

Chapter 2

Profile of the Study Area

2 Profile of the Study Area

2.1 Study Area and Target Area

2.1.1 Division of Municipalities

This study collectively refers to the municipalities in the Republic of Turkey as the “*Belediye*”, which means municipality in Turkey. As shown in the table below, the *belediyesi* is divided into three categories. Greater municipalities (GM) refer to large cities established in 1984, which constitute more than two district municipalities (DM). DM refers to autonomous municipalities within the GM. Although the GM and DM are each assigned their own areas of jurisdiction, some administrative functions overlap and cause confusion. A single municipality (SM) refers to municipalities with the combined administrative functions of a GM and a DM, and those adjacent to a GM require the GM’s approval for budgetary plans. Consequently, for convenience, this study divides an SM into a single municipality (SM) and an adjacent municipality (AM).

Table 2-1: Division of Municipalities

Municipality		Item	Turkish	Study Terminology
Greater municipality			Buyuksehir Belediyesi	Greater municipality (GM)
District municipality			Belediyesi	District municipality (DM)
Municipality	Single municipality		Belediyesi	Single municipality (SM)
	Single municipality adjacent to the GM		Belediyesi	Adjacent municipality (AM)

2.1.2 Study Area and Target Area

The study will cover the provinces of Adana and Icel. In accordance with the results of the discussion on the IC/R (Inception Report), which are recorded in the M/M on the IC/R, the study will focus on the greater municipalities of Adana and Mersin. As a result the target areas are those under the jurisdictions of the greater municipalities of Adana and Mersin. More precisely, adjacent municipalities (AM) of Adana and Mersin GMs are not included in the target area.

2.2 Adana Greater Municipality

2.2.1 Natural Conditions

a. Physical Features, Climate and Vegetation

Turkey has an area of approximately 780,000km², and is located between 35° and 42° of north latitude, and 25° and 45° of east longitude. While the majority of the country, referred to as Anatolia, is in the Asian continent, 3% lies in the European continent. The latter is separated from Anatolia by the Bosphorous, the Sea of Marmara, and the Dardanelles Strait. The national capital is Ankara, which is situated almost at the centre of Anatolia.

As shown in Figure 2-1, Turkey is bordered on the east by Iran, Armenia and Georgia, by Iraq, Syria and the Mediterranean Sea on the south, by Bulgaria, Greece, and the Aegean Sea on the west, and the Black Sea on the north. Almost 2/3 of Turkey is bordered by water.



Figure 2-1: Map of Turkey

Asiatic Turkey includes a belt of mountain ranges with a mean elevation of about 1100m dominating the north and south and encircling the Central Anatolian Plateau. North of the plateau are the Pontic Mountains, and to its south rise the Taurus Mountains. Lowlands are mainly in coastal areas.

Turkey has a rugged terrain that was formed in relatively recent geological times, and this region of the Earth's crust is quite active as evidenced by frequent tremors and occasionally destructive earthquakes. The following details the four climatic regions of the country:

- Low southern and western coastal region

Generally humid and characteristically mediterranean climate: hot, dry summers, and mild, rainy winters. The average annual rainfall in this region is 650mm. The mean annual temperature is about 20° C, ranging from an average of 11° C in the coldest month to 29° C in the warmest month.

- Black Sea coast

Warm summers, mild winters and a fair amount of rainfall throughout the year: average annual rainfall of 2,400mm. The mean annual temperature is about 14° C, ranging from an average of 7° C to 23° C.

- **Northeastern Highlands**

Warm summers but severely cold winters. The mean annual temperature is about 4° C, with a monthly average ranging from -12° C to 18° C.

- **Central Anatolian Plateau**

Hot, dry summers and cold, moist winters. The mean annual temperature is about 12° C, the highest being 0° C and the warmest at 23° C on average.

