Developing Proposal Areas for New Social Housing Designs: The Case of Southeastern Anatolia Region

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ABSTRACT
The housing need in Turkey has been a topic that always remains on the agenda and generally the planned areas have been inadequate and the housing construction speed has fallen behind the housing need of the increasing population. In many countries of the world, social housing projects are developed offering different options to meet the housing need. In Turkey, the social housing projects are made by the Housing Development Administration of the state in order to meet the housing needs of people with different income groups. Especially after 1980, since the social housings started upon the establishment of the Housing Development Administration have been constructed in slum prevention areas or due to their affordable prices and the reasons such as choosing a place in the public land, the construction of these housings has accelerated in urban fringes.

Constructing the social housing buildings build on a wide area by considering the properties such as agricultural area, forest or natural area which are in the fringes of the settlements having different topography and climate for location selection is crucial for the preservation of the ecological balance. The most suitable land use type is first determined through land suitability analyses that consider land properties and user needs. Today, GIS is widely used to determine suitability of the settlement. The aim of the present study is to determine the areas suitable for social housing in the metropolitan has dense population growth in the Southeast Anatolia Region (Turkey) by using GIS.
Keywords: Social Housing, the Housing Development Administration, Land Use, Gis

1. INTRODUCTION
The population movements in Turkey has been varied in various period due to various reasons and has been effective in shaping the residential areas. The change that has occurred as a result of the globalization dated to recent periods has affected the settlements from various aspects and caused transformation. In fact, the population growth changing due to many reasons has made the cities transforming with the effect of globalization attractive and has become one of the reasons increasing the population. The housing need in Turkey has been a topic that always remains on the agenda and generally the planned areas have been inadequate and the housing construction speed has fallen behind the housing need of the increasing population. "This rapid increase of urban population causes high level impact on the urban environment and creates many problems such as unplanned sprawl, inadequate housing facilities, traffic congestion, insufficient drainage, sewerage problem and lack of other amenities" (Parry et al., 2018).

In many countries of the world, social housing projects are developed offering different options to meet the housing need. In Turkey, the social housing projects are made by TOKI of the state in order to meet the housing needs of people with different income groups. Especially after 1980, since the social housings started upon the establishment of the Housing Development Administration have been constructed in slum prevention areas or due to their affordable prices and the reasons such as choosing a place in the public

land, the construction of these housings has accelerated in urban fringes. This has led to transformation in agricultural and forest areas feeding the city in many aspects on the urban fringes as well as pressure on the ecological texture.

In this context, finding suitable area for further development or evaluation of land suitability for urban land use planning to overcome undesirable urban growth and protect environment around cities becomes all the more important (Kazil & Ali, 2015)." (Parry et al., 2018) Land-use suitability analysis is a tool used to identify the most suitable places for locating future land uses. (Collins et al, 2001)."Land use planning plays an important role in site development, urban renewal and achievement of sustainable urban development (Wang et. al, 2013, 2014)." (Parry et al., 2018). "It is extremely important to prepare land use plans that enable the transfer of natural resources to future generations and that enable the planned and sustainable use of these resources in a manner that is suitable for their potential." (Akıncı et al., 2013).

The Housing Development Administration, which has a large share in the construction of social housing in Turkey, first conducts geotechnical surveys in the area where it would conduct the application and starts the construction according to the report result. Constructing the social housing buildings build on a wide area by considering the properties such as agricultural area, forest or natural area which are in the fringes of the settlements having different topography and climate for location selection is crucial for the preservation of the ecological balance. The most suitable land use type is first determined through land suitability analyses that consider land properties and user needs (Akbulak, 2010). "Land use suitability analysis is the process of determining the suitability of a given land area for a certain type of use (agriculture,forest, recreation, etc.) and the level of suitability." (Akıncı vd, 2013). Land suitability assessment is a context-dependent, multi-criteria evaluation of land capacity for development, based on the opinion of experts who define the most desirable factors and their optimal values and weights for this purpose (Jiang and Eastman, 2000; Stoms et al., 2002). (Marull vd, 2007).

Today, GIS is widely used to determine suitability of the settlement. Land suitability analysis based on GIS environments is a process that aims to identify the best locations of development while considering environmental sustainability [4].(Aburas et.al., 2016). "Since McHarg (1969), land suitability assessment has become a standard practice in land use planning. The wide acceptance of GIS applications has permitted the development of spatially explicit approaches based on mapping parameters characterizing the land surface" (Fabos et al., 1978). (Marull et al., 2007). "According to Cowen (1988) , GIS are often referred as a decision support system for integrating spatially referenced data, due to their embodied techniques and procedures. However, multicriteria decision methods provide frameworks for structuring decision problems, designing, evaluating and prioritizing alternative decisions" (Malczewski, 2006; Marttunen, Lienert and Belton, 2017). (Demesouka et al., 2019).

The aim of the present study is to determine the areas suitable for social housing in the metropolitan has dense population growth in the Southeast Anatolia Region (Turkey) by using GIS. In order for decision makers to be able to rank the results, the resultant map was classified into 4 levels as follows: 1st degree, 2nd degree, 3rd degree suitable area and not suitable area. This evaluation incorprates the follwing information: topography (altitude, slope, view), geology, erosion and current land use. For this purpose, ideal areas for future social housing applications were determined and proposals were made.

2. MATERIAL AND METHOD

The study area included 4 metropolis centers including Diyarbakır, Mardin, Şanlıurfa and Gaziantep located in the Southeastern Anatolia Region (Figure 1). The Housing Development Administration applied social housing projects in stages in 5 areas in the central districts of Diyarbakır, 3 areas in the central districts of Mardin, 10 areas in the

central districts of Gaziantep, and 4 areas in the central districts of Şanlıurfa including urban transformation areas or public lands due to low cost.

