

### 1.3 Mersin Greater Municipality (GM)

#### 1.3.1 Target Area

As indicated in the IC/R (Inception Report), the study will cover the provinces of Adana and Icel. In accordance with the results of the discussion on the IC/R, which are recorded in the M/M on the IC/R, the study will focus on the greater municipalities of Adana and Mersin. Accordingly, the target areas are under the jurisdiction of these two greater municipalities, as shown in **Figure 1-6** and **Figure 1-11**, respectively. Further, the target area does not include the municipalities adjacent (AM) to Adana and Mersin GMs.

#### 1.3.2 Natural Conditions

##### a. Location and Area

Mersin is located on the Mediterranean coastline at 34° C of east longitude. It is bordered by the town of Tarsus in the east, the Taurus Mountains in the north, the town of Silifke in the west, and the Mediterranean Sea in the south. The project area is presented in Figure 1-10.

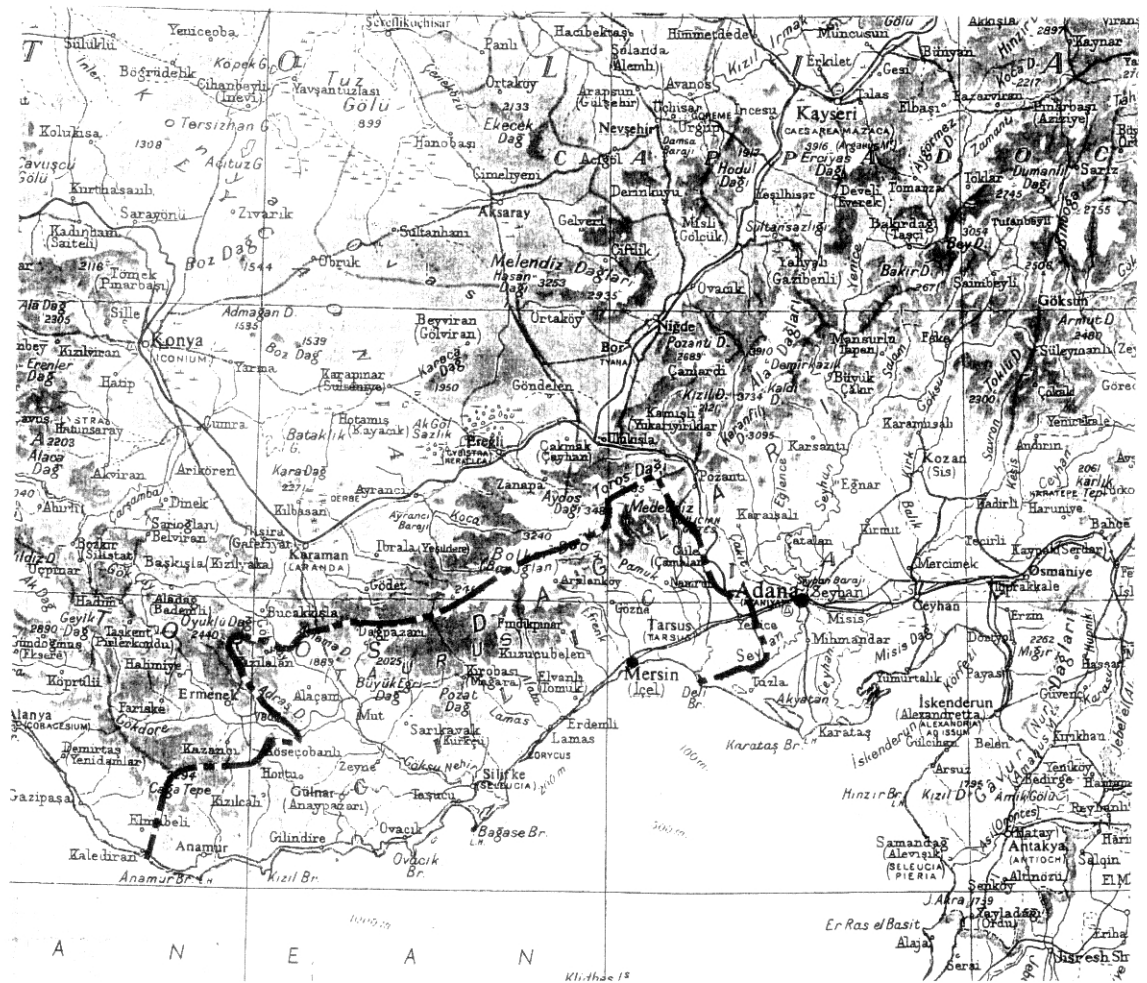


Figure 1-10: Map of Study Area (Icel Province)

Mersin is located at the centre of the province of Icel. Its harbour is the third largest in Turkey and was built to give Anatolia a large port conveniently close to Adana and its agriculturally rich hinterland.

The city and its hinterland are situated on a plain that is geologically favourable to agriculture. Along the Mediterranean coast, the city is at sea level, while it is situated at an altitude of up to 170m on the northern border. Lower coastal areas are exposed to winter floods.

Because of the richness of the soil in the area, agricultural activities are widespread especially east of the city. Further, there is a high potential for industrial development, which is favoured by provincial authorities.

#### **b. Climate**

Mersin has a typical Mediterranean climate: hot, dry summers and mild, rainy winters.

From June to September, the air temperature can soar from 31° to 38° C, averaging 24° to 29° C. From December to March, an average air temperature of 11° to 14° C, and a minimum air temperature of 3 to 8° C, can be expected. Frost is rare and there are no snowfalls.

Annual rainfall averages about 672mm, around 75% (500mm) of which can be expected from November to March. Potential annual evaporation is about twice as big as the annual precipitation. Humidity is 80% in summer and 60% in winter.