Large areas in the south, west, and northwest are covered by vegetation typical of the mediterranean region, consisting mainly of thick, scrubby underbrush in the lowlands and deciduous or coniferous forest at higher altitudes up to the timberline. The humid northern areas of the country are the most densely wooded regions of Turkey. On the eastern Black Sea are subtropical forests, while the Anatolian interior is made up of steppes. Forests, mostly oak and coniferous forests, are observed only on elevated parts.

b. Adana

b.1 Location and Area

The province of Adana is located in fertile Cukurova plain at the southern part of Turkey. It is the most developed city in the Mediterranean Region, with its very rapidly developing trends in agricultural and industrial sectors.

Adana is located on the Mediterranean coastline at 34.5° east longitude. The city is bordered by the town of Tarsus in the west, Taurus Mountains in the north, the town of Ceyhan in the east, and the Mediterranean Sea in the south. Figure 2-2 shows the location of the project area.

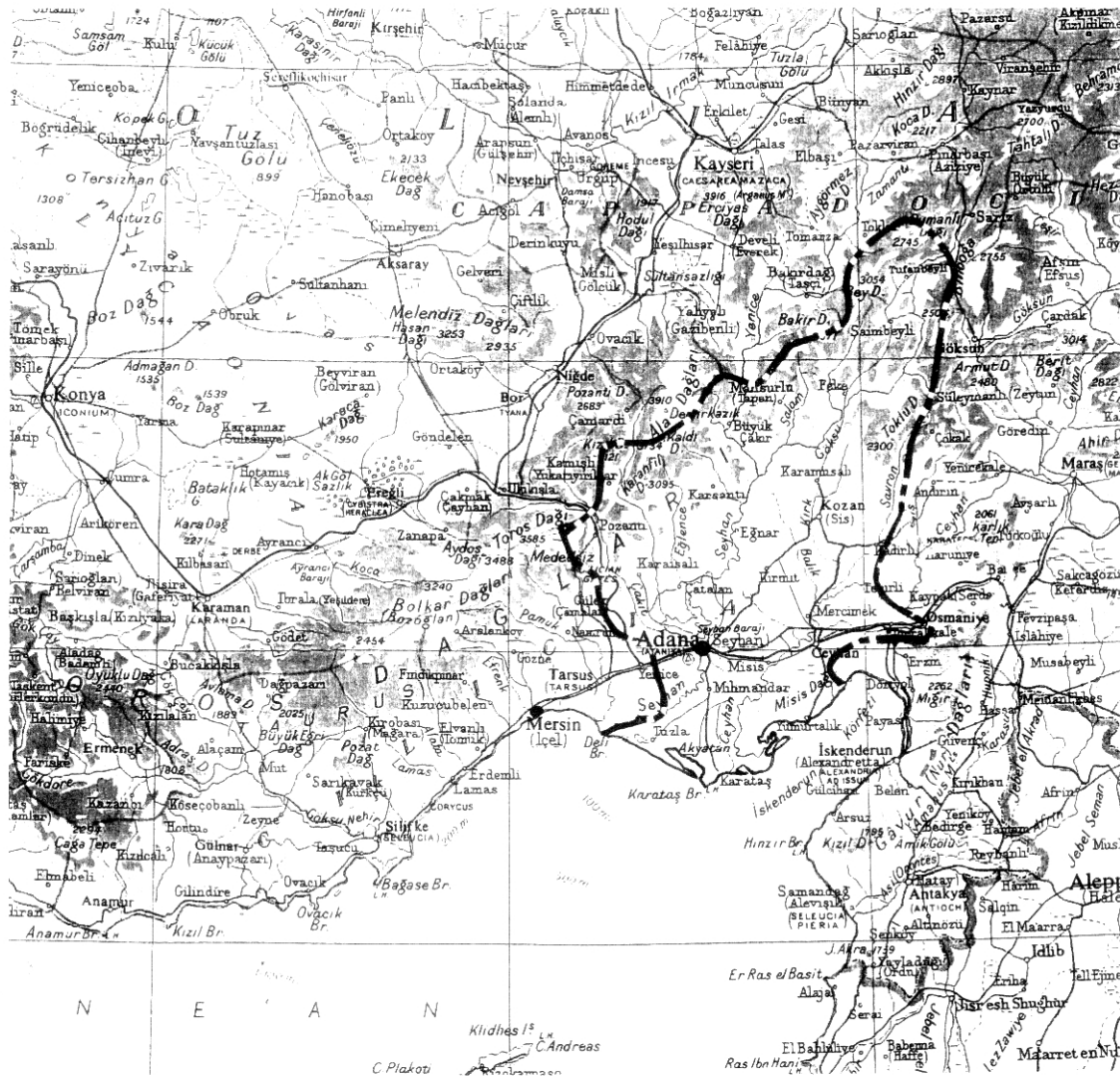


Figure 2-2: Map of the Study Area (Adana Province)

b.2 Climate

The climate of Adana shows the typical characteristics of the Mediterranean, that is hot and dry in summer, mild and rainy in winter. The average temperature is 18.8° C, with the highest at 25.2° C and the lowest at 13.1° C. The relative mean humidity is 66% and the average annual precipitation is 646.8mm. The largest amount of rainfall falls in December. July gets the least amount of rainfall.

The wind predominantly hails from the north, northwest, northeast, south, southeast and southwest. The annual average wind velocity is 2.6m/sec. The city generally experiences an average of 7.3 stormy days in February and March. The Statistical Year Book (1996) of Turkey sites the following climatic information for Adana:

- Average altitude: 20m
- Annual average temperature: 18.8° C
- Highest and lowest temperature: 45.6° C and -8.4° C, respectively
- Average hours of sunshine (annual): 7.54 hrs. (4.38 in winter and 11.22 in summer)

- Average relative humidity (annual): 66% (69% in April, 60% in October)
- Total precipitation: 647.1mm
- Number of days with precipitation: 76.4
- Daily maximum precipitation: 125.5mm (October 1996)
- Number of days with frost: 6.1 days

