AFFECTS DETERMİNATİON OF THE NATURAL FACTORS SUCH AS CLİMATE, SOİL, VEGETATİON AND GEOMORFOLOGY ON LANDUSE/COVER BY HELPİNG GEOGRAPHY İNFORMATİON SYSTEM (GİS) İN THE KESİS STREAM BASİN (SOUTH OF TURKİYE)

Fatih KARAOSMANOGLU[1], Rıfkı SINDIR[2], Tülin DOGAN[3]

1 Ministry National Education, Adana Province, Turkiye
2 Department of Geography, faculty of letters, University of VAN 100. Year, Van Province, Turkiye
3 Tepebag High School, Adana Province, Turkiye

DOI: https://doi.org/10.56293/IJASR.2022.5459

IJASR 2022
VOLUME 5
ISSUE 6 NOVEMBER - DECEMBER **ISSN: 2581-7876**

Abstract: There is a close interaction between any natural environment and especially human beings and other living things. This interaction; It controls landforms, climate, soil and vegetation. Climate is the most important external force that shapes the earth. For these reasons, human beings; It maintains its life in the natural environment by adapting to the landforms and climate. The behavior of human beings to adapt to nature has emerged as land use. In this study; Landforms, climate, soil and vegetation that are effective on land use in Kesis Stream Basin were examined. In the study, geographic information systems (GIS) were chosen as the method, and the elevation model, other data obtained from the institutions constitute the study materials. These data were processed through GIS and explained visually and numerically.Accordingly, it has been determined that the rugged landforms of the basin do not allow settlement and agricultural activities since they correspond to approximately 80% of the area (Table 3). In the basin, brownish forest soils and red Mediterranean soils developed, in which Mediterranean climate characteristics are observed. On these soil surfaces; conifer, mixed and broad-leaved plant species showed a wide distribution. While alluvial and colluvial soils developed on landforms such as polje, uvala, and sinks in the basin, it was determined that these surfaces were used as settlement and agricultural areas. As a result, it was determined that more than 70% of the area (Table 6) limited settlement and agriculture in the Kesis Stream basin, as a natural result of the mutual interaction of landforms, climate, soil and plant characteristics. Apart from these, it has been determined that about 17% of them, such as the accumulation fan, polje, uvala, doline, low plateau, are engaged in settlement and agriculture. Here; the rules of natural factors should be prioritized and land use plans should be made to adapt to this.

Keywords: Landuse/cover, Vegetation, Climate, Landforms, Kesis Basin

1. Introduction

Since the existence of human-beings, the desire to use the natural environment in which they live for their own purposes and to benefit from the environment by changing this natural environment continues. The pressure of human-beings on the natural environment, especially with the industrial revolution, has accelerated the use of natural resources and continues exponentially today. On the other hand, this situation has brought with it a number of natural and human problems with the excessive intervention of human-beings in the natural environment.These; In addition to human problems such as unplanned urbanization, pollution, improper land use, air pollution, they are natural problems such as floods, landslides and droughts. In fact, the source of these problems is generally human and humanity and economic activities of human-beings.In fact, natural factors such as landforms, climate, soil and vegetation, which are effective in the formation of any geographical area, also determine the land use of the area.

Understanding the scope of land use change, driving forces, and consequences is very crucial for proper management of land resources (Bufebo, B &Elias, E, 2021).Land use patterns have changed spatially, horizontally and vertically, and the elevation factor has been a determining factor in this change. (Bayındır, 2006: 18). The change of the altitude along with the landforms at short distances has not only diversified and influenced the general appearance of the earth but also changed the possibilities of land use(Gozenç, 1975: 170; Tas ve Yakar, 2010:

58).Soil plays a unique role in habitat provisions for animals, plants and humans (Parras-Alcántara et al., 2016; Breure et al., 2018).As it is known, soil formation is affected by climate, vegetation, topography, geomorphology, main material and time factor. In the initial phase of soil formation, the effects of geomorphology and parent material on soil formation are strongly felt, but as time progresses, climate replaces them and the climate leaves its dominant mark on soil formation. As a result, zonal or climatic soil types are formed according to the climatic conditions of that region (Atalay et all., 1990). Red soils are found along fractures and between bedding surfaces in karstic regions of both Mediterranean and Aegean regions of Turkey. These soils are very unique and information on pedogenesis in karstic regions are rather limited (Atalay, 1997).

The reddish Mediterranean soils, which are especially found in the parts of the Taurus Mountains higher than 1000 m, become darker and turn into reddish-brownish and brown. This is due to the increase in organic matter accumulation due to the decrease in temperature in high places (Atalay, 2006). The ecological importance of the topography is fully stressed by altitude, aspect and climate. İn the Taurus mountains altitudinal distribution of the forest zone is as fellow: 0-1000/1200 m *Pinus brutia* zone, 800-2000 m encompasses Oromediterranean coniferous forest and subalpin zone starts above natural timberline (Atalay et all., 2014). In the Mediterranean region there are two main vegetation formations in accordance with the temperature conditions: In the lower belt is the main natural occurrence area of Pinus brutia forests. The maquis and garrigues are the secondary vegetation where Pinus brutia forests have been partly and completely destroyed. The upper belt of Taurus Mountains is a belt with significant black pine (*Pinus nigra*), cedar, (*Cedrus libani*), and Taurus fir (*Abies cilicica*) Atalay and Efe, 2010).Forest formation of Oro-mediterranean region: in the moist parts of the oro-belt of Taurus mountains, coniferous trees are dominant. Most of the forests are coniferous, comprised of *pinus nigra* Arnold. Subsp.*pallasiana*. *Cedrus libani* A.Rich, *Abies cilicica* carr and *juniperus foettidissima* wild and *Juperus excelsa* Bied. Which form the tree line(Davis 1965-1985, Davis 1988, Ozturk et all 1991, Atalay 1987, 2002).As a result of the high average altitude of our country, the conditions of human geography have been shaped depending on the physical geography(Tanoğlu, 1947; Kolukısa, 2004: 36; Ergün ve Buldur, 2006: 305; Bayındır, 2006: 18-23).Based on the studies mentioned above, it can be said that natural factors such as landforms, climate, soil and vegetation have the main effect on the determination of land use/cover in the research area.In this respect, in order to determine rational land use in any geographical area, the climate and landforms that basically shape human-beings and living things should be examined. Therefore, the rules of climate and landforms should be determined and the use of land based on these natural rules should be embodied rather than human and economicdemands.In this study; Landforms, climate, soil and vegetation characteristics that affect the land use/cover in the Kesis basin will be examined. As a result, the analysis and evaluation of the land use/cover of the Kesis basin, which is shaped by these natural factors, will be made.

