

Landscape Characteristics and Main Plant Species of Floristic Composition of Doğanbey Old Village in Aydın

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ABSTRACT

Doğanbey old village is a historic rural settlement that is located in the national park of Dilek Peninsula Büyük Menderes Delta. The village reflects rural and unique landscape characteristics and units with both natural and human-influenced elements. The aim of this study is to determine floristic composition of the village and to confirm landscape characteristics by field study. As the methodology; empirical analyses were implemented to determine rural landscape characteristic units and plant species identification at the site. Both native and cultural plant species of the village were determined at the site. Results support the uniqueness of the village with its endemic plant species and its rural habitat. In conclusion; touristic potential of the village should be highlighted with a pro-environmental approach, and future implication or development plans should consider biodiversity conservation from the aspect of sustainability of the village.

Keywords: Dilek Peninsula Büyük Menderes Delta National Park, Doğanbey old village, floristic composition, visual landscape characteristics

Introduction

Landscape defines a frame of a scenery and has a holistic character with its components. Measuring the landscape characteristic studies increase day by day. Cultural Ecosystem services which is recognized for human wellbeing can be measured by the landscape characteristics also (Ridding et al., 2018). Landscape has a mosaic character that is formed by both natural and human effects, but when it completes its natural succession, then we can clearly define the components of the holistic landscape. For instance, a rural landscape component can be crop fields, line ordered plantations, one or two storey country houses or a streamline with specific plantations. Urban landscape characteristics can be different and suitability can be observed between the components; as more paved areas, high storey buildings, formal design of the streets and squares (State of Western Australia, 2007).

Wang and Yu define landscape characteristic as unique aesthetic features that can distinguish one scene from another in certain time and space ranges (Wang & Yu, 2012). This defining the uniqueness that peculiar to the area. In the light of this information; this study clarifies the peculiar landscape characteristics of Doğanbey Old Village with reference to its floristic composition and scenery features.

Material and Methods

Material

Doğan Bey Old Village is the study area of this manuscript which is located in the national park of Dilek Peninsula Büyük Menderes Delta in Aydın, Turkey (Figure 1). The village is ancient from BC VII and had been home to many ancient cities as Tebai and Lade. The name of Doğanbey old village comes from "Domatia" as Greek name. It is the village of Söke sub province. Other previous villages are Tuzburgazı and Atburgaz, which come previously before Doğanbey Village.

This manuscript examines the visual landscape characteristics of Doğanbey old village that is well known with its historical and architectural features. Visual landscape characteristics comprise both manmade and natural features as architectural and floristic structure. (State of Western Australia, 2007).

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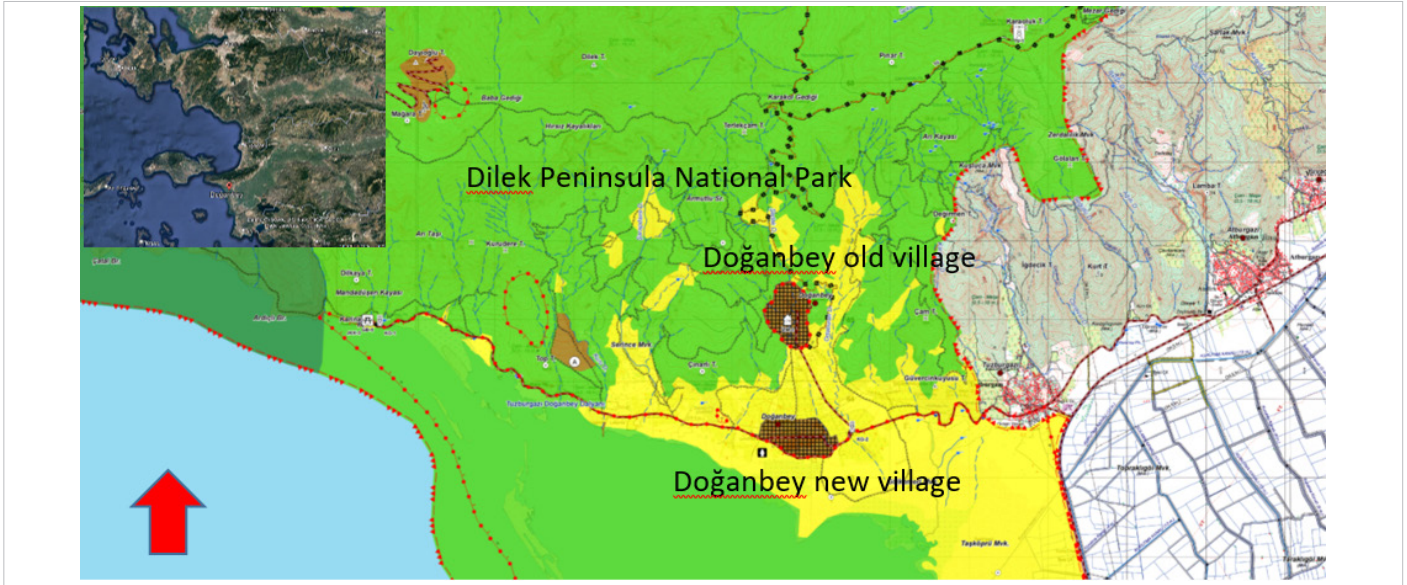


