Republic of Turkey
Prime Ministry
State Planning Organization

GAP

The Southeastern Anatolia Project Master Plan Study

Final Master Plan Report

VOLUME 4

Appendices D, E, F, G

April 1989

Nippon Koei Co. Ltd.
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THE SOUTHEASTERN ANATOLIA PROJECT
MASTER PLAN STUDY

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Appendices D,E,F,G

Appendix D : DETAILED DATA AND ANALYSIS RELATED TO SPATIAL STRUCTURE

Appendix E : PRESENT CONDITIONS AND EXISTING PROJECTS OF WATER RESOURCES DEVELOPMENT

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ABBREVIATIONS

Abbreviations of Organizations/Institutions (1/2)

CBIE		Census of Business and Industrial Establishments
CIMMYT		International Maize and Wheat Improvement Center
ÇİTOSAN	Çimento Sanayii	Turkish Cement Company
Çukobirlik		Çukurova Cotton Agricultural Sales Cooperatives Union
ÇÜZF	Çukurova Üniversitesi Ziraat Fakültesi	Çukurova University Facultyof Agriculture
DESİYAB	Devlet Sanayi ve İşçi Yatırım Bankası A.Ş.	State Industry and Workers Investment Bank (Now, Development Bank of Turkey)
D M I	Devlet Meteoroloji İşleri	State Meteorological Service
D S İ	Devlet Su İşleri	General Directorate of State Hydraulic Works
E B K	Et ve Balık Kurumu	Fish and Meat Organization
EIE (EIEI)	Elektrik İşleri Etüd İdaresi	Electrical Power Resources Survey and Development Administration
F A O		Food and Agriculture Organization
G A P	Güneydoğu Anadolu Projesi	Southeastern Anatolia Project
GDRA		General Directorate of Rural Affairs, MAFRA
Güneydoğu Birlik		Southeastern Agricultural Sales Cooperatives Union
IRRI		International Rice Research Institute
İ G E M E	İhracatı Geliştirme Merkezi	Export Promotion Center
KÜSGET	Küçük Sanayi Geliştirme Teşkilatı	Small Industry Development Organization
M A E D		Model for Analysis of the Energy Demand
M A F R A		Ministry of Agriculture, Fishery and Rural Affairs
M A G	Müsteşarlık Araştırma Grubu	Research and Project Promotion Group, SPO
M E N R		Ministry of Energy and Natural Resources
M E T U		Middle East Technical University
M G A P	Müsteşarlık Güneydoğu Anadolu Projesi	Southeastern Anatolia Project Group, SPO
M T A	Maden Tetkik Arama	Mineral Research and Exploration Institute
P B	Pamukbank	
P M U		Project Management Unit
R D C		Regional Development Center
Ş E B	Şekerbank	
S E C P		Census of Social and Economic Charasteristics of the Population

Abbreviations of Organizations/Institutions (2/2)

SEE		State Economic Enterprise
SIS	Devlet İstatistik Enstitüsü DİE	State Institute of Statistics
SPO	Devlet Planlama Teşkilatı DPT	State Planning Organization
SÜB	Sümerbank	
TAÇE	Türk-Alman Çıraklık Eğitimi	Turkish-German Apprentice Training Center
TCDD	Türkiye Cumhuriyeti Devlet Demiryolları	Turkish State Railways
TCK	Türkiye Cumhuriyeti Karayolları	General Directorate of State Highways
TCZB	Türkiye Cumhuriyeti Ziraat Bankası	Turkish Agricultural Bank
TEK	Türkiye Elektrik Kurumu	Turkish Electricity Authority
TEKB	Türkiye Emlak Kredi Bankası	Turkish Emlak Bank
TETEK	Türkiye Transit Karayolu	Trans Turkey Highway
THB	Türkiye Halk Bankası	Turkish Halk Bank
THK	Türk Hava Kurumu	Turkish Air Organization
THY	Türk Hava Yolları	Turkish Airlines
TİB	Türkiye İş Bankası	Turkish Is Bank
TİGEM	Tarım İşletmeleri Genel Müdürlüğü	State Farms General Directorate
TKİ	Türkiye Kömür İşletmeleri	Turkish Coal (lignite) Enterprises
TKK	Tarım Kredi Kooperatifleri	Agricultural Credit Cooperatives
TKV	Türkiye Kalkınma Vakfı	Turkish Development Foundation
TMO	Toprak Mahsulleri Ofisi	Soil Products Office
TOPRAKSU		(Former) General Directorate of Land and Water Development
TPAO	Türkiye Petrolleri A.O.	Turkish Petroleum Corporation
TSEK	Türkiye Süt Endüstrisi Kurumu	Turkish Dairy Industries Organization
TSK	Tarım Satış Kooperatifleri	Agricultural Sales Cooperatives
TTK	Türkiye Taşkömürü Kurumu	Turkish Hard Coal Enterprises
TURSAB	Türkiye Seyahat Acentaları Birliği	Union of Travel Agencies of Turkey
TYT	Türkiye Yapağı Tiftik	Turkish Wool Mohair Corporation
TYUAP	Tarımsal Yayım ve Uygulamalı Araştırma Projesi	Agricultural Extension and Applied Research Project
TZDK	Türkiye Zirai Donatım Kurumu	Turkish Agricultural Supply Organization
WASP		Wien Automatic System Planning Package
YSE	Yol Su Elektrik	(Former) Road, Water and Electricity Services

Abbreviations of Technical Terms

BOT	Build, Operate and Transfer
CIF	Cost, Insurance and Freight
D/D	Detailed Design
El.	Elevation
F/S	Feasibility Study
GDP	Gross Domestic Product
GNP	Gross National Product
GRP	Gross Regional Product
ICOR	Incremental Capital Output Ratio
IRR	Internal Rate of Return
LPG	Liquified Petroleum Gas
M/P	Master Plan
O-D	Origin-Destination
TDN	Total Digestible Nutrients
TDS	Total Dissolved Solids
VAT	Value-Added Tax

Abbreviations of Measures

Length

mm	millimeter
m	meter
km	kilometer

Area

km^2	square kilometers
ha	hectare
m^2	square meter
da	decare = 0.1ha

Volume

lit	litre
m^3	cubic meter
Mm^3	million cubic meters

Weight

kg	kilograms
t	tons

Time

s	second
sec	second
hr	hour
yr	year

Money

TL	Turkish lira
US $	United States dollar

Energy

GWh	Gigawatt-hour
kWh	Kilowatt-hour
kW	Kilowatt
MW	Megawatt
koe	kilograms of oils equivalent
toe	tons of oil equivalent
Mtoe	million tons of oil equivalent
kcal	kilocalorie
GJ	Gigajoule
hp	Horse power

Others

%	percent
^{0}	degree
^0C	degree Celsius

D

APPENDIX D
DETAILED DATA AND ANALYSIS RELATED TO SPATIAL STRUCTURE

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FIGURES

Figure D.1 Plains of the GAP Region

Appendix D : DETAILED DATA AND ANALYSIS RELATED TO SPATIAL STRUCTURE

D-1. Present Land Use Pattern and Land Resources

1. Location and climate

The GAP region is mainly composed of plains encircled by mountainous terrains on the east, north and west. The southern boundaries of the Region is the Iraqi and Syrian state borders. The total land area of the Region is 73,000 km² and it is located between 36° 30' - 38° 40' north latitudes and 36° 30' - 42° 40' eastern longitudes.

The Region comprises six provinces with land areas; Adiyaman 761,399 ha, Diyarbakir 1,535,444 ha, Gaziantep 764,170 ha, Mardin 1,232,286 ha, Siirt 1,100,268 ha, and Sanliurfa 1,902,057 ha. The Region is mainly composed of Lower Euphrates and Tigris river basins, and upper Mesopotamian plains. The following are the plains of the Region covering almost 2,000,000 ha of land (Figure D.1).

- Urfa - Harran
- Birecik, Suruc, Baziki
- Siverek - Hilvan
- Mardin - Ceylanpinar
- Gaziantep
- Yavuzeli, Araban
- Besni - Keysun
- Adiyaman
- Kahta Right Coast
- Kahta Left Coast
- Cermik
- Tigris Left Coast
- Tigris Right Coast
- Batman, Garzan
- Idil
- Nusaybin - Cizre

As separated from Mediterranean climatic influence, a terrestrial climate dominates the Region with high temperatures and low precipitation (Table D.1). The highest precipitation records are found at mountain sides of Taurus Mountains located at the northwest of the Region. Decreasing precipitation towards the south is mainly due to the latitude, terrestrial climate and topographic conditions. While the amount of precipitation reaches 1,200 to 1,300 mm at the mountain side stations of northwest, it is approximately 300 mm at the southern border stations. Average annual precipitation for the central cities such as Adiyaman and Sanliurfa is 835.4 mm and 473.1 mm respectively. The differences between annual averages and summer averages are an indication of extreme summer drought.

High differences between average temperatures of the coldest and the warmest months is the characteristics of terrestrial climate. Minimum temperatures of the provincial centers of the Region are; in Gaziantep - 17.5°C (January), Diyarbakir - 24.2°C (January), Sanliurfa - 12.4°C (February), Adiyaman - 9.4°C (January), in Siirt - 19.3°C (January), and in Mardin - 13.9°C (February). Maximum temperatures are; in Gaziantep 42.8°C (August), Adiyaman and Diyarbakir 46.2°C (July), Sanliurfa 46.5°C (July), Siirt 42.7°C (July) and in Mardin 42°C (August).

Frost days usually begin by the end of November and in December and ends by the end of February or in March.

2. Land resources

The land in the Region is classified into eight soil classes. The land suitable for cultivation in classes I, II and III constitutes 33.8% of the total land in the Region (Table D.2). According to MAFRA (TOPRAKSU) classifications, class IV soil is also suitable for cultivation with some improvement measures. Including this class soil, the share of cultivable land increases to 42.8%. Over 90% of the land in classes I, II and III and some 65% of the land in class IV have already been cultivated. About 445,000 ha in these classes are presently used as meadows, pastures, settlements or under bush cover.

Distribution of problem areas associated with land is given in Table D.3. As shown, salinity and alkalinity problems are not serious problems in the Region at present. Small magnitude of salinity problems exists in Adiyaman and in the Akcakale irrigation area. Drainage problems are also minimal with 4,408 ha of land having insufficient drainage of classes II, III and IV soil.

Surface stone coverage is a major problem. While it is not dominant in Adiyaman and Gaziantep, it is widely observed in Mardin and along the provincial boundaries between Sanliurfa and Diyarbakir. In classes II, III and IV of soil, 37.1% of land is covered with stones.

Wind erosion is observed in limited areas. Water erosion is another major problem. Moderate and strong water erosion is observed on classes II, III and IV soil in all the provinces. In these soil groups, 61-79% of the land has moderate and 4-18% has strong water erosion. The share of water erosion susceptible area on cultivable land is 77.8% in Adiyaman, 70.0% in Diyarbakir, 96.6% in Gaziantep, 66.1% in Mardin, 77.6% in Siirt and 69.2% in Sanliurfa.

Water erosion is also increasing in lower classes of soil. In classes V, VI and VII of soil, water erosion problems cover over 90% in all the provinces, except in Gaziantep where the problem

is seen on 61.4% of the land in these classes.

Land suitable for cultivation and for other uses is considered to be below 12% gradient. In the Region, 94% of the total land is in this category (Table D.4). The areas with slopes greater than 6% are located along the northern and northeastern fringes of the Region and cover most of the Siirt province.

3. Present land use pattern

The total area of all the provinces is 7,295,724 ha; 42.3 % of this land (3,082,896 ha) is used for agricultural purposes, of which dry and irrigated farming occupies 37.7 % (2,795,733 ha), orchards 3.5 % (252,126 ha) and special crops 1.1 % (80,094 ha), 33.3 % of the total used as pastures and 0.008 % as meadows (Table D.5). Forest and heath cover 20.5 % of the Region, while the settlements, marshes, river beds, rocks and water surfaces compose the rest of the Region.

Sanliurfa has the largest cultivated land with 36.2 % of the Region's total, followed by Diyarbakir (20.3 %), Gaziantep (15.5 %), Mardin (15.1 %), Adiyaman (7.9 %) and Siirt (4.9 %). Sanliurfa also has the largest share of the fertile land (38.1 %) in the Region followed by Diyarbakir, Mardin, Gaziantep, Adiyaman and Siirt (Table D.2).

Adiyaman

Dry farming land covers 206,576 ha of land and constitutes 84.7% of the total cultivated land of the province. Most of the dry farming land is fallowed. Of the dry farming land, 34,977 ha are on 6th and 7th class of soil which may need to be converted into another use (Table D.6).

Total amount of irrigated land is 12,260 ha. The orchards cover 22,949 ha of provincial land. According to more recent reports of TOPRAKSU, the area covered by special crop (2,083 ha) has increased due to the increased pistachio production in the province. It is stated that this expansion has mainly been at the expense of meadow and pasture land.

Adiyaman is one of the two provinces in the Region where forests are naturally grown. However, the forest area is rather small covering only 2.3 % (17,462 ha) of the provincial land.

Diyarbakir

The majority of the province's cultivated land is used for dry farming and it is fallowed. The area of dry land is 567,232 ha and constitutes 90.5 % of the total cultivated land. While 61,879 ha of dry farming land is on 6th and 7th classes of soil which may be turned into pastures, 58,054 ha of 1st and 2nd class soil is used as pasture. Irrigated land is 26,114 ha, but 2,583 ha of this land is on 6th class soil. The orchards cover

33,185 ha (2.2 %) mostly on land of lower soil classes. Diyarbakir has 404,245 ha (26.3 %) of heath covered land, 16,721 ha of which is on the first four classes of soil.

Gaziantep

The cultivated area of Gaziantep is 479,202 ha covering 62.5 % of the total provincial land. Dry farming is the dominant land use with 294,085 ha and 76.6 % of this land is fallowed.

Part of the dry farming land (20.6 %) is on 6th and 7th classes of soil. The orchards and special crops cover 162,483 ha (21.2 % of the total provincial land) being the largest in the Region.

Mardin

Mardin has 466,286 ha of cultivated land and 80.8 % (376,965 ha) of this land is used for dry farming and it is mostly fallowed.

There is 22,256 ha of irrigated land, of which 547 ha are on 7th class of soil which may be converted to orchards. Heath land covers 266,096 ha or 21.6 % of the provincial land, of which the 2nd and 3rd classes of soil cover 6,162 ha.

Siirt

Total cultivated area of the province is 150,012 ha, covering 13.6 % of the total provincial land. As such Siirt has the lowest share of cultivated land in the Region. Dry farming land which is fallowed covers 136,245 ha corresponding to 90.8 % of the total cultivated area.

Siirt has the largest heath covered land (595,523 ha) in the Region. The parts of the heath land on 2nd, 3rd and 4th classes of soil occupy 9,619 ha.

Sanliurfa

Sanliurfa is the province with the largest cultivated land in the Region. The total cultivated land is 1,116,997 ha or 58.7% of the total provincial land, constituting 36.2% of the Region's total cultivated land. However, 1,047,590 ha of this land is used for dry farming and it is mostly fallowed. Dry farming land on 1st class of soil is suitable for irrigation. There is 59,393 ha of dry farming land on 6th class of soil. Dry farming land on 7th class of soil extends over 26,759 ha.

Total pasture land of the province is 742,529 ha but 10,577 ha is on 1st and 2nd classes of soil which can be used for agricultural purposes.Orchards cover 25,643 ha. The heath land is 11,429 ha.

D-2 Present Conditions and Prospects of Transportation

1. Present conditions of transportation

1.1 Transportation infrastructure

(1) Roads and highways

Road network

The road network in Turkey and in the GAP region consists of State, provincial and rural roads. As of 1987, the Region contains 29,968 km of roads consisting of 4,345 km State and provincial roads and 25,623 km rural roads (Table D.7). This corresponds to 9.7% of the total road length 308,204 km in Turkey. However, the Region contains only 7.7% of the State and provincial roads, while the Region's share of rural roads is high at 10.2% due to the dispersed settlement pattern in the Region. The road density in the Region is 138 m/km² of asphalt/gravel roads and 165 m/km² graded and raw roads.

Interprovincial road network between major urban centers is conducted on asphalt covered single lane roads, most of which are gravel based. District roads connecting Gaziantep-Kilis, Gaziantep-Yavuzeli-Araban-Besni, Diyarbakir-Bismil, Gercus-Midyat-Omerli, Mardin-Cizre, Sanliurfa-Akcakale, and Viransehir-Ceylanpinar are second class asphalt covered gravel roads. The remaining district centers are interconnected by a network of third class roads.

Rural roads

Through the work of the Ministry of Agriculture, Forestry and Rural Affairs, initiated by YSE (Yol Su Elektrik), most villages within the six provinces have achieved a road link with district towns and provincial cities. In the Region, 98% of villages and hamlets have been linked to the State and provincial road system. The existing roads serve 2.1 million people in the rural areas by reaching 3,435 villages and 4,879 hamlets. From current information, only isolated villages in Siirt are without direct road link. Most villages, even within mountainous areas have access to roads - either directly entering the village or passing around its perimeter (Table D.8).