Prevailing wind directions are from NNW and SSW, with a maximum velocity of about 2.5m/sec.

#### **c. Geographical and Geological Conditions**

The city is located on the Berdan-Efrenk Plain, a delta plain formed from alluvial deposits originating from the Taurus Mountains inclosed by the rivers Berdan, Delicay, Mezitli, and Efrenk. Mersin region is situated in one of the earthquake zones of the Mediterranean basin.

### **1.3.3 Social Conditions**

#### **a. Administration**

##### **a.1 Area**

Mersin Greater Municipality, which was applied present greater municipality system in 1994, has an area of 8,222 ha and total population of 499,452 in 1997, according to the general population survey done in 1997. It consists of three district municipalities (*Icel Belediyesi*), e.g., Akdeniz, Toroslar and Yenisehir. Each district municipality has its own council and mayor. Akdeniz District has 25 sub-districts (*mahalles*), Toroslar 21, and Yenisehir 18. These are not municipal units, however, for they are directly connected with the provincial government or central government. Outline of three districts in the greater municipality is as shown in the table below.

Table 1-31: District Municipalities in Mersin GM (1997 Population Survey)

DM	Area (ha) in 1996 * <sup>1</sup>	Population in 1997 * <sup>2</sup>	Population Density (persons/ha)
Akdeniz	2,995	201,021	67.1
Toroslar	2,526	184,112	72.9
Yenisehir	2,700	114,319	42.3
Total	8,222	499,452	60.7

Source : \*1: Mersin Wastewater Study, 1996

\*2: State Statistics Institute (SSI) of Icel Province

As referred from the table, districts are well developed already. But seeing the density difference, Yenisehir has a biggest potential for development comparatively. It can be said that the municipal areas soon require their expansions. Above mentioned districts are called the city, the central core area of the Greater Municipality.

Beside these, outside of the city itself lies a vast adjacent area, with islanding town municipalities and villages. In Mersin, there are fifteen town municipalities, and five villages, and vacant land with no population. The adjacent areas in 1990 is 22,205 ha and the population of it is 125,478.