The basic plant type in Adana is Maquis, the characteristic vegetation of the Mediterranean climate. In higher areas (800-1200m) the forests are dominant, covering 29.46% of the entire province. The plains are used for agriculture and covers 39.1% of the province.

b.3 Geographic and Geological Conditions

The geology of the Cukurova Region is alluvial and the soil throughout the region is class III soil due to its high humic content. Although the groundwater table is not very high, a great part of the province depends on groundwater for their drinking water supply. As of 2002, Adana will acquire fresh water from Catalan Dam, at the end of the completion of the project, to flow 17m³ per second, which will meet the demand of the town till the year 2040. The aquifer should be adequately assessed by conducting hydro-geological measurements.

2.2.2 Social Conditions

a. Administration

a.1 Area

Adana Greater Municipality was established in 1987, after the adoption of greater municipality system in 1984 in Turkey. It covers an area of 8,878 ha; 195,200ha if the adjacent areas are included. It consists of two district municipalities, Seyhan and Yuregir, and 15 town municipalities and 105 villages in the adjacent area. Table 2-2 shows an outline of Seyhan and Yuregir district municipalities in 1990.

Table 2-2: District Municipalities of Adana (1990)

DM	Area (ha)	Population	Density
Seyhan	6,035	642,321	106.4
Yuregir	2,843	273,829	96.3
Total	8,878	916,150	103.2

Source : Economic and Social Indicators, Adana, State Statistics Institute (SSI), 1997

As reflecting its long development process, both districts have a high population density. Like in all other Turkish cities, district municipality is divided into lesser sub-districts (*mahalles*). Seyhan has 70, and in Yuregir 36 sub-districts, as neighbourhoods, reporting to both the municipalities and the provincial government, however, these are not municipal organisations, but connected directly to the provincial government and the central government. Surrounding these two district municipalities, there spread vast adjacent areas, especially east of Yuregir. Adjacent areas are first divided into sub-districts (*bucak*). And on these sub-districts float town municipalities and villages. Table 2-3 summarises the basic data of these adjacent areas. The total population of Adana in 1990, including its adjacent area, is 1,041,650.