(2) Railways

The railway network in the Region constitutes a part of the State railway (TCDD) system in Turkey. There are two TCDD railway mainlines within the GAP region. One passes in an east-west direction along the southern border of the Region, linking Turkey to eastern Syria and northwestern Iraq. The other line links Malatya to Diyarbakir and Kurtalan in Siirt. The total length within the Region, including some branch lines, is 805 km (Table D.9).

Of the major GAP cities, only Gaziantep, Diyarbakir and Batman have direct access to railway facilities. The cities of Mardin, Siirt, Sanliurfa and Adiyaman are 10 to 50 km away from the railway lines. All services within the Region are conducted on single-track sections. Current services are not satisfactory due to ineffective management and inadequate conditions of physical facilities.

(3) Aviation

Within and contiguous to the GAP region, there are six airports available to commercial civilian services: viz. Gaziantep, Diyarbakir, Sanliurfa, Elazig, Malatya and Adana. All the airports, except ones at Sanliurfa and Elazig, have adequacy for use of DC-9 and B-727 aircrafts. Adana has capacity for B-727 and A-320. All the airports, except Adana, have only one commercial flight per day at most. No intra-regional services exist.

(4) Pipelines

Small volume, pipelines have been installed between various wellheads and local collection points. Medium volume pipelines have been radiated from the Batman refinery for collection of crude. Two pipelines have been installed for international throughout of petroleum from locations east and south of Turkey to terminal points within Iskenderun Gulf.

(5) Ports

Two ports are available at Mersin and Iskenderun just outside the Region for inter-regional and international shipping. These ports at present function well without severe time delays or unduly high costs for handling.

1.2 Passengers and freight traffic

(1) National transport development

Table D.10 shows the past modal split in Turkey for goods and passengers. Four modes of transport are based on the State Institute of Statistics, and figures for pipeline use within domestic services have been added. After initial review, the annual figures for cargo carried on coastal shipping was removed from the table as they do not appear consistent.

As seen from Table D.10, both goods haulage and passenger transport within Turkey increased by a factor of seven between 1960 and 1986 (average annual growth of 7.7% for goods and 7.8% for passengers). For goods movement, the road transport handled in 1960 only 44% of the total ton-kms, while the railway had 55%.

By 1970, the road system increased its share to 74%, and since then it has continually augmented its role to reach 85% of the national goods volume, handling 6.5 times the ton-kms of the railway traffic by TCDD. The road transport of goods had grown at an average annual rate of 10.4% in 1960-86 period. Aviation has experienced a five fold growth, but still handles an insignificant amount of the cargo volume. The market shares of pipelines have remained within a narrow range of 1.5 to 2.2% of the total goods movement.

Movement of passengers has also reflected a national shift from high railway participation to a near total domination by road services. In 1960, the roads handled just three times the railway volumes of passenger, but by 1986 this volume difference had widened to 16 times. Difference would be even wider, if suburban railway's volume of passenger-kms are excluded, and the railway share would drop from 6% to less than 2%. The road transport of passengers had grown at an average annual rate of 8.8% between 1960 and 1986. Passengers on coastal shipping have declined since 1960, while aviation has experienced a seven fold increase. Most of the coastal passenger shipping relates to daily passenger flows at Istanbul.

(2) Road traffic

Traffic surveys by TCK

Road transportation in the GAP region can be analyzed to some extent based on the past traffic survey data. TCK regularly publishes the results of its traffic and transportation surveys, which include the number of vehicles of different kinds on main road sections in Turkey. Older publications also contain the data on freight transport by goods category and passenger movements. TCK is carrying out origin-destination (O-D) surveys by selecting several points every year, but unfortunately the results of recent years are still in the form of raw data, and no O-D table is available.

Comparison of the TCK survey results in different years to see the trend in traffic patterns is difficult for two reasons. Points of surveys are slightly different by year, and the coding system of roads was recently changed. Also in older publications, some freight data were apparently calculated from the total tonnage with fixed shares for different goods groups. Within these limitations, the following observations can be made from the TCK survey results.

Changes in traffic pattern

The number of vehicles by kind on main sections of the road network in the GAP region is shown in Tables D.11 through D.13 for three recent years - 1975, 79, and 85. For a few sections, the points of surveys are slightly different by year, making the comparison difficult. It is observed that the traffic on E-24

highway increased significantly, especially for trucks. This is primarily due to international freight movements caused in part by the recent hostilities in the neighbouring countries.

No other sections of the main roads show significant increase in freight traffic. Decrease in trucks on the Diyarbakir-Ergani road reflects the reduction in copper production in Ergani. Decrease in trucks on the Diyarbakir-Sanliurfa road may reflect more the diversion of traffic to E-24 than the decrease in the copper-related traffic.

In all the sections shown in Tables D.11 and D.12 except these two roads, agricultural products and manufactured goods constitute the main portion of goods carried in terms of tonnage. Shares of manufactured goods are higher on sections west of the Diyarbakir-Sanliurfa road, while agricultural products have larger shares in the east for both 1975 and 1979 (Tables D.11 and D.12). Livestock transport is concentrated mostly on the Diyarbakir-Ergani road, and animal products on the eastern portion of E-24 highway leading to the Iraqi border. Bus traffic around Diyarbakir increased significantly, while automobile movements decreased on such sections.

(3) Other traffic

Railways

The TCDD railway shares of passenger and freight movement have been declining rapidly in the past few decades (Table D.10). At present, the passenger share is at 6% of the total national demand in terms of passenger-km, and the freight share is 12% in terms of ton-km. The railway data for the GAP region indicate that its role is even smaller than found in the Country.

Analysis of the railway transportation data published in 1986 by TCDD for the Southeastern part of Turkey show that the railway lines passing through the GAP region carried in total 1,340 million ton-km, consisting of 240 million ton-km passengers and 1,100 million ton-km freight. These correspond to 3.5% of the national total for passengers, 7.1% for freight, 6.0% overall (Table D.9).

Commodity haulage by TCDD into and out of the Region is represented by grains, cement, fertilizer, steel products, cotton, petroleum, coal and minerals. Domestic passengers and freight traffic carried by the railways within the Region is quite limited.

Aviation

Air transportation is primarily used for passenger transport. National air cargo and transport volumes in 1984 were 1,707,985 passengers and 136,726 tons of goods. In the same year the Gaziantep and Diyarbakir airports carried 30,718 and 75,527

domestic passengers and 109 and 1,060 tons of domestic cargo respectively in 1984 (Table D.14).

Maritime transport

Maritime transport related to the GAP region is through the two outer ports - Mersin and Iskenderun. Cargo tonnage handled at these ports have not been increasing much in recent years, reducing their relative importance in the total national shipping. These ports have not been increasing much in recent years, reducing their relative importance in the total national shipping. These ports at present contribute to 10% of the total cargo loaded for national and international shipping and less than 20% of the total cargo unloaded (Table D.15).

1.3 Existing transport plans and policies

(1) Transportation Master Plan

The National Transportation Master Plan (TMP) was prepared through the participation of 15 ministries, covering the period 1983-93. The principal goal of TMP was to determine the needs of the national population and economy and to plan the necessary investments in the most rational way possible.

To guide the transportation sector within the TMP context two different studies were initiated during the past 15 years. The data and the experiences gained from these studies have provided the general guidelines for the GAP Master Plan. In summary the TMP aims to streamline the sector in accordance with the expected population and economic growth of the Nation. For this purpose, the Plan seeks:

- to improve passenger safety,
- to meet demands,
- to expand accessibility
- to diminish transportation costs and to conserve energy requirements,
- to decrease dependency on a single source of energy,
- to decrease adverse effects on the environment,
- to achieve better management,
- to increase earnings from international transportation and
- to conserve and develop scarce local resources to be used beyond 1990's.

(2) Fifth Five Year Plan

The Fifth Five Year Plan (1984 - 1989) had introduced considerable flexibility in the planning of investment in the transportation sector. Criteria for guiding investment during this period were :

- high priority to be given to investments which would enable transport to respond effectively to shifts and growth in demand,

- high priority to be given to selective investments in the modernization of equipment and workshop facilities that would raise the performance of the sector as a whole,

- avoidance of dispersion of the investment effort - in the case of railroads rehabilitation and improvement of signalling and maintenance facilities,

- improvement of those sections of the main railway lines having a large potential for raising operational performance and quality,

- deferment of some investments for major new railway lines, electrification and inter-city passenger transportation,

- for highways, emphasizes on rehabilitation of the existing network with upgrading of selected high-priority sections of trunk roads to motorway standards and strengthening of maintenance activities and

- concentrate on improving container handling facilities in selected ports to support foreign trade and transit traffic.

(3) Transport public sector investment

The transportation public sector investment in Turkey was TL 1,139 billion (1988 values) in 1980 and of this TL 66 billion, or 5.8 % were allocated to the GAP region. By 1987, investments in this sector had decreased to TL 1,023 billion and the Region's share also decreased to TL 46 billion, or 4.5 % of the national total. These decreases, in both the Nation and the Region had been due to the completion or near completion of some major investment projects such as the Trans Turkey Highway (TETEK) which extends from Thrace in Northwest Turkey to Habur - Mardin.

Sub-sectorally, regional transportation investments between these periods had been primarily for the construction of State and provincial highways and rural roads. State and provincial roads received 56 %, 58 % and 68 % of the Region's investment allocation of the transportation in 1980, 1985 and 1987 respectively. Rural roads on the other hand received 26 %, 14 % and 15 % during the same period. Railroads and aviation investments have continued to be marginal (Table D.16).

(4) Policy decisions

Transportation policies with medium to long term objectives

should be a fundamental guide in the annual planning of investment decisions. Recent investment decisions being outside of the scope of the TMP (1982-1993) has created ambiguities within the framework of the plan. Political and international developments since the preparation of the TMP has resulted in the re-evaluation of the sector's current and expected developments.

Operations of various transportation services needs a coordinated effort in determining tariffs, timetables, investments and planning of investments. Currently no single agency has such a responsibility, with the exception of the investment planning conducted by SPO. A Transportation Co-ordination Agency (TCA) was established several years ago to satisfy such requirements. TCA has been abolished without being replaced by an alternative responsible body. Sectoral responsibilities are scattered in various ministries and agencies.

1.4 Transport-related organizations

Institutions involved in various aspects of planning are found in the public and the private sectors. They may be summarized as follows:

Government organizations

* Prime Ministry
  - State Planning Organization
    Preparation of all plans, programs etc., related to transportation. Approval of plans and programs prepared by other government agencies. Follow-up applications of plans and programs.

  - General Directorate of Meteorology

    Meteorological affairs related to transportation safety.

* Ministry of Transportation
  Responsible for overall activities related to transportation with the exception of (1) Highway construction, (2) Highway safety, (3) Enforcement of maritime rules.

* Ministry of Public Works and Resettlement
  - General Directorate of Highways

    Construction and maintenance of State highways, provincial roads and motorways and vehicle inspection.

* Ministry of Agriculture, Forestry and Rural Services
  - General Directorate of Rural Affairs

    Construction and maintenance of village roads.

* Ministry of Interior
  - General Directorate of Security

    Highway safety.

  - H.Q. Gendarmes

    Highway safety.

  - Coast Guard

    Enforcement of maritime rules.

* Municipalities

    Construction and maintenance of urban roads and streets, urban transportation.

Public or semi-public companies dealing with transportation

* Turkish State Railways (TCDD)

    Railway (monopoly) and port operations (partially).

* Turkish Maritime Organization

    Port operations (partially) and passenger transportation (monopoly over long distances).

* Maritime Bank Cargo Lines

    Maritime cargo transportation

* Turkish Airlines (THY)

    Airline operator

* Bogazici Airlines

    Airline operator

* Handling Company (HAVAS)

    Airport handling

* Turkish Airports Authority (DHMI)

    Airport operations, air traffic control, etc.

* BOTAS

    Pipeline operator

* USAS

Catering company

Legal private organizations

* Chamber of Maritime Trade

An advisory body for maritime transportation

* Turkish Association of Chauffeurs and Vehicle Owners

An advisory body for road transportation - acting on behalf of taxies and domestic transporters.

* Turkish Foundation for Accident Prevention

An advisory body for highway safety.

* Turkish Association of Ship Owners

An active organization for maritime transport.

* Union of International Road Carriers

An active organization for international transit road transportation.

2. Prospects of the Region's transport

2.1 Passenger traffic growth

Passenger traffic grows in general as the population increases and the urbanization proceeds. Increasing income levels also work positively for passenger traffic growth. The differential growth of many urban centers and changes in spatial income distribution usually change the pattern of passenger traffic. The TMP, however, applied a uniform 4.6% annual growth of passenger-km to all the major corridors, based on the perception that the differences in the increase in urban population during the plan period will not be large enough to alter the existing passenger traffic pattern.

The GAP implementation at full scale will change the Region's population distribution considerably. Some urban centers will grow more rapidly, receiving incoming population from neighbouring areas and other regions of the Country. Rural-urban population movements will certainly change as major irrigation schemes are implemented. At the macro level, however, the passenger traffic growth within the Region will be affected primarily by the overall growth of the Region's economy.

Future passenger traffic on road will grow generally in line with

the population increase and economic growth. The latter is reflected in traffic generation per capita. The per capita GRP is expected to grow at 3.7% per annum. Assuming the elasticity of 0.8 with respect to per capita GRP, the traffic generation per capita will grow at 2.96% per annum. Combining the effects of population increase at 3.0% per annum, the passenger traffic on road will grow on an average at the annual rate of 6.0%.

2.2 Future freight traffic pattern

The freight traffic projection was made by the TMP in two steps. First, a uniform growth of the freight traffic was assumed on all the corridors. This rate was determined at 4.0% per annum in terms of ton-km based on assumed economic growth. Second, additional freight traffic was assigned to different corridors, depending on expected increases in transport needs of different commodities obtained from related agencies.

A large amount of agricultural products and processed goods to be generated by GAP implementation may change the traffic pattern in the Region. In order to analyze main directions of GAP related commodity flow in the future, a simple network model has been used. Demand and supply for main goods involved in GAP are specified by province and for major export directions. Main locations of processing facilities are specified with possible maximum capacity. Such traffic pattern that will minimize the total ton-kilometers has been found out by linear programming. The objective of this analysis is to clarify general traffic pattern that will likely prevail in the future rather than to project future traffic on particular road or railway section.

Main GAP related goods analyzed are cereals and their products, live animals and meat, cotton and its products, oil seed and edible oils, and vegetables and processed vegetables. The total regional production and regional/export demand for these commodities were specified for the model. The results of optimization are summarized in the following.

For cereals and their products, major outflow of products from Mardin to Siirt and from Sanliurfa to the west are observed. Exports of cereals are represented by feed grains to the neighbouring countries and wheat to Eastern Anatolia.

Flow of meat is generally from the east to west with Diyarbakir and Siirt as the main processing centers. Small amount of meat export from Siirt and export of animals from Mardin are observed.

For cotton and its products and raw/processed vegetables, major flow is along the main corridors: Diyarbakir-Sanliurfa, Sanliurfa-Gaziantep, and Mardin-Sanliurfa. Oil seed flows from Mardin to Diyarbakir for processing and to southeast for export. Major flow of both oil seed and edible oils is observed from

Sanliurfa to the west.

2.3 Future modal split

Current contribution of different transport modes to the total passenger traffic in Turkey is approximately 93% by roads, 6% by railways and 1% by shipping and airways. Modal split for the freight traffic at present is approximately 85% by roads, 12% by railways and 3% by airways and pipelines (Table D.10). Railway contribution in the Region is smaller for passengers, and the freight traffic by pipelines is larger.

Future modal split in the Region will depend on several factors. For railways, the improvement of existing organization and physical conditions is a prerequisite to the future penetration into greater haulage. Upgrading of the outer ports with container handling facilities will improve the future prospect of this mode of transport.

Aviation may handle 5% of the selected passenger markets involving major cities. In intra-area cargo, it will not reach one percent of the tonnage offered. Extension of pipeline network is foreseen primarily for domestic use.

Overall, however, road transport will continue to be the dominant means both for passenger and freight. Roads will account for some 95% of passenger mobility and 80-85% of cargo movement in 2005.

3. Transportation development needs

3.1 Development needs by mode

(1) Roads

The General Directorate of State Highways (TCK) has demonstrated good management and project control for the Region's main highways. Its offices of regions 5, 8 and 9 have upgraded many of the primary and secondary highways in the past decade and maintained and resealed roads on a routine basis, despite poor soil conditions, limited budgets and a spread-out network. No major backlog of uncompleted works exist in the GAP region.

Intra-regional traffic, conducted primarily along the east-west corridor of Adana-Silopi does create bottlenecks in the existing network. This high volume traffic corridor, in excess of 4,000 ADT, resulting from the arising needs of the Middle-eastern trade and the transit traffic for the transportation of bulk commodities like coal and petroleum are a major concern.

Immediate road transportation needs of the Region can be summarized as:

- To realign the Adiyaman-Kahta road northward, through Narince and Gerger and to merge it with the Siverek to Ergani road at Cermik.

- To realign other roads to be disrupted by the planned priority dam projects.

- To complete and upgrade the road between Diyarbakir and Batman which passes through Bismil.

- To improve and increase the road maintenance capacities of TCK, especially along the Gaziantep-Sanliurfa-Diyarbakir highway.

- To evaluate the possible impacts of improving the highway between Adiyaman and Malatya which passes through Celikhan.

- To develop a regional farm to market road strategy based on prospective rural growth centers

- To analyze the expected future transit transportation volumes of the major producing and shipping countries as they relate to the GAP region.