2. Study Area

The study area is located in the Mediterranean region in the south of Turkey, between 37° 19' 00"- 37° 51' 00" northern latitudes and 36° 12' 30"- 36° 36' 50" east longitudes (Figure 1).

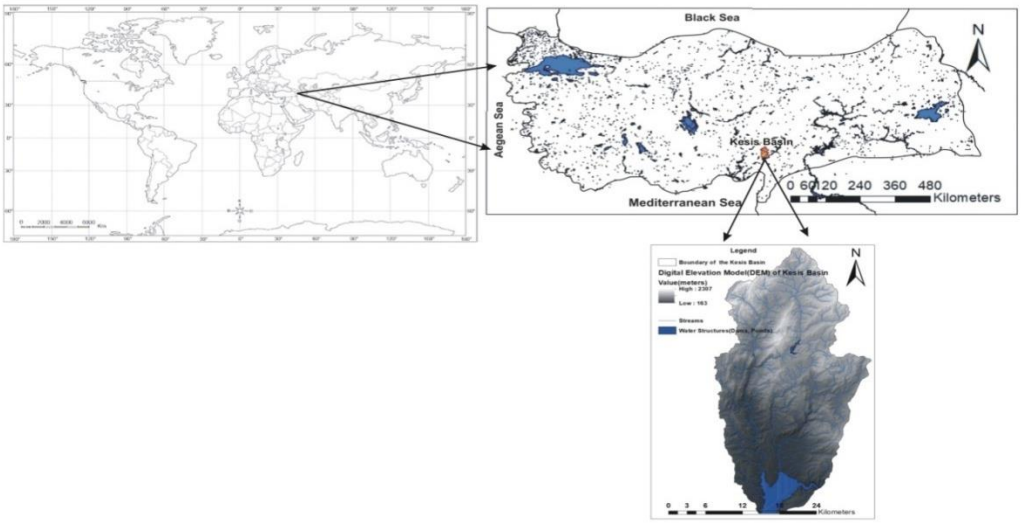

Figure 1: Location of the Study Area

The research area has a very rugged structure with an area of 826.49 km² and an altitude increasing from 163 m to 2300 m from south to north, steep and deeply split valleys by rivers. In terms of the climate characteristics of the field, it decreases from 19 ˚C to 12.4 ˚C from south to north and shows a decrease in annual average temperature values. The precipitation values of the basin, on the other hand, increase from 743.2 mm to 1473 mm, and an increase is observed from south to north (Table 1).In the Kesis basin, soil pedogenesis processes developed according to these climatic characteristics. Under the effects of the Mediterranean climate conditions that are effective in the basin; brown forest soils, red Mediterranean soils and alluvial and colluvial soils developed in areas where hydrographic processes were effective.The vegetation of the study area, on the other hand, developed under the effects of the landforms of the basin, climatic characteristics, soil types developed accordingly, and these three factors. Accordingly, plant species such as *maquis, pinus brutia, and pinus nigra* and *cedrus libani* from south to north were widely distributed in the basin.

3. Materials and Method

In this study, real field data such as Alos-palsar (12.5 ×12.5 resolution) digital elevation model data, climate (Table 2), soil, vegetation (stand), land use/cover obtained from related institutions were chosen as research materials.Geographic information systems were chosen as the method here. All these data were processed in geographic information systems (GIS) and various visual figures and tables were produced in accordance with the purpose. These are the table regarding the climate data of the Kesis Stream basin, the landforms of the basin, the soil distribution of the basin and the vegetation distribution of the area. After all these data, the figure expressing the land use/cover of the basin was created. These natural factors, whose effects on the land use/cover of the basin are examined, are analyzed and evaluated in the following findings and discussion sections. In addition, to make the study clear and understandable, the mentioned elements are presented below with a model flow (Figure 2).

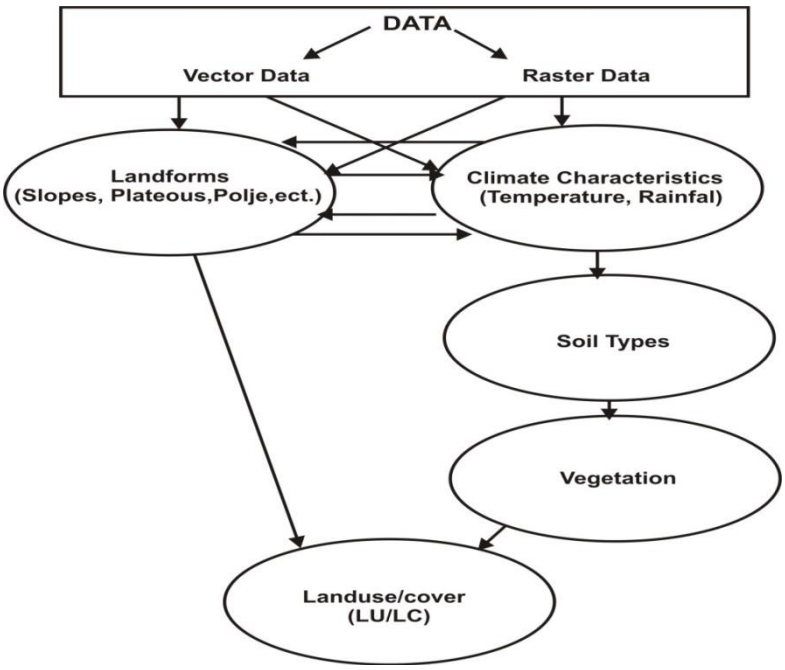

Figure 2: Model Flow the Landuse/cover Determining in the Kesis Basin

4. Findings and Discussions

When the findings obtained from this study are evaluated as a whole, it is possible to say that primarily the landforms play a fundamental role on the land use/cover of the Kesis Stream basin. Because the current topographic structure of the basin and the main morphological units such as high plains, plateaus, slopes, polje and uvala that develop depending on this structure are the main factors that determine the relationship of human with the natural environment. Climate characteristics, which have an important effect as external forces in the formation of these landforms, are another important factor that determines land use in the Kesis Stream basin.The Mediterranean climate conditions observed in the basin are hot and dry in summers and warm and rainy in winters;

It has a significant impact on the land use type of the site and other human and economic conditions. In other words, the Mediterranean climate features create ideal climatic conditions for the life of human beings, while on the other hand, it also prepares the environment for human beings to use the natural environment in the most effective way.