Figure 1.
Location of Doğanbey Old Village in Dilek Peninsula Büyük Menderes Delta National Park (Without Scale).

General Features of the Study Area Doğanbey Old Village

Typical Greek Architecture style can be seen at the village with tiny stone houses in 2 storeys. The first storey is generally used for animals. The original residents were Greek people from Samos, Chios and Cyprus islands. After the agreement between Turkey and Greece in 1923; Greek residents moved, and Turkish people from Thessaloniki came and settled down at the village.

The original structure of the houses were just individual rooms ordered around the courtyard. Domatia means room in Greek language. Since the structure forms of the houses are the rooms ordered around a courtyard; the village name comes from these individual rooms as the structure style is Domatia (Öden, 2019).

The village has two centers that are social and religious. After the settlement of Turkish people, since they engaged with agriculture, they needed more flat area, and after a while, they left the village in 1980 and moved to the lowland plains, which are more suitable for agriculture. This new location called New Doğanbey Village (Figure 1).

After the abandonment of the old village, new residents bought the ruin of houses and restored them as adhered to original structures. Local stones of the old village were marble and slate that extract from Mykele Mountain near the village (Öden, 2019). This part summarizes the Doğanbey Old and New Villages' historical processes.

Village is a well-conserved village with its natural texture both from the aspect of construction structures of the houses and floristic composition. Since the old village is protected by a national park status, constructions can only be restored by the approval of the restoration projects from cultural and natural heritage preservation board. The village has a high tourism potential, touristic visits has seen by both foreign and domestic tourists.

Landscape Characteristics of the Village

It reflects a holistic rural landscape characteristic with both cultivated and native plant species. Original local stone-paved paths separating the drain and the pedestrian path (Figure 2), local stone material of the house structures are leading regional characteristics peculiar to the village. Causeys are very common as the street structure of Doğanbey

village. Şarлак stream runs through the village and divides the village into two parts (Figure 3). The village has characteristic components of streamside rural landscape that can be defined with the native plant species as *Vitex agnus castus*, *Nerium oleander*, *Platanus orientalis* and *Spartium junceum*.

Turkey has divided into 58 natural landscape characteristics according to the study of Erol (1993), as cited in Uzun (2018). In this study; bedrocks, geomorphology, geologic structures, climatology, ground and underground hydrology, wild life, biotic conditions, abiotic conditions are all considered and then general landscape characteristics are