- To conduct the O-D survey on major highways and to evaluate its implications on the GAP region traffic flows.

(2) Railways

Issues of new TCDD alignments within GAP region are the following:

- Between Gaziantep and Nusaybin there are 18 stations and three halts. While Gaziantep has facilities for loading and discharge of goods wagons, such facilities in Nusaybin are limited.

- In Nizip, Yesildag, Karkamis, Akcakale, Ceylanpinar, and Senyurt there are sidings for local loading of wagons. However, the other stations are provided only for the passing function of trains and the signalling requirements. Passing limits are 500 m generally with some stations having ability for 700 m.

- Between Gaziantep and Narli, the 84 km of single track line contains seven intermediate stations. However, none of these are for commercial goods service, but rather for signaling, and control of train operations. Passing can be done with trains of 655 m. However, the 1.5 percent gradient is the parameter establishing the train limit of tonnage.

- The Malatya-Kurtalan line has little traffic east of Diyarbakir. Passenger services are not well provided and the cost of operation is high. Further, passenger fares are not established at a renumerative level. Lack of wagon capacity, train capacity, locomotive availability, and existence of very slow cargo services means that coal from this area is shipped 450 km via truck rather than railway.

- A provision for unit-train operation between Kurtalan and Kars should be evaluated.

- The potential for goods movement between Batman and Kurtalan and points to the north and west of Malatya should be studied.

- The potential for the railway to serve the Batman refinery in a more effective manner should be reviewed. Otherwise, based on economic operation, the railway services east of Diyarbakir could be reviewed for suspension.

- The prospective utility of railroad connection should be studied between Sanliurfa and Diyarbakir (to connect Diyarbakir with the planned re-aligned railroad passing through Sanliurfa) and Kurtalan to Iraqi border with Mardin link.

Within the railway, a prime consideration is the increased traffic from the northeast Turkey to the steel plant at Iskenderun. Iron ore and coking materials are hauled along this line, using the Fevzipasa tunnel section. IBRD and other lending agencies have been asked to review this track section. However, little action has been made. With the new focus of traffic demand to the north and east of Fevzipasa, rather than south as the line was originally built, question is raised for undertaking a study of the traffic and engineering in order to make the alignment more productive.

The world-wide growth in container utilization has occurred due to reduced costs, increased security of goods and improved ease of handling. As a result, all commodities will require near-term evaluation for their potential to be containerized. While such measures may seem less important for domestic commerce, the growing orientation to international trade will require the impact of this technology on the market strength of GAP production to be analyzed.

(3) Aviation

Civilian air services and related infrastructure needs within GAP require study and possible change. While land based transport has a clear priority within the needs of GAP, there is current need to more clearly see the policy required within the next decade

for fixed-wing air transport. The potential, within the context of GAP regional development, has not been realized by THY or other agency during the last decade.

Due to the distances, with the growth of population, and with the overall economic development, there is a growing need for expanded civilian aviation. Firstly, within cities of 100,000 population having no airport, there is need for small-aircraft operation or the economic study of their traffic potential. While the daily capacity of air service need not be large, the ability of provinces and small cities to offer such service permits business travelers to extend their activities.

The national experience with THY's Dash 7, F-28, and F-27 domestic scheduled operation to smaller cities, suggests a need for divesting THY from an exclusive responsibility and encouraging private smaller carriers entering into service. Without reduction in safety standards, new firms can be given certificates to provide services needed by the city and not by the international carriers only.

The study of air services should look to city-pairs within the GAP and between the GAP provincial cities and contiguous cities. A survey of airline passengers using Adana, Diyarbakir, Gaziantep, Malatya, Elazig and Van airports should be conducted to clarify origins and destination of travellers to determine potential market areas of air travellers.

Some important considerations would include:

- Siirt has little safe area for provision of airport. Weather conditions for several months would make air-craft operations very difficult. Existing provincial roads provide good link to Batman and Diyarbakir. There would be some potential for service to Mus and/or Van, but the roads are quite slow. Therefore services might be concentrated on Diyarbakir.

- Adiyaman could be developed into an air facility for Dash 7 or similar aircraft. However, for larger aircraft there would be problem for attraction of passengers. Exception is the case where the tourist potential was developed to the degree that permitted nearly exclusive tourist use of aircraft. However there would be great seasonality within this traffic due to weather, temperature, and general parameters of EEC vacations.

- Currently for Adiyaman, the airport of Gaziantep provides a link with less than two hour road journey. In future the new road across the Ataturk Dam and the airport at Sanliurfa will provide an equal attraction for local people.

- If Gaziantep has plans for a new airport at a different site than the present facility, then it should be sited between Gaziantep, Kahramanmaras, and Adiyaman.

- An international class airport will be required in the long-term future. The city of Sanliurfa, being the envisaged regional center, is a candidate location. However, the site selection should reflect future development of the Region including irrigated agriculture, urbanization / industrialization, tourism development and higher order service provision.

- The degree of intra-area air travel demand should be studied with a view to the development of domestic flights which do not focus exclusively on Ankara and Istanbul.

(4) Pipelines

The GAP region contains a good network of military associated pipelines. It is possible to convert this network to dual purpose use through the construction of new pumping stations and pipe links. Investments for such a system should also include the creation of tank farms in Diyarbakir, Sanliurfa and Gaziantep to reduce fluctuations during services.

(5) Ports and others

Transport needs for exporting, especially the use of Mersin and Iskenderun ports, which are currently under - utilized and inland container depots are essential. It would be necessary to determine the total amount of agricultural and manufactured goods that will need containerization, storage and transfer facilities. Since the major exports from the Region will include mostly agricultural products, a silo network with appropriate locations and sizes - along railways and major highways - will become essential.

Depot network should be extended to the port of Iskenderun in order to create a good link with maritime transportation facilities. Other export market links should include railway alignments that will connect with those located in Iraq, Syria, Iran and the Soviet Union.

3.2 Road capacity needs

(1) Traffic projection

Road traffic on 13 main road sections within the Region is projected and needs for capacity expansion clarified. The projection is made separately for passengers and freight and converted into a common unit.

Passenger traffic is expected to grow at 6.0% per annum described above. Although differential growth is expected different road sections, a uniform growth is assumed simplicity. It is also assumed that the shares betwe automobiles and buses for carrying passengers will not change f each road section. Thus, the number of automobiles and bus will increase at 6.0% per annum.

Freight traffic is projected in two steps. First, the number o trucks is increased at a uniform rate of 4.0% per annum for al the road sections. This rate is used in the TMP for freigh traffic projection and considered to represent a trend growth. Second, traffic generation directly related to the GA implementation is added to different road section.

For the latter step, the flow of GAP related commodities derive by the traffic pattern analysis is converted to traffic volume. For each commodity, the annual tonnage transported is converte to daily traffic. This, in turn, is converted to the number of trucks by assuming 12 tons per vehicles as the average payload capacity of trucks.

The passenger and freight traffic in terms of number of vehicles of different kinds is converted to a common term of passenger car unit (PCU). The following conversion factors were used by the TMP.

Automobile Equivalents of Vehicles According to Terrain

	Terrain		
Type of vehicle	Flat	Undulating	Rough
Automobiles	1	1	1
Buses	2	3	4
Trucks	2	3	5

Source: Transportation Master Plan 1983-93

Most parts of the road sections under study are on undulating rolling terrain. Thus, the number of buses and trucks is converted to PCU's by multiplying with three.

The results of road traffic projection are summarized in Table D.17. The table shows the current traffic in PCU's based on the TCK traffic count data for 1985 and the projected traffic in PCU's for 1995, 2000, and 2005. Additional traffic to be generated directly by the GAP is also shown for each road section.

(2) Evaluation

TCK considers road sections with routine demand of more than 5,000 vehicles to be candidates for dual-lane, expressway type

design. Actual decisions depend on several factors, heavy vehicles involvement being a major one. Thus, relative magnitude of capacity needs for different roads is compared here on the basis of PCU's.

As seen from Table D.17, those road sections exceeding the 5,000 PCU's threshold at present are along E-24: Gaziantep-Nusaybin, and Cizre-Silopi/Habur. The time when this threshold is reached is different for other roads. The road sections exceeding 5,000 PCU's by 1995 are Diyarbakir-Silvan/Kozluk and Hilvan-Diyarbakir. Those passing the threshold by 2005 are Diyarbakir-Ergani, Sanliurfa-Hilvan, and Kiziltepe-Mardin. The road sections Adiyaman-Sanliurfa/Diyarbakir road and Mardin-Cinar will not reach the threshold by 2005.

If the additional traffic by GAP is taken into account, the implementation timing for upgrading each road section may change. Upgrading of the Sanliurfa-Hilvan and the Kiziltepe-Mardin sections may be justified by 2000 rather than 2005. If the GAP related additional traffic is fully realized by 2005, the traffic growth will be highest for Sanliurfa-Hilvan, Hilvan-Diyarbakir and Kiziltepe-Mardin (Table D.17).

D-3 Urban Development

1. Urban population growth

The GAP region's population has been growing at a faster rate than the National average. Within the Region this growth rate is relatively higher for urban places than the remainder of the Region. Places with populations larger than 10,000, classified as urban by the State Institute of Statistics and the State Planning Organization (classification used until the 1985 Census), made up 46 % of the Region's total population in 1985. There are 34 places of this size group. With the exception of Sanliurfa-Muratli, they are also municipalities (Table D.18).

The growth among most of these urban centers has been a continuous one. These places are the administrative and commercial centers of the Region and with the exception of Akcakale, Ceylanpinar and Muratli they are located on major transportation corridors. Growth rates among these places vary. They have been grouped into five categories by their average population growth rate characteristics.

a. Group 1 : Consistent positive growth (1965-1985)
b. Group 2 : Consistent positive growth (1975-1985)
c. Group 3 : Recent upturn in growth (1975-1985)
d. Group 4 : Inconsistently positive
e. Group 5 : Decreasing

Population growth among these centers is not a function of their size. Location, administrative and commercial functions associated with these centers have influenced their growth rates more. Silopi, Sirnak, Cermik, Ceylanpinar, Cizre, Nusaybin, Nizip (Group 1 and 2) are examples of municipalities with consistent growth rates which have unique economic activities as well as administrative functions.

Batman, unlike the centers in Group 1 and 2, is in Group 5 and it has had a decreasing population growth rate. The economic momentum of Batman due to increased petroleum refining activity peaked toward mid-nineteen seventies and since then this growth has slowed down. Production levels in Batman have not increased and this has resulted in slower growth. Employment in the TPAO-Batman refinery has increased from 545 in 1984 to 576 in 1985- an increase of only 31 workers.

Since 1965 the growth patterns of most of these large central places has parallelled that of the Region's. However their population growth rates have been mostly at higher rates than those of the overall Region (Tables D.19 and D.20).

Urban population increases based on alternative economic growth projections have been estimated using past population statistics

published by the State Institute of Statistics. These analysis are based on census statistics of periods 1945-1985 and 1965-1985 for provincial and urban/rural populations respectively (further discussion in Appendix G).

In these exercises the trend approach, assuming the continuation of the past socio-economic trends, results in the lowest population growth (Tables D.20 and D.21). Alternative A, with the realization of maximum irrigation development, is seen to induce the highest population growth of the Region. Alternative B, maximum power generation, and Alternative C, slower development, result in lower population growth (Tables D.22 through D.24).

2. GAP spatial development strategy

2.1 Spatial development

Space has profound impact on the organization of economic and social activities. Selection of sites most often will have long term impacts upon service-delivery systems. Therefore, improving performance of these systems over which administrators can exert some control could lead to a more efficient use of resources.

Location of facilities are critical for the provision of basic human services. Those decisions concerning locational decisions require good planning since it will be difficult to modify location patterns that are being determined today.

A spatial development framework indicates the variation over space of development potentials. It would guide the formulation and evaluation of development projects and locational decisions related thereto. Development efforts should better be concentrated on selected areas of higher potentials and attainable objectives, rather than spread thinly over a large area. General expectation is that by doing so, the development of respected hinterlands will also be induced.

2.2 The "Kinked Development Axis"

For planning the Region's spatial development the priority should be set for the 'Kinked Axis' connecting the three major cities: i.e. Gaziantep. Sanliurfa and Diyarbakir. Along this corridor, Gaziantep is easily connected to Adana and it is a nodal point on the inter-regional traffic. Diyarbakir is the distribution center for goods originating from and destined to the northeastern regions of Turkey. Sanliurfa is located practically at the 'heart' of the GAP region, it is equidistant from the major GAP urban centers and it has the potential to develop its own agro-industrial capacities and to make use of the expected production increases of the Region's agriculture.

The proposed development corridor in 1985 had a population of 1.2

million or 29 percent of the regional population living in slightly over one-hundred settlements of varying sizes. Of the Region's total manufacturing establishments 80 % were located on or along this corridor and they employed over 80 % of the total manufacturing labor force.

The density along this corridor based on the 1985 population has been estimated to be approximately 422 persons/km² compared to the regional density of 56 persons/km² (Table D.26).

Development policies along this corridor should be oriented towards the improvement and the expansion of infrastructure and utilities and to encourage the location of strategic industries on or close to it. Decisions concerning the planning of such services should also consider the inducing effects of those improvements on communities along secondary road networks.

Initial development should be concentrated on the major centers of Gaziantep, Sanliurfa and Diyarbakir including their immediate influence areas within a 10 km diameter and the secondary administrative centers of Nizip-Gaziantep, Birecik-Sanliurfa Suruc-Sanliurfa, Hilvan-Sanliurfa and Siverek-Sanliurfa including their urban influence areas within a 5 km distance.

Population growth rates along this corridor is expected to be 4.7 % on an average per annum for the next 20 years while the GAP region as a whole will achieve a 3.02 % (based on Alternative C, slower growth rate) average annual growth rate during the same period. These rates are expected to decrease after about twenty years and they should eventually resemble the current (1985) national annual average population growth rate of about 2.4 %.

This corridor will have dual functions. To the southern periphery it will serve as a consolidated and a robust base with strategic manufacturing establishments found along its course. The northern part, extending from Sanliurfa to Diyarbakir will be a channel through which goods to and from the South-central Anatolia region will pass.

3. Corridor development analysis

3.1 Corridor development

Development most frequently occurs along transportation corridors. On such corridors localities with unique geographic advantages, administrative status and entrepreneurial potential usually grow and develop faster than other localities. It is to these localities where most State and private investments are channeled.

Development planning along corridors must be multi-sectoral with special emphasis on agricultural production, urbanization,

manufacturing and transportation. These sectoral components need to be analyzed sector-wise as well as cross-sectorally. As well, regional integration of these corridors with the hinterlands needs to be achieved in order to realize the participation of those living in more remote areas in the development process.

Development occurs sectorally and inter-sectorally through technological linkages. Spatial implication of these developments are reflected in the tendencies of manufacturing industries to agglomerate in urban centers and along major transportation corridors. It is in these centers and corridors where wide selection of inputs and public and private services, as well as marketing opportunities converge.

3.2 Corridor and hinterland development

Settlements along the corridors offer various levels of services. Higher order services are most often found in settlements with populations in excess of 100,000. Major hospitals, institutions of higher education, regional administrative centers, airports, specialized business services and wholesale trades are usually located in these places. Lower order services such as weekly markets, health clinics, basic agricultural inputs, retail stores and pharmaceuticals are usually found in centers with populations larger than 10,000.

In 1985 there were four centers larger than 100,000. By 2005 their numbers are expected to reach 12. Correspondingly, most places along these corridors will have higher growth rates than the Region in general, resulting in the concentration of larger settlements along them. By 2005, 38 of the Region's 45 settlements with populations larger than 10,000 will be located along these corridors.

Smaller settlements not along these corridors will rely on these centers as marketing and transportation outlets and seek social, financial, technical and other specialized services in them. Seasonally unemployed and marginally employed persons in the surrounding villages may find employment in these centers and they may eventually choose to settle there. Thereby migration patterns would shift from inter-regional migration to intra-regional migration.

Development of the corridors will eventually provide the Regional rural population easier access to public and private services. For example; in 1985, for each corridor center with population larger than 10,000 there were approximately 115 villages within a radius of 50 km. By 2005 these figures will be 45 km and 91 villages respectively. That is, villages will have closer and more centers able to respond to the needs of village populations in the Region.

3.3 Rural settlements and corridors

Some rural settlements will grow faster than others. Rich agricultural hinterland and strategic geographic location can be identified as the two most important factors for such a development. These places will gradually develop indigenous small scale commercial activities such as grocery and repair shops and animal markets, serving villages within close proximity. Due to these characteristics, such villages can be identified as central villages. The population threshold for identifying such central villages has been assumed to be between 2,000-5,000.

In the GAP region villages that are expected to develop into central villages in the near future are located mainly along the major corridors. In 1985 the number of villages with populations in this size group were 21. By 2005 their numbers are expected to be about 34.

Improving the service capacities of these central villages can be an effective method of reaching smaller villages. Some of the public and private services provided mainly at the district level can be brought to these central villages on a weekly basis. With proper scheduling and sufficient notification the population of the surrounding villages can travel less distance to attain essential services.

Mobil vehicles properly equipped and manned can be used to provide more frequent services to these centers. Some services that can be easily brought to these centers includes: agricultural extension, banking, health, library, legal and entertainment.