2.1. Method of the Study

In the study, housing needs which have arisen in accordance with population projections were determined first. In the study, the settlement suitability analysis was conducted for including four city centers for Diyarbakır, Mardin, Şanlıurfa and Gaziantep provinces. The suitability of the settlement places for the study field was conducted with the help of "hierarchical ordering of appropriate field usage" study proposed by McHarg (1974) and Lyle (1985). "Lyle offers a comprehensive approach embracing theory, practice and method" (Makhzoumi and Pungaetti, 1999). "McHarg's approach is most frequently referred to as map overlays in the literatures of Environmental Impact Assessment. The method begins with inventory of natural factors (climate, geology, physiography, hydrology, soil, vegetation, wildlife, and land use) of the study area" (Huang,1990).

While determining the suitability conditions, natural factors that may be effective for each potential use and their sub-factors along with the scores were determined according to the studies conducted by Zengin (2017) and Karaelmas (2003) on this matter before. In determining the sub-factors, the presence of existing maps that could be used as a base was effective. In his study, Zengin (2017) used 4-point Likert type scale to determine the "usage potential". In order to determine the potential field uses, the weight scores (suitability values) are formed by giving numerical values of 1 to 4 to the sub-units of the evaluation criteria. The scoring is rated as 4- Very Suitable, 3- Suitable, 2- Less Suitable, 1- Not Suitable, respectively (Yeşil and Yılmaz, 2013). Karaelmeas (2003) conducted his studies on three groups including 3- Very effective, 2- Effective and 1-Ineffective (Zengin, 2017).

By using ArcGis program in the study, the settlement suitability was determined based on altitude, slope, aspect, geological structure, erosion status and land use characteristics. By giving a suitability value between 1 (the worst) and 4 (the best) to present functions, different scoring was performed for each study area.

2.2. Purpose of the study

It is important to conduct the settlement suitability analysis within the framework of a holistic planning approach in determining the place where the social housing buildings will be built in order to meet the housing need arising from the population growth. Social housing applications of the four major cities in the Southeastern Anatolia Region have continued due to the population growth. Therefore, the location choice for the new social housing buildings is important. In this context, it is necessary to identify the social housing areas where ecological balance is achieved throughout the city. The aim of the study is to determine the ideal social housing areas that integrate with the city by conducting the suitability analysis to the settlement that supports the ecological balance.

3. DISCUSSION AND RESULTS

3.1. Population Growth and Housing Need

Along with the migration from rural to urban areas, the housing need increased after the 1950s and 1980s in Turkey. Due to the reasons such as inadequate housing stock for the increasing population or low purchasing power, squatting has appeared and cities continued to grow unplanned. "In parallel with the increase in population and urbanization, accumulations and large population masses appeared in large cities and correspondingly housing demand increased" (Ören and Yüksel, 2013). Natural population growth and rural-urban migration in these years increased the population in large cities in the Southeastern Anatolia Region and led to housing problems.

Although the housing problem has been tried to be solved with the supports of cooperatives, institutions and organizations, local governments and state over the years,

housing has not been produced sufficiently. Since 1984, the government has started to deal with the housing problem of the low and middle income group in particular and the Housing Development Administration was established and thus the public housing construction has been tried to be met and the housing construction has continued to increase. "while the number of housing provided loan by the government before 1980 was around 10 thousand per year, this number reached to 150 thousand in 1984 and 157 thousand in 1987 upon the establishment of the housing development fund" (Karasu, 2001: 50). The number of housing buildings built by TOKI was 837.572 in 2018 (toki.gov.tr, 07.08.2019).

The population of Turkey has followed an increasing trend and the need for housing has been increasing accordingly. According to TSI's data, the population of the country which was 64.729.501 people in 2000 reached to 82.003.882 people in 2018 (tuik.gov.tr, 07.08.2019). Especially after 1950, the urbanization rate started to increase rapidly in Turkey; the urbanization rate which was 24.22% in 1927 and 31.09% in 1960 has become 92.5% today (Figure 1).

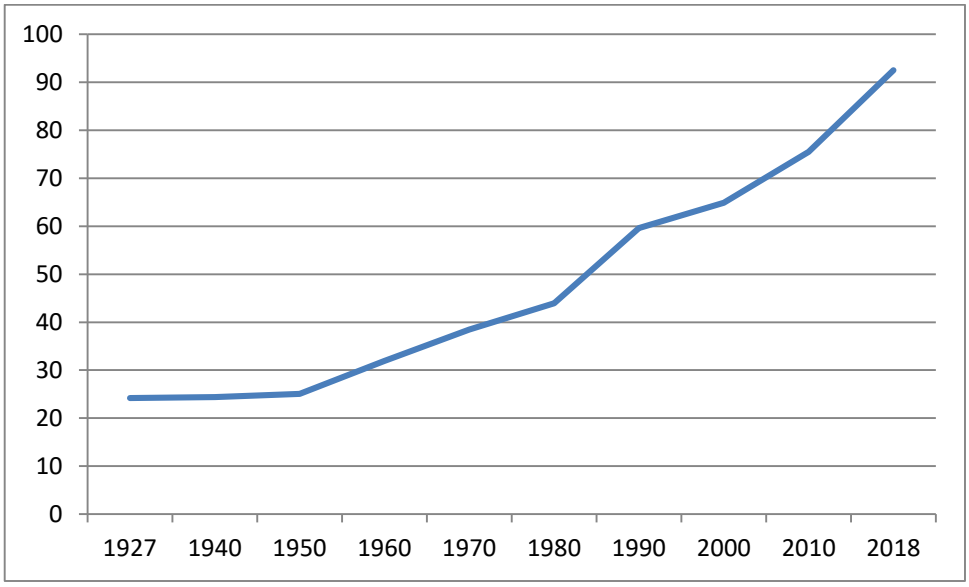


Figure1. Urbanization rate in Turkey between the years 1927-2018(tuik.gov.tr, 18.09.2019)