Soil formation that develops under Mediterranean climate characteristics and soil types that develop accordingly determine the type and variety of soils in the basin. This situation also determines how and in what way the basin lands will be used. Similarly, vegetation compatible with the soil conditions formed under Mediterranean climate conditions is another important factor determining land use. The factors determining the land use of the Kesis Stream basin are evaluated in detail under the following headings.

4.1. *Affects on the landuse/cover of the landforms in the Kesis Basin*

In fact, the physical topography conditions of any geographical area, with exceptions, are the main element that determines the relationship between man and the natural environment in that area. In the Kesis Stream basin, it is observed that the landforms of the basin determine the relationship of human beings with the natural environment (Figure 3). It can be said that landforms such as peak flats, high flats, high plateaus and sloping surfaces in the basin correspond to very limited usage areas by human beings (Figure 3). The landforms mentioned here correspond to an area of 639.48 km² with a rate of 77.37% (Table 3).On the other hand, landforms such as low plateaus, polje, uvala, sink, range of deposit and valley floor are mostly used by local people for settlement purposes in agricultural areas and partially inside these landforms, on the edges and mostly on the slopes. The total share of these surfaces in the basin corresponds to an area of 149.49 km², which is approximately 18%. It is observed that the water structures in the basin cover a very limited area with an area of 33.39 km² and a rate of 4% (Table 3).As a result of the rugged structure formed by the steep and deep fragmentation of the basin by the rivers, Peak flats, high flats, high plateaus and slope surfaces have emerged. The current geographical distribution of these landforms in the basin constitutes more than about 2/3 of them. It has been determined that these surfaces are not suitable for settlement and economic activities by human beings. Again, these surfaces have an important effect on the settlements and have gained the status of a geographical structure in which rural settlements are predominant by limiting the settlements to a significant extent.Since other landforms in the basin such as polje, uvala, range of deposits, sinks, valley floor provide suitable conditions for settlement and agriculture, it has been observed that the local people are engaged in settlement and agricultural activities on these surfaces.

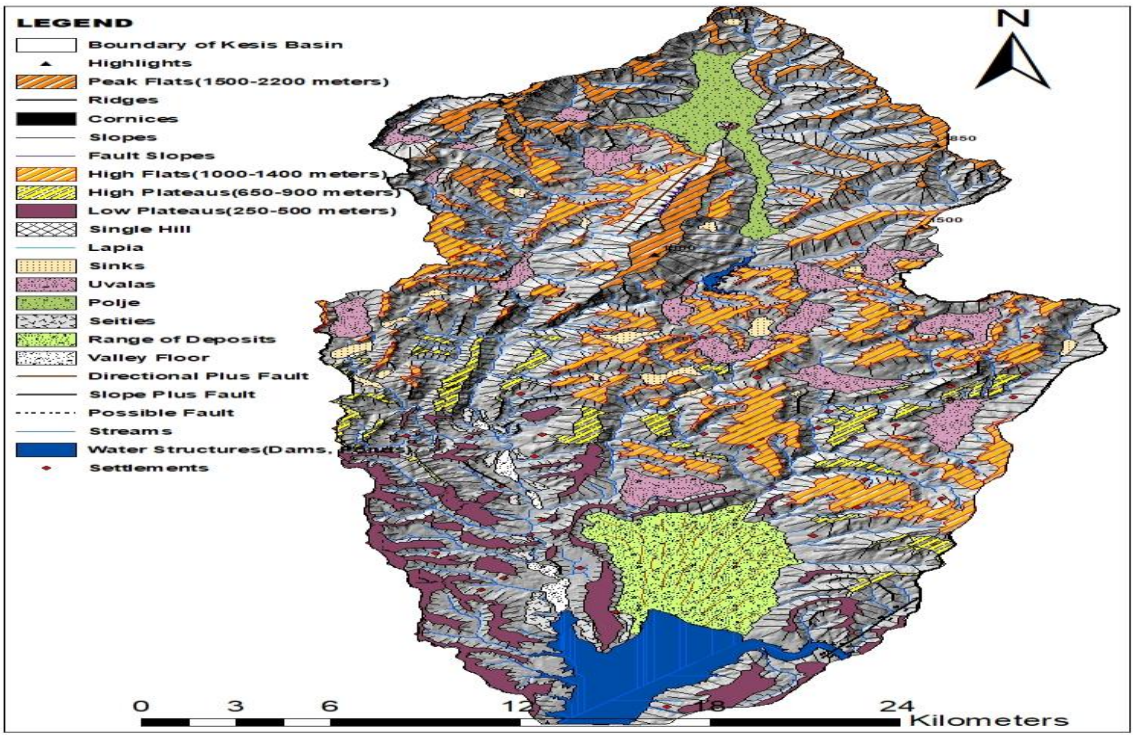

Figure 3: The Landforms in the Kesis Basin(Source: It was benefited from Master Thesis, Karaosmanoglu, 2011)

Table 3: Areal Amounts and Rates of the Landforms in the Kesis Basin

Landforms of the Kesis Basin	Areal Amounts(Km²)	Rates (%)
Peak Flats	27.79	3.36
High Flats	71.75	8.68
High Plateaus	21.37	2.58
Slopes	518.57	62.75
Low Plateaus	41.82	5.06
Polje	18.55	2.24
Uvalas	36.90	4.46
Sinks	7.19	0.87
Seities	4.93	0.58
Range of the Deposits	41.45	5.00
Valley Floor	3.58	0.42
Water Structures(Dams, Ponds)	33.39	4.00
Total Area	**826.49 Km²**	**100**