Table 2-3: Adana Adjacent Areas (1990)

DM	Sub-district	Population	Area (ha)	Density
Seyhan	Central	29,800	35,965	0.8
Yuregir	Central	37,410		
	Dogankent	25,975		
	Yakapinar	32,315		
	<i>Subtotal</i>	95,700	150,357	0.6
Total		125,500	186,322	0.7

Source : Economic and Social Indicators, Adana, SSI, 1997

a.2 Administration

a.2.1 Adana Greater Municipality

The urban services within the Adana metropolitan centre are politically, legislatively and administratively managed under the “Greater Municipality” status. Within the structural context of the Adana Greater Municipality, two municipalities are active, namely Seyhan and Yuregir District Municipalities. The administrative organisation of these municipalities described below, carry the characteristics of a prevalent and traditional scheme adopted by the rest of the municipalities in Turkey with trivial variations.

The Mayor of the Adana Greater Municipality carries out office operations with the Post- Secretariat. The Board of Advisors, the Inspection Council and the Legislative Advisors are the independent units attached directly to the Mayor. The General Secretary is the paramount of hierarchically organised administrative staff of the Greater Municipality, who is assisted by four Deputy General Secretaries. Within the framework of a certain task assignment, as envisaged by the Mayor, respective Deputy Secretaries are responsible for the supervision of the activities of individual departments.

The Departments of the Adana Greater Municipality are:

- (i) Official Correspondence and Decisions
- (ii) Personnel Recruitment and Training
- (iii) Research, Planning and Coordination
- (iv) Accounting
- (v) Administrative and Fiscal Affairs
- (vi) Enterprises and Dividends
- (vii) Urban Development and Environmental Protection
- (viii) Public Health and Social Services
- (ix) Civil Works
- (x) Machinery Logistics, Maintenance and Repair

Each department is headed by a Department Head with respective subordinates.

The Department of Official Correspondence and Decisions includes two subordinate sections: Official Documents Registry as well as Protocol and Archives. Similarly, the Personnel Recruitment and Training Department is also composed of two subordinate sections: Personnel Records as well as Training and Employee Relations.

Research, Planning and Coordination Department is an important unit possessing subordinate sections: Research, Development and Investment Planning; Data Processing; Infrastructure Coordination Board, Transport Coordination Board; and Public Relations. Accounting Department, on the other hand, has Revenues; Expenditures; Budgeting, Programming and Fiscal Supervision ; and lastly Credits and Dividends.

The subordinates of the Department for Administrative and Fiscal Affairs are constituted by Procurement and Contracting, Store Management, Administrative Affairs, and Civil Defense sections. The Enterprises and Dividends Department generally deals with commercial activities of the Adana Greater Municipality and is supported by Wholesale Market, Bus Terminal and Parking Places, Local Public Transportation, Commerce and Dividends Sections.

The Cleansing Section is situated within the Department of Urban Development and Environmental Protection, along with Environmental Protection and Quality Control, Municipal Police and Fire Fighting Sections.

The Department for Public Health and Social Services covers Public Health, Licensing, Veterinary Services, Cemetery, Social and Cultural Affairs Sections. Urban Development Department has further subordinate sections engaged in physical planning of Adana, such as: Urban Planning; Implementation; Mapping and Surveying; Project Development; Green Areas; Squatter Zones and Mass Housing; as well as Real Estate and Expropriation. Civil Works Department encompasses Construction and Maintenance; Street Construction; Registry and Numbering; Traffic and Sign Sections. The Department of Machinery Logistics, Maintenance and Repair comprises: Asphalt and Concrete Production; Machinery Maintenance and Repair; Machinery Operations and Insurance Sections.

a.2.1 Seyhan District Municipality

The Seyhan District Municipality is governed by the Mayor and three deputy mayors. The Secretariat of the Mayor's Office and the Marital Affairs are the main units which are directly attached to the Mayor, who is also in close collaboration with advisors. One of the three deputy mayors is responsible for:

- Commercial relations
- Data processing
- Public health
- Veterinary services
- Municipal police
- Revenues directorates