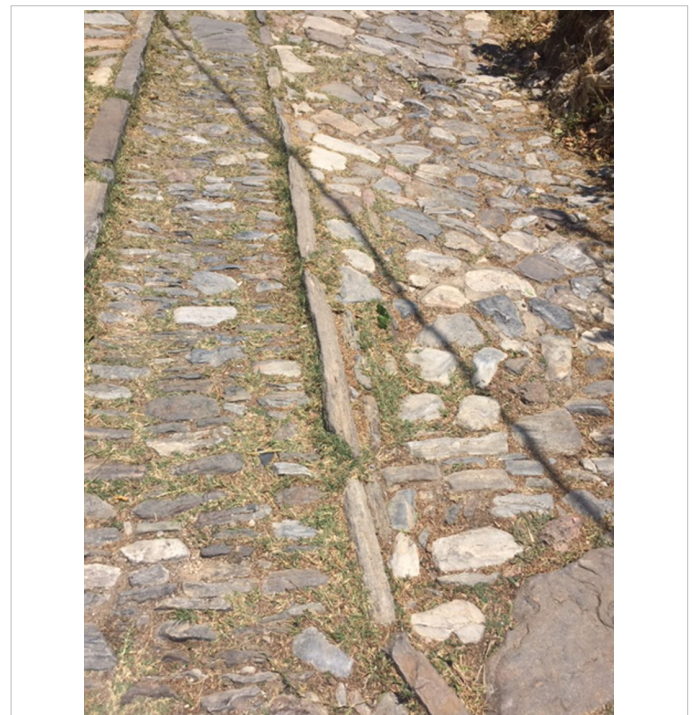


Figure 2.
Stone Path That Divides the drain and Pedestrian (own photo).



Figure 3.
 Şarlak Stream That Runs Through the Village (Photo: Şat, 2021).

determined. Erol (1993) had been created a general landscape characteristic map of Turkey in a scale of 1/2.000.000 (Figure 4).

According to this map, Doğanbey Old Village takes place at 12120 North Menderes massive landscape. This considers the bedrock difference. But this kind of classification remains incapable from the aspect of giving visual details of the landscape. In some sort of landscapes; geomorphological structures come forth as in Kapadokya or Pamukkale, and for other landscapes; different structures come forth

as the unique features peculiar to that local area. It changes whether the features of the local area.

Landscape characteristics in settlements are different. In the areas where the lack of naturalness, different features considered as built environment suitability, historic buildings, landmarks, art works etc (State of Western Australia, 2007). Landscape characteristics in settlements and urban areas may be influenced by various factors such as social, economic and cultural impacts (Wang & Yu, 2012).



Figure 4.
 Landscape Characteristics of Turkey (Erol, 1993).

Table 1.
Landscape Character Type Definition (Visual Landscape Management System, Department of CALM, 1994)

Visual Significance	Landform	Vegetation Patterns	Water Form
High			
Moderate			
Low			
(Anonymus, 1994)			

Doğanbey Old Village located in a geothermal area (Tarcan & Gemici, 2003); besides this natural features, village has scenery features as visual characteristics. Previous studies about the village shows tourism potential as the old village track with both Turkish and Greek architecture carrying the traces of the past civilizations (Kılıçaslan et al., 2011).

Methodology

Methodology has two stages; that are determining the landscape characteristics visually and determining the floristic composition on site with empirical studies. Determining floristic composition was important since creates an evidence for naturalness of the village. Naturalness of the village is a point that we consider on site studies to determine the landscape characteristic type.

At first; we define the visual landscape character as natural, artificial or built or rural. We used the Landscape Character Type Definition Chart to determine the landscape characteristics of the village. Then we define the landscape character units as landform, vegetation, water bodies, human land use that make an area identifiable or unique (State of Western Australia, 2007). Visual landscape study requires a matrix classification by considering the area's features as defined in table below (Table 1).

The above table can be filled by local observation and assessment on site. This can be achieved by determination of visual landscape quality assessment. Visual landscape quality assessment requires an empirical study on;

- Landscape character of hub site and context.
- Degree of evident alteration or change from the naturally established landscape character-based on level of "naturalness".
- Degree and sensitivity of views and seen areas from travel routes and use areas (duration, frequency, position in the landscape, number of viewers, distance).
- Public perception of landscape values of hub sites (related to the level of concern for visual landscape values and sensitivity rating).
- Special features and focal points within view of the hub site.

Results

Landscape characteristics of Doğanbey Old Village

Landscape character type of Doğanbey Old Village is determined by considering the natural and the artificial features as defined in table 2 below (Table 2).

According to this table, rural characteristics of the area, tried to be clarified and determined by their unique and common features. Those defined features reflect the rural character. As the example for characteristic features of a rural landscape; linear plantation, cropland sizes, stone fountains, paved roads, local materials as windmill, historic buildings, roadside or streamside vegetation and remnant vegetation and more can be given. At this stage floristic composition was used to determine the naturalness of the village.