4.2. *Affects on the landuse/cover of the climate characteristics in the Kesis Basin*

Climate is expressed as the average of weather events that have occurred over many years in any geographical area. Climate is another very important natural factor that determines the relationship of man with the natural environment and also controls human and economic activities. Climate is also the most important external force that is effective in the formation of landforms. In addition, it determines the conditions of soil formation and the growing conditions of the vegetation, and also determines the conditions of how human beings and other living things will produce food through the soil. Along with all this, it directly controls the interaction of human beings with the natural environment.The basin is located within the Central Taurus orogenic mountainous mass. As Atalay & Efe (2010) stated, the climate of the area is shaped by seasonal air masses, frontal conditions and topographic structure.The Climate is characterized by mild and rainy winters. Warm and dry summers prevail in this region. This is mostly related to the air mass occupying the region. Indeed, during the summer periods the fronts forming encountering between the maritime tropical air mass (mT) coming from the Atlantic Ocean and the maritime polar air mass originated from Western Europe lead to heavy rainfall The mean annual precipitation varies between 800 and 2000 millimeters. The distribution of the precipitation is determined by frontal activities, exposure, the direction of mountain ranges, and altitude. The rainy area of the region is the southwest slopes of the Taurus Mountains due to the fact that the fronts coming from the Mediterranean Sea are mostly prevented by the mountains (Atalay&Efe, 2010).

In the Kesis Stream Basin, under the effects of the above-mentioned air masses, it is observed that the precipitation in the basin increases from approximately 800 mm to 1400 mm from the south to the north (Table 2).The climate of the region is characterized by hot and dry summers, somewhat cold winters, and rainy winter and spring seasons (Atalay&Efe, 2010). Although the stated features are similar in the Kesis Stream basin, the annual average temperatures of 19 ˚C in the south of the area decreased by 12.4 ˚C in Andırın with the increase in altitude as one goes to the north (Table 2). All these prevailing climatic conditions determined both soil formation and vegetation. Under these climatic conditions, brown forest soils and red Mediterranean soils dominated the basin, while the distribution of alluvial and colluvial soils suitablefor settlement and agriculture remained very limited. The same climatic conditions ensured widespread distribution of plant species such as *maquis, pinus brutia, beech, oak* from the south of the basin, and larch, cedar and fir with the increasein altitude. It has been determined that the rich vegetation of the basin determines the land use by limiting the settlement and agricultural activities. As a result, the climatic conditions of the basin determine the soil formation and vegetation and control the land use/cover in the Kesis Stream basin.

Table 2: Perennial Precipitation and Temperature Data Used to Determine the type of Climate in the Kesis Basin (Temperature: Andırın, 1984-1994, Kadirli; 1998-2020, Precipitation: Andırın, 1953-1995; Çokak, 1969-1994)

Stations	Temperature Data (Months)												
Kadirli Station	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**Annual Average**
Average Temperature	9,0	10,0	13,8	17,0	21,5	25,9	28,8	28,9	26,0	21,9	15,1	10,9	19,0
Average Maximum Temperature	19,7	19,5	26,7	30,9	34,5	37,5	39,6	38,2	36,5	34,6	29,7	22,1	40,3
Average Minimum Temperature	0,3	0,1	3,3	6,9	10,8	15,5	19,8	19,8	16,2	10	3,9	0,5	0,4
Highest Temperature	21,7	24	30,7	35,4	36,7	41,7	44	42	38	38,2	30,9	23	44
Lowest Temperature	-3,0	-2,8	0,6	2,8	9,0	13	19	16	13,8	4,6	-1,4	-2,7	-3,0
Andırın Station	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**Annual Average**
Average Temperature	2,4	2,0	5,4	9,8	15,2	18,4	21,8	20,2	19,0	15,7	8,5	3,9	12,4
Average Maximum Temperature	12,6	12,7	18,3	24,8	29,3	29,7	32,6	33,9	31,4	27,1	20,3	14,0	34,4
Average Minimum Temperature	-6,0	-8,1	-5,4	1,8	4,3	8,6	12,3	13,9	11,2	5,4	-2,4	-6,1	-8,4
Highest Temperature	16,2	16,2	22	28,4	32,6	33,4	35	39,4	33,2	32,6	23,4	19,4	39,4
Lowest Temperature	-14,2	-13,8	-11	-1,6	2,0	5,8	9,8	11,4	9,0	0,5	-8,0	-11,6	-14,2
	Rainfall/Precipitation Data (Months)												
Stations	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**Annual Average**
Kadirli	88,5	86,6	95,6	99,5	83,0	50,5	12,4	13,6	23,7	42,6	65,0	96,1	**743,2**
Andırın	198,6	173,2	196,1	202,0	141,9	78,9	19,9	18,6	53,1	74,0	114,8	203,5	**1473,5**
Çokak	202,9	172,6	177,0	175,9	113,6	36,5	8,0	9,9	29,3	96,2	143,2	232,1	**1397,2**

4.3. *Affects on the landuse/cover of the soil types in the Kesis Basin*

Soil characteristics of any geographical area (suitable for irrigation, dryness or infertility) directly affect agriculture and settlement. Because it has been observed that human beings, under more favorable climatic conditions, choose fertile agricultural areas where they can produce food for settlement and agricultural purposes. In other words, fertile and irrigable lands have been chosen as important agricultural and settlement areas from past to present. Soils in the Kesis Stream basin were shaped under Mediterranean climatic conditions. Accordingly, brown forest soils, red Mediterranean soils, alluvial and colluvial soils developed in the basin (Figure 4).