The second deputy mayor is in charge of

- Personnel recruitment and training
- Official correspondence and decisions
- Legislative affairs
- Accounting
- Board of Inspectors
- Urban development
- Real estate and mapping

- Administrative and fiscal affairs
- Cultural and social affairs
- Expenditures directorates

The third deputy mayor supervises:

- Street construction
- Cleansing
- Procurement
- Machinery logistics, maintenance and repair
- Green areas directorates

a.2.2 Yuregir District Municipality

The Yuregir District Municipality is governed by a mayor and three deputy mayors. The Secretariat of the Mayor's office, advisors, legislative affairs directorate, board of inspectors, municipal police and marital affairs directorate are the units, which are directly attached to the mayor. One of the three deputy mayors is responsible for

- Correspondence
- Accounting
- Expenditures
- Revenues
- Commercial relations
- Logistics
- Personnel recruitment and training
- Real estate directorates

The second deputy mayor is in charge with the supervision of the following directorates:

- Civil works
- Urban development
- Mapping and surveying
- Green areas
- Repair shop

The third deputy mayor supervises:

- Public health
- Medical services
- Veterinary services
- Administrative affairs
- Public relations
- Vocational training
- Culture and sports
- Civil defense
- Street construction
- Cleansing departments

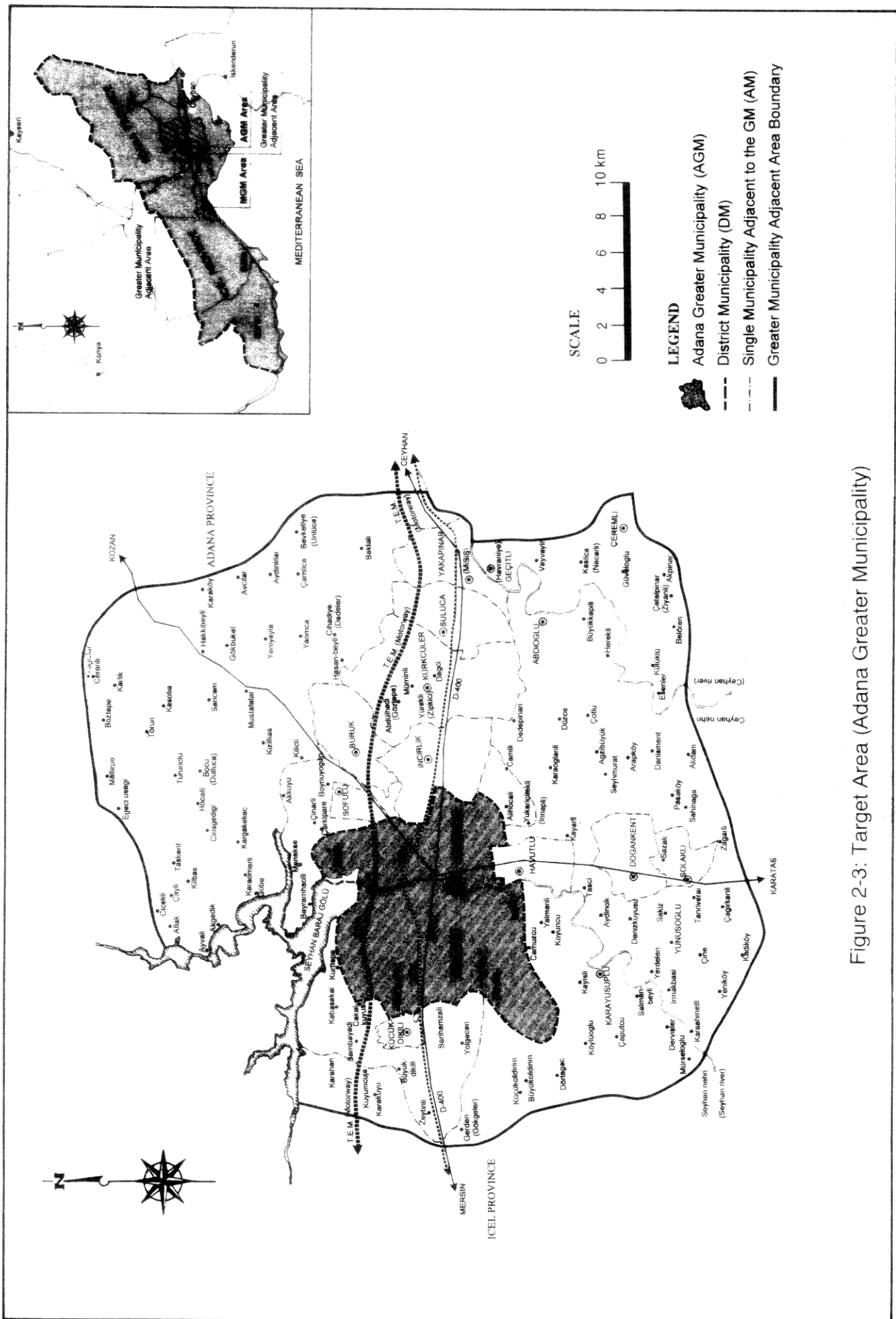


Figure 2-3: Target Area (Adana Greater Municipality)

b. Community

Like most of other countries in the modern world, district community activities are not so active in Turkey. But it can be pointed out that the inside apartment houses, *kapici* system is still working and it may be said that the most powerful community activity. Almost all apartment dwellers are hiring *kapici*, or caretaker, with dwellers common expense. *Kapici* is cleaning staircase, elevator, and other common spaces, sometimes even sidewalks in front of the apartment. Moreover, he or she collecting garbage from each room and bringing down to the apartment's garbage depot or public dust bin, and keeping it and around clean. This is a quite Turkish tradition, and has a meaningful way of keeping neighbourhood clean. When social education will be programmed, *kapicis* should be the first people to be engaged.