In parallel with the population change throughout the country, the population in the four metropolitan cities in Southeastern Anatolia Region, which constituted the study field, has also increased. According to TSI's data, the population of Diyarbakır which was 1.317.750 people in 2000 reached to 1.732.396 people in 2018, the population of Gaziantep which was 1.292.817 people in 2000 reached to 2.028.563 people in 2018, the population of Mardin which was 709.316 people in 2000 reached to 829.195 people and the population of Şanlıurfa which was 1.257.753 people in 2000 reached to 2.035.809 people in 2018 (Figure 2).

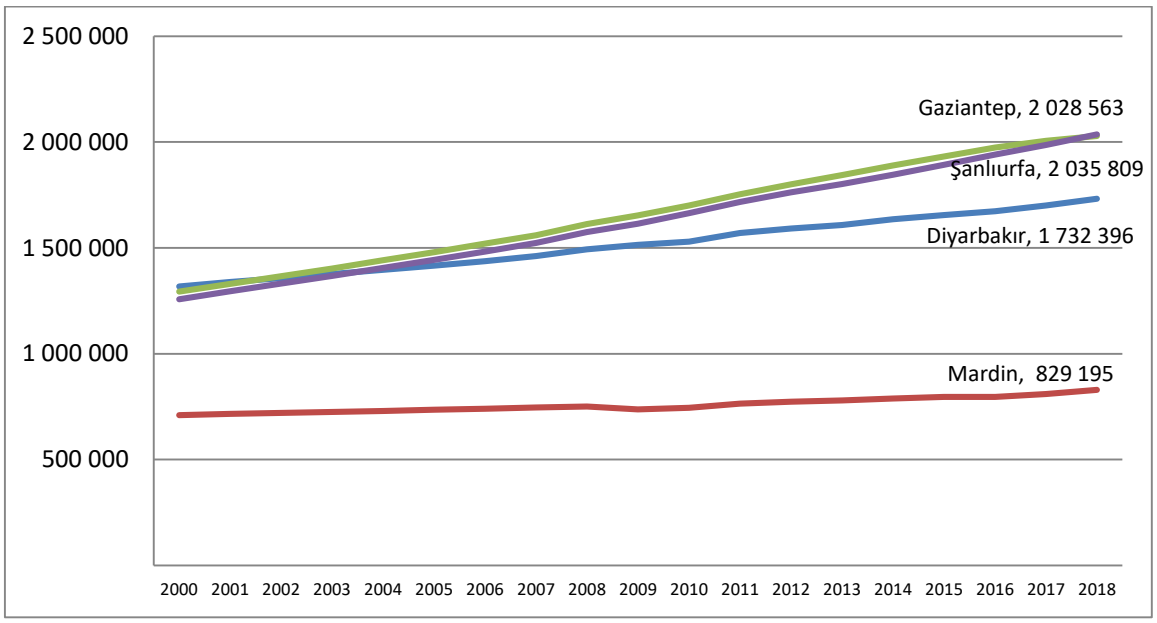


Figure 2. Population change in study areas between the years 2000-2018 (tuik.gov.tr, 07.08.2019)

The increasing population has caused the need for new settlements and TOKI is seen to have filled an important gap in this regard. Population projections showed that in 2025, the population of Diyarbakır would be 1.885.744, the population of Mardin would be 867.985, the population of Gaziantep would be 2.330.559, and the population of Şanlıurfa would be 2.355.157 (Figure 3).

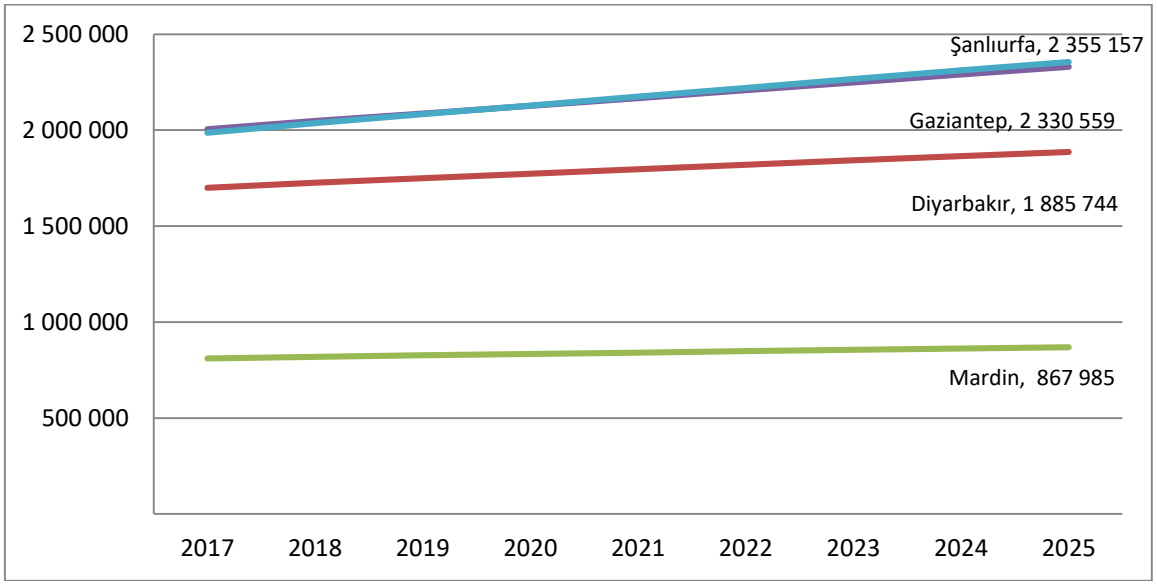


Figure 3. Population estimates of the study areas (tuik.gov.tr, 07.08.2019)