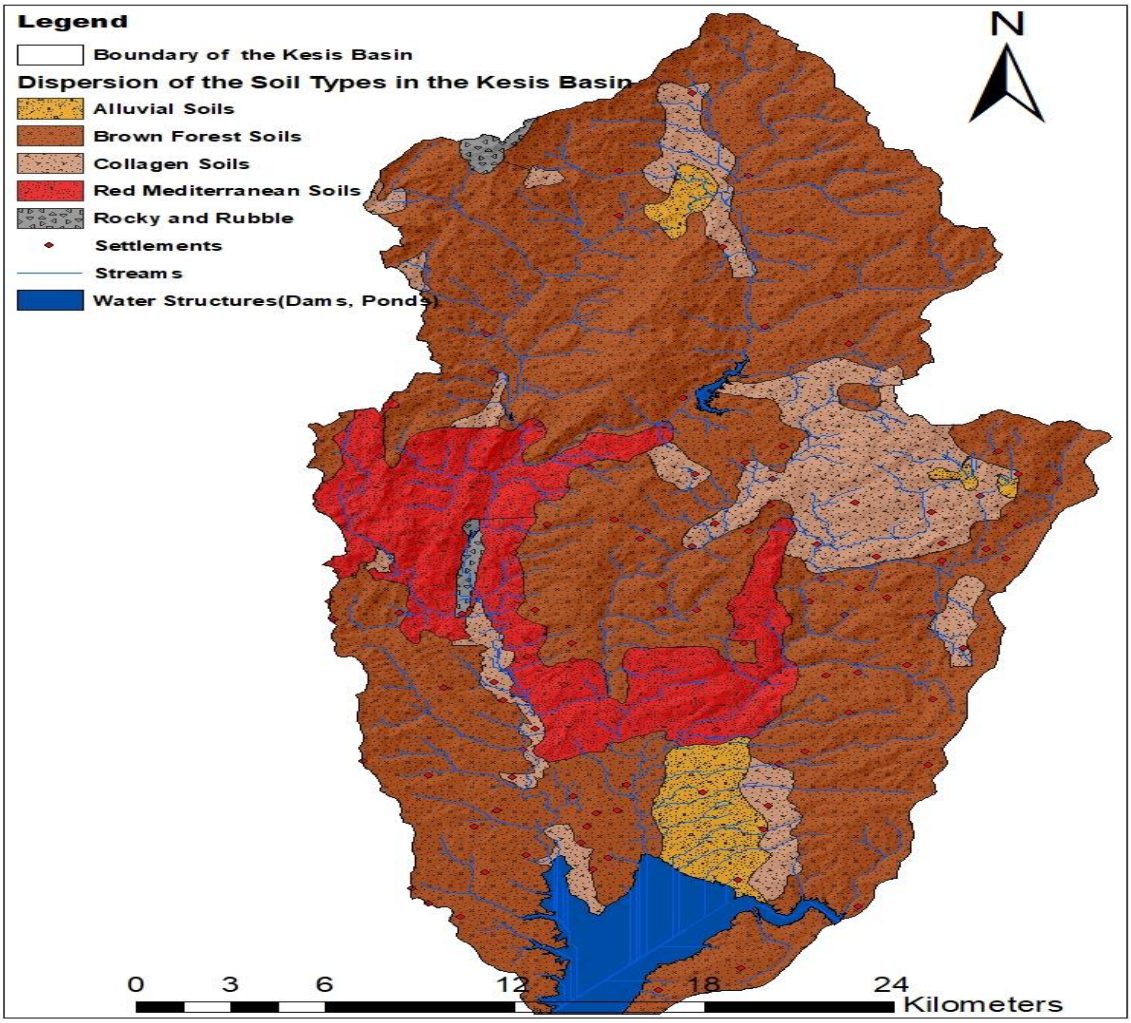

Figure 4: Distributions of the soils in Kesis Basin (Source: It was benefited from Master Thesis, Karaosmanoglu, 2011)

Table 3: Areal Amounts and Rates of the Soils in the Kesis Basin

Soil Types and Other Areas in the Kesis Basin	Areal Amounts(Km²)	Rates (%)
Alluvial Soils	26.91	2.23
Collagen Soils	101.58	12.30
Brown Forest Soils	554.08	67.14
Red Brown Mediterranean Soils	105.54	12.78
Stony and Rubble	5.10	0.62
Water Structures(Dams, Ponds)	33.39	4.04
Total Area	**826.49 Km²**	**100**

The basin is lithologically composed of rocks such as limestone, sandstone, shale, and conglomerate formed in different geological periods. In this respect, karstification processes and related karstic shapes are dominant in the basin. Soil formation in the field was not independent of these processes and developed under the control of these processes.Soils which developed along the fractures have been transported vertically by a widening of the fractures via dissolution of the limestones. Thus, the soil mass may be removed from the near surface to much deeper zones by vertical transportation with time. Such soils in general are red and completely decalcified. This explains why soils are found in the fillings of caves and of karstic depressions (Atalay&Efe, 2010).Brown forest soils, which are shaped due to the dense vegetation of the area, have a rate of 67.14% with an area of 554.08 km². The red Mediterranean soils, formed under similar conditions, have an area of 105.54 km² and a rate of 12.78%. Both soil groups in the

basin cover the majority of the area with a ratio of approximately 80%.Brown forest soils are found on the schist and marly materials under the forests containing red pine, black pine and oak stands. Intrazonal soils cover the sloppy areas having sparse vegetation (Atalay &Efe, 2010).These lands are within the scope of forest lands and correspond to areas where settlement and agricultural activities are prohibited in accordance with the forest laws of Turkey. From this point of view, soil surfaces covering only 20% or even less area in the Kesis Stream basin correspond to places suitable for settlement and agricultural activities. As a result, as it can be understood from here, the soil types in the basin and the areas they cover in the basin are another natural factor that determines the land use.

4.4. *Affects on the landuse/cover of the vegetation in the Kesis Basin*

Vegetation in any geographical area shows development based on the prevailing climatic characteristics and the soil types formed accordingly. In fact, plant species that find a habitat under certain temperature and precipitation conditions in the field of any geographical area are constantly in close interaction with the parent material, climate and soil characteristics. However, depending on the decomposition of the parent material and the horizontalization that occurs in soil formation under effective climatic conditions, the plant species that find a habitat on it also determine the type of soil by increasing the amount of organic matter in the soil. In the Kesis Stream basin, the vegetation that grows under the Mediterranean climatic conditions has made significant effects on the soil type of the basin, ensuring its diversification as Brown forest soils and Red Mediterranean soils. Considering the distribution of vegetation in the Kesis Stream basin; it is observed that almost the majority of the basin is covered with coniferous, mixed-leaved and broad-leaved plant species (Figure 5).