c. Public Education

The MoE, in co-operation with the MoD, has its programme on elementally school service. Once a year, their engineers and specialist visiting schools and explaining the importance of environmental conservation, including garbage problems. They prepare some publications especially for school children with year of about ten. Their lecture is carefully done in a soft atmosphere and discussing frankly with children. In some schools, they are collecting waste paper for recycling, however, this kind of action is still with small scale and only a few examples. Beside this lecture, school gives classes concerning with environment problems and garbage problems twice a week.

d. Public Health

Medical facilities or institutes will be mentioned in section 3.3, *Opinion Survey on Medical Institutions*. Here, city's and living conditions will be mentioned. In Adana, greater/district/town municipalities are working very earnest in garbage collection, even in the slums (*gecekodu*), and road and public space cleansing. Thus, the city's impression through eye observation is quite good. Municipalities and/or the residents set communal garbage bins on roads, in distance of 30-100 m. Where the communal dustbin is far or not set, each family prepares their own oil barrels. These systems are seen in the slums (*gecekodu*), except most recent developed areas. Collection time seems to be a problem, however, until night time, bins and cans filled with garbage can be observed, especially deep in subdistrict areas. In detached housing areas with narrow roads, where collection truck is hard to enter, sometimes it is seen neighbours are co-operating bring their garbage to a truck. But in some low income sub-districts, illegal dumping in vacant land can be seen, although rare.

Roads and public space cleansing is a work of greater/district/town municipalities. By their effort, these space are respectably clean. Only one problem is that the time of cleansing is not regular. Sometimes we see working staff are working up to near midnight.

