effects of ecological relation of homegardens to landscape architecture are their complexity of patterns, diversity of plants, naturalness or not and climatic features.
- *As visual*, generally, the places are where people live and throw the day unwinding. They are focal points combining people with have a range of plant richness and diversity. Most of the time, the people who live in these places is highly valued as a visual riches on offer. Therefore, the characteristic features of each garden include cultural designs (Moreno-Black et al., 1996 and Mohan, 2004).

## 2. An application on homegardens in hazelnut plantations

Homegardening is a traditional agroforestry system where a clearly bounded piece of land immediately surrounding the dwelling house is cultivated with a mixture of perennials and annuals. Can homegardens conserve biodiversity and develop landscape planning in Turkey? This is an important question, given the low forest cover in the country and peoples’ high dependency on the natural production systems. The first step in assessing the conservation value of homegardens is to undertake a thorough botanical and structural survey. Total plant diversity measures the direct conservation value of homegardens, while structural features may indirectly conserve other taxa, such as birds, reptiles, amphibians, small mammals, or arthropods (Kabir and Webb 2007, Sunwar et al. 2006, Smith et al. 2006, Peyre et al. 2006, Ali 2005, Blanckaert et al. 2004, Wezel and Bender 2003). Homegardens are

an integral part of the farming system, an adjunct to the house where selected trees, shrubs and herbs are grown for edible products and cash income (Pandey et al. 2007, Trinh et al. 2003, Ceccolini 2002).

Homegardens are a common feature in Turkey like what they are in many countries, and often exhibit remarkable variability in composition and structure in geographic regions of Turkey. The homegardens in urban in the Black Sea region in Turkey related to urban-rural are basically the determiners to form the urban and regional landscape patterns. In this region, the homegardens having minimal and limited area, the importance and functions with effective systems contains mainly the hazelnut (*Corylus avellana*) and tea (*Camelia chinensis*) plantations. The hazelnut plantations are more common than the other agricultural crops in Northern Black Sea Region of Turkey especially in Trabzon.

## 2.1. Material and methods

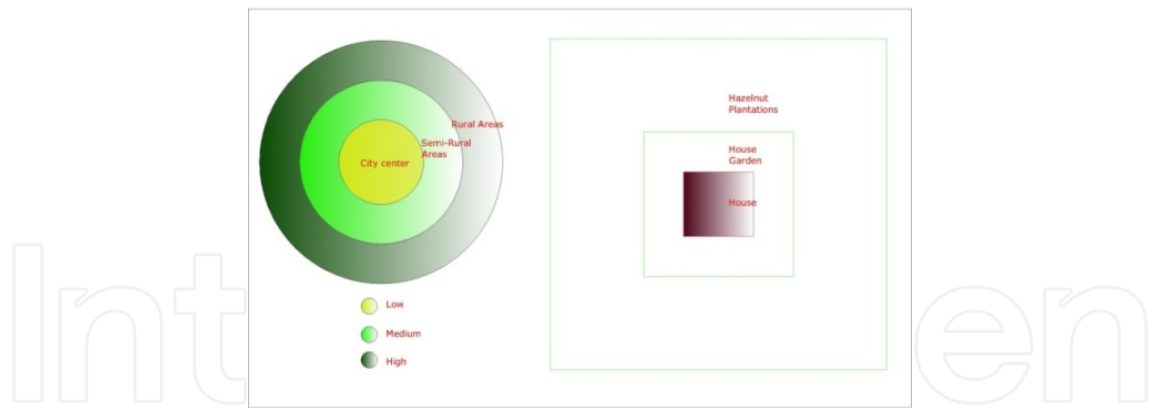
### Study Area

This stage has been carried out within the city of Trabzon, in the northeastern Black Sea Region of Turkey (401330N–411070N; 371070E–401300E UTM) (Figure 1-2). The city of Trabzon, which covers an area of approximately 4.685 km<sup>2</sup>, has a population about 283.233 inhabitants making it the third largest principal city in the region (Anonymous 2008).