According to the general population survey done in 1997, the population of the adjacent areas comes up 150,502. Thus, the total population of Mersin GM, including the adjacent area, is 649,954. The Greater Municipality has a power over town municipalities on their major planning decisions, and has right to plan over its own adjacent area. Sometimes, however, the master plan covers beyond the adjacent boundary, which is thought inseparable with the planning coordination of the greater municipality. But legally it is the land under control of the provincial government and the central government, in some cases, municipal planning and those of the province and the central will conflict. There is not yet exist the strict legal rule, which authority is overwhelming.

## a.2 Administration

Similar to Adana, urban services within the Mersin metropolitan centre are also politically, legislatively and administratively managed under the “Greater Municipality” status. Within the structural context of the Mersin Greater Municipality, three district municipalities are active, namely, Yenisehir, Toroslar, and Akdeniz District Municipalities. The administrative organisation of these municipalities described below, possess the typical characteristics traditional administration scheme adopted by rest of the municipalities in Turkey, however only with marginal variations.

### a.2.1 Mersin Greater Municipality

Mersin Greater Municipality is governed by the Mayor. Beside the Post-Secretariat, the Mayor collaborates with 5 Advisors; whereas MESKI (Mersin Water and Sewerage Authority), Public Relations, Board of Inspectors, Legislative Advisors, Municipal Police, Press and Information are the directly attached units. The General Secretary is the highest rank of hierarchically organised administrative staff of the Mersin Greater Municipality. The General Secretary is assisted by two deputy General secretaries. Civil Defence is the unit which is directly attached to the General Secretary.

According to the organisation scheme of the Mersin Greater Municipality, each of two deputy general secretaries are responsible for the functioning of certain departments. One of the deputies is in charge of: (i) Research, Planning and Coordination, (ii) Urban Development, (iii) Civil Works, and (iv) Machinery Logistics, Maintenance and Repair Departments. The other supervises the activities of: (i) Public Health and Social Services, (ii) Accounting, (iii) Official Correspondence and Decisions, (iv) Personnel Recruitment, (v) Environmental Protection, and (vi) Procurement Departments.

Research, Planning and Coordination Department consists of Infrastructure Coordination Board, Transport Coordination Board and Local Public Transportation Sections. Urban Development Department, on the other hand, has: Planning; Real Estate and Expropriation; Mapping and Surveying; as well as Construction Supervision Sections. The engagements of the Civil Works Department are carried out by Communication Section as well as Contracting and Project Implementation Sections with respective subordinates. Machinery Logistics, Maintenance and Repair Department is the operative unit working with a repair shop.

Under the responsibility field of the Public Health and Social Services Department, three subordinate units are active: Public Health, Veterinary Services and Cemetery Sections. Accounting Department covers Fiscal Affairs, Revenues, Wholesale Market and Bus Terminal Sections. The Departments for Official Correspondence and Decisions; Fire Fighting; Green Areas; and Data Processing are individually attached to the Deputy General Secretary. The rest of the units are Personnel and Procurement Departments as well as Environmental Protection Department with Environmental Protection and Cleansing Sections.

### **a.2.2 Yenisehir District Municipality**

The Yenisehir District Municipality is governed by the Mayor and three deputy mayors. The Secretariat of the Mayor's Office along with Marital Affairs, Legislative Affairs, Personnel and Recruitment, Public Relations, Information and Press, Municipal Police, Social Affairs and Civil Defence Directorates are directly attached to the Mayor. While one of the deputies is responsible for (1) Cleansing, (2) Green Areas, and (3) Street Construction Directorates, the second deputy supervises (1) Civil Works, (2) Urban Development, (3) Planning, and (4) Mapping and Expropriation Directorates. The third deputy, on the other hand, looks after (1) Accounting, (2) Official Correspondence, (3) Real Estate and Procurement Directorates.

### **a.2.3 Toroslar District Municipality**

The Toroslar District Municipality is governed by a mayor and two deputy mayors. Beside the Secretariat of the Mayor's Office and the Directorate for Legislative Affairs, Press Information and Public Relations as well as Data Processing Directorates are the units, which are directly attached to the mayor. While one of the deputy mayors is responsible for administrative and fiscal issues, the other is assigned primarily for the performance of technical services.