e. Employment

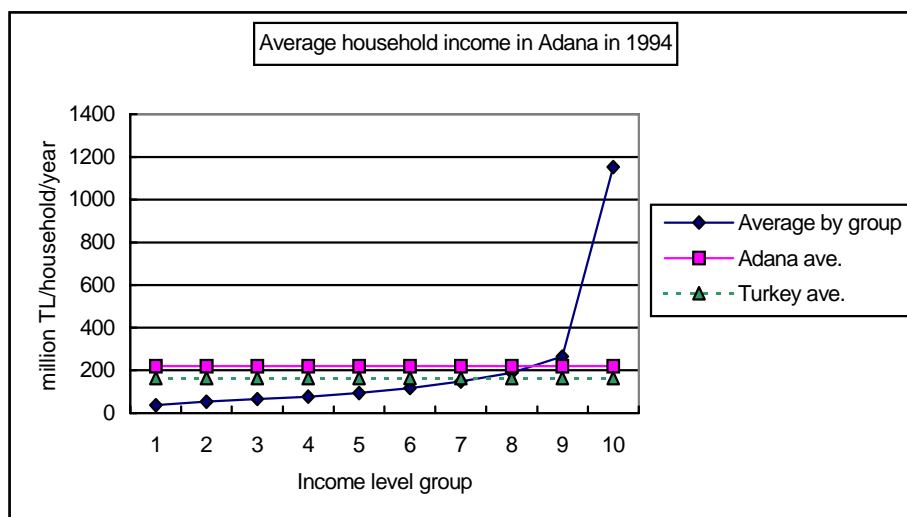
Unemployment rate per province is not known due to lack of relevant basic data after population census was carried out in 1990. As of 1990, the unemployment rate of Adana Province was reported to be 6.05%, while the average unemployment rate on the national basis was 6.4% (these figures show unemployed persons seeking for job). While unemployment rate for male was reported high at 9.24%, that for female was

reported as 2.87%. The rate of unemployed persons of 12 year old and over was reported as 41.0% in Adana Province whereas it was 36.0% on national level.

f. Income Level

According to 1994 Household Income Distribution Study carried out by SSI, average income per household in Adana Province was 220.1 million TL (equivalent to US\$ 5,830), which was about 1.3 times of the average income per household in Turkey of 165.1 million TL (equivalent to US\$ 4,370). However, only top 30% earns more than average income of national level and low ranked 50% earns less than 104.0 million TL (equivalent to US\$ 2,750).

On national level, the average income per household in urban area was 202.5 million TL (equivalent to US\$ 5,360) while that in rural area resulted in 117.2 million TL (equivalent to US\$ 3,100). The discrepancy between these two are quite big. The ratio between urban population and non-urban population was approximately 4:1 in Adana Province in 1990.



Source: 1994 Household Income Distribution Study, SSI

Figure 2-4: Average Household Income in Adana

2.2.3 Population

a. Population Provided by the SSI

Table 2-4 below shows the population growth in Adana; the figures do not include the adjacent areas. As Adana is the regional centre of the Cukurova region, it saw a rapid growth in its population. Most part of population increase was caused by immigration from the southeastern part of Turkey. Most migrants settled in slums (*gecekodu*), especially in fringe area (from southern to western part) of Seyhan before, and in the southern to western part of Yuregir. The growth rate in Yuregir is lower than that of Seyhan recent years, because of traffic access problem to the Central Business District (CBD).

Table 2-4: Population Growth of Adana GM (excluding adjacent areas)

Year	Seyhan			Yuregir			Total	
	Population	(%)	Growth Rate (%)	Population	(%)	Growth Rate (%)	Population	Growth Rate (%)
1955	-	-	-	-	-	-	168,628	-
1960	-	-	-	-	-	-	231,548	6.5
1965	-	-	-	-	-	-	289,919	4.6
1970	-	-	-	-	-	-	347,454	3.7
1975	-	-	-	-	-	-	475,384	6.5
1980	-	-	-	-	-	-	574,515	3.9
1985	-	-	-	-	-	-	777,554	6.2
1990	642,321	70.1	-	273,829	29.9	-	916,150	3.3
1997	742,619	71.8	2.1	290,952	28.2	0.9	1,033,571	1.7

Source: Data on 1955 - 90 from Adana M/P and Data on 1997 from general population survey done by SSI (State Statistics Institute) of Adana Provincial Office in 1997.