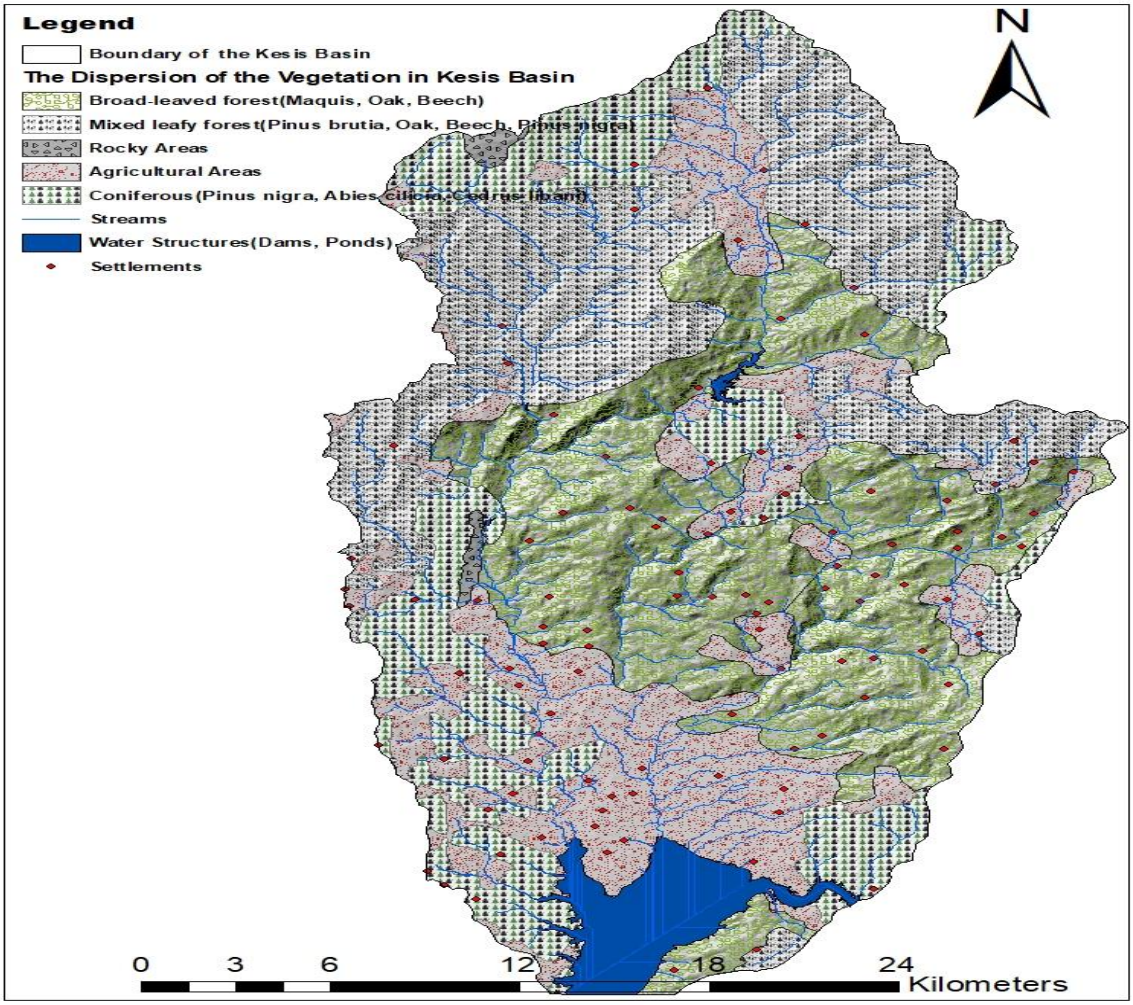

Figure 5: The Dispersion of the Vegetation in the Kesis Basin (Source: It was benefited from Master Thesis, Karaosmanoglu, 2011)

In the Mediterranean region there are two main vegetation formations in accordance with the temperature conditions: In the lower belt is the main natural occurrence area of *Pinus brutia* forests. The *maquis* and *garrigues* are the secondary vegetation where *Pinus brutia* forests have been partly and completely destroyed. The upper belt of Taurus Mountains is a belt with significant black pine (Pinus nigra), cedar, (*Cedrus libani*), and Taurus fir (*Abies cilicica*)(Atalay &Efe, 2010).

Species such as *pinus brutia, pinus nigra, cedrus libani, Abies Cilicica* are widely distributed in the coniferous forests from south to north in the basin. Generally, broad-leaved species such as *maquis, oak and beech* spread in the southern parts of the area and on the valley floors.It was determined that there are mixed-leaf species such as maquis, oak and pinus nigra in the upper parts of the basin, Andırın district and around the polje. Under all these conditions, coniferous forests have an area of 137.10 km² with a ratio of 16.59%, broad-leaved forests with an area of 269.08 km² with a ratio of 32.56%, and mixed-leaved forests with an area of 204.62 km² with a ratio of 24.76%. It corresponds to a ratio of 1 (Table 4). Based on these ratios, approximately 74% of the basin is covered with plant species related to forest cover.

Therefore, a significant part of the basin corresponds to areas that are not suitable for settlement and agriculture. Since the other 177.75 km² area and 21.50% correspond to agricultural areas, these sections are suitable for settlement and agricultural activities (Table 4). The existing vegetation of the Kesis Stream basin is an important factor limiting the land use of the basin. Although settlement and agricultural areas have been opened by deforestation based on human factors in the basin, these negative processes are prevented by the current forest laws of the country. In other words, the presence of natural vegetation in the basin is an important factor determining land use.

Table 4: Areal Amounts and Rates of the vegetation in the Kesis Basin.