Conditions such as rapid urbanization and migration from rural to urban areas, aging of housing, improvement or elimination of existing slums, disasters and inadequate income distribution along with the natural population growth cause housing problems and increase housing demand (Ören and Yüksel, 2013). Therefore, the need for social housing has also increased in the study areas examined depending on the population growth. According to a study conducted based on the population of 2025 and the size of existing households, it is estimated that 30.669 new houses in Diyarbakır, 71.903 new houses in Gaziantep, 7.459 new houses in Mardin and 56.025 new houses in Şanlıurfa will be needed (Table 1).

Table 1. Estimates of housing needs of the study areas

City	Household size (2017)*	Population in 2018	Population estimate for 2025	Increase of population between the years 2018-2025	Housing need estimation for 2025
Diyarbakır	5	1.732.396	1.885.744	153.348	30.669
Gaziantep	4,2	2.028.563	2.330.559	301.996	71.903
Mardin	5,2	829.195	867.985	38.790	7459
Şanlıurfa	5,7	2.035.809	2.355.157	319.348	56.025
*Reference: https://www.drdatastats.com/turkiye-hanehalki-buyuklugu-haritasi-2017-yili/ 07.08.2019)					

Population forecastings have indicated that the population would continue to increase. In order to meet the housing needs of the increasing population, it is important to ensure the ecological balance in the location selection of the regions where the houses will be built.

3.2. Suitability for Settlement

Although city centers of Diyarbakır, Mardin, Gaziantep and Şanlıurfa located in Southeastern Anatolia Region have different topographic and geological characteristics, they have similar climatic characteristics and are generally under the influence of hot-dry climate region.

3.2.1. City Center of Diyarbakır

Diyarbakır is located in the central part of Southeastern Anatolia Region, in the north of Al Jazeera (Mesopotamia). (www.diyarbakir.bel.tr, 28.05.2019). It is possible to list the natural thresholds of the city of Diyarbakır as follows:

- It has continental climate characteristics where summers are very hot.
- Steppe vegetation is quite widespread.
- The most important river is the Tigris River. The river flows in parallel to the eastern part of the lava field where the city of Diyarbakır is located" (www.diyarbakir.bel.tr, 28.05.2019).
- The Tigris River which divides the city in two is also surrounded by fertile agricultural lands.
- The settlement starts at an altitude of 625 m.
- Basalt is commonly seen in the city in terms of geological properties and occasionally quaternary, undifferentiated continental clastic rocks and continental clastic rocks are also seen.
- The existing land use of the city is composed of artificial surfaces, agricultural areas, forests and semi-natural areas and the presence of water.

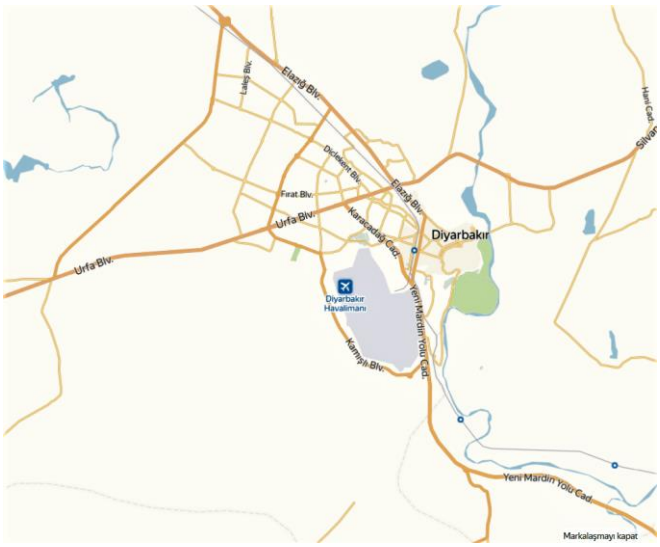


Figure 4. Location of the Tigris River

The artificial thresholds of the city are structured areas, industrial areas, airport, university and commercial areas. In the area covering the city center of Diyarbakır for which settlement suitability analysis was conducted, the altitude varies between 625-820 m and the slope varies between 0% and 81%. Since the settlement starts at an altitude of 625 m, the places below this altitude were not considered as suitable areas (Table 2). There is an orientation to different directions and its south directions are considered as ideal areas for settlement since they are located in a hot dry climate zone (Table 2). The places with Basalt properties which are evaluated as suitable for construction from geological aspect were evaluated as ideal areas for settlement. The areas having the erosion risk were considered as inconvenient areas (Table 2). Depending on the existing structure, the city structure, artificial structures, industrial and commercial areas and airports was considered suitable areas for settlement (Table 2).