3.4 Corridor development analysis for GAP

Evaluation of corridors

The important corridors in the GAP provinces have been analyzed, based on population potential, density, transportation network, land use capability and manufacturing activity. As a result, 23 such corridors have been determined. These corridors in 1985 constituted 61 % of the Region's total population. By 2005, due to their locational advantages growth rates along these corridors are expected to exceed 4.4 % compared to the 3 % growth rate of the overall GAP region and they will contain approximately 80 % of the total population (Tables D.26 and D.27).

Evaluation of these corridors has determined that the two major corridors with regional importance are Corridor A, extending from Gaziantep to Mardin and Corridor B, extending from Gaziantep to Diyarbakir (The Kinked Development Corridor). Of these two corridors, B has been selected as the one with immediate developable potential. It is along this corridor that the highest

percentage of the population of the Region live and work. Also, this corridor has fewer number of settlement points, whereby investments can be more concentrated (Tables D.25 and D.28).

Densities along these corridors vary. Large centers along corridors influence these densities. Exclusion of administrative centers, which are also the major population centers determines rural densities. This analysis has revealed that the corridor No. 21, extending from Bekirhan to Kurtalan has the most dense rural population (Table D.29).

Locational considerations

A strategic spatial development policy formulation can result in changing a region's development structure. A major issue pertinent to the selection of locations which are expected to have inducement effects is the availability of usable resources. These corridors are the major transportation networks on which all major urban centers are located. Immediate concern for the Region's development should be the efficient allocation of resources.

A widely dispersed superficial remedies will not have positive long lasting effects. Investments need to be injected into the right activities at the most strategic locations. Sector-wise investment without spatial consideration will not be as effective as an investment directed at optimal locations.

Areas that are outside of these corridors are predominantly small village settlements with average population of about 500. Although, all of them have road access to these corridors. Only in the Siirt province some of the isolated villages are without direct road link.

Accessibility to urban services and transportation are two important factors in determining development potential. These are measured by the distance from selected centers directly or by means of main transport routes.

In line with the basic strategy for spatial development, the highways connecting all of the provincial centers and those centers showing high growth rates are taken as arteries and the corridor band on both sides of the highways is considered to be of high potential.

Planning needs

High potential development areas identified in the GAP Master Plan (the Master Plan, Chapter IV) will need to be analyzed in respect of their existing regional and sub-regional functions, economic activities, infrastructure and social services. With these background and the expected socio-economic developments within each area, covering their centers and respective hinterlands, appropriate multi-sectoral development plans and

implementation programs can be better prepared.

Essential elements that need to be covered in developing such plans are:

1. Urban land use and zoning,
2. Urban expansion,
3. Housing,
4. Infrastructure,
5. Transportation,
6. Economic activities,
7. Social services,
8. Communications,
9. Environmental protection and
10. Demographics.

Initially a sound information base needs to be established using existing data concerning each of these items; insufficiencies need to be corrected and then systematically updated. These sets of current and reliable data and information need to be readily made available to administrators, planners, developers and researchers.

The implementation programs for each component needs to be carefully weighed against available resources and implementation capacities. Planning of development and economic growth will need to be complementary to one another. Land, financial resources and growth capacities of each potential area must be carefully evaluated.

Planning of development in each of these development areas requires the use of scare resources in an efficient manner. The consequences of uncontrolled urban expansion, environmental negligence, inconsistent land use and inaccurate design parameters after the fact are difficult to correct.

Phasing of corridor development

Development of corridors due to financial and implementation capacity limitations need to be selectively programmed. The 23 corridors which encompass 60 % of the Region's population have been ranked and the eventual development of these corridors have been phased into the future Five Year. Development Plan frameworks.

Phasing strategy for the development of these corridors are:

1. To establish an economically viable corridor, capitalizing on existing economic activities and locational advantages,

2. To extend intensive development at the ends of corridor B and establish a 'Y' type of spatially developed corridor extending to Cizre and Siirt on the

east and develop the Gaziantep - Adiyaman - Sanliurfa axis on the northwest and

3. To interconnect the remaining secondary axis with the major regional corridors.

The development phasing of these corridors have been made into three time periods compatible with the Sixth, Seventh, Eighth and Ninth Five Year Development Plans. Phase I period covers Corridor B, during which major regional public works, urban and rural infrastructure and irrigation works along this corridor will need to be planned and their implementation started.

Phase II involves the integration of the Batman-Siirt axis, Adiyaman and the Sanliurfa-Mardin-Silopi axis with the core 'Kinked Axis' extending from Gaziantep to Diyarbakir. During this phase, major corridors leading into and out of the Region, Islahiye-Gaziantep and Elazig-Bingol-Diyarbakir, are scheduled for development.

Phase III involves the completion of the matrix of corridor development.

PHASING OF GAP CORRIDOR DEVELOPMENT

PHASE I (1990-1994, Sixth Five Year Development Plan)

CORRIDOR 1
" 3 'Kinked Axis' (CORRIDOR B)

PHASE II (1995-2004, Seventh and Eighth Five Year Development Plan)

CORRIDOR 7
" 13 Extension of Gaziantep-Sanliurfa

CORRIDOR 8
" 9
" 12
" 14
" 16 Integrating Siirt, Batman and the southern corridors to Diyarbakir

CORRIDOR 2
" 5
" 19
" 22 Integrating Adiyaman and Islahiye to Gaziantep, Urfa and Siverek

CORRIDOR 10
" 23 Integrating GAP region, via Diyarbakir with interior Anatolia

PHASE III (2005 +, Ninth Five Year Development Plan)

CORRIDOR 4
" 6
" 11
" 15
" 17
" 18
" 20
" 21 Completion of intra-regional corridor matrix

(Note: See Figure 4.9 in the Master Plan)

4. Urban growth

4.1 Urban planning

The Reconstruction Act defines the urban planning process in two stages. These are:

a) Master planning stage and

b) Implementation planning stage.

In the Act these two separate but complementary activities are indicated as being the necessary steps to be undertaken before any physical development occurs. All settlements with populations of 10,000 and above are required to prepare such plans before any physical development can be carried out.

These plans need to be realistic and practical. Cost estimates, phasing of implementation, departmental implementation capacities and available resources must be included in plans. Plan implementation, in particular as it relates to public investment, should be coordinated through SPO.

Those centers which will grow relatively faster than other settlements (Table D.29) need to update their plans in accordance with their regional responsibilities, to create a more pleasant urban environment and to provide the minimum amount of infrastructural and services necessary for attracting potential investors.

Urban places grow at different rates. These changes are the results of each settlement's internal dynamism and the effect of the surrounding environment. Growth of each center is dependent upon the relative share of each respective center's growing economic sectors.

Urban economic growth reflects itself, to a large extent upon population growth. Population growth can partially be used as a proxy for determining the economic dynamism of urban places. Urbanization in the Region, especially along the main transportation corridors in places with administrative and market functions has been high. Not all of this growth can be attributable to economic development.

Many of the smaller centers of the Region have economic base which are predominantly service sector oriented, contrary to the "Export Base" theory in which manufacturing activities function as the mechanism of growth. A point to be made here is the concentration of those relatively fast growing centers along the major transportation corridors. Some of these places have grown primarily due to their administrative functions.

The list of urban centers which need immediate reviewing and updating of city development plans are: Hilvan-Sanliurfa, Birecik-Sanliurfa, Siverek-Sanliurfa, Suruc-Sanliurfa, Nizip-Gaziantep. Merkez-Sanliurfa. Merkez-Diyarbakir and Merkez-Gaziantep, all of which are located along the corridor numbers 1 and 3, or the "Kinked Development Axis".

Some important issues in the future planning of these centers are :

- Planning should be realistic. Plans should be oriented to implementable projects and the availability of funds must be carefully weighted during program formulation.
- Procedures must be established to collect and update sector data in order to obtain a better basis for project development.
- Coordination must be ensured among all the related agencies.
- Private sector resources (e.g., land development, housing and urban transport) should be mobilized.
- The potential for land development as a means of guiding the direction of urban development has been neglected. This policy should be re-evaluated and institutional measures supporting it should be strongly implemented.
- "The Plan" should be more than a mere picture of a settlement at a future time period. It should include specific objectives with realistic implementation and financial scheduling.
- Resource requirements, both financially and technically, will most likely be in excess of their own internally generated volumes, therefore a set of priority projects in each of these centers should be selected and the necessary resources should be committed.

4.2 Urban land take

Urban centers in the GAP region are densely populated. The average density for the 20 urban centers which have been closely studied is estimated at 213 persons/ha. Of these centers Sanliurfa-Birecik and Merkez-Diyarbakir have the highest densities while Akcakale-Sanliurfa and Siverek-Sanliurfa have the lowest densities (Table D.30).

Geographical characteristic of these centers is the major determinant of their respective densities. Both Akcakale and Siverek are located on a flat plain allowing a horizontal

expansion of those centers, while Birecik and Diyarbakir are bounded by rivers, forcing them towards a more concentrated growth.

Estimates of urban land take, for the 38 centers which will be larger than 10,000 in the year 2005, based on a 213 persons/ha density give the additional requirement of approximately 16,000 ha of land for urban purposes. Even if density policies became more relaxed and more dense population allowances were made, extra urban land requirements by the year 2005 would be no less than 13,000-14,000 ha with density increases of 10 - 20 %.

Urban land take, and density policies for urban settlements must be taken in light of tradeoffs between urban activities and agricultural uses. Density policies in urban areas where spatial expansion is at the expense of prime agricultural lands must be a serious consideration for city planners. Of the 20 urban centers which were studied 13 were seen to be gradually infringing upon first and second class agricultural lands where intensive vegetable farming activity is being carried out. Urban expansion areas need to be carefully selected and the necessary policies for their implementation need to be formulated.

4.3 Immediate policy needs

Based on the on-site observations of the 20 centers, those which are in need of immediate policy decision concerning this infringement are: Suruc-Sanliurfa, Merkez-Gaziantep, Batman-Siirt, Viransehir-Sanliurfa, Merkez-Diyarbakir, Merkez-Sanliurfa, Kiziltepe-Mardin, Akcakale-Sanliurfa, Ergani-Diyarbakir Siverek-Sanliurfa, Merkez-Adiyaman, Kiziltepe-Mardin, Silvan-Diyarbakir and Bismil-Diyarbakir.

Municipal administrators, especially in the GAP region which is expected to have extremely high rates of urbanization need to be aware of the future consequences of unrealistic planning. The Cukurova experience, where much of the prime agricultural lands alongside major transportation arteries and urban settlements have given way to other uses should be taken as an example of unplanned growth. Once agricultural land is converted to urban oriented uses it is lost forever.

5. Urban areas and industrial estates

Urban areas have accommodated small scale industrial activities in close proximity to the population. Growth in the number of industrial establishments and the subsequent land requirements have resulted in competition for scarce urban land. Industrial activities generate noise, smoke and heavy traffic which city planning institutions would rather relocate to the outer fringes of urban settlements.

The establishment of industrial zones and estates on sites with the necessary infrastructures and attractive credit policies to induce the relocation of these establishments to these sites has become a popular policy tool of municipalities. The GAP region has six such industrial estates at present, seven sites under construction and 12 more that are being planned. A listing of these sites and their characteristics have been presented in Table D.31.

These sites, especially those in Gaziantep have been very successful. This center has a growing economy which is continuously expanding. Facility and service requirements that are necessary as a consequence of this growth are being provided by these sites. For example, in Gaziantep there are three sites currently under construction which upon completion is expected to accommodate 1,423 industrial shops that will be employing approximately 8,500 workers.

Industrial estates due to the incentive measures associated with locating in these sites is seen as a tool to encourage healthier urban industrial development. By taking advantage of the agglomeration effects provided at these sites it is expected that further development would be induced. Another important side effect of these sites is to provide facilities for those establishments presently in the cities to relocate to these industrial sites.

A list of benefits provided to industrial establishments at these sites are;

- Parcelled sites with infrastructure services
- Zoning consistent with municipal land use policies
- Agglomeration effects conducive for improving production
- Lowered transportation costs for inputs and outputs - close proximity to other complementary activities.
- Attractive incentive policies for establishing firms on these premises.
- Ease of managing industrial waste and other refuse matter.
- Ease of organizing transportation of workers to and from work.
- Parking facilities for large transportation vehicles

Industrial estates which are planned with good information relevant to the specific municipalities can provide a momentum for further development. Appropriate services provided at these sites can be an attraction for potential investors.

Some important criteria for determining the need for industrial estates as well as the type of establishments for which they are to be designed should ideally include these major components. These criteria should be directly associated with the municipality that is nearby. Studies and analysis of these items should be conducted with the cooperation of municipal experts.

Preparatory studies for establishing these sites should include:

A) Comparative advantages

- Important local industrial/manufacturing products
- Availability of raw materials

B) Socio-economics

- Requests of the local entrepreneurs
- Products which could be locally produced and marketed
- Availability of expertise and manpower
- Development priority as determined by SPO and the investment incentives that can be advantageously used
- Resource base by district
- Inter-industry relationship

C) Legal/administrative status

- Consistency with city plans
- Potential industrial site's legal status
- Other legal constraints

D) Infrastructure

- Existing infrastructure services such as road, sewerage, water, electricity and refuse disposal services
- Planned infrastructure services and the incremental need due to the planned industrial site

E) Spatial analysis

- Location in relation to agriculture, schools and residences
- Land use policies of the municipalities
- Future municipal expansion areas
- Existence of irrigation schemes, historical ruins and other unique objects

F) Environmental Impacts

- Possible sources and type of pollution (noise, air, water) that will most likely be produced
- Types of precautionary measures that are available to alleviate the problems
- Determination of high risk activities and to propose control measures to manage them

Initial studies may be quite positive for the establishment of an industrial site in a specific municipality. More extensive analysis may result otherwise. Decision makers should be ready to accept the results of carefully conducted studies. Analysts should be objective in design as well as implementation when

conducting site selection and feasibility studies. It should be understood that the establishment of an industrial site may not be the best alternative for increasing the productivity of a municipality. Resources may be more usefully spent for other immediate needs and the establishment of an industrial site may be more rational if undertaken at a future time period.

6. Basic municipal infrastructure

6.1 Existing conditions and needs

Overview

Municipal infrastructure services in GAP Region are very insufficient. The rapid urbanization and limited financial resources have resulted in low capacities and unmet demand. In what follows, the attention is directed to water supply and sewerage. Urban roads, solid waste disposal and other infrastructure are not dealt with.

Based on an inventory conducted by the SPO/PMU in 1987 it was determined that of the 89 municipal centers only two had sewerage infrastructure and 17 had drinking water infrastructure. The remaining municipalities had on-going construction work or were preparing the necessary projects, or had no infrastructure plan whatsoever.

In many of these municipalities there exists some sort of a system of providing water and sewerage services. By current hygienic and technically acceptable standards most would be classed as being unacceptable. As a consequence of economic development and increasing consumption that are occurring in these urban areas the existing conventional infrastructure systems in most municipalities are being strained.

Planning needs

Municipal infrastructure development of the GAP region needs to be planned with a good analysis of current needs and expected population and economic growth during the next ten to twenty years. Regional urban infrastructure development plans need to be phased with the expected growth of the GAP region.

Regional and sub-regional centers which provide essential inputs to the Region will need to develop their service capacities to respond to such demands immediately. The remaining municipalities need to upgrade and expand their services at least to the level of standards established by the Iller Bank.

A plan of action identifying objectives as well as physical and financial constraints must be prepared in cooperation with National, regional and local agencies. Since the benefits of the on-going GAP investments will provide benefits to the Region and the Nation as a whole the responsibility of tackling these issues

must be done in a cohesive manner.

Volume needs

In the GAP region approximately 60 % of all the urban households have water connections provided by the municipal administrations. Water supplied to these households is also below the demand levels. The remainder of the households have either no water connections or very little obtained from wells, springs, or neighbourhood facilities.

Estimates of water that eventually reaches households is only 64 % of the total amount of water supplied (pumped). The system losses are large due to the aged structures and insufficient maintenance.

In 1985 for those households with water connections, the usable water estimate of the 33 municipalities has been determined to be 109 liter/person/day, which is only 60 % of the water demand based on volume standards set by the Iller Bank. When the unmet demand of those households without any water connections is included this deficiency becomes more striking (Table D.33 and D.34).

Sewerage infrastructure information on volume capacities, connections and characteristics of these systems are non-existent. Based on information provided by the Iller Bank, of the 33 municipalities, only one municipality has completed its sewerage infrastructure construction (Kiziltepe, 1982), while the remaining ones are either under construction or are being studied.

None of the municipalities in our study have treatment plants. Therefore, projections include estimates of treatment plants based on capacity needs in accordance with planned sewerage infrastructure volumes (Table D.35).

6.2 Infrastructure investments

(1) Bases for cost estimate

Iller Bank has adopted a policy of providing technical and financial assistance based on varying infrastructure volume requirements of each municipality. Projects are designed based on estimates of the expected average water consumption and the necessary sewerage volumes. Then, projects are prepared and they are eventually implemented.

The period between the preparation of the projects and the initial construction activity varies up to 15 years. The period of completion of the construction works also varies greatly. In some municipalities there are some projects which are still unfinished after 15 years.

The validity of project parameters most often become outdated after about 10 years. Agencies are fully aware of these limitations. Financial capacities are indicated as being the major restricting factor in the completion of the construction works.