The deputy mayor who is responsible for administrative and fiscal issues, supervises (1) Personnel and Recruitment Directorate with connected implementation and Record Divisions, (2) Official Correspondence Directorate with Document Registry

and Administrative Affairs Division, (3) Accounting directorate with Charging, Implementation and Control Division, (4) Real Estate Directorate with Store Management Division, and (5) Municipal Police Directorate.

The other deputy mayor responsible for the performance of technical services is in charge of the following directorates with respective divisions: (1) Civil Works Directorate with Urban Development, Occupancy Permitting, Construction Licensing and Construction Supervision Divisions, (2) Mapping and Expropriation Directorate with connected Expropriation Division, (3) Project and Construction Directorate with Machinery Logistics Division, (4) Green Areas Directorates with Public Parks and Gardens Division, and lastly (5) Cleansing Directorate with connected divisions.

#### **a.2.4 Akdeniz District Municipality**

The Akdeniz District Municipality is governed by a mayor and three deputy mayors. Beside the Secretariat of the Mayor's Office, those units, such as the Board of Inspectors, Legislative Affairs, Civil Defence, Data Processing, press-Information-Public Relations and Planning-Programming-Budgeting Directorates are directly attached to the Mayor. The three deputy mayors are assigned to cope with administrative and fiscal issues, public health and social welfare issues, as well as technical services, respectively.

The deputy mayor who is in charge administrative and fiscal issues supervises the following directorates: (1) Personnel and Recruitment Directorate with Implementation, Recording and Training Divisions, (2) Official Correspondence Directorate with Decisions and Protocols as well as General Documents and Administrative Affairs Divisions, (3) Accounting Directorate with connected Budgeting and Expenditures, Enterprises and Dividends, Advance and Credit Payments Divisions, and lastly (4) Procurement Directorate with Purchasing and Contracting as well as Store Management Divisions.

The second deputy mayor who is responsible for public health and social welfare issues looks after the activities of: (1) Municipal Police Directorate involved in control and licensing duties, (2) Public Health and Social Affairs Directorate with Medical Centre, Hygienic Supervision, Social Affairs and Environmental Police Divisions, (3) Veterinary Services, (4) Cleansing Directorate with connected Urban Cleansing and Pest Combat Divisions, as well as (5) Green Areas Directorate.

The third deputy mayor engaged in technical services supervises: (1) Urban Development directorate with connected Planning, Mapping, and Surveying, Plan Implementation, Construction Licensing, Construction Supervision, Occupancy Permit and Real Estate Divisions, (2) Civil Works Directorate with Research Projects, Contracting and Final Calculations, Street Construction, Asphalt Production, Facility Supervision Divisions, and lastly (3) Machinery Logistics Directorate with attached Repair shop and Craftsmanship Divisions.