Table 2. Diyarbakır settlement eligibility analysis criteria (weight scores)

ALTITUDE	
625 m below	1
625-691	4
691-747	4
747-820	4
820-1011	4

SLOPE (%)	
0-5	3
5-9	4
9-16	4
16-26	3
26-81	1

ASPECT	
South-South West-South East	4
East-West	2
North-North West-North East	1

GEOLOGICAL PROPERTIES	
Basalt	4
Quaternary	1
Undifferentiated continental clastic	1
Continental clastic	1

EROSION STATUS	
No erosion	4
Middle level of erosion	2
High level of erosion	1

LAND USE		
Artificial Surfaces	Uninterrupted city structure	4
	Interrupted city structure	4
	Industrial and commercial areas	4
	Airport areas	4
	Mine fields	1
	Construction waste disposal sites	1
	Green residential areas	1
	Sports and recreation areas	1
Agricultural Areass	Non-irrigated cultivated land	1
	Temporarily irrigated areas	1
	Fruit Gardens	1
	Pasture	2
	Mixed cultivation patterns	1
	Mainly agricultural land but filled with natural cover	1
Forest And Semi-Natural Areas	Natural meadow	1
	Discontinuous woodland-bushes	1
	Beach sand and sand flats	1
	Weak vegetation areas	2
Water Presence	Waterways	1
	Water areas	1

According to the settlement suitability analysis conducted for Diyarbakır city by combining and scoring the analyses stated in Table 2, the study region is divided into two

by Tigris river. The east and west of the river show different settlement characteristics. There are mostly alluvial soils and low-rise buildings in the east of the Tigris river and traditional historical texture in the west. The north and northwest sides constitute the developmental aspects of the city. Today, the west side of the river where the current settlement is located has more ideal areas in terms of settlement. The areas where the river and its branches are located have been determined as the third-degree suitable area or unsuitable area (Figure 5).

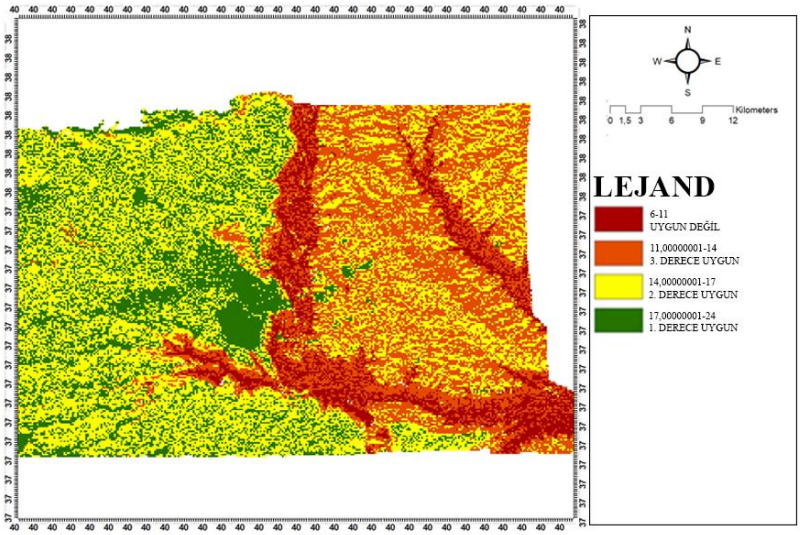


Figure 5. Availability of settlement in the city of Diyarbakır

3.2.2. City Center of Mardin

It is possible to list the natural thresholds of the city of Mardin as follows:

- Due to the desert climate in the south and the high mountains in the north prevent cool air masses from entering the region, it is seen that the summers are very hot and the continental climate (www.mardin.gov.tr/cografi-bilgiler, 28.05.2019).
- The calcareous sections of the mountains have turned into plateaus. These plateaus are lined with lavas that come to the surface in some places.
- The tributaries of the Tigris and Euphrates rivers formed corridors in the province and yielded fertile plains came into existence (www.mardinkulturturizm.gov.tr/TR-56481/cografya.html, 28.05.2019)
- The settlement starts at an altitude of 900 m.
- In the city in terms of geological properties, occasionally limestone, quaternary, rocks and continental clastic rocks are also seen.
- The existing land use of the city is composed of artificial surfaces, agricultural areas, forests and semi-natural areas.

The artificial thresholds of the city are structured areas, industrial areas and commercial areas. In the area covering the city center of Mardin for which settlement suitability analysis was conducted, the altitude varies between 566-1231 m and the slope varies between 0 % and 156 %. Since the settlement starts at an altitude of 900 m, the places below this altitude were not considered as suitable areas (Table 3). There is an orientation to different directions and its south directions are considered as ideal areas for settlement (Table 3). The places with limestones properties which are evaluated as suitable for construction from geological aspect were evaluated as ideal areas for settlement. The areas having the erosion risk were considered as inconvenient areas (Table 3). Depending on the existing structure, the city structure, artificial structures, industrial and commercial areas was considered suitable areas for settlement (Table 3).

Table 3. Mardin settlement eligibility analysis criteria (weight scores)

ALTITUDE	
566-709 m	1
709-834 m	1
834-933 m	4
933-1043 m	4
1043-1231 m	4

SLOPE (%)	
0-5	3
5-9	4
9-16	4
16-26	3
26-53	2
53-73	1
73-156	1

ASPECT	
South-South West-South East	4
East-West	2
North-North West-North East	1

GEOLOGICAL PROPERTIES	
Limestone (eosen)	4
Quaternary	1
Terrestrial crumbs	1

EROSION STATUS	
No erosion	4
Middle level of erosion	2
High level of erosion	1

LAND USE		
Artificial Surfaces	Uninterrupted city structure	4
	Interrupted city structure	4
	Industrial and commercial areas	4
	Mine fields	1
	Construction waste disposal sites	1
Agricultural Areass	Non-irrigated cultivated land	1
	Temporarily irrigated areas	1
	Vineyards and rose cultivation	1
	Pasture	2
	Mixed cultivation patterns	1
	Mainly agricultural land but filled with natural cover	1
Forest And Semi-Natural Areas	Natural meadow	1
	Discontinuous woodland-bushes	1
	The bare rock	2
	Weak vegetation areas	2

According to the settlement suitability analysis conducted for Mardin city by combining and scoring the analyses stated in Table 3, the city center and its surroundings are determined as suitable areas for settlement and due to the effect of the topography towards the north and south, areas that are not suitable for settlement are seen (Figure 6).