In the GAP provinces, most of the municipal policies for project planning and implementation are oriented towards the newly expanding urban areas. They are easier and less costly to plan and implement. Therefore, most central parts of these centers become neglected and the pre-existing systems are over used. Financial limitations restrict the overhauling of the entire urban infrastructure systems.

In the 33 municipalities, with populations greater than 10,000 in 1985 which have been analyzed, almost all had at least a preliminary project design and a cost estimate of infrastructure requirements. Dates of project preparation varied between 1968 and 1988 and the project capacity targets were for 20 to 30 years hence. Most have not been brought up to final design level.

The project volume parameters are in conformity with the standards set by the Iller Bank. The costs vary due to the technical characteristics and the existing economic circumstances.

It has been assumed that of the households with water connections, most have some sort of a sewer connection, but functional only at 50 % capacity and those without water connections have no sewerage services at all. The sewerage capacity supply-demand estimations are based on these premises.

In this study estimates in relation to the planned volumes have been used to adjust the original municipal estimate for the costs for the year 2005. Volume standards suggested by the Iller Bank have been maintained. Water volume supply and consumption figures have been adjusted using data provided by the State Institute of Statistics on water consumption. Also, 20 municipalities have been visited by the Consultant to verify some of the published information and to gather further data.

Infrastructure investment cost analysis of the project information provided by the Iller Bank indicates the unit cost of US $ 57.00 per m^3/day for drinking water systems, while the corresponding figure for sewerage is estimated to be US $ 326.00. Based on international standards, the figures are one-fourth and twice as much for water and sewerage infrastructure investments respectively. Since there are very few sewerage treatment plant projects unique to the GAP region no generalization will be made.

The infrastructure cost estimates for the 33 municipalities has been based on the analysis of existing preliminary cost

estimates. The range for unit costs vary more so for drinking water systems than for the sewerage systems. Each project has been analyzed independently; therefore cost adjustments for the target year 2005 will reflect the original municipal project cost characteristics.

(2) Infrastructure investment costs

Drinking water

The municipal drinking water project summaries provided by the Iller Bank that have been prepared between 1968 and 1988 has formed a foundation of the GAP. The projects were designed to be effective for periods up to 35 years and the delivery volumes ranged between 1,200 m^3/day and 600,000 m^3/day. The corresponding per capita daily volume ranged between 15 and 1,400 liters. The average municipal project figures would be 37,700 m^3/day (Table D.36).

Investment costs for each of these projects vary considerably. They reflect the designs encompassed unique water sources, storage, pumping and distribution systems. The average unit cost for the 33 projects, based on 1988 prices, is TL 38.0 million per liter/sec. Some project costs are seen to be ten times as high as this regional average.

The targeted total water consumption for these municipalities had been about 1.2 million m^3/day at a total cost of TL 547.8 billion, in mid-1988 price (Table D.37).

The population figures were also adjusted to reflect the Master Plan projection to the target year of 2005. Then water supply and demand estimates were made using Iller Bank and SIS information and municipal contacts. The original unit cost estimates for Sanliurfa and Gaziantep were re-estimated using the regional average figure of TL 38.0 million per l/s. The unit costs of the original projects, converted from current values to 1988 values, were then used to estimate drinking water investment costs.

In the year 2005 the total daily water consumption in these municipalities is expected to reach 1.0 million m^3/day with an investment requirement of TL 687.4 billion in mid-1988 price. Total population that will be serviced is estimated to be 5.4 million.

Sewerage

Project summaries provided by the Iller Bank indicate planning of the sewer network capacities with almost twice the volume of the drinking water systems. This is done in order to provide sufficient flow since sewerage systems fill in gradually. After a period of 20 - 25 years the water and usable sewerage volume capacities converge.

Project unit cost estimations are based on 20 municipal project summaries provided by the Iller Bank. Based on the analysis of these projects the total flow volume need on a daily basis has been estimated to be 2.5 million m^3 with a total investment requirement of TL 192.6 billion (mid-1988 price) or US $ 57.00/m^3/day. The corresponding regional average unit cost is TL 6.6 million per l/p/d (Table D.38).

In estimating the investment requirements for the year 2005, populations and volumes were adjusted, and the respective unit cost estimates were used to derive total investment requirements. Investment requirements for the 10 municipalities lacking the necessary information were calculated using the original regional unit cost of TL 6.6 million per lit/sec.

In 2005 the total daily sewerage volume needs in these 33 municipalities is expected to reach 2.4 million m^3/day with an investment requirement of TL 169.2 billion (mid-1988 price). Total population that will be serviced is estimated to be 5.4 million (Table D.39).

Sewage treatment

The GAP region at present has no functioning treatment plants. There are preliminary plans for Adiyaman-Merkez, Samsat and Suruc. A treatment plant in Sanliurfa-Merkez was started in 1982 but it has yet to be finished. The information base for such plants are unavailable; therefore cost estimates have been made using cost curves provided in "Wastewater Treatment Plants, Syed R. Qasim, 1985. Holt, Rinehart and Winston Publishers" (Table 6).

Three different methods of treatment are generally available:

1. Aeration lagoon
2. Activated sludge
3. Trickling filter

Regression model of costs for 50 l/s, 500 l/s and 5000 l/s volume capacities for each option was formulated and regressed against volume needs of each of the 33 municipalities. Land values in these cost estimates was assumed to be TL 334.00/m^2 (US $ 1,000/acre).

Of these treatment methods, the aeration lagoon offers the most economic option. The most costly method is the activated sludge, followed by the trickling filter option. If land availability is not a restrictive factor, the aeration lagoon offers the best solution. For larger municipalities, the adoption of activated sludge process should be a part of their long-term plans in view of environmental regulations to be enforced. For many municipalities, combinations of two or more systems may be found to be the best solution, given financial and other constraints they face (Table D.40).

they face (Table D.40).

In estimating total costs the sewerage volume outputs were used in the regression model.

(3) Phasing of project implementation

The GAP implementation plan calls for the immediate development of the infrastructure requirements of settlements along the corridor extending from Gaziantep to Diyarbakir. Seven municipalities with populations greater than 10,000 (1985) are found along this axis.

The development of these infrastructures (total investment cost: TL 554.1 billion) has been grouped into the Priority 1 of the implementation plan. It is recommended that background socio-economic and urban planning studies are conducted in these settlements. With these inputs projects need to be prepared with consideration of financial and physical implementation capacities in each of the respective centers.

Priority 2 will cover those municipalities (total investment cost:TL 185.0 billion) that are not along the priority axis but having a high population growth index (+2.00). Priority 3 includes those municipalities (total investment cost:TL 117.6 billion) with growth index smaller than 2.00 (Table D.41).

The expected total investment cost requirements for municipal infrastructure are TL 856.7 billion. These costs, if spread over the next three five year plan periods, imply the annual expense of TL 57.1 billion.

Table D.1 Meteorological Characteristics of Southeastern Anatolia Region

Meteo-Station: ADIYAMAN
Location: 37 45'N 38 17'E 678 m
Observation Period: 1938 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	8	7.7	9.5	14.3	20.4	25.6	32.4	37.0	36.9	32.2	24.6	17.5	10.4	22.4
Min.	C	8	1.2	2.2	5.4	9.5	13.7	19.3	23.2	22.9	18.3	13.0	7.9	3.4	11.7
Ave.	C	8	4.3	5.6	9.6	15.0	19.9	26.4	30.6	30.3	25.3	18.4	12.2	6.5	17.0
Relative Humidity	%	8	73	71	62	52	47	29	24	23	30	46	59	73	49.1
Rainfalls	mm	33	189.2	128.3	116.4	76.3	54.9	4.3	1.7	1.0	3.1	28.0	82.2	149.5	834.9
Evaporation	mm														0.0
Wind speed	m/sec	5	2.6	2.3	2.6	2.5	2.7	3.1	3.0	2.8	2.5	2.1	2.0	2.1	2.5
No. of sunny days	no.	8	3.1	3.0	3.9	4.9	7.2	15.2	26.6	26.8	18.8	10.2	8.1	5.4	133.2

Meteo-Station: DIYARBAKIR
Location: 37 55'N 40 12'E 660 m
Observation Period: 1929 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	42	6.6	8.9	14.2	20.4	26.5	33.2	38.2	38.2	33.2	25.3	16.7	9.2	22.6
Min.	C	42	-2.4	-1.1	2.0	6.8	11.0	16.0	21.6	20.9	15.7	9.6	4.4	-0.2	8.7
Ave.	C	42	1.8	3.6	8.1	13.8	19.3	25.9	31.0	30.5	24.9	17.2	10.0	4.2	15.9
Relative Humidity	%	38	77	73	65	61	55	34	24	24	28	46	67	77	52.6
Rainfalls	mm	41	80.2	68.6	62.2	72.1	42.9	7.1	0.9	0.6	3.4	30.4	55.9	71.5	495.8
Evaporation	mm	33	26.1	39.7	70.2	96.5	142.6	266.5	400.7	389.1	280.1	146.4	50.9	26.5	1935.3
Wind speed	m/sec	33	2.2	2.7	2.9	2.6	2.4	3.2	3.7	3.3	2.8	2.2	1.6	1.7	2.6
No. of sunny days	no.	41	5.8	4.6	5.3	4.7	7.2	18.0	24.3	25.1	21.5	13.0	7.8	6.1	143.4

Meteo-Station: DIYARBAKIR (Kulp)
Location: 38 30'N 41 03'e 1125 m
Observation Period: 1930,1950,1953 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	4	4.8	6.7	11.4	17.7	24.4	31.4	36.9	36.0	31.1	22.7	15.4	8.0	20.5
Min.	C	4	-1.6	-0.7	3.8	8.3	13.0	18.4	22.9	22.0	17.9	11.8	6.9	1.8	10.4
Ave.	C	4	1.2	2.9	7.1	12.6	18.4	24.7	29.7	28.6	24.0	16.7	10.7	4.6	15.1
Relative Humidity	%	4	67	65	59	53	43	28	20	21	29	46	59	70	46.7
Rainfalls	mm	14	195.0	185.1	160.2	143.7	88.3	18.8	0.5	0.0	5.0	59.3	107.6	192.2	1155.7
Evaporation	mm														0.0
Wind speed	m/sec	3	1.6	1.3	1.7	1.3	1.5	1.7	1.8	1.6	1.5	1.7	1.2	1.4	1.5
No. of sunny days	no.	6	6.7	5.2	5.0	6.1	11.0	20.7	26.3	27.3	20.2	14.3	9.3	7.8	159.9

Meteo-Station: DIYARBAKIR (Hani)
Location: 38 22'N 40 22'E 850 m
Observation Period: 1952 - 1953,1961 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	3	4.5	6.0	12.3	19.4	24.6	30.4	35.0	34.8	30.1	22.4	15.3	7.7	20.2
Min.	C	3	-1.1	-1.0	4.8	9.1	13.7	18.5	23.0	22.8	18.2	11.9	7.0	1.9	10.7
Ave.	C	3	1.6	2.7	8.5	14.3	19.4	24.9	29.2	28.9	24.3	17.2	11.1	4.3	15.5
Relative Humidity	%	3	71.0	69	63	52	48	32	26	25	28	43	58	68	48.6
Rainfalls	mm	7	134.7	197.4	160.0	137.8	57.5	16.3	4.7	0.0	1.4	80.7	116.4	194.4	1101.3
Evaporation	mm														0.0
Wind speed	m/sec	3	2.6	2.6	2.8	2.4	2.6	3.2	3.2	3.0	2.8	2.5	2.3	2.3	2.7
No. of sunny days	no.	3	5.0	7.3	4.7	6.0	11.3	19.0	24.3	24.7	16.3	11.7	7.7	6.3	144.3

Meteo-Station: GAZIANTEP
Location: 37 05'N 37 22'E 855 m
Observation Period: 1929 - 1936,1939 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	31	6.6	8.6	12.9	19.1	24.9	30.6	34.4	34.5	30.3	23.5	16.2	9.1	20.9
Min.	C	31	-1.0	-0.2	2.1	6.4	11.2	16.6	20.6	20.4	15.3	8.7	4.1	0.6	8.7
Ave.	C	31	2.6	3.8	7.2	12.7	18.2	23.7	27.1	26.9	22.2	15.3	9.4	4.5	14.5
Relative Humidity	%	31	81	77	71	64	55	44	40	42	46	58	71	80	60.8
Rainfalls	mm	34	114.5	87.1	72.1	47.7	29.6	6.3	1.7	2.3	3.9	34.0	61.0	98.6	558.8
Evaporation	mm	15	22.4	26.6	55.7	90.4	132.8	215.9	286.6	278.6	185.8	99.8	47.0	24.8	1466.4
Wind speed	m/sec	31	2.0	2.1	2.3	2.3	2.2	3.0	3.3	2.6	1.9	1.4	1.3	1.6	2.2
No. of sunny days	no.	31	5.0	4.5	5.2	5.9	8.8	20.0	27.7	27.5	22.4	13.2	8.2	6.0	154.4

Meteo-Station: GAZIANTEP (kilis)
Location: 36 44'N 37 05'E 638 m
Observation Period: 1932 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	11	9.7	11.8	16.2	21.6	27.9	33.6	36.7	36.9	32.8	26.5	19.7	12.2	23.8
Min.	C	11	1.6	2.3	4.6	8.3	12.5	15.6	19.8	20.1	16.9	12.2	7.3	3.6	10.4
Ave.	C	11	5.4	6.7	10.1	14.8	20.7	25.3	27.9	28.0	24.3	18.9	12.8	7.6	16.9
Relative Humidity	%	11	75	72	64	57	51	44	45	46	46	50	62	72	57.0
Rainfalls	mm	39	108.4	88.0	74.4	46.0	26.3	4.6	1.6	0.9	4.8	33.0	55.8	99.0	542.8
Evaporation	mm														0.0
Wind speed	m/sec	10	2.7	2.5	2.8	3.1	2.5	3.4	4.0	3.6	2.8	1.8	1.5	2.2	2.7
No. of sunny days	no.	11	4.9	3.5	6.2	7.4	13.0	21.7	29.8	28.9	22.9	13.4	9.4	4.8	165.9

Table D.1 Meteorological Characteristics of Southeastern Anatolia Region

Meteo-Station: ADIYAMAN
Location: 37 45'N 38 17'E 678 m
Observation Period: 1938 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	8	7.7	9.5	14.3	20.4	25.6	32.4	37.0	36.9	32.2	24.6	17.5	10.4	22.4
Min.	C	8	1.2	2.2	5.4	9.5	13.7	19.3	23.2	22.9	18.3	13.0	7.9	3.4	11.7
Ave.	C	8	4.3	5.6	9.6	15.0	19.9	26.4	30.6	30.3	25.3	18.4	12.2	6.5	17.0
Relative Humidity	%	8	73	71	62	52	47	29	24	23	30	46	59	73	49.1
Rainfalls	mm	33	189.2	128.3	116.4	76.3	54.9	4.3	1.7	1.0	3.1	28.0	82.2	149.5	834.9
Evaporation	mm														0.0
Wind speed	m/sec	5	2.6	2.3	2.6	2.5	2.7	3.1	3.0	2.8	2.5	2.1	2.0	2.1	2.5
No. of sunny days	no.	8	3.1	3.0	3.9	4.9	7.2	15.2	26.6	26.8	18.8	10.2	8.1	5.4	133.2

Meteo-Station: DIYARBAKIR
Location: 37 55'N 40 12'E 660 m
Observation Period: 1929 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	42	6.6	8.9	14.2	20.4	26.5	33.2	38.2	38.2	33.2	25.3	16.7	9.2	22.6
Min.	C	42	-2.4	-1.1	2.0	6.8	11.0	16.0	21.6	20.9	15.7	9.6	4.4	-0.2	8.7
Ave.	C	42	1.8	3.6	8.1	13.8	19.3	25.9	31.0	30.5	24.9	17.2	10.0	4.2	15.9
Relative Humidity	%	38	77	73	65	61	55	34	24	24	28	46	67	77	52.6
Rainfalls	mm	41	80.2	68.6	62.2	72.1	42.9	7.1	0.9	0.6	3.4	30.4	55.9	71.5	495.8
Evaporation	mm	33	26.1	39.7	70.2	96.5	142.6	266.5	400.7	389.1	280.1	146.4	50.9	26.5	1935.3
Wind speed	m/sec	33	2.2	2.7	2.9	2.6	2.4	3.2	3.7	3.3	2.8	2.2	1.6	1.7	2.6
No. of sunny days	no.	41	5.8	4.6	5.3	4.7	7.2	18.0	24.3	25.1	21.5	13.0	7.8	6.1	143.4

Meteo-Station: DIYARBAKIR (Kulp)
Location: 38 30'N 41 03'e 1125 m
Observation Period: 1930,1950,1953 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	4	4.8	6.7	11.4	17.7	24.4	31.4	36.9	36.0	31.1	22.7	15.4	8.0	20.5
Min.	C	4	-1.6	-0.7	3.8	8.3	13.0	18.4	22.9	22.0	17.9	11.8	6.9	1.8	10.4
Ave.	C	4	1.2	2.9	7.1	12.6	18.4	24.7	29.7	28.6	24.0	16.7	10.7	4.6	15.1
Relative Humidity	%	4	67	65	59	53	43	28	20	21	29	46	59	70	46.7
Rainfalls	mm	14	195.0	185.1	160.2	143.7	88.3	18.8	0.5	0.0	5.0	59.3	107.6	192.2	1155.7
Evaporation	mm														0.0
Wind speed	m/sec	3	1.6	1.3	1.7	1.3	1.5	1.7	1.8	1.6	1.5	1.7	1.2	1.4	1.5
No. of sunny days	no.	6	6.7	5.2	5.0	6.1	11.0	20.7	26.3	27.3	20.2	14.3	9.3	7.8	159.9