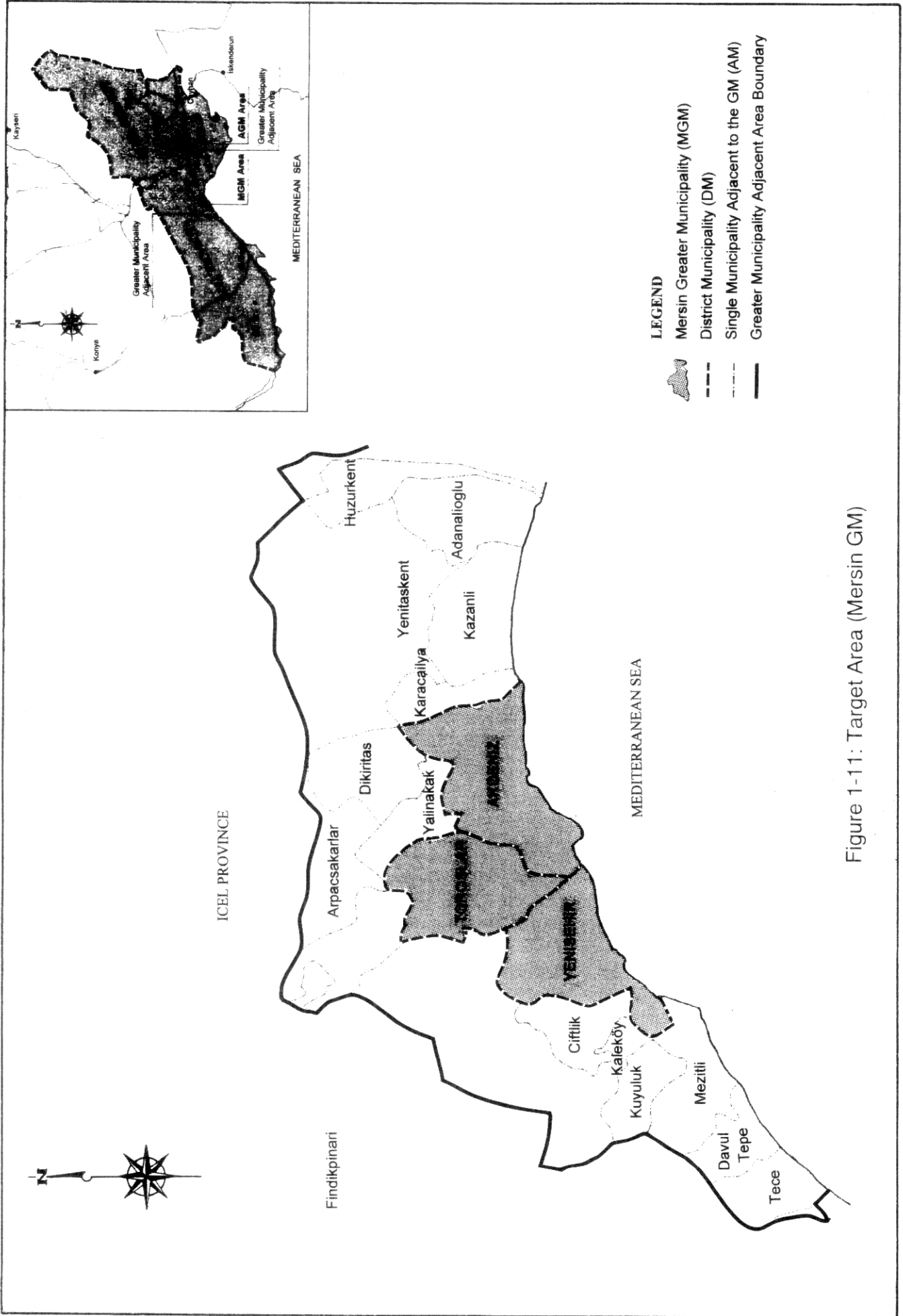


Figure 1-11: Target Area (Mersin GM)

## **b. Community**

Comparing with Adana, Mersin has a smaller communities. But detached houses share much more part than in Adana. Thus, community system seems a little bit different than that of Adana. In the CBD, high rise apartments are major building style. In these apartments, *kapici* system is working. But in detached houses in fringe areas, house wives have another kind of community. They are preparing their own cousins gathering together in one's house, with chatting about their daily lives. In preparing public education system, these groups are quite adequate for group instruction, such like segregation or manners to discharge their garbage.

## **c. Public Education**

In Mersin, just the same public education system is carried out like in Adana. Ministry of Environment conducting education in schools and campaigning, co-operating with Ministry of National Education. Guide book for children and other pamphlets or booklets are prepared and delivered to the people with catching some occasions. Greater Municipality itself is quite passive in these activities. It is highly expected to cooperate these three authorities in public education.