Doğanbey Old Village's Floristic Structure with Both Cultivated and Native Plant Species

In the village; the stream bed and some of the stone house ruins indicate the native plant species of the area and, they reflect the floristic structure of the village. Besides many cultivated plants observed in the village. Sixty plant species belong to 33 families are determined in the village. (Table 3.) Botanical nomenclature follows the "Flora of Turkey and East Aegean Islands" of Davis (Davis, 1965–1985).

Capparis spinosa, *Sarcopoterium spinosum*, *Silybum marianum*, *Olea oleaster*, *Campanula tomentosa*, *Verbascum sp.*, *Phillyrea latifolia* and *Euphorbia sp.* are the native species defined at the ruins of the stone houses (Figure 5-8). At the stream bed, mostly *Vitex agnus castus*, *Nerium*

Table 2.
Doğanbey Old Village Character Type and Visual Landscape Features

Visual Significance	Landform	Vegetation Patterns	Water Form	Human-Influenced Features
High	Natural Delta view from the village Natural embankments which is in harmony with settlement area, like a man-made form but is a natural form of Şarлак stream which runs through the village and separates the settlement into two parts	Individual remnant vegetation stands and exotic trees Ephemeral wild plant species which is harmony with houses Ornamental plantation Existence of endemic plant species on stone walls of the village	Linear form of seasonal stream valley which runs through the village Embankment slope and typical streambed vegetation	Historic stone houses built by local materials Paved road patterns
Moderate	Hills and valleys are the natural landforms of the village Rock outcrops	Dwarf Mediterranean vegetation type		Drinking fountains which is peculiar to the village
Low	Valley slopes			Stone borders of the houses that comprise the courtyards