Meteo-Station: DIYARBAKIR (Hani)
Location: 38 22'N 40 22'E 850 m
Observation Period: 1952 - 1953,1961 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	3	4.5	6.0	12.3	19.4	24.6	30.4	35.0	34.8	30.1	22.4	15.3	7.7	20.2
Min.	C	3	-1.1	-1.0	4.8	9.1	13.7	18.5	23.0	22.8	18.2	11.9	7.0	1.9	10.7
Ave.	C	3	1.6	2.7	8.5	14.3	19.4	24.9	29.2	28.9	24.3	17.2	11.1	4.3	15.5
Relative Humidity	%	3	71.0	69	63	52	48	32	26	25	28	43	58	68	48.6
Rainfalls	mm	7	134.7	197.4	160.0	137.8	57.5	16.3	4.7	0.0	1.4	80.7	116.4	194.4	1101.3
Evaporation	mm														0.0
Wind speed	m/sec	3	2.6	2.6	2.8	2.4	2.6	3.2	3.2	3.0	2.8	2.5	2.3	2.3	2.7
No. of sunny days	no.	3	5.0	7.3	4.7	6.0	11.3	19.0	24.3	24.7	16.3	11.7	7.7	6.3	144.3

Meteo-Station: GAZIANTEP
Location: 37 05'N 37 22'E 855 m
Observation Period: 1929 - 1936,1939 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	31	6.6	8.6	12.9	19.1	24.9	30.6	34.4	34.5	30.3	23.5	16.2	9.1	20.9
Min.	C	31	-1.0	-0.2	2.1	6.4	11.2	16.6	20.6	20.4	15.3	8.7	4.1	0.6	8.7
Ave.	C	31	2.6	3.8	7.2	12.7	18.2	23.7	27.1	26.9	22.2	15.3	9.4	4.5	14.5
Relative Humidity	%	31	81	77	71	64	55	44	40	42	46	58	71	80	60.8
Rainfalls	mm	34	114.5	87.1	72.1	47.7	29.6	6.3	1.7	2.3	3.9	34.0	61.0	98.6	558.8
Evaporation	mm	15	22.4	26.6	55.7	90.4	132.8	215.9	286.6	278.6	185.8	99.8	47.0	24.8	1466.4
Wind speed	m/sec	31	2.0	2.1	2.3	2.3	2.2	3.0	3.3	2.6	1.9	1.4	1.3	1.6	2.2
No. of sunny days	no.	31	5.0	4.5	5.2	5.9	8.8	20.0	27.7	27.5	22.4	13.2	8.2	6.0	154.4

Meteo-Station: GAZIANTEP (kilis)
Location: 36 44'N 37 05'E 638 m
Observation Period: 1932 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	11	9.7	11.8	16.2	21.6	27.9	33.6	36.7	36.9	32.8	26.5	19.7	12.2	23.8
Min.	C	11	1.6	2.3	4.6	8.3	12.5	15.6	19.8	20.1	16.9	12.2	7.3	3.6	10.4
Ave.	C	11	5.4	6.7	10.1	14.8	20.7	25.3	27.9	28.0	24.3	18.9	12.8	7.6	16.9
Relative Humidity	%	11	75	72	64	57	51	44	45	46	46	50	62	72	57.0
Rainfalls	mm	39	108.4	88.0	74.4	46.0	26.3	4.6	1.6	0.9	4.8	33.0	55.8	99.0	542.8
Evaporation	mm														0.0
Wind speed	m/sec	10	2.7	2.5	2.8	3.1	2.5	3.4	4.0	3.6	2.8	1.8	1.5	2.2	2.7
No. of sunny days	no.	11	4.9	3.5	6.2	7.4	13.0	21.7	29.8	28.9	22.9	13.4	9.4	4.8	165.9

Meteo-Station: GAZIANTEP (Nizip)
Location: 37 02'N 37 48'E 510 m
Observation Period: 1957 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	6	8.4	10.4	15.7	21.8	27.4	33.4	37.2	37.1	32.8	24.5	17.7	10.8	23.1
Min.	C	6	2.9	3.3	6.6	10.7	15.2	20.2	23.2	22.9	19.1	13.6	8.9	4.7	12.6
Ave.	C	6	5.2	6.3	10.5	15.9	21.1	27.0	30.2	29.8	25.4	18.2	12.4	7.2	17.4
Relative Humidity	%	4	75	70	66	52	50	34	28	29	38	54	65	76	53.1
Rainfalls	mm	14	96.3	75.8	58.7	35.4	28.2	4.5	1.1	0.3	2.0	27.8	42.2	91.7	464.0
Evaporation	mm														0.0
Wind speed	m/sec	3	1.2	1.1	1.2	1.3	1.3	1.5	1.5	1.4	1.2	0.9	0.8	1.2	1.2
No. of sunny days	no.	6	2.5	4.2	5.5	7.2	10.0	20.0	28.3	26.5	20.8	9.7	8.2	5.2	148.1

Meteo-Station: MARDIN
Location: 37 18'N 40 44'E 1080 m
Observation Period: 1939 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	29	5.1	6.5	10.5	16.8	23.4	30.0	34.3	34.2	29.5	21.9	14.4	7.6	19.5
Min.	C	29	0.2	1.0	4.0	9.3	14.7	19.9	23.8	24.3	20.4	14.0	8.2	2.9	11.9
Ave.	C	29	2.7	3.8	7.3	13.1	19.3	25.4	29.6	29.6	24.9	17.9	11.2	5.2	15.8
Relative Humidity	%	29	76	70	64	57	46	33	30	32	36	47	59	70	51.7
Rainfalls	mm	32	130.2	104.0	102.0	89.7	46.5	2.2	0.5	0.4	1.6	31.2	75.7	120.2	704.2
Evaporation	mm														0.0
Wind speed	m/sec	24	2.9	3.2	2.9	2.6	2.4	2.7	2.5	2.4	2.2	2.3	2.5	2.8	2.6
No. of sunny days	no.	31	6.4	6.1	6.0	6.2	10.5	22.1	26.4	26.5	22.6	12.9	8.7	7.4	161.8

Meteo-Station: MARDIN (Cizre)
Location: 37 19'N 42 11'e 400 m
Observation Period: 1938 - 1961,1963 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	7	11.0	13.1	17.2	22.3	28.7	36.8	41.2	41.1	36.2	28.6	20.6	12.9	25.8
Min.	C	7	2.9	4.4	7.0	10.8	14.8	19.9	23.2	22.1	17.9	13.9	9.1	4.5	12.5
Ave.	C	7	6.4	8.2	11.5	16.0	21.7	29.3	33.4	32.2	27.3	20.6	14.0	8.0	19.1
Relative Humidity	%	7	66	66	63	61	50	27	23	24	28	44	59	68	48.3
Rainfalls	mm	26	130.4	101.3	127.3	93.3	43.9	1.4	0.2	0.0	0.8	18.7	72.8	122.1	712.2
Evaporation	mm														0.0
Wind speed	m/sec	5	1.1	1.1	1.2	1.1	1.0	1.2	0.9	0.9	1.0	1.0	0.8	0.9	1.0
No. of sunny days	no.	7	7.3	6.1	6.1	4.8	10.3	22.4	28.3	29.6	22.1	13.3	10.8	7.8	168.9

Meteo-Station: MARDIN (Derik)
Location: 37 24'N 40 16'E 780 m
Observation Period: 1964 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	5	7.4	8.8	13.9	19.8	25.8	32.9	37.0	36.9	32.2	24.2	17.0	9.7	22.1
Min.	C	5	1.5	1.6	5.3	9.7	14.1	19.2	23.1	23.1	18.4	13.2	8.6	3.2	11.8
Ave.	C	5	4.4	5.1	9.4	14.7	20.2	26.5	30.4	30.1	25.3	18.2	12.4	6.4	16.9
Relative Humidity	%	5	70	65	59	52	45	28	30	29	33	45	57	69	48.5
Rainfalls	mm	7	162.8	106.1	115.6	77.1	36.0	2.0	0.0	0.2	2.3	58.8	88.8	124.5	774.2
Evaporation	mm														0.0
Wind speed	m/sec	3	3.1	3.2	3.1	2.8	3.3	3.4	3.1	2.6	2.5	2.6	2.4	2.8	2.9
No. of sunny days	no.	6	4.3	4.7	4.2	3.7	9.3	20.2	26.5	27.0	20.8	9.5	8.5	5.8	144.5

Meteo-Station: MARDIN (Nusaybin)
Location: 37 02'N 41 14'E 500 m
Observation Period: 1953 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	5	10.4	12.4	16.5	22.5	29.4	36.0	40.3	39.9	35.0	27.3	20.7	12.8	25.3
Min.	C	5	3.7	3.9	7.9	12.1	17.1	21.9	25.1	24.3	21.0	15.6	10.9	5.6	14.1
Ave.	C	5	6.6	7.6	11.5	16.8	23.0	29.0	32.7	31.8	27.3	20.4	14.8	8.5	19.2
Relative Humidity	%	5	74	70	67	62	54	40	38	38	43	56	64	74	56.7
Rainfalls	mm	17	91.7	62.4	63.2	62.7	40.4	1.4	1.1	0.0	0.6	16.0	43.0	79.3	461.8
Evaporation	mm														0.0
Wind speed	m/sec														0.0
No. of sunny days	no.	5	5.2	5.2	5.0	7.0	11.2	25.0	28.8	29.6	22.2	11.2	10.8	6.6	167.8

Meteo-Station: MARDIN (Savur)
Location: 37 34'N 40 52'E 925 m
Observation Period: 1957 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	5	6.3	7.8	13.1	19.2	25.1	31.7	36.1	36.0	30.9	23.2	15.8	8.3	21.1
Min.	C	5	0.1	0.1	4.2	8.3	12.1	16.6	20.9	20.9	16.2	10.8	6.1	1.6	9.8
Ave.	C	5	3.0	3.7	8.4	13.8	19.3	25.5	29.8	29.3	24.2	17.0	10.7	4.7	15.8
Relative Humidity	%	5	84	83	77	72	66	53	49	50	52	67	79	84	68.0
Rainfalls	mm	12	93.9	55.2	69.8	70.5	59.6	4.7	2.1	0.8	2.3	31.1	46.5	71.0	507.5
Evaporation	mm														0.0
Wind speed	m/sec	3	2.8	2.6	2.7	2.3	2.2	2.5	2.1	2.3	2.4	2.5	2.4	2.5	2.4
No. of sunny days	no.	6	4.7	6.3	5.3	4.8	7.8	20.3	26.2	26.8	20.0	10.3	8.8	6.0	147.3

Meteo-Station: SIIRT
Location: 37 56'N 41 56'E 95 m
Observation Period: 1959 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	29	6.2	8.2	12.3	18.6	24.9	31.9	36.7	36.6	31.6	23.7	15.5	8.6	21.2
Min.	C	29	-0.9	0.1	3.2	8.3	13.1	18.4	23.0	22.7	18.2	12.1	6.3	1.4	10.5
Ave.	C	29	2.5	3.9	7.6	13.3	19.2	25.7	30.4	30.0	24.9	17.6	10.6	4.8	15.9
Relative Humidity	%	29	75	69	64	58	52	35	28	28	32	47	63	72	51.9
Rainfalls	mm	39	115.0	106.6	110.7	106.0	65.9	8.8	1.3	0.4	5.3	47.6	86.1	102.4	756.1
Evaporation	mm														0.0
Wind speed	m/sec	29	1.4	1.7	2.0	2.0	1.8	2.0	2.0	2.0	2.0	1.8	1.5	1.4	1.8
No. of sunny days	no.	29	5.8	5.2	4.6	4.8	8.1	19.2	24.1	25.5	21.8	12.3	8.1	6.4	145.9

Meteo-Station: SIIRT (Batman)
Location: 37 52'N 41 10'E 540 m
Observation Period: 1959 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	8	7.6	9.5	15.4	20.6	26.5	34.0	39.0	38.9	33.7	25.2	17.0	9.4	23.1
Min.	C	8	-1.2	0.1	3.3	6.8	10.5	14.3	18.9	18.5	13.6	8.6	4.2	1.0	8.2
Ave.	C	8	2.8	4.5	9.2	13.7	18.7	25.5	30.2	29.4	24.0	16.5	9.9	4.8	15.8
Relative Humidity	%	8	80	79	70	68	60	38	28	27	34	55	74	82	57.9
Rainfalls	mm	11	77.7	66.8	78.3	90.5	61.8	8.0	0.7	0.4	3.0	39.5	54.7	70.8	552.2
Evaporation	mm														0.0
Wind speed	m/sec														0.0
No. of sunny days	no.	8	5.0	3.6	4.5	4.9	9.4	17.4	25.2	26.9	20.6	11.1	7.4	3.0	139.0

Meteo-Station: SIIRT (Kurtalan)
Location: 37 56'N 41 42'E 675 m
Observation Period: 1929 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	4	6.8	8.3	14.6	18.6	25.6	33.6	38.5	38.6	33.0	24.0	16.6	10.6	22.4
Min.	C	2	-3.2	-1.8	3.0	6.8	12.0	15.4	18.7	18.4	14.8	9.9	4.4	0.9	8.3
Ave.	C	4	1.5	3.6	8.6	12.8	18.7	25.9	31.0	30,4	24.4	16.4	10.1	5.2	15.7
Relative Humidity	%	2	72	72	64	58	51	22	18	18	30	53	67	74	49.9
Rainfalls	mm	12	111.7	96.6	107.7	99.7	62.5	5.8	0.7	0.1	8.2	26.5	68.5	92.2	680.2
Evaporation	mm														0.0
Wind speed	m/sec														0.0
No. of sunny days	no.	4	9.8	5.5	6.8	6.0	10.5	19.5	27.2	27.5	21.8	16.2	11.5	9.0	171.3

Meteo-Station: SIIRT (Pervari)
Location: 37 53'N 42 35'E 1380 m
Observation Period: 1952 - 1957,1959 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	6	3.7	4.7	9.5	14.1	21.2	27.1	32.2	32.0	27.1	19.4	13.3	9.2	17.8
Min.	C	6	-4.1	-3.6	0.8	4.8	8.8	12.7	16.9	16.6	12.4	7.5	3.1	-2.1	6.2
Ave.	C	7	-0.5	-0.2	5.1	9.6	15.5	21.3	25.7	25.5	20.3	12.9	7.7	1.8	12.1
Relative Humidity	%	6	74	75	74	54	49	32	22	20	29	46	55	70	50.0
Rainfalls	mm	15	75.1	79.0	118.6	127.4	73.2	7.9	3.4	2.3	10.8	52.4	76.3	83.6	710.0
Evaporation	mm														0.0
Wind speed	m/sec	7	1.0	0.9	1.3	1.6	1.5	1.8	1.8	1.9	1.7	1.2	0.9	0.8	1.4
No. of sunny days	no.	7	9.4	7.7	4.7	6.4	11.6	19.8	25.3	22.8	20.4	13.1	9.7	9.3	160.2

Meteo-Station: SIIRT (Sirnak)
Location: 37 32'N 42 28'E 1380 m
Observation Period: 1953 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	5	5.9	6.2	9.7	14.8	22.0	28.4	32.4	32.2	26.9	19.3	13.7	7.4	18.2
Min.	C	5	-0.4	-0.5	2.6	5.6	12.2	19.0	22.1	22.7	17.6	11.7	7.1	1.3	10.1
Ave.	C	5	2.6	2.6	5.6	9.6	17.2	23.2	26.6	26.9	21.6	15.1	9.9	4.1	13.8
Relative Humidity	%	2	74	67	66	49	30	18	13	12	16	37	40	63	40.4
Rainfalls	mm	17	136.2	120.5	143.3	140.8	63.6	5.2	1.6	1.4	6.3	32.9	82.9	122.5	857.2
Evaporation	mm														0.0
Wind speed	m/sec	3	2.3	2.1	2.5	2.3	2.2	2.1	2.0	2.0	2.1	2.3	2.1	2.2	2.2
No. of sunny days	no.	5	9.2	9.2	7.0	7.2	12.2	21.8	26.6	28.8	19.6	11.0	11.2	9.8	173.6

Meteo-Station: SANLIURFA
Location: 37 08'N 38 46'E 547 m
Observation Period: 1929 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	39	9.3	11.5	15.7	21.8	28.4	34.3	38.5	38.3	33.7	26.8	19.0	12.0	24.1
Min.	C	39	1.4	2.4	4.8	9.3	14.2	19.5	23.5	23.4	19.3	13.6	8.4	3.7	12.0
Ave.	C	39	5.1	6.6	10.1	15.8	21.8	27.8	31.7	31.4	26.6	19.9	13.1	7.4	18.1
Relative Humidity	%	38	71	67	60	53	43	30	27	28	32	42	58	69	48.3
Rainfalls	mm	7	134.7	197.4	160.0	137.8	57.5	16.3	4.7	0.0	1.4	80.7	116.4	194.4	1101.3
Evaporation	mm	23	35.0	46.4	72.9	113.6	180.0	292.4	384.7	372.8	269.3	163.6	77.1	39.9	2047.7
Wind speed	m/sec	31	2.4	2.6	2.8	2.7	2.7	3.7	3.9	3.3	3.0	2.2	2.0	2.0	2.8
No. of sunny days	no.	39	6.3	5.6	6.4	7.2	11.0	22.2	27.4	28.5	23.9	14.6	9.5	7.5	170.1