## **d. Public Health**

### **d.1 Municipal Waste**

#### **d.1.1 Collection**

Public manner on discharging waste seems better than cities in other region. Municipality's waste collection system is working quite well. District Municipalities are extending to about 95 % of the residents. In almost every sub-district has communal dustbins in some distance, 30-100 m. Where communal dustbins are not set, every house prepares their own cans to dispose of their garbage, which will be collected by municipality's waste collection truck. Mechanised operation is adopted for collection works as a means of improving labour efficiency, reducing worker injuries, and reduce waste collection cost.

Roads have been cleaned almost everyday, major roads by AGM, and minor roads by District Municipalities(DM). Moreover, it is observed that each family by housewives or children is cleansing their road in front of houses.

Wastewater is another problem, but road side shallow ditch is collecting waste water and it is connected to the municipal sewage disposal system in normal housing complex areas, but newly constructed *gecekondu* areas.

#### **d.1.2 Composting**

A composting plant has been operated at the landfill site. If the composting operation is conducted properly, the potential do not exists for pathogenic organisms to survive composting process. In general, most pathogenic organism found in MSW and other organic material to be composed will be destroyed at the temperatures and exposure times used in controlled composting operations.

#### **d.1.3 Landfill Operation**

The health and safety of the workers at landfills is crucial in the operation of landfill. There are several scavengers living with children in the landfill site. They work

together with heavy equipment for landfill work. Attention must be given to the scavengers not to be injured during landfill works.

#### **d.2 Medical Waste**

Medical waste is separated into 3 categories namely infectious, glass, general at source in the medical institutions

Containers for infectious medical waste are locked in order to avoid people's direct contact at central collection point.

Mersin Greater Municipality(MGM) is giving infectious medical waste collection service to major medical institutions. MGM has a collection vehicle exclusively used for infectious waste. The crew is composed of one driver and one collection worker. Attention is given to the types of protective clothing and boots and puncture-proof gloves supplied to the workers.

Infectious medical waste is incinerated in a medical institution, although almost all of the institutions do not conduct intermediate treatment.

Medical infectious waste has been disposed of in a trench, which is isolated in the Mersin disposal site with dis-infection by lime and cover soil available from nearby.

#### **e. Employment**

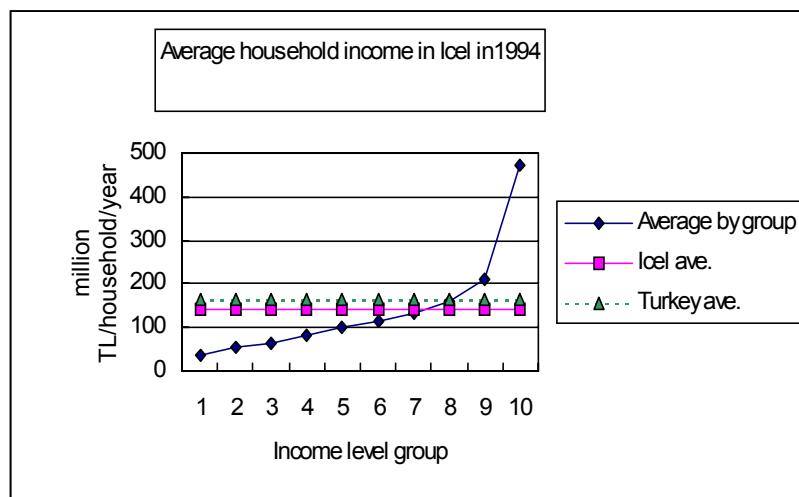
Unemployment rate per province is not obtained due to lack of relevant basic data after population census was carried out in 1990. On the assumption that the ratio of unemployed person within unemployed force looking for job is the same as Adana Province, the unemployment rate can be estimated to be 5.47% in Icel Province as of 1990 while that on national level is 6.4%. While unemployment rate for male was estimated high at 8.20%, that for female was 2.65%. The ratio of unemployed force within 12 year old and over in Icel Province resulted in 37.2%, which is slightly higher than that of national average of 36.0%.