The aim of this study is to determine the potential of contributions of landscape planning and designing of the homegardens in Trabzon city of Turkey. Therefore, the hazelnut plantations were evaluated in Trabzon city.



**Figure 1.** Study Area



**Figure 2.** Disturbutions of Home Gardens and Some of the Homegardens in Trabzon City

### Methods

In this study, about 30 homegardens having hazelnut plantations (Figure 3) around Trabzon were examined and plants being in these gardens were identified (Acar et al. 2007 and Tokul 2001) (Table 3).



**Figure 3.** Hazelnut (*Corylus avellana*) Plantations and Hazelnut Fruits and Leaves

## 2.2. Results

Turkey has 9 cultivated *Corylus avellana* taxa and they are named differently by the indigenous people (Anonymous 2007).

The species near the borders, in deeper sides and under the hazelnut plants in the research areas were identified. According to this research, totally 90 annual and biannual species (19 species near the borders, 14 inside and 57 under the hazelnut plants) were identified (Figure 4) (Table 3).

Hazelnut is one of the most important income resources among all agricultural products in Turkey and the country is number one in the list of hazelnut producers with the rate of 72 percent all over the world. Trabzon and its neighborhoods have important hazelnut plantations and most of the green areas in the urban side are these hazelnut fields (Reis, 2003).

Hazelnut plantations also include fruit trees such as *Malus* sp. (Apple), *Prunus* sp. (Plum), *Pyrus* sp. (Pear), *Prunus persica* (Peach).

Hazelnut fields are on slopes of the riverbanks in general, especially because of the geography of the Black Sea Region. Indigenous people in the area plant some trees to conserve their hazelnut fields and to make the borders of neighborhoods clear (Table 3).

Plant Species	Native	Exotic	Fruit	Groundcover	Shrub	Tree	Hedge	Within Homegarden
<i>Acer campestre</i>	X					X	X	
<i>Achillea millefolium</i>	X			X				
<i>Agrimonia eupatoria</i>	X			X				
<i>Allium cepa</i>	X			X				
<i>Allium porrum</i>	X			X				
<i>Alnus glutinosa subsp. glutinosa</i>	X					X	X	
<i>Bellis perennis</i>	X			X				
<i>Brassica oleracea</i>	X			X				
<i>Capsella bursa-pastoris</i>	X			X				
<i>Carpinus betulus</i>	X					X	X	
<i>Carpinus orientalis</i>	X					X	X	
<i>Chaerophyllum aureum</i>	X			X				
<i>Cirsium arvense</i>	X			X				
<i>Colchicum speciosum</i>	X			X				
<i>Cornus mas</i>	X		X				X	X
<i>Cornus sanguinea</i>	X				X		X	
<i>Corylus avellana</i>	X		X					X
<i>Crataegus monogyna</i>	X				X		X	
<i>Cydonia oblonga</i>		X						X
<i>Dactylorhiza euxina</i>	X			X				