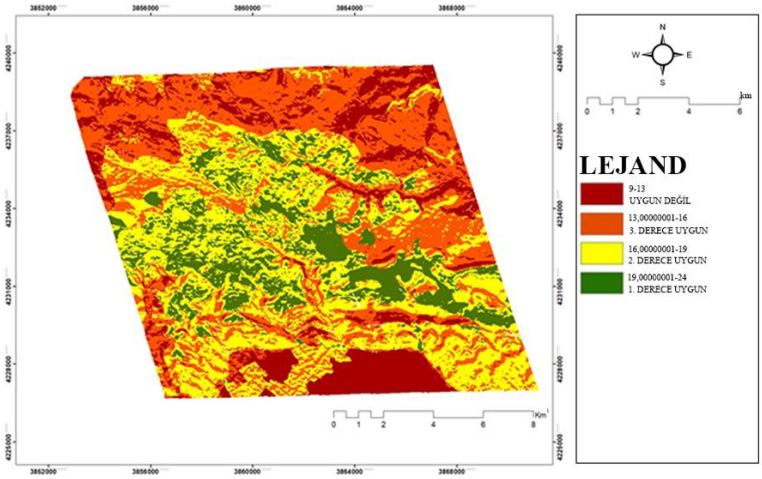


Figure 6. Availability of settlement in the city of Mardin

3.2.3. City Center of Gaziantep

It is possible to list the natural thresholds of the city of Gaziantep as follows:

- Although the southern parts of the province are influenced by the Mediterranean climate, summers are generally hot and dry and winters are cold and rainy.
- There are important mountains and plains in the province where Sof Mountains are the extensions of Southeast Taurus Mountains.
- There are important rivers such as Euphrates, Nizip, Afrin, Merziman and Alleben creeks.
- Various agricultural activities are carried out in the provincial lands, more than half of which are suitable for agriculture (www.gaziantepturizm.gov.tr/TR52291/cografya.html,28.05.2019).
- The settlement starts at an altitude of 730 m.
- In the city in terms of geological properties basalt, limestone and quaternary are seen.
- The existing land use of the city is composed of artificial surfaces, agricultural areas, forests and semi-natural areas and the presence of water.

The artificial thresholds of the city are structured areas, industrial areas, airports and commercial areas. In the area covering the city center of Gaziantep for which settlement suitability analysis was conducted, the altitude varies between 400-1487 m and the slope varies between 0 % and 101 %. Since the settlement starts at an altitude of 730 m, the places below this altitude were not considered as suitable areas (Table 4). There is an orientation to different directions and its south directions are considered as ideal areas for settlement (Table 4). The places with Basalt and limestones properties which are evaluated as suitable for construction from geological aspect were evaluated as ideal areas for settlement. The areas having the erosion risk were considered as inconvenient areas (Table 4). Depending on the existing structure, the city structure, industrial and commercial areas, highway, railway and associated land and airport was considered suitable areas for settlement (Table 4).

Table 4. Gaziantep settlement eligibility analysis criteria (weight scores)

ALTITUDE	
400-729 m	1
729-850 m	4
850-960 m	4
960-1152 m	4
1152-1487 m	4

EROSION STATUS	
No erosion	4
Middle level of erosion	2
High level of erosion	1

LAND USE

SLOPE (%)	
0-5	3
5-12	4
12-19	4
19-27	3
27-37	2
37-50	2
50-67	1
67-101	1

ASPECT	
South-South West-South East	4
East-West	2
North-North West-North East	1

GEOLOGICAL PROPERTIES	
Basalt	4
Limestone (miocene)	3
Quaternary	1

Artificial Surfaces	Uninterrupted city structure	4
	Interrupted city structure	4
	Industrial and commercial areas	4
	Highway, railway and associated land	4
	Airport	4
	Mine fields	1
	Garbage disposal areas	1
	Construction waste disposal sites	1
	Green residential areas	1
	Sports and recreation areas	1
Agricultural Areass	Non-irrigated cultivated land	1
	Temporarily irrigated areas	1
	Vineyards and rose cultivation	1
	Fruit Gardens	1
	Poplar cultivated areas	1
	Pasture	2
	Mixed cultivation patterns	1
	Mainly agricultural land but filled with natural cover	1
Forest And Semi-Natural Areas	Conifer trees	1
	Mixed tree forests	1
	Natural meadow	1
	Discontinuous woodland-bushes	1
	The bare rock	2
	Weak vegetation areas	2
Water Presence	Water areas	1

According to the settlement suitability analysis conducted for Gaziantep city by combining and scoring the analyses stated in Table 4, in the city there are suitable areas for settlement and areas that are not suitable for settlement are mostly concentrated in the southeast (Figure 6).