#### **f. Income Level**

According to 1994 Household Income Distribution Study carried out by SSI, average income per household in Icel Province was 143.3 million TL (equivalent to US\$ 3,800), which was approximately 0.9 times the average income per household in Turkey of 165.1 million TL (equivalent to US\$ 4,370). However, only top 25% earns more than average income on national level and low ranked 50% earns less than 107.0 million TL (equivalent to US\$ 2,830).

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 is quite big. The ratio between urban population and non-urban population was approximately 3:1 in Icel Province in 1990.





Source: 1994 Household Income Distribution Study, SSI

Figure 1-12: Average Household Income in Icel

### 1.3.4 Population

#### a. Population Provided by the SSI

The population in the city was almost 500,000 according to the general population survey done by the SSI (State Statistics Institute) of Icel Provincial Office in 1997. Table 1-32 shows the population growth in the city.

Table 1-32: Population Growth in Mersin

Year	Akdeniz		Toroslar		Yenisehir		Total	
	Population	Growth Rate (%)	Population	Growth Rate (%)	Population	Growth Rate (%)	Population	Growth Rate (%)
1955	-	-	-	-	-	-	50,104	-
1960	-	-	-	-	-	-	68,485	6.4
1965	-	-	-	-	-	-	86,692	4.8
1970	-	-	-	-	-	-	112,982	5.4
1975	-	-	-	-	-	-	152,236	6.1
1980	-	-	-	-	-	-	216,308	7.3
1985	-	-	-	-	-	-	314,350	7.8
1990	187,070	-	150,210	-	85,077	-	422,357	6.1
1997	201,021	1.03	184,112	2.95	114,319	4.31	499,452	2.4

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

By 1990 the city showed extremely high growth rate, and especially it grew over 7 % from 1975 to 1985. This means the city's high economic development, and these were caused by immigrants from the south-eastern part of Turkey. This is a phenomena which can be seen in every city of Turkey those years. It, however, dramatically calms down from 1990 due to the intensive efforts made by the government for the development of the south-eastern part of Turkey.

According to the general population census done in 1990 and general population survey done in 1997, the populations of the adjacent area is in 1990 and 1997 are 125,478 and 150,502, respectively. Thus the growth rate of the adjacent area is 2.63 % and a little bit higher rate than that (2.42 %)of the city however.

#### b. Population deduced by the Current Waste Stream

Based on the general population survey conducted by the SSI (State Statistics Institute) of Icel Provincial Office in 1997 the population of Mersin GM in 1998 is estimated at 514,055.

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 data of the existing Composting Plant disposal site. Based on the WACS and the population in 1998, 514,055, the daily discharge amount is estimated at 311 ton/day. However, the daily discharge amount in Mersin GM is calculated at 415 ton/day based on the disposal amount data of the Composting Plant disposal 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 restaurant, etc.
3. The population during the day, which includes visitors to the city, generates the extra amount of waste.

The above-mentioned matters shall be 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 Mersin GM in 1998 at 634,850 for this report in order to accord the disposal amount at the Composting Plant disposal site. Applying this figure the population growth of Mersin GM is changed as shown in the table below.

Table 1-33: Population Growth of Mersin GM (excluding adjacent areas)

Year	Akdeniz		Toroslar		Yenisehir		Total	
	Population	Growth Rate (%)	Population	Growth Rate (%)	Population	Growth Rate (%)	Population	Growth Rate (%)
1955	-	-	-	-	-	-	50,104	-
1960	-	-	-	-	-	-	68,485	6.4
1965	-	-	-	-	-	-	86,692	4.8
1970	-	-	-	-	-	-	112,982	5.4
1975	-	-	-	-	-	-	152,236	6.1
1980	-	-	-	-	-	-	216,308	7.3
1985	-	-	-	-	-	-	314,350	7.8
1990	187,070	-	150,210	-	85,077	-	422,357	6.1
1998	255,516	3.97	234,024	5.70	145,310	6.92	634,850	5.2

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

Consequently the team formulated the current waste stream in Adana as presented in section 3.2.1.