Table 3.
Cultivated and Native Plant Species Determined at the Village

No.	Scientific Name	Common Name (Tr)/(En)	Cultivated (Cv) or Natural (N)	Familia
1	<i>Acacia dealbata</i> Link.	Mimoza/Silver wattle	Cv.	Fabaceae
2	<i>Agave americana</i> L.	Sarısabır/American aloe	Cv.	Asparagaceae
3	<i>Albizia julibrissin</i> Durazz.	Gülibrişim/Persian Silk tree	Cv.	Fabaceae
5	<i>Asphodelus aestivus</i> Brot.	Çiriş otu/Summer asphodel	N	Asphodelaceae
6	<i>Bougainvillea spectabilis</i> Willd.	Begonvil/Great bougainvillea	Cv.	Nyctaginaceae
7	<i>Caesalpinia gilliesii</i> (Hook.) D. Dietr.	Aslan bıyığı/Bird of paradise	Cv.	Fabaceae
8	<i>Campanula tomentosa</i> Lam.	Tüylü çançığeği/Furry bellflower	N	Campanulaceae
9	<i>Campsis radicans</i> (L.) Seem.	Acem borusu/Trumpet vine	Cv.	Bignoniaceae
10	<i>Capparis spinosa</i> L.	Kapari/Caper bush	N	Capparaceae
11	<i>Carpobrotus edulis</i> (L.) N.E. Br.	Kaz ayağı/ice plant	Cv.	Aizoaceae
12	<i>Ceratonia siliqua</i> L.	Keçi boynuzu/Carob	N	Fabaceae
13	<i>Cercis siliquastrum</i> L.	Erguvan/Judas tree	Cv.	Fabaceae
14	<i>Chamaerops humulis</i> L.	Bodur palmiye/Chamaerops	Cv.	Arecaceae
15	<i>Citrus limon</i> (L.) Osbeck.	limon/Lime	Cv.	Rutaceae
16	<i>Cupressus sempervirens</i> L.	Akdeniz servisi/Mediterranean cypress	N	Cupressaceae
17	<i>Cydonia oblonga</i> Mill.	Ayva/Quince	Cv.	Rosaceae
18	<i>Duranta erecta</i> L.	Menekşe ağacı/Pigeon berry	Cv.	Verbenaceae
19	<i>Elaeagnus angustifolia</i> L.	İğde/Russion olive	Cv.	Elaeagnaceae
20	<i>Eriobotrya japonica</i> (Thunb.) Lindl.	Yenidünya/Loquat	Cv.	Rosaceae
21	<i>Eucalyptus globulus</i> Labill.	Okalıptus/Blue gum	Cv.	Myrtaceae
22	<i>Euphorbia</i> sp.	Sütleğen/Spurge	N	Euphorbiaceae
23	<i>Ficus carica</i> L.	İncir/Common fig	Cv.	Moraceae
24	<i>Fragaria vesca</i> L.	Çilek/Woodland strawberry	Cv.	Rosaceae
25	<i>Gazania</i> sp.	Koyungözü papatya/Gazania	Cv.	Asteraceae
26	<i>Helichrysum</i> sp.	Ölmez çiçeği/Strawflower	Cv.	Asteraceae
27	<i>Juglans regia</i> L.	Ceviz/Persian walnut	Cv.	Juglandaceae
28	<i>Juniperus sabina</i> L.	Yatay ardıç/Savin juniper	Cv.	Cupressaceae
29	<i>Lagerstroemia indica</i> (L.) Pers.	Oya/Crepe myrtle	Cv.	Lythraceae
30	<i>Lantana camara</i> L.	Mine çalısı/Spanish flag	Cv.	Verbenaceae
31	<i>Laurus nobilis</i> L.	Defne/Sweet bay	N	Lauraceae
32	<i>Lavandula angustifolia</i> Mill.	Lavanta/Lavender	Cv.	Lamiaceae
33	<i>Melia azedarach</i> L.	Tespah ağacı/China berry tree	Cv.	Meliaceae
34	<i>Morus alba</i> L.	Beyaz dut/White mulberry	CV.	Moraceae
35	<i>Nerium oleander</i> L.	Zakkum/Oleander	N	Apocynaceae
36	<i>Nicotiana glauca</i> Graham	Yabani tütün/Tree tobacco	Cv.	Solanaceae
37	<i>Olea europaea</i> L.	Zeytin/Olive	Cv.	Oleaceae
38	<i>Olea oleaster</i> Hoffmanns. & Link.	Delice/Wild olive	N	Oleaceae
39	<i>Parthenocissus quinquefolia</i> (L.) Planch.	Amerikan sarmaşığı/Virginia creeper	Cv.	Vitaceae
40	<i>Phillyrea latifolia</i> L.	Akçakesme/Green olive tree	N	Oleaceae
41	<i>Pinus brutia</i> Ten.	Kızılçam/Turkish pine	N	Pinacea
42	<i>Pinus pinea</i> L.	Fistikçamı/Stone pine	Cv.	Pinacea
43	<i>Pistacia terebinthus</i> L.	Menengiç/Terebinth	N	Anacardiaceae
44	<i>Platanus orientalis</i> L.	Doğu çınarı/Oriental plane	N	Platanaceae
57	<i>Platycladus orientalis</i> (L.) Franco	Doğu mazısı/Chinese arborvitae	Cv.	Cupressaceae
45	<i>Prunus armeniaca</i> L.	Kayısı/Apricot fruit	Cv.	Rosaceae

No.	Scientific Name	Common Name (Tr)/(En)	Cultivated (Cv) or Natural (N)	Familia
4	<i>Prunus dulcis</i> (Mill.) D.A. Webb	Badem/Sweet Almond	Cv.	Rosaceae
46	<i>Punica granatum</i> L.	Nar/Pomegranate	Cv.	Lythraceae
47	<i>Pyracantha coccinea</i> M. Roem.	Ateşdikeni/Red firethorn	Cv.	Rosaceae
48	<i>Quercus coccifera</i> L.	Kermes meşesi/Kermes oak	N	Fagaceae
49	<i>Quercus pubescens</i> Willd.	Tüylü meşe/Downy oak	Cv.	Fagaceae
50	<i>Robinia pseudoacacia</i> L.	Yalancı akasya/Black locust	Cv.	Fabaceae
51	<i>Rosmarinus officinalis</i> L.	Biberiye/Rosemary	Cv.	Lamiaceae
52	<i>Salvia officinalis</i> L.	Adaçayı/Common sage	Cv.	Lamiaceae
53	<i>Sarcopoterium spinosum</i> (L.) Spach	Abdestbozan/Prickly	N	Rosaceae
54	<i>Schinus molle</i> L.	Yalancı karabiber ağacı/American pepper	Cv.	Anacardiaceae
55	<i>Silybum marianum</i> (L.) Gaertn.	Deve dikeni/Milk thistle	N	Asteraceae
56	<i>Spartium junceum</i> L.	Katırtırnağı/Spanish broom	N	Fabaceae
58	<i>Verbascum</i> sp.	Siğirkuyruğu/Mullein	N	Scrophulariaceae
59	<i>Vitex agnus castus</i> L.	Hayıt/Chaste tree	N	Lamiaceae
60	<i>Vitis vinifera</i> L.	Asma/Common grape vine	Cv.	Vitaceae