Plant Species	Native	Exotic	Fruit	Groundcover	Shrub	Tree	Hedge	Within Homegarden
<i>Daucus corota</i>	X			X				
<i>Diospyros kaki</i>	X		X					X
<i>Diospyros lotus</i>	X		X					X
<i>Dryopteris dilotata</i>				X				
<i>Echium vulgare</i>	X			X				
<i>Euphorbia peplis</i>	X			X				
<i>Fagus orientalis</i>	X					X	X	
<i>Ficus carica</i>	X		X					X
<i>Fragaria vesca</i>	X			X				X
<i>Fraxinus exelcior</i>	X					X	X	X
<i>Galeobdelon luteum</i>	X			X				
<i>Galium aparine</i>	X			X				
<i>Geranium purpureum</i>	X			X				
<i>Hedera helix</i>	X			X				X
<i>Helleborus orientale</i>	X			X				X
<i>Heracleum apiifolium</i>	X			X				
<i>Hypericum perforatum</i>	X			X				
<i>Lamium purpureum</i>	X			X				
<i>Laurocerasus officinalis</i>	X		X				X	X
<i>Lysimachia verticillaris</i>	X			X				
<i>Malus sylvestris</i>		X	X					X
<i>Mercurialis perennis</i>	X			X				
<i>Myosoton aquaticum</i>	X			X				
<i>Nasturtium officinale</i>	X			X				
<i>Ostrya carpinifolia</i>	X					X	X	
<i>Phaseolus vulgaris</i>	X			X				
<i>Phytolacca americana</i>	X			X				
<i>Picea orientalis</i>	X					X	X	X
<i>Pimpinella rhodantha</i>	X			X				
<i>Pisum sativum</i>	X			X				
<i>Plantago major</i>	X			X				
<i>Platanus orientalis</i>	X					X	X	X
<i>Polygala major</i>	X			X				
<i>Polygonum aviculare</i>	X			X				
<i>Populus nigra</i>	X					X	X	X
<i>Primula vulgaris</i>	X			X				
<i>Prunus avium</i>		X	X					X
<i>Prunus cherry</i>		X	X					X
<i>Prunus domestica</i>		X	X					X
<i>Prunus persica</i>		X	X					X
<i>Pyrus sylvestris</i>		X	X				X	X



Plant Species	Native	Exotic	Fruit	Groundcover	Shrub	Tree	Hedge	Within Homegarden
<i>Quercus hartwissiana</i>	X					X	X	
<i>Ranunculus constantinopolitanus</i>	X			X				
<i>Raphanus raphanistrum</i> subsp. <i>Raphanistrum</i>	X			X				
<i>Rhinanthus angustifolius</i>	X			X				
<i>Rosa canina</i>	X				X		X	
<i>Rubus fruticosus</i>	X				X		X	
<i>Rumex acetosella</i>	X			X				
<i>Rumex pulcher</i>	X			X				
<i>Ruscus acuelatus</i>	X			X				
<i>Salvia glutinosa</i>	X			X				
<i>Sambucus ebulus</i>	X			X				
<i>Sambucus nigra</i>	X				X		X	
<i>Scrophularia nodosa</i>	X			X				
<i>Senecio vulgaris</i>	X			X				
<i>Stachys</i> sp.	X			X				
<i>Stelleria media</i>	X			X				
<i>Tanacetum parthenium</i>	X			X				
<i>Taraxacum crepidiforme</i>	X			X				
<i>Trachytomon orientalis</i>				X				
<i>Trifolium pratense</i>	X			X				
<i>Trifolium repens</i>	X			X				
<i>Tussilaga farfara</i>	X			X				
<i>Ulmus minor</i>	X					X	X	X
<i>Veronica officinalis</i>				X				
<i>Vicia cracca</i>	X			X				
<i>Vinca major</i>	X			X				
<i>Vitis</i> sp.		X	X					X
<i>Zea mays</i>	X			X				

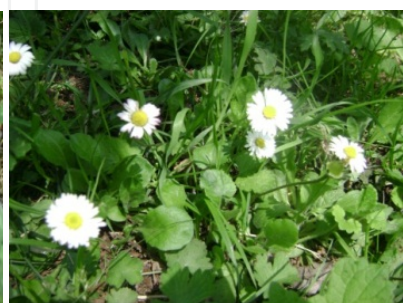
**Table 3.** Plant Species in Home Gardens (Hazelnut Plantations) of Trabzon City



*Ground cover compositions*



*Trifolium repens*



*Bellis perennis*



**Figure 4.** Some of the Ground Covers Under the Hazelnut Plantations

### 3. Conclusions

The results of this study can be given the following items.