Vegetation Species and Other Areas in the Kesis Basin	**Areal Amounts(Km²)**	**Rates (%)**
Agricultural Areas	177.75	21.50
Coniferous (Pinus nigra, Abies Cilicia, Cedrus libani)	137.10	16.59
Broad-Leaved Forest (Maqius, Oak, Beech, Pinus burita)	269.08	32.56
Mixed Leafy Forest (Pinus nigra, Oak, Beech)	204.62	24.76
Rocky Areas	4.55	0.55
Water Structures(Dams, Ponds)	33.39	4.04
Total Area	**826.49 Km²**	**100**

5. Conclusions and Propasals

In the Kesis Stream basin, based on the findings and evaluations obtained above, it has been determined that landforms, climate, soil characteristics and vegetation play a fundamental role on the land use of the basin. Of the natural factors mentioned, landforms have a primary effect, and depending on their mutual interaction with the climate, the soil properties and vegetation of the area have also been formed under the control of these interactions. In other words, it is possible to say that soil properties and vegetation have a secondary effect on the land use of the basin. The effects of these factors are clearly observed in the land use/cover of the Kesis Stream basin (Figure 6, Table 5).

5.1. *The landuse/cover in the Kesis Basin*

In the Kesis Stream Basin, land use/cover; It was determined that it consisted of irrigated agricultural areas, dry agricultural areas, vineyard areas, pasture areas, forest areas, rocky areas, water structures and settlement areas (Figure 6). Accordingly, the total area of irrigated agricultural areas, dry agricultural areas and vineyards in the basin corresponds to a ratio of 16.9% with an area of 139.76 km². Based on the fact that the settlements in the basin are rural settlements, it is observed that while a significant part of them are located on the edges of agricultural areas such as range of deposits, uvala and sinks(doline), other settlements are scattered on sloping slope surfaces within forest areas. Therefore, it is possible to say that the settlement areas in the basin have an area of approximately 70 km² with a rate of 8.47% (Table 6).

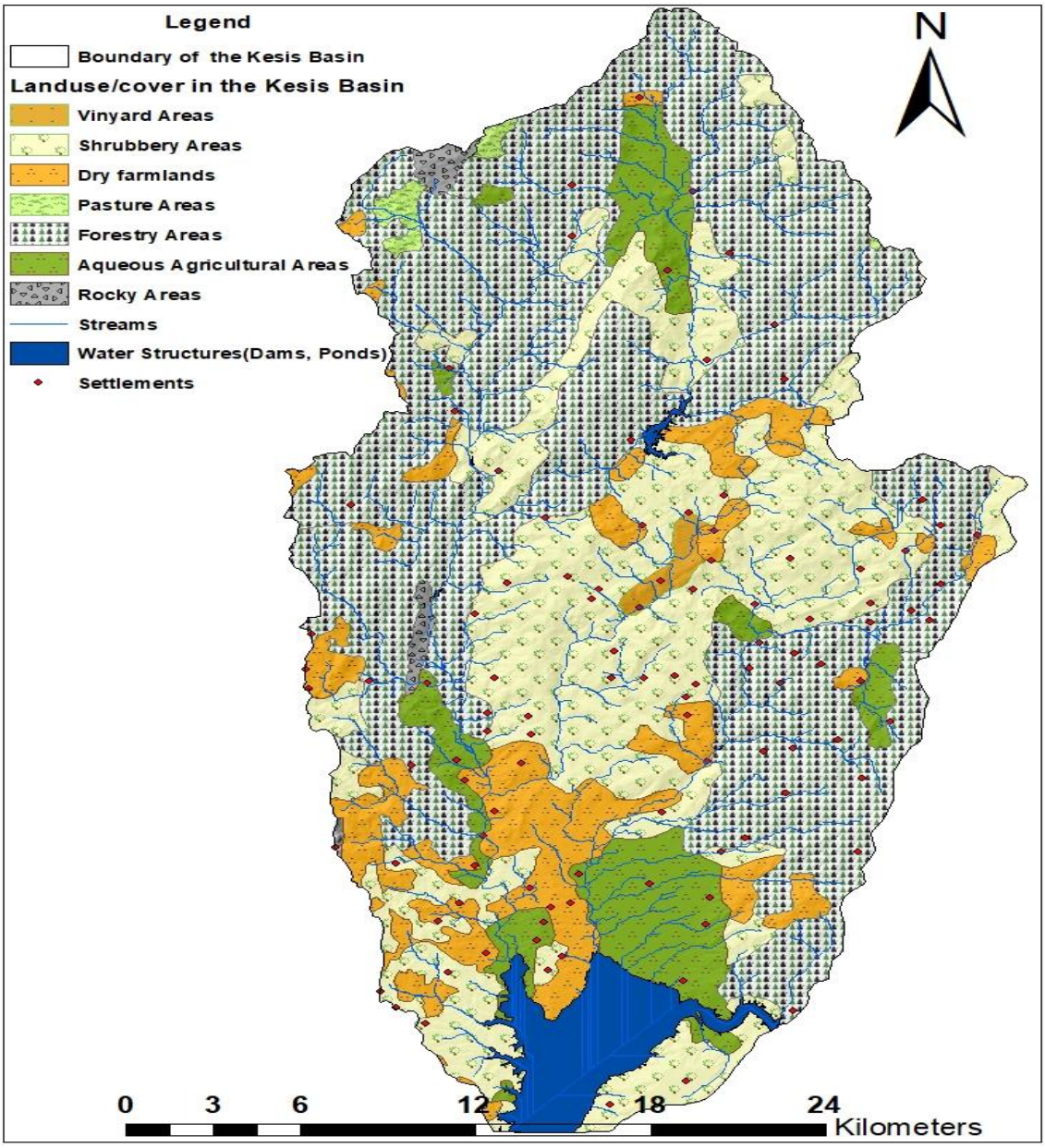

Figure 6: The Landuse/cover in the Kesis Basin (Source: It was benefited from Master Thesis, Karaosmanoglu, 2011)

It was determined that forest areas, pasture areas and rocky areas in the basin correspond to 70.58% with an area of 583.34 km². It was determined that the water structures in the study area correspond to an area of 33.39 km² with a rate of 8.47% (Table 6).As a result, based on the findings and discussion section above, it was determined that slope surfaces, peak flats, high plains, and surfaces corresponding to high plateaus in the landforms section mostly do not allow settlement and agricultural activity. In this study, the surfaces mentioned are; It was determined that brown forest soils correspond to red Mediterranean soils. Again the same surfaces; It was found that coniferous, mixed-leaved and broad-leaved plant species overlapped with the areas they covered. In addition, these surfaces; These are the surfaces where settlement and agricultural activities are prohibited according to the forest laws of the relevant country. Apart from these areas, it has been observed that the range of deposits, which corresponds to an area of about 20%, surfaces such as uvala and sinks(doline) correspond to alluvial and colluvial soils. It has been determined that these surfaces correspond to agricultural areas in the distribution of vegetation, and that the same surfaces correspond to irrigated agricultural areas, dry agricultural areas and vineyards where settlement and agricultural activities are allowed in the land use / cover.In summary, in determining the land use/cover of any geographical area, first of all, the landforms of the researched area should be determined. Based on these landforms,

the processes brought about by natural processes such as climate, soil and vegetation should be determined meticulously. Human beings will adapt to these processes; human, economic and other parameters should be planned.