Meteo-Station: SANLIURFA (Akcakale)
Location: 36 42'N 38 58'E 375 m
Observation Period: 1954 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	6	10.5	12.8	17.8	23.8	29.4	35.7	39.3	39.0	34.5	26.6	19.9	12.7	25.2
Min.	C	6	2.2	2.4	5.4	9.0	13.6	18.3	21.3	20.9	16.3	11.6	6.6	3.5	10.9
Ave.	C	6	6.0	7.3	11.2	16.4	22.1	28.2	31.3	30.5	25.4	18.5	12.5	7.6	18.1
Relative Humidity	%	6	77	71	65	56	45	33	32	35	36	51	64	76	53.4
Rainfalls	mm	15	64.7	45.1	48.4	31.8	29.4	5.6	0.1	0.0	1.1	19.7	29.7	55.5	331.1
Evaporation	mm														0.0
Wind speed	m/sec	5	1.7	1.5	1.3	1.4	1.8	2.1	2.5	1.9	1.5	1.0	0.9	1.1	1.6
No. of sunny days	no.	6	3.7	4.3	6.0	8.0	11.5	23.3	29.5	28.2	22.2	10.0	9.7	5.2	161.6

Meteo-Station: SANLIURFA (Birecik)
Location: 37 02'N 37 58'E 347 m
Observation Period: 1951 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	7	10.2	12.3	17.8	23.7	29.6	35.8	39.5	39.1	34.9	27.4	20.1	12.8	25.3
Min.	C	7	1.5	2.4	5.6	8.4	13.0	18.0	21.5	20.5	15.2	11.0	6.7	3.6	10.6
Ave.	C	7	5.3	7.0	11.4	16.1	21.6	27.6	31.0	30.3	25.1	18.5	12.5	7.7	17.8
Relative Humidity	%	7	76	75	68	57	48	37	34	36	40	54	67	77	55.8
Rainfalls	mm	18	75.5	59.0	50.2	30.6	15.7	4.1	0.5	1.5	1.7	23.8	34.8	70.6	368.0
Evaporation	mm														0.0
Wind speed	m/sec	3	3.1	2.6	2.4	2.5	2.8	3.3	3.2	3.1	2.3	2.1	1.9	2.2	2.6
No. of sunny days	no.	7	5.1	4.0	4.4	7.3	11.3	20.1	28.8	28.8	21.6	10.6	7.8	5.3	155.1

Meteo-Station: SANLIURFA (Ceylanpinar)
Location: 36 50'N 39 55'E 398 m
Observation Period: 1956 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	14	11.3	13.7	18.2	24.2	30.8	37.2	41.1	41.0	36.1	28.9	21.0	13.8	26.4
Min.	C	13	1.3	1.5	4.2	8.0	12.7	17.2	20.6	20.0	14.5	9.8	5.3	2.4	9.8
Ave.	C	14	6.0	7.3	11.1	16.2	22.6	28.9	32.3	31.4	25.8	19.2	12.6	7.8	18.4
Relative Humidity	%	14	73	68	63	59	46	33	31	32	36	45	60	68	51.2
Rainfalls	mm	15	73.7	47.2	43.8	38.9	22.5	1.9	0.2	0.0	1.8	19.7	27.0	51.7	328.4
Evaporation	mm	14	28.3	36.0	66.0	96.8	176.7	289.4	354.5	331.6	231.5	134.8	58.3	29.6	1833.5
Wind speed	m/sec	6	1.2	1.1	1.2	1.3	1.3	1.5	1.5	1.4	1.2	0.9	0.8	1.2	1.2
No. of sunny days	no.	14	5.6	5.0	4.5	4.6	11.1	21.4	28.1	28.4	23.8	12.7	9.3	6.4	160.9

Meteo-Station: SANLIURFA (Siverek)
Location: 37 45'N 39 19'E 801 m
Observation Period: 1929 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	7	6.6	8.2	13.7	19.5	25.6	32.3	36.6	36.3	31.5	23.6	16.8	9.8	21.7
Min.	C	7	-0.2	0.9	4.9	8.6	13.4	19.0	22.8	22.4	18.4	12.7	7.6	2.7	11.1
Ave.	C	7	2.9	4.3	9.0	14.0	19.6	26.1	30.4	29.7	24.7	17.5	11.5	5.8	16.3
Relative Humidity	%	7	73	73	66	57	47	30	24	26	30	45	61	73	50.4
Rainfalls	mm	39	98.5	83.3	75.8	57.8	38.9	7.1	0.9	0.6	2.8	31.8	63.8	84.4	545.7
Evaporation	mm														0.0
Wind speed	m/sec	3	4.8	4.4	4.4	4.0	3.9	4.0	4.1	3.8	3.7	3.7	3.7	4.1	4.1
No. of sunny days	no.	7	4.6	2.8	4.1	4.3	6.7	16.7	26.0	25.6	19.0	10.7	6.7	5.0	132.2

Meteo-Station: SANLIURFA (Viransehir)
Location: 37 12'N 39 45'E 575 m
Observation Period: 1950 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	5	9.5	11.7	16.1	22.1	27.6	33.8	37.9	37.6	33.0	26.0	19.1	11.8	23.9
Min.	C	5	2.5	2.7	5.8	10.7	14.1	18.5	22.5	21.5	17.6	13.4	8.6	4.0	11.8
Ave.	C	5	5.6	6.8	10.6	16.1	21.2	27.3	30.9	30.0	25.4	19.2	13.2	7.4	17.8
Relative Humidity	%	4	72	67	63	57	46	29	27	28	33	48	6071	68	550.8
Rainfalls	mm	18	116.4	82.1	86.3	64.9	43.1	4.3	0.0	1.0	1.2	22.0	49.1	95.9	566.3
Evaporation	mm														0.0
Wind speed	m/sec	2	1.6	1.0	0.8	0.8	0.7	1.0	1.1	1.0	0.8	0.6	0.4	0.6	0.9
No. of sunny days	no.	5	3.2	5.0	3.8	4.4	8.0	19.2	25.8	26.6	21.0	8.8	7.0	5.4	138.2

eteo-Station: SANLIURFA (Akcakale)
ocation: 36 42'N 38 58'E 375 m
bservation Period:1954 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	6	10.5	12.8	17.8	23.8	29.4	35.7	39.3	39.0	34.5	26.6	19.9	12.7	25.2
Min.	C	6	2.2	2.4	5.4	9.0	13.6	18.3	21.3	20.9	16.3	11.6	6.6	3.5	10.9
Ave.	C	6	6.0	7.3	11.2	16.4	22.1	28.2	31.3	30.5	25.4	18.5	12.5	7.6	18.1
Relative Humidity	%	6	77	71	65	56	45	33	32	35	36	51	64	76	53.4
Rainfalls	mm	15	64.7	45.1	48.4	31.8	29.4	5.6	0.1	0.0	1.1	19.7	29.7	55.5	331.1
Evaporation	mm														0.0
Wind speed	m/sec	5	1.7	1.5	1.3	1.4	1.8	2.1	2.5	1.9	1.5	1.0	0.9	1.1	1.6
No. of sunny days	no.	6	3.7	4.3	6.0	8.0	11.5	23.3	29.5	28.2	22.2	10.0	9.7	5.2	161.6

Meteo-Station: SANLIURFA (Birecik)
Location: 37 02'N 37 58'E 347 m
Observation Period:1951 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	7	10.2	12.3	17.8	23.7	29.6	35.8	39.5	39.1	34.9	27.4	20.1	12.8	25.3
Min.	C	7	1.5	2.4	5.6	8.4	13.0	18.0	21.5	20.5	15.2	11.0	6.7	3.6	10.6
Ave.	C	7	5.3	7.0	11.4	16.1	21.6	27.6	31.0	30.3	25.1	18.5	12.5	7.7	17.8
Relative Humidity	%	7	76	75	68	57	48	37	34	36	40	54	67	77	55.8
Rainfalls	mm	18	75.5	59.0	50.2	30.6	15.7	4.1	0.5	1.5	1.7	23.8	34.8	70.6	368.0
Evaporation	mm														0.0
Wind speed	m/sec	3	3.1	2.6	2.4	2.5	2.8	3.3	3.2	3.1	2.3	2.1	1.9	2.2	2.6
No. of sunny days	no.	7	5.1	4.0	4.4	7.3	11.3	20.1	28.8	28.8	21.6	10.6	7.8	5.3	155.1

Meteo-Station: SANLIURFA (Ceylanpinar)
Location: 36 50'N 39 55'E 398 m
Observation Period:1956 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	14	11.3	13.7	18.2	24.2	30.8	37.2	41.1	41.0	36.1	28.9	21.0	13.8	26.4
Min.	C	13	1.3	1.5	4.2	8.0	12.7	17.2	20.6	20.0	14.5	9.8	5.3	2.4	9.8
Ave.	C	14	6.0	7.3	11.1	16.2	22.6	28.9	32.3	31,4	25.8	19.2	12.6	7.8	18.4
Relative Humidity	%	14	73	68	63	59	46	33	31	32	36	45	60	68	51.2
Rainfalls	mm	15	73.7	47.2	43.8	38.9	22.5	1.9	0.2	0.0	1.8	19.7	27.0	51.7	328.4
Evaporation	mm	14	28.3	36.0	66.0	96.8	176.7	289.4	354.5	331.6	231.5	134.8	58.3	29.6	1833.5
Wind speed	m/sec	6	1.2	1.1	1.2	1.3	1.3	1.5	1.5	1.4	1.2	0.9	0.8	1.2	1.2
No. of sunny days	no.	14	5.6	5.0	4.5	4.6	11.1	21.4	28.1	28.4	23.8	12.7	9.3	6.4	160.9

Meteo-Station: SANLIURFA (Siverek)
Location: 37 45'N 39 19'E 801 m
Observation Period: 1929 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	7	6.6	8.2	13.7	19.5	25.6	32.3	36.6	36.3	31.5	23.6	16.8	9.8	21.7
Min.	C	7	-0.2	0.9	4.9	8.6	13.4	19.0	22.8	22.4	18.4	12.7	7.6	2.7	11.1
Ave.	C	7	2.9	4.3	9.0	14.0	19.6	26.1	30.4	29.7	24.7	17.5	11.5	5.8	16.3
Relative Humidity	%	7	73	73	66	57	47	30	24	26	30	45	61	73	50.4
Rainfalls	mm	39	98.5	83.3	75.8	57.8	38.9	7.1	0.9	0.6	2.8	31.8	63.8	84.4	545.7
Evaporation	mm														0.0
Wind speed	m/sec	3	4.8	4.4	4.4	4.0	3.9	4.0	4.1	3.8	3.7	3.7	3.7	4.1	4.1
No. of sunny days	no.	7	4.6	2.8	4.1	4.3	6.7	16.7	26.0	25.6	19.0	10.7	6.7	5.0	132.2

Meteo-Station: SANLIURFA (Viransehir)
Location: 37 12'N 39 45'E 575 m
Observation Period: 1950 - 1970

Item	Unit	Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total/Ave
Air Temperature															
Max.	C	5	9.5	11.7	16.1	22.1	27.6	33.8	37.9	37.6	33.0	26.0	19.1	11.8	23.9
Min.	C	5	2.5	2.7	5.8	10.7	14.1	18.5	22.5	21.5	17.6	13.4	8.6	4.0	11.8
Ave.	C	5	5.6	6.8	10.6	16.1	21.2	27.3	30.9	30.0	25.4	19.2	13.2	7.4	17.8
Relative Humidity	%	4	72	67	63	57	46	29	27	28	33	48	6071	68	550.8
Rainfalls	mm	18	116.4	82.1	86.3	64.9	43.1	4.3	0.0	1.0	1.2	22.0	49.1	95.9	566.3
Evaporation	mm														0.0
Wind speed	m/sec	2	1.6	1.0	0.8	0.8	0.7	1.0	1.1	1.0	0.8	0.6	0.4	0.6	0.9
No. of sunny days	no.	5	3.2	5.0	3.8	4.4	8.0	19.2	25.8	26.6	21.0	8.8	7.0	5.4	138.2

Table D.2 Distribution of Soil Capability Classes in GAP Provinces (ha)

	Land Suitable For Cultivation				Limited Use	Land not Suitable for Cultivation				non-Agr. use
	I	II	III	Total	IV	V	VI	VII	Total	VIII
Adiyaman (ha)	21928	58258	64432	144618	56733	1456	88307	430493	520256	38260
%	2.4	7.1	8.8	5.9	8.6	85.0	10.3	14.2	13.3	14.0
Diyarbakir (ha)	150765	225104	180022	555891	140468	0	260965	520185	781150	58029
%	16.5	27.5	24.6	22.6	21.3		30.4	17.1	20.0	21.2
Gaziantep (ha)	80753	122939	76224	279916	88572	218	90904	298935	390057	7747
%	8.9	15.0	10.4	11.4	13.4	12.7	10.6	9.8	10.0	2.8
Mardin (ha)	181598	137788	120367	439753	95518	0	189277	450712	639989	56525
%	19.9	16.8	16.4	17.9	14.5		22.1	14.8	16.4	20.7
Siirt (ha)	22489	39698	41939	104126	37702	0	94243	775979	870222	88183
%	2.5	4.8	5.7	4.2	5.7		11.0	25.5	22.3	32.3
Sanliurfa (ha)	454219	234903	249572	938694	239998	39	134005	564693	698737	24589
%	49.8	28.7	34.1	38.1	36.4	2.3	15.6	18.6	17.9	9.0
TOTAL	911752	818690	732556	2462998	658991	1713	857701	3040997	3900411	273333
%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Turkiye Arazi Varligi; Kullanma, Siniflar, Sorunlar, Koy Isleri ve Kooperatifler Bakan., Topraksu Gn. Mud., Toprak Etudleri ve Haritalama D.Bsk. Ankara, 1978.

Table D.3 Distribution of Problem Areas Among Different Classes of Soil

IN II, III AND IV CLASS SOILS (ha.)

	SALINITY AND ALKALINITY					DRAINAGE						WATER EROSION				
	Light Salinity	Saline	Alkaline	Light Salin.-Alk.	Total	Insufficie	Poor	Bad	Extreme	Total	Stone Coverage	Medium	Strong	Extremly Strong	Total
ADIYAMAN											25840	120519	19098		139617
DIYARBAKI						306				306	189367	330949	51098		382047
GAZIANTEP						2877	131			3008	40633	224368	51593		275961
MARDIN										0	183406	211889	22037		233926
SIIRT						1063				1063	12359	76108	16462		92570
SANLIURFA						31				31	367206	471842	29490		501332
TOTAL						4277	131			4408	818811	1435675	189778		1625453

IN V, VI AND VII CLASS SOILS (ha.)

ADIYAMAN	42			194	236		1456	236		1692	295603		330547	161998	492545
DIYARBAKI											580639	11980	316187	451485	779652
GAZIANTEP											235681	1099	150415	87861	239375
MARDIN											631220	3427	352934	307608	663969
SIIRT											752674	2596	179532	685410	867538
SANLIURFA											603211	26603	287794	372461	686858
TOTAL	42				236		1456			1692	3099028	45705	1617409	2066823	3729937

Source: Turkiye Arazi Varligi; Kullanma, Siniflar, Sorunlar, Koy Isleri ve Kooperatifler Bakan., Topraksu Gn. Mud., Toprak Etudleri ve Haritalama D.Bsk. Ankara, 1978.

Table D.4 Distribution of Land According to Slope Groups (ha)

	% 0-2	% 2-6	% 6-12	Total	% 12-20	% 20-30	% 30+
Adiyaman (ha)	26282	68615	109222	204119	117450	158175	137318
Diyarbakir(ha)	260161	276224	360704	897089	197374	51928	39989
Gaziantep (ha)	93625	182326	148704	424655	105064	35965	57217
Mardin (ha)	257086	209480	221418	687984	158578	76302	983
Siirt (ha)	28406	43347	113436	185189	101530	172078	12150
Sanliurfa (ha)	609946	550913	321683	1482542	68569	30387	269
TOTAL	1275506	1330905	1275167	3881578	748565	524835	247926

Source: Turkiye Arazi Varligi; Kullanma, Siniflar, Sorunlar, Koy Isleri ve Kooperatifler Bakan., Topraksu Gn. Mud., Toprak Etudleri ve Haritalama D.Bsk. Ankara, 1978.