- Hazelnut plantations are very important income resources for the indigenous people.
- The homegardens having hazelnut plantations are the most dominate open green areas in and around Trabzon city.
- Some agricultural products such as hazelnut, tea etc. creates habitats for some other plants, which makes a serious contribution to biodiversity in urban areas.
- It is easy to claim that hazelnut fields are useful to get some fruits at the same time. That is the reason that hazelnut plantations should be supported for agroforestry studies.
- Homegardens contributes to floral diversity of landscape architecture with owned plant biodiversity.
- Especially, agricultural landscapes have different visual preferences affect people as visual effects. In this context, their diversity of size, color, texture, form effect on and visual state of landscape.
- Agricultural landscapes are in the landscape ecology concepts as patch and matrix (Forman, 1983, Forman and Godron 1986, Forman, 1995). According to Eroğlu, 2012, plant compositions that created by agricultural patches are important landscape element both visually and ecologically. Therefore, homegardens are important ecological patches and landscape elements.

- Homegardens and agricultural landscapes are to consider landscape components with their visual and ecological potentials in optimal land use planning, landscape development plans, development plans, landscape plans and local levels in terms of design applications.

Homegardens include some cultural features such as plant material, planting style, agricultural applications and architectural structure. In order to evaluated tothese characteristics in tourism and tourism planning, they must be investigated and explored.

### Author details

Engin Erođlu

*Düzce University, Faculty of Forestry, Department of Landscape Architecture, Düzce, Turkey*

Cengiz Acar

*Karadeniz Technical University, Faculty of Forestry, Department of Landscape Architecture, Trabzon, Turkey*

İbrahim Turna

*Karadeniz Technical University, Faculty of Forestry, Department of Forest Engineering, Trabzon, Turkey*

### 4. References

- Acar, C., Acar, H., Erođlu, E. (2007). Evaluation of Ornamental Plant Resources to Urban Biodiversity and Cultural Changing; A Case Study of Residential Landscapes in Trabzon City (Turkey). *Building and Environment*. Vol. 42. Pages. 218-229.
- Ali, A.M.S. (2005). Homegardens in Smallholder Farming Systems: Examples From Bangladesh. *Human Ecology*, Vol. 33, No. 2, April 2005 ( 2005).
- Anonymous. (2007). <http://www.findık.com/yetiřtiricilik.asf?sayfa=102>. (accessed 12 December 2007)
- Anonymous. (2008). Trabzon Valiligi, <http://www.trabzon.gov.tr/index.htm>, 2008 (accessed 10 January 2008).
- Atik, M. (2009). Avrupa Birliđinde Dođanın Korunması ve Natura 2000, Türkiye ve Orta Dođu Amme İdaresi Enstitüsü Yayını, No: 354, Yerel Yönetimler Merkezi yayını No: 27, Sayfa: 119-134, Ankara.
- Blanckaert, I., Swennen, R.L., Paredes Floresa, M., Rosas, R., Lopeza, R., Saadea, L. (2004). Floristic Composition, Plant Uses and Management Practices in Homegardens of San Rafael Coxcatlan, Valley of Tehuacan-Cuicatlan, Mexico. *Journal of Arid Environments* 57, 39–62.
- Ceccolini, L. (2002). The Homegardens of Soqotra Island, Yemen: An Example of Agroforestry Approach to Multiple Land-Use in an Isolated Location. *Agroforestry Systems* 56: 107–115,