Table 6: Areal Amounts and Rates of the Landuse/cover in the Kesis Basin

Landuse/cover in the Kesis Basin	Areal Amounts (Km²)	Rates (%)
Aqueous Agricultural Areas	76.52	9.26
Dry farmlands	58.38	7.06
Vinyard Areas	4.86	0.58
Shrubbery Areas	240.16	29.06
Ormanlık Alan	332.35	40.21
Pasture Areas	5.05	0.61
Rocky Areas	5.78	0.70
Water Structures(Dam, Ponds)	33.39	4.04
Settlements Areas	70	8.47
Total Area	**826.49 Km²**	**100**

References

1. Atalay, İ., (1987).General ecological properties of the natural occurrence areas of cedar (cedrus libani A.Rich) and regioning of seed transfer of cedar in Turkey.*General directory of forestry publication*. Ankara, no.663, p167.
2. Atalay, İ., (1997).Red Mediterranean soils in some karstic regions of Taurus Mountains, Turkey. *Catane, Volume 28, Issues 3–4*, February 1997, Pages 247-260.
3. Atalay, İ., (2002). Ecoregion of Turkey. *Ministry of forestry publication*, no.163, İzmir, Turkey, p 266.
4. Atalay, İ., (2006).Toprak Oluşumu Sınıflandırması ve Coğrafyası.*3. Baskı, Meta Basım Maatbacılık Hizmetleri*, Bornova, İzmir.
5. Atalay, İ., Efe, R., (2010). Ecoregions of the Mediterranean Area and the lakes region of Turkey. Environment and Culture in the Mediterranean Region (Geomed), (*Proceedings of international symposium on geography*), 2008, Antalya, Turkey.
6. Atalay, İ., Sezer, L. İ. , Erlat, E. , Işık, Ş. & Mutluer, M. (1990).The Factors Affecting Soil-Forming In the Aegean Region . Ege Coğrafya Dergisi, 5 (1), Retrieved from https://dergipark.org.tr/tr/pub/ecd/issue/4889/67098.
7. Atalay, İ., Efe, R., Öztürk, M., (2014). Ecology and Classification forests in Turkey.(3rd İnternational Geography Semposium-GEOMED2013), *Procedia-Social Behavioral sciences 120*, p 788-805.
8. Bufebo, B & and Eyasu Elias, E, (2021).Land Use/Land Cover Change and Its Driving Forces in Shenkolla Watershed, South Central Ethiopia.*Scientific World Journal*, Volume 2021, Article ID 9470918, 13 pages https://doi.org/10.1155/2021/9470918.
9. Bayındır, F., (2006). Malatya İlindeki Genel Arazi Kullanımının Yükselti Kuşaklarına Göre Değişimi. (Yüksek Lisans Tezi, Fırat Üniversitesi, Sosyal Bilimler Enstitüsü, Elâzığ). https://tez.yok.gov.tr/UlusalTezMerkezi/,(Translate: The Land Use Of Malatya Province Changing According To The Higlands, University of Fırat, Enstituation of Social Sciences, Master Thesis, Elazıg)
10. Davis, P.D., (1965-1985). Flora of Turkey and the East Aegean İnlands. *Vol.1-9*, Edinburgh University press.
11. Gozenc, S., (1975). Arazi kullanılması ve değerlendirilmesinin coğrafi yönden tetkiki. *İstanbul Üniversitesi Coğrafya Enst. Dergisi*, 20-21, 169- 180.
12. Ozturk, M., Gemici, G.Gork & O, Secmen, (1991).A general account of high mountain flora and vegetation of mediterranean part of Turkey. *Ege Uni.J.Fac.Sci.* Vol 13, p 51-59.
13. Tas, B. & Yakar, M. (2010). Afyonkarahisar ilinde yükselti basamaklarına göre arazi kullanımı. *Coğrafi Bilimler Dergisi,* 8(1), 57-76.
14. Tanoğlu, A. (1947). Türkiye'Nin irtifa kuşakları. *Türk Coğrafya Dergisi*, 9-10, 37-55.
15. Kolukısa, E. A. (2004). Türkiye Coğrafyası ve Jeopolitiği (Fizikî). Ankara: Aydan Yayıncılık.
16. Ergün, A. & Buldur, A. D,. (2006). Sivas ilinde yükselti basamaklarına göre 1990-2015 yılları arasında nüfus ve yerleşmelerin dağılışı ve değişimi. *ZfWT*, 8(3), 303-327.

17. Parras-Alcantara, L., Lozano-Garcia, B., Keesstra, S., Cerda, A., Brevik, E., (2016). Long-term effects of soil management on ecosystem sevices and soil estimation in olive grove top soil. *Sci.Total Environment.571*, 498-506.
18. Breure, A., Lijzen, J., Maring, L., (2018). Soil and management in circular economy. *Sci.Total Environment.624*, 1125-1130.
19. (Karaosmanoglu, F. (2011). Keşiş Çayı havzası (Andırın-Kahramanmaraş) ve yakın çevresinin fiziki coğrafyası,Yüzüncü Yıl Üniversitesi / Sosyal Bilimler Enstitüsü / Coğrafya Ana Bilim Dalı / Fiziki Coğrafya Bilim Dal, https://tez.yok.gov.tr/UlusalTezMerkezi/tez)
20. (İng.Traslt: The physical geography of Keşiş river basin (Andırın/Kahramanmaraş) and its close vicinity, University of 100. Year, Entituation of Social Science, Master Thesis, Van, p 1-152)