oleander, *Platanus orientalis*, *Spartium junceum* species were observed as characteristic species of the streambed. Besides this, *Campanula tomentosa* which is an endemic plant species of the area is well conserved with its habitat as the stone walls (Figure 9).

Cultivated plants were also observed in the village. Those species are mostly top fruit species as *Punica granatum*, *Cydonia oblonga*, *Prunus armeniaca*, *Citrus limonum*, *Fragaria vesca*, *Juglans regia*, *Eriobotrya japonica* and *Olea europaea*. Also, some herbal and shrub species identified to use for meals and medicinal tea as *Salvia* sp., *Rosmarinus* sp., *Laurus nobilis*, *Vitis vinifera*, *Ficus carica* and *Seratonia siliqua*.

In addition to this useful species, ornamental species used at the close surrounded yards of the houses as *Lagerstroemia indica*, *Nerium oleander*, *Campsis radicans*, *Parthenocissus quinquefolia*, *Lantana camara*, *Acacia dealbata*, *Albizzia julibrissin*, *Caesalpinia gilliesii*, *Juniperus Sabina* and *Nicotiana glauca* (Figure 10-13).

Discussion, Conclusion, and Recommendations

Measurement of Landscape characteristics is a substantial issue that reflects various visual parametric. Even the characteristics are determined and classified as the main objects of the landscape by the experts, it carries the effects of individual values. Experts consider



Figure 5.
Olea oleaster (Photo: Şat, 2021).

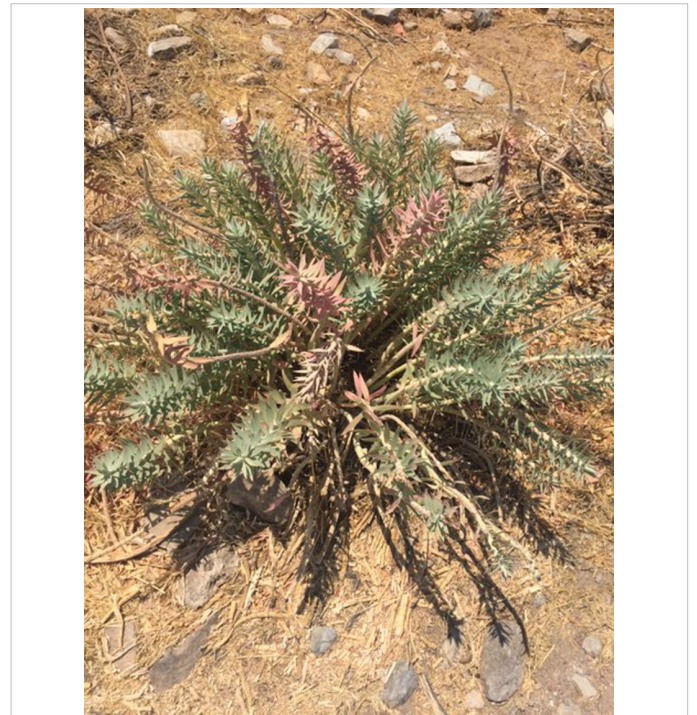


Figure 6.
Euphorbia sp. (Photo: Şat, 2021).



Figure 7.
Verbascum sp. (Photo: Şat, 2021).

the built, natural or historic values of the landscape too. Evaluation contains a complex processes compose of site surveys, definitions according to the accepted qualifications, aesthetic classification and visual features. As the result; combination of those evaluation by considering whole values explained above, takes place at the landscape characteristic table. Sometimes landscape characteristic evaluation by the experts verified by the questionnaires of users (Gungor & Polat, 2018).