- Çepel, N. (1990). *Ekolojik Terimler Sözlüğü*. İstanbul Üniversitesi Orman Fakültesi Yayınları, 3048, ISBN 975-404-195-4, İstanbul.
- Christanty, L. (1990). Homegardens in Tropical Asia, with Special Reference to Indonesia. Homegardens in Tropical America: A Review. In: K. Landauer, K and Brazil, M (eds.), *Tropical Homegardens*, pp 9-20. United Nations University Press, Tokyo, Japan.
- Council of Europe, (2000). *European Landscape Convention*, Council of Europe, Strasbourg.
- EC, (2012). *European Commission, Agricultural and Rural Development*, Brussels.
- Fernandes, E.C.M., Nair, P.K.R. (1986). An Evaluation of the Structure and Function of Tropical Homegardens. *Agricultural Systems* 21:279-310.
- Forman, R.T.T., Godron, M., (1986). *Landscape Ecology*, Wiley, New York.
- Forman, R.T.T. (1983). Corridors in a Landscape: Their Ecological Structure and Function, *Ekologia (Czechoslovakia CSSR)*, 2,375-387.
- Forman, R.T.T. (1995). *Land Mosaics Ecology of Landscape and Region*, Cambridge University Press, Cambridge, U.K.
- Gökalp, D.D., Yazgan, E.M. (2013). Kırsal Peyzaj Planlamada Agroturizm ve Agriturizm. *KMÜ Sosyal ve Ekonomik Araştırmalar Dergisi* 15 (24): 25-29, ISSN: 1309-9132.
- Kabir, E., Webb, E.L. (2008). Can Homegardens Conserve Biodiversity in Bangladesh? *Biotropica* 40(1): 95–103 2008.
- Karahan, F., Orhan, T. (2008). Uzundere Vadisi Tarımsal Faaliyetlerinin Peyzaj Çeşitliliğine Etkileri. *Alinteri*, 15(B), 26-32, ISSN: 1307-3311.
- Mazumdar, S., Mazumdar, S. (2012). Immigrant Home Gardens: Places of Religion, Culture, Ecology, and Family. *Landscape and Urban Planning* 105 (2012) 258–265.
- Mohan, S. (2004). *An Assessment of the Ecological and Socioeconomic Benefits Provided By Homegardens: A Case Study of Kerala, India*. A Dissertation Presented to the Graduate School of the University of Florida in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy. University of Florida.
- Moreno-Black, G., Somnasang, P., Thamathawan, S. (1996). Cultivating Continuity and Creating Change: Women's Home Garden Practices in Northeastern Thailand. *Agriculture and Human Values* 13: 3-11.
- Pandey C.B., Rai, R.B., Singh, L., Singh. A.K. (2007). Homegardens of Andaman and Nicobar, India. *Agricultural Systems* 92,1–22.
- Peyre, A., Guidal A., Wiersum. K.F., Bongers, F. (2006). Dynamics of Homegarden Structure and Function in Kerala, India. *Agroforestry Systems* (2006) 66:101–115.
- Reis, S. (2003). *Çevresel Planlamalara Altlık Bir Coğrafi Bilgi Sistemi Tasarımı ve Uygulaması: Trabzon İl Bilgi Sistemi (TİBİS) Modeli*, Doktora Tezi, D: Yomralıoğlu T., KTÜ Fen Bilimleri Enstitüsü Jeodezi ve Fotog. Müh., s.1-181, Trabzon.
- Smith, R.M., Philp H.W., Ken,T., Kevin J.G. (2006). Urban Domestic Gardens (VI): Environmental Correlates of Invertebrate Species Richness. *Biodiversity and Conservation*.15:2415–2438.
- Sunwar, S., Gustaf, T.C.M, Subedi, A., Bystrom, M. (2006). Homegardens in Western Nepal: Opportunities and Challenges for on-farm Management of Agrobiodiversity. *Biodiversity and Conservation* (2006) 15:4211–4238.

- Tokul, A. (2001). Şalpazarı-Ağasar Deresi Havzası Tarım Arazileri ile Orman Vejetasyonunun Floristik Yönden Karşılaştırılması. KTÜ Orman Fakültesi Orman Müh. Bölümü, Orman Botaniği ABD. Bitirme Tezi, Trabzon.
- Trinh, L.N., Watson, J.W., Huec, N.N., Ded, N.N., Minhe, N.V., Chuf, P., Sthapit, B.R., Eyzaguirre, P.B. (2003). Agrobiodiversity Conservation and Development in Vietnamese Home gardens. *Agriculture, Ecosystems and Environment* 97 317–344.
- Turna, İ. (2012). Tarımsal Ormancılık Ders Notları. KTÜ Orman Fakültesi Orman Mühendisliği Bölümü Silvikültür Anabilim Dalı, Trabzon.
- Wezel, A., Bender, S. (2003). Plant Species Diversity of Homegardens of Cuba and Its Significance for Household Food Supply. *Agroforestry Systems* 57: 39–49, 2003.