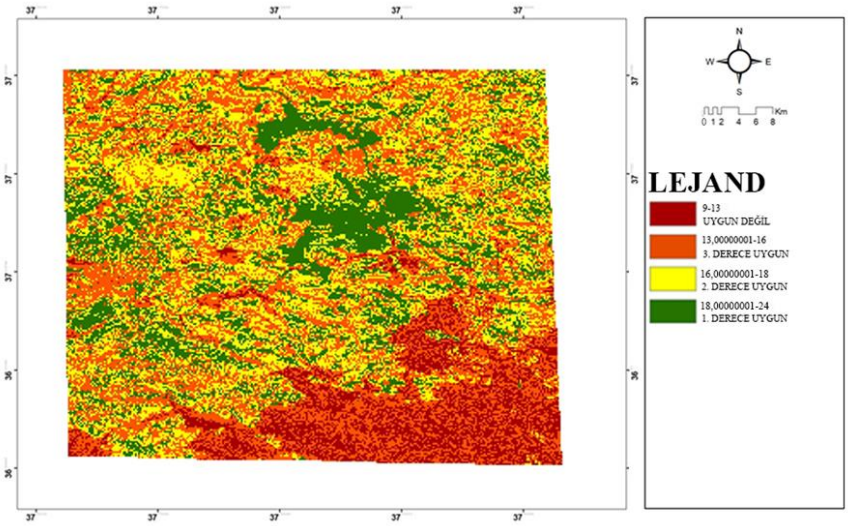


Figure 6. Availability of settlement in the city of Gaziantep

3.2.4. City Center of Şanlıurfa

It is possible to list the natural thresholds of the city of Şanlıurfa as follows:

- It has continental climate characteristics where summers are very hot and the winters are rainy and relatively mild (www.sanliurfa.bel.tr/icerik/19/2/fiziki-yapi, 28.05.2019).
- Mountains at the north of the province has low heights.
- Karacadağ is the highest point with an altitude of 1,938 meters in the province with wide plains (www.sanliurfa.gov.tr/sehrimiz, 28.05.2019).
- Euphrates River is the most important river in the province.
- The settlement starts at an altitude of 518 m.
- In the city in terms of geological properties basalt, limestone and quaternary are seen.
- The existing land use of the city is composed of artificial surfaces, agricultural areas, forests and semi-natural areas.

The artificial thresholds of the city are structured areas, industrial areas, airports and commercial areas. In the area covering the city center of Şanlıurfa for which settlement suitability analysis was conducted, the altitude varies between 378- 946 m and the slope varies between 0 % and 114 %. Since the settlement starts at an altitude of 518 m, the places below this altitude were not considered as suitable areas (Table 5). There is an orientation to different directions and its south directions are considered as ideal areas for settlement since they are located in a hot dry climate zone (Table 5). The places with basalt and limestones properties which are evaluated as suitable for construction from geological aspect were evaluated as ideal areas for settlement. The areas having the erosion risk were considered as inconvenient areas (Table 5). Depending on the existing structure, the city structure, industrial and commercial areas, highway, railway and associated land and airport was considered suitable areas for settlement (Table 5).

Table 5. Şanlıurfa settlement eligibility analysis criteria (weight scores)

ALTITUDE	
378-511 m	1
511-616 m	4
616-700 m	4
700-787 m	4
787-946 m	4

EROSION STATUS	
No erosion	4
Middle level of erosion	2
High level of erosion	1

LAND USE		
Yapay	Uninterrupted city structure	4

SLOPE (%)	
0-5	3
5-9	4
9-16	4
16-27	3
27-37	2
37-51	2
51-114	1

ASPECT	
South-South West-South East	4
East-West	2
North-North West-North East	1

GEOLOGICAL PROPERTIES	
Basalt	4
Limestone (miocene)	3
Quaternary	1

Yüzeyler	Interrupted city structure	4
	Industrial and commercial areas	4
	Highway, railway and associated land	4
	Airport areas	4
	Mine fields	1
	Garbage disposal areas	1
	Construction waste disposal sites	1
	Green residential areas	1
	Sports and recreation areas	1
Tarım Alanları	Non-irrigated cultivated land	1
	Temporarily irrigated areas	1
	Vineyards and rose cultivation	1
	Fruit Gardens	1
	Pasture	2
	Mixed cultivation patterns	1
	Mainly agricultural land but filled with natural cover	1
Orman ve Yarı Doğal Alanlar	Conifer trees	1
	Natural meadow	1
	Discontinuous woodland-bushes	1
	Weak vegetation areas	2

According to the settlement suitability analysis conducted for Şanlıurfa city by combining and scoring the analyses stated in Table 5, although the majority of the city is suitable for settlement, the presence of agricultural areas and topographical features in the southeast of the city have caused areas not suitable for settlement. (Figure 7).