Figure 8.
Sarcopoterium spinosum (Photo: Şat, 2021).



Figure 9.
Endemic Plant of the Village, Campanula tomentosa Is Well Conserved at the Stone Wall Structure (Photo: Şat, 2021).

Landscape characteristics can be classified spatially. Wang & Yu, spatially define 4 types of Landscape characters namely; internal urban space, external urban space, mode of urban space group and mode within spatial landscape types (Wang & Yu, 2012). According to this approach Doğanbey Village takes place in external urban space which are generally composed of natural environments.

Wang & Yu furtherly divide external urban space into two areas as natural landscapes and landscapes of humanities. Natural landscapes involve topography, flora and fauna, hydrology, climates, soils, etc., including forests, grasslands, farm gardens, plantations, living beings, rivers, and lakes. The landscapes of humanities can be divided into agglomeration landscapes (primarily including building constructions, streets, squares, parks, sport fields, ponds, rivers, wells, springs, miniature gardens, orch-yards, forests, and so on), productive landscapes (farm-lands,



Figure 10.
Nicotiana glauca (Photo: Şat, 2021).



Figure 11.
Albizzia julibrissin (Photo: Şat, 2021).



Figure 13.
Caesalpinia gilliesii (Photo: Şat, 2021).

plantations, grain agriculture, stock farms, dairies, horticultural agriculture, and ranches, among others), and tourism landscapes (historic and cultural sights, natural scenes, and so) (Wang & Yu, 2012). Definitely classification of a spatial landscape is difficult. Area can reflect more than one type of characteristics so this makes it more sensitive and valuable. Doğanbey Old Village has carrying more than one character with reference to those classifications as historic, natural, architectural structure. Reflecting also the match of those different characters.

Doğanbey Old Village has a holistic rural character with both cultivated and native plant species. Ruins and the streamline that passes through the village with peculiar native species, give the characteristic to the village. Besides, residents' cultivated plant species both for the benefit or ornamental reasons complete the visual landscape characteristics for the floristic aspect. Exotic and ornamental species also adapted to the



Figure 12.
Campsis radicans (Photo: Şat, 2021).

village conditions and are well used by the residents as a part of rural life. Structural features of the village also enrich the tourism potential of the village. Since the location is in the national park, the village surrounded by natural beauties as the delta and the national park's both floristic and faunistic features. This gain village more importance and sensitivity.

Just at the village, 60 species belong to 33 families determined. *Campanula tomentosa* was endemic to the area, which needs stony structures like walls or yards as the habitat. This reflects the good combination of the structure of the village with both natural and built environment.

Doğanbey old village has high tourism potential with its natural scenery and features and historical and cultural features. The prior touristic potential is given to the track between Panionion and Doğanbey old village, which length is 30km (Kılıçaslan et al., 2011). This tourism potential can be more attractive by labelling the plant species of the village, both cultivated and native ones. By adding orientation and information boards to the track route, the quality of the track will increase. Some small configurations and applications on touristic aspect envisage to upgrade the existent potential of the village. Of course, an implication plan and a development plan for the future will be necessary. Inevitably need for an education center both for residents and for tourists for sustainable implementations is foreseen. For many events, this center can be used effectively and ensures warm relations between participants both from inside and outside. Collaboration and association increases the strength of the village.

Another and significant threat is the investment of the houses by substantial and powerful people whose goals do not match with the sustainable implementation. Since the residents are not inhabitant from the local area, they need extra information and adaptation efforts. This should interest local or national park governance more closely. Every protected area's administration as a national park or in another status

should be well in contact with residents, inhabitants. Effective participation of the residents, inhabitants in the legislations and implementations; more adaptive approach to policy-making processes related to biodiversity conservation in Turkey (Birben, 2019) is inevitable from the aspect of sustainability. It is highlighted particularly, since the protected areas increase in Turkey, but within a great contradiction, conservation cannot be effectively implemented (Yıldız & Atmış, 2019). Main reason for this lack of conservation is leaving little room for conservation and environmental concerns by the politicians in comparison with other requirements as energy or extractive industries (Gross, 2012).

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