Note: Seyhan and Yuregir became independent district municipalities in 1987

Further detailed data, those of sub-districts, are not available at this moment. According to the census survey in 1990, number of household in Adana GM totals 181,198 and the average household size is 5.1/household. In recent years, it is said that the size decreased its scale in parallel with decrease in birth rate and the nuclearisation of families, but present exact number is not available.

The growth rate used to fluctuate a lot, although it has stabilised in recent years (1990-1997). In Adana GM average growth rate went down to 1.7%. It is estimated that this phenomenon is a transitory one, because of *gecekondü* construction control.

The ongoing Yeni Adana Project, the North Yuregir Housing Project currently under examination, and large scale industrial construction will invite much more migrants from the southeastern part of Turkey. And the importance of Adana in Cukurova region, and its economic and industrial growth may make growth rate recovering.

On the other hand, the representatives of AGM expressed concern about these figures due to the following:

- Since the founding of the republic, Adana has exhibited a much higher rate of increase than what was indicated in the last census (1.7% is too low compared to past actual figures and future population estimates).
- During the period 1990-1997, the years of the previous and last census, the municipality has had a great number of migrants from southeastern provinces, as evidenced in the increasing number of water bills issued by a company of the AGM. Furthermore, the overall municipal services has increased albeit the same cannot be said with regards to the degree of resident satisfaction over the services in question.
- Although the migrants left due to discomfort, they believe they will soon be returning to their respective places of origin. As the income from the central government is rated according to population, a great number of migrants have left Adana for a few days in order to be counted in their own cities and ensure themselves with a higher allocation in the future.

- In view of extending the municipal territory by 2020, the population forecast should take some of the adjacent municipalities – which will be incorporated into the Adana GM territory – into consideration.

b. Population deduced by the Current Waste Stream

Based on the general population survey conducted by the SSI (State Statistics Institute) of Adana Provincial Office in 1997 the population of Adana GM in 1998 is estimated at 1,091,451.

The study team conducted a comprehensive WACS (waste amount and composition survey) in summer, i.e., waste discharge ratio survey, recycling amount survey and final disposal amount survey at the existing Sofulu dump site. Based on the WACS and the population in 1998, 1,091,451, the daily discharge amount is estimated at 737 ton/day. However, the daily discharge amount in Adana is calculated at 805 ton/day based on the disposal amount at the Sofulu dump site. This contradiction may be due to:

1. Some errors in the WACS such as waste discharge ratio, recycling amount, disposal amount, etc.
2. Some errors in the number of each discharge source such as population, number of restaurants, etc.
3. The population during the day, which includes visitors to the city, generates extra amount of waste.

The above-mentioned matters was examined and reviewed in the second and third study work in Turkey. Although the population provided by the SSI is an official one, there is an argument on the population of the target area and there are several figures on it. Then temporarily the team sets up the population of Adana GM in 1999 at 1,196,620 for this report in order to accord the disposal amount at the Sofulu dumpsite. Applying this figure the population growth of Adana GM is changed as shown in the table below.

Table 2-5: Population Growth of Adana GM (excluding adjacent areas)

Year	Seyhan			Yuregir			Total	
	Population	(%)	Growth Rate (%)	Population	(%)	Growth Rate (%)	Population	Growth Rate (%)
1955	-	-	-	-	-	-	168,628	-
1960	-	-	-	-	-	-	231,548	6.5
1965	-	-	-	-	-	-	289,919	4.6
1970	-	-	-	-	-	-	347,454	3.7
1975	-	-	-	-	-	-	475,384	6.5
1980	-	-	-	-	-	-	574,515	3.9
1985	-	-	-	-	-	-	777,554	6.2
1990	642,321	70.1	-	273,829	29.9	-	916,150	3.3
1999	859,170	71.8	3.3	337,450	28.2	2.3	1,196,620	3.8

Source: Data on 1955 - 90 from Adana M/P and Data on 1998 estimated by the study team.

Note: Seyhan and Yuregir became independent district municipalities in 1987

Consequently the team elaborates a current waste stream in Adana as presented in the section 3.1.1.