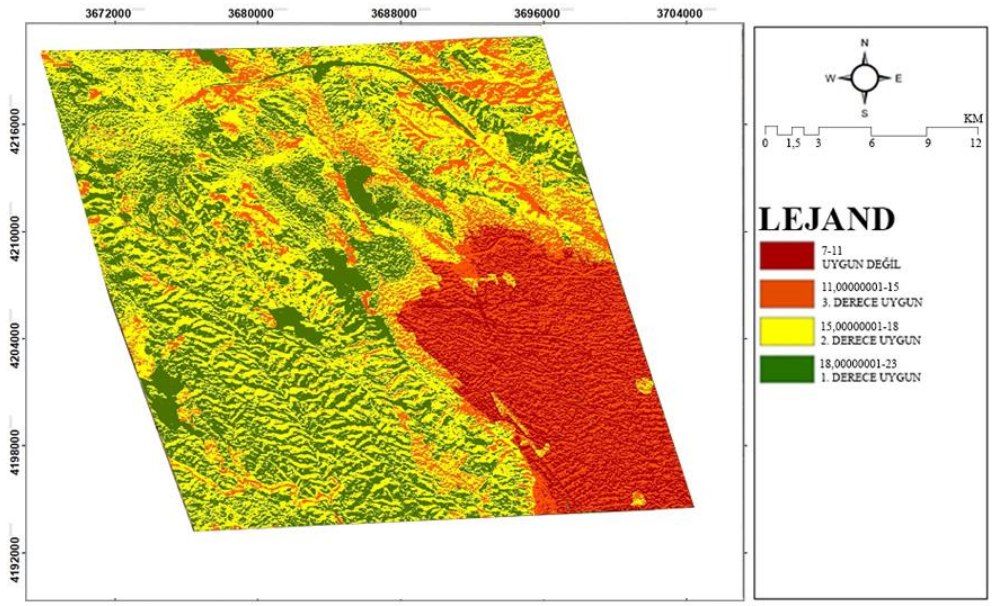


Figure 7. Availability of settlement in the city of Şanlıurfa

The evaluations revealed that the settlement suitability analysis should be made in sustainable social housing design. The selection of suitable areas for settlement in all applications of the Housing Development Administration is important for healthier urbanization and formation of livable cities. Therefore, it is necessary to develop proposals areas for sustainable social housings and to include them in planning by conducting the settlement suitability analysis covering the whole city

4. CONCLUSION

It is clear that the population and the need for housing will increase in the cities in the upcoming years. One of the primary steps to be taken in order to meet the housing need is to choose a suitable location preserving the ecological balance. It is crucial to have an approach covering the whole city in the location selection of public housing areas and to design these areas to meet the needs of the society. The settlement suitability analyses conducted for Diyarbakır, Mardin, Gaziantep, and Şanlıurfa within the scope of the study should be taken into account during planning and implementation. It is recommended to choose social housing areas, to be made in the future, in the areas that are suitable for settlement in terms of altitude, slope, aspect, geological structure, soil characteristics, erosion condition and land use. According to the results of the settlement suitability condition conducted by considering these criteria and giving suitability values between 1 (the worst) and 4 (the best) to the current functions, proposal areas for social housing in four metropolitan cities were developed (Figure 8).

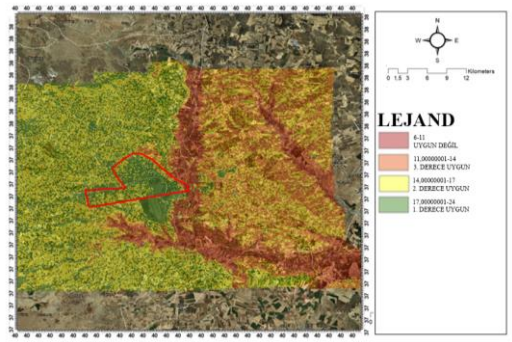
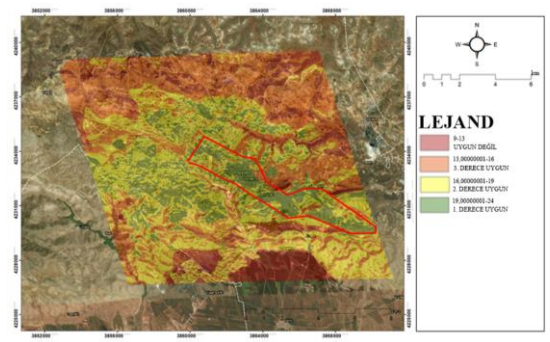
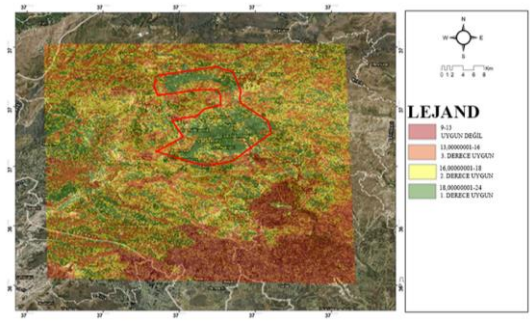
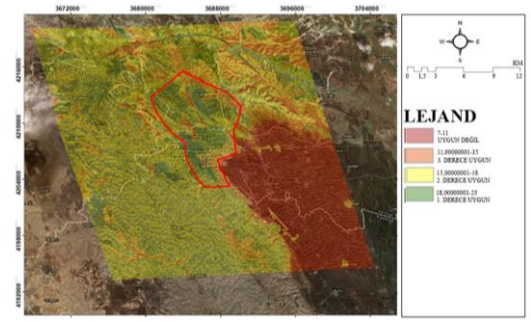
<table>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>According to the availability of settlement analysis made for the city of Diyarbakır, it is considered appropriate to choose new housing units in the region between Şanlıurfa Road in the west direction and Elazığ road in the northwest direction.</td><td>According to the availability of settlement analysis made for the city of Mardin, in the region on the northwest-southeast axis, it is considered appropriate to select new housing units.</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>According to the availability of settlement analysis made for the city of Gaziantep, it is considered appropriate to choose new housing areas around Adana - Şanlıurfa motorway route.</td><td>According to the availability of settlement analysis made for the city of Şanlıurfa, it is considered appropriate to select new housing units around the Şanlıurfa-Diyarbakır motorway.</td></tr>
</table>

Figure 8. Recommended area for social housing in Diyarbakir, Mardin, Gaziantep and Sanliurfa

In conclusion, social housing is a needed phenomenon today as it is in the past and they are built in wider areas to meet the housing need of the increasing population. Nowadays, the public housing has advantages and disadvantages. In general, social housings cannot fully evaluate the topographical properties of the area and they are built in areas that do not integrate with the city and put pressure on the ecological structure. Based on this study, which covers the case of Southeastern Anatolia Region, it is extremely important to construct the public house areas, to be constructed in this region, in the areas preserving the ecological balance in terms of sustainability of the cities.

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