Table D.5 Present Land Use Pattern in GAP Provinces (ha)

		CULTIVATED LAND					MEADOW PASTURE			FOREST - HEATH			OTHERS*	WATER SURFACES	PROVINCIAL LAND AREA
		DRY FARMING	IRRIGATED	ORCHARD	SPECIAL CROP	TOTAL	MEADOW	PASTURE	TOTAL	FORESTS	HEATH	TOTAL			
ADIYAMAN	(ha)	206576	12260	22949	2083	243868	587	345185	345772	17462	113049	130511	36616	3100	759867
	%	27.2	1.6	3.0	0.3	32.1	0.1	45.4	45.5	2.3	14.9	17.2	4.8	0.4	100.0
DIYARBAKIR	(ha)	567232	26114	33185		626531		443294	443294		404245	404245	56167	5301	1535538
	%	36.9	1.7	2.2		40.8		28.9	28.9		26.3	26.3	3.7	0.3	100.0
GAZIANTEP	(ha)	294085	22634	95017	67466	479202		193098	193098	42939	42587	85526	7411	1055	766292
	%	38.4	3.0	12.4	8.8	62.5		25.2	25.2	5.6	5.6	11.2	1.0	0.1	100.0
MARDIN	(ha)	376965	22256	66590	475	466286		439330	439330		266096	266096	58717	1356	1231785
	%	30.6	1.8	5.4		37.9		35.7	35.7		21.6	21.6	4.8	0.1	100.0
SIIRT	(ha)	136245	5025	8742		150012		263206	263206		595523	595523	87472	4020	1100233
	%	12.4	0.5	0.8		13.6		23.9	23.9		54.1	54.1	8.0	0.4	100.0
SANLIURFA	(ha)	1047590	33694	25643	10070	1116997		742529	742529		11429	11429	25639	5424	1902018
	%	55.1	1.8	1.3	0.5	58.7		39.0	39.0		0.6	0.6	1.3	0.3	100.0
TOTAL	(ha)	2628693	121983	252126	80094	3082896	587	2426642	2427229	60401	1432929	1493330	272022	20256	7295733
	%	36.0	1.7	3.5	1.1	42.3	0.0	33.3	33.3	0.8	19.6	20.5	3.7	0.3	100.0

Note: * sands, rocks, settlements and river bands

Source: Turkiye Arazi Varligi; Kullanma, Siniflar, Sorunlar, Koy Isleri ve Kooperatifler Bakan., Topraksu Gn. Mud., Toprak Toprak Etudleri ve Haritalama D.Bsk. Ankara, 1978.

Table D.6 Land Use Patterns Among Different Classes of Soil by Provinces (ha)

PROVINCE	Soil Class	DRY FARMING	IRRIGATED	ORCHARD	SPECIAL CROP	TOTAL	MEADOW	PASTURE	FORESTS	HEATH	SETTLEMENT AND OTHERS	WATERS	TOTAL
ADIYAMAN	1	12288	8210	843	0	21341	587	0	0	0	0		21928
	2	52711	1846	3155	312	58024	0	95	0	139	0		58258
	3	56408	1675	5803	324	64210	0	94	0	128	0		64432
	4	50192	529	4137	440	55298	0	1370	0	65	0		56733
	5	0	0	0	0	0	0	0	0	0	1456		1456
	6	32901	0	7325	0	40226	0	40378	0	7703	0		88307
	7	2076	0	1686	1007	4769	0	303248	17462	105014	0		430493
	8	0	0	0	0	0	0	0	0	0	35160	3100	38260
TOTAL		206576	12260	22949	2083	243868	587	345185	17462	113049	36616	3100	759867
(%)		27.19	1.61	3.02	0.27	32.09	0.08	45.43	2.30	14.88	4.82	0.41	100.00
DIYARBAKIR	1	137894	6287	688	0	144869	0	1758	0	3794	344		150765
	2	156908	6903	3005	0	166816	0	56296	0	1387	605		225104
	3	137978	4187	5259	0	147424	0	27676	0	4637	285		180022
	4	72573	5954	2956	0	81483	0	51375	0	6903	707		140468
	5	0	0	0	0	0	0	0	0	0	0		0
	6	48208	2583	17930	0	68721	0	130807	0	61104	333		260965
	7	13671	200	3347	0	17218	0	175382	0	326420	1165		520185
	8	0	0	0	0	0	0	0	0	0	52728	5301	58029
TOTAL		567232	26114	33185	0	626531	0	443294	0	404245	56167	5301	1535538
(%)		36.94	1.70	2.16	0.00	40.80	0.00	28.87	0.00	26.33	3.66	0.35	100.00
GAZIANTEP	1	57524	19450	3209	507	80690	0	0	0	0	63		80753
	2	84196	2844	19320	16529	122889	0	0	0	50	0		122939
	3	44428	0	16327	10775	71530	0	4119	0	372	203		76224
	4	47424	0	25994	10619	84037	0	4392	0	143	0		88572
	5	0	0	0	0	0	0	0	0	0	218		218
	6	36854	340	23241	19233	79668	0	10144	362	630	100		90904
	7	23659	0	6926	9803	40388	0	174443	42577	41392	135		298935
	8	0	0	0	0	0	0	0	0	0	6692	1055	7747
TOTAL		294085	22634	95017	67466	479202	0	193098	42939	42587	7411	1055	766292
(%)		38.38	2.95	12.40	8.80	62.54	0.00	25.20	5.60	5.56	0.97	0.14	100.00
MARDIN	1	176097	3675	659	0	180431	0	31	0	0	1136		181598
	2	92446	13796	15761	0	122003	0	13874	0	1491	420		137788
	3	71787	3030	13595	475	88887	0	26396	0	4671	413		120367
	4	26460	1208	15709	0	43377	0	46046	0	5787	308		95518
	5	0	0	0	0	0	0	0	0	0	0		0
	6	7583	0	16473	0	24056	0	113310	0	51521	390		189277
	7	2592	547	4393	0	7532	0	239673	0	202626	881		450712
	8	0	0	0	0	0	0	0	0	0	55169	1356	56525
TOTAL		376965	22256	66590	475	466286	0	439330	0	266096	58717	1356	1231785
(%)		30.60	1.81	5.41	0.04	37.85	0.00	35.67	0.00	21.60	4.77	0.11	100.00
SIIRT	1	20859	1060	312	0	22231	0	163	0	0	95		22489
	2	32453	2879	107	0	35439	0	1717	0	2413	129		39698
	3	34409	1046	327	0	35782	0	2825	0	3075	257		41939
	4	22551	40	2151	0	24742	0	8720	0	4131	109		37702
	5	0	0	0	0	0	0	0	0	0	0		0
	6	19874	0	2197	0	22071	0	45027	0	27029	116		94243
	7	6099	0	3648	0	9747	0	204754	0	558875	2603		775979
	8	0	0	0	0	0	0	0	0	0	84163	4020	88183
TOTAL		136245	5025	8742	0	150012	0	263206	0	595523	87472	4020	1100233
(%)		12.38	0.46	0.79	0.00	13.63	0.00	23.92	0.00	54.13	7.95	0.37	100.00
SANLIURFA	1	421927	23212	4559	1883	451581	0	44	0	0	2594		454219
	2	204023	7287	10798	1618	223726	0	10533	0	0	644		234903
	3	206820	1463	3260	2047	213590	0	34741	0	31	1210		249572
	4	128668	1732	4459	2200	137059	0	102352	0	0	587		239998
	5	0	0	0	0	0	0	0	0	0	39		39
	6	59393	0	2181	1420	62994	0	70730	0	0	281		134005
	7	26759	0	386	902	28047	0	524129	0	11398	1119		564693
	8	0	0	0	0	0	0	0	0	0	19165	5424	24589
TOTAL		1047590	33694	25643	10070	1116997	0	742529	0	11429	25639	5424	1902018
(%)		55.08	1.77	1.35	0.53	58.73	0.00	39.04	0.00	0.60	1.35	0.29	100.00
GENERAL TOTAL		2628693	121983	252126	80094	3082896	587	2426642	60401	1432929	272022	20256	7295733
(%)		36.03	1.67	3.46	1.10	42.26	0.01	33.26	0.83	19.64	3.73	0.28	100.00

Source: Turkiye Arazi Varligi, Topraksu, 1978.

Table D.7 Highways and Roads (1987)

Province	National and Provincial Roads	Rural Roads			(km.)
	TCK	Asphalt	Gravel	Graded	Raw
ADIYAMAN	644	82	1497	1025	344
DIYARBAKIR	823	92	2899	1580	629
GAZIANTEP	510	141	2689	105	315
MARDIN	876	130	1689	2129	168
SIIRT	639	140	1272	1074	939
SANLIURFA	853	104	2605	2697	1278
TOTAL REGION	4345	689	12651	8610	3673
RESIDUAL TURKEY	52301	4258	126072	53290	42315
TURKEY	56646	4947	138723	61900	45988

Source : TCK

Table D.8 Village Road Links (1988)

	Paved	Graveled/ Graded	No Roads	Total No. of Villages
Adiyaman				
No	66	283	1	350
%	18.9	80.9	0.3	100
Diyarbakir				
No	81	606	10	697
%	11.6	86.9	1.4	100
Gaziantep				
No	82	314	0	396
%	20.7	79.3	0.0	100
Mardin				
No	81	639	0	720
%	11.3	88.8	0.0	100
Siirt				
No	74	367	57	498
%	14.9	73.7	11.4	100
Sanliurfa				
No	85	682	7	774
%	11.0	88.1	0.9	100
GAP				
No	469	2891	75	3435
%	13.7	84.2	2.2	100

Source : MAFRA

Table D.9 Railway Transportation (1986)

Tracks	Length (km.)	Gross Ton km. (1000) Passenger	Freight	Total
Maden-Batman	173	69160	113285	182445
Batman-Kurtalan	69	31361	13487	44848
Narli-Malatya*	(182)	64190	769131	833321
Narli-Gaziantep*	(84)	15444	62308	77752
Gaziantep-Karkamis	91	23824	46124	69948
Cobanbey-Karkamis	55	202	459	661
Karkamis-Nusaybin	326	36441	94077	130518
Senyurt-Mardin	24	35	443	478
REGIONAL TOTAL	805	240657	1099314	1340776
PERCENT OF TURKEY	7.80	3.53	7.11	6.02
RESIDUAL TURKEY	9520	6575343	14367686	20942224
PERCENT OF TURKEY	92.20	96.47	92.89	93.98
TOTAL TURKEY	10325	6816000	15467000	22283000
PERCENT	100	100	100	100

* only partly within the GAP region
Source : TCDD

Table D.10 Freight and Passenger Traffic by Mode, Selected Years

(1) Goods movement (Unit: ton-kms)

Year	Highways	Railways	Airways	Pipelines	Total
1960	3,678	4,632	12		8,322
1965	8,415	5,735	15		14,165
1970	17,447	6,092	25		23,564
1975	29,424	6,799	49	1,030	37,302
1980	36,418	5,167	32	720	42,337
1985	45,634	7,959	59	1,228	54,880
1986	48,463	7,396	64	1,382	57,305

(2) Passenger movement (Unit: passenger-kms)

Year	Highways	Railways	Shipping	Airways	Total
1960	10,880	3,633	304	115	14,934
1965	24,931	3,414	205	115	28,713
1970	41,311	3,444	133	308	45,196
1975	68,395	2,199	142	619	71,355
1980	74,721	6,011	120	395	81,247
1985	91,567	6,489	131	718	98,905
1986	97,609	6,052	139	785	104,585

Source: SIS, Transport Review, 1970-1987

Table D.11 Road Transport of Passengers and Freight on Selected Roads in GAP Regions, 1975

Control Section No	From	To	No of vehicles			Total No Of Passengers	Goods carried in tons						
			Auto	Bus	Truck		Agricultural Producte	Mineral ares & build mater	Animal Prod	Manufact. goods.	Live Stock	Miscall	Total
06 23	Gaziantep border	Gaziantep	1,114	250	1,363	12,550	3,172	1,527	0	5,991	0	1057.000	11,747
06 24	Gaziantep	Birecik	1,772	195	1,789	3,756	13,157	4,163	0	7,865	0	1388.000	25,420
06 25	Birecik	Sanliurfa	900	154	944	8,488	2,197	1,058	0	4,151	0	733	8,139
06 26	Sanliurfa	Siverek	608	107	581	6,403	965	1,150	37	779	408	371	3,710
06 27	Siverek	Sanliurfa border	697	82	396	5,547	658	784	25	531	278	253	2,259
06 29	Diyarbakir	Siirt border	629	68	447	6,812	1,035	778	0	1,099	0	60	2,972
06 31	Siirt border	Bitlis	490	35	415	4,773	965	718	0	1,021	0	55	2,760
10 01	Sanliurfa	Viransehir	160	24	175	2,183	483	179	11	294	0	84	1,051
59 04	Golbasi	Adiyaman	229	50	216	3,353	405	91	26	666	79	39	1,306
59 05	Adiyaman	Adiyaman border	207	37	204	2,432	382	86	25	628	74	37	1,232
69 04	Diyarbakir border	Diyarbakir	392	59	446	4,307	465	1,887	0	181	26	26	2,585
69 05	Diyarbakir	Mardin border	805	132	283	9,904	640	508	0	696	0	38	1,833
69 07	Kiziltepe	Nusaybin	213	9	75	1,549	198	77	9	131	0	36	451
69 12	Cizre	Irag border	234	9	138	1,893	364	141	17	240	0	66	828

Source : Gen. Dir. Of Highways, Traffic and Transportation Survey, 1975.

Table D.12 Road Transport of Passengers and Freight on Selected Roads in GAP Regions, 1979

Control Section No	From	To	No of vehicles			Total No Of Passengers	Goods carried in tons						
			Auto-mobile	Bus	Truck		Agricultural Producte	Mineral ares build mater	Animal Prod	Manufact. goods.	Live Stock	Miscall aneans	Total
06 23	Gaziantep border	Gaziantep	861	255	1,292	11,882	3,007	1,448	0	5,680	0	1,003	11,138
06 24	Gaziantep	Birecik	1,772	213	1,450	11,624	3,376	1,625	0	6,367	0	1,125	12,502
06 25	Birecik	Sanliurfa	380	63	507	3,607	1,181	568	0	2,230	0	394	4,373
06 26	Sanliurfa	Siverek	435	45	399	3,540	662	790	26	535	280	255	2,548
06 27	Siverek	Sanliurfa border	256	45	278	2,594	462	551	18	373	195	178	1,777
06 29	Diyarbakir	Siirt	1,009	68	690	9,449	1,579	1,218	0	1,697	549	499	4,991
06 31	Siirt border	Bitlis	464	21	366	4,049	852	633	0	902	0	48	2,435
10 01	Sanliurfa	Viransehir	237	28	376	3,456	1,038	384	23	632	0	180	2,257
59 04	Golbasi	Adiyaman	321	60	303	3,840	568	128	37	934	110	55	1,832
59 05	Adiyaman	Adiyaman border	374	22	183	2,752	343	77	22	564	66	33	1,105
69 04	Diyarbakir border	Diyarbakir	1,812	191	789	15,432	822	3,334	0	320	46	46	4,568
69 05	Diyarbakir	Mardin border	698	38	256	5,875	578	459	0	629	0	34	1,700
69 07	Kiziltepe	Nusaybin	173	9	157	1,693	414	160	19	273	0	75	941
69 12	Cizre	Irag border	250	71	847	3,354	2	864	102	1	0	407	5,083

Source : Gen. Dir. Of Highways, Traffic and Transportation Survey 1979

Table D.13 Road Transport on Selected Roads in GAP Regions, 1985

Control Section No.	From	To	No of vehicles Autos	Buses	Trucks
400-22	Gaziantep border	Gaziantep	780	435	4,408
400-23	Gaziantep	Birecik	448	101	3,264
400-24	Birecik	Sanliurfa	448	100	3,246
885-12	Sanliurfa	Siverek	394	91	559
360-07	Siverek	Sanliurfa border	328	600	421
360-09	Diyarbakir	Siirt border	680	730	622
965-11	Siirt border	Bitlis	504	42	488
400-26	Sanliurfa	Viransehir	352	51	3,464
360-04	Golbasi	Adiyaman	144	64	207
360-06	Adiyaman	Adiyaman border	217	8	166
885-11	Diyarbakir border	Diyarbakir	570	95	366
950-09	Diyarbakir	Mardin border	571	51	324
400-29	Kiziltepe	Nusaybin	361	30	2,949
430-01	Cizre	Irag border	198	32	3,007

Source : TCK, Traffic and Transport Survey, 1985.

Table D.14 Air Transportation in GAP Region

Airport		Passengers	Cargo (Ton)
Gaziantep	1980	18,281	59
	1984	30,718	109
	Annual growth	13.85 (%)	16.59 (%)
Diyarbakir	1980	59,855	550
	1984	75,527	1,060
	Annual growth	5.99 (%)	17.82 (%)
Turkey	1980	848,495	69,770
	1984	1,707,985	136,726
	Annual growth	19.11 (%)	18.32 (%)

Source: SIS, 1987 Annual.

Table D.15 Transportation Volumes of Regional Ports

		OUTGOING VESSELS				IN-COMING VESSELS			
		Cleared with cargo		Cargo loaded		Entered with cargo		Cargo unloaded	
	Year	Number	Net tonnage	Livestock head	Goods tons	Number	Net tonnage	Livestock head	Goods tons
Total National	1979	4855	20170824	196626	27209807	4857	14617449	846276	15479670
	1980	4864	15779635	353830	22165359	5167	15388936	586818	21093317
	1981	5804	18836804	346571	26552533	5597	15780864	547750	20183539
	1982	8079	25618067	580766	32478228	8014	23193791	1843	24318054
	1983	8505	24508134	483348	33811694	7985	23838852	6377	35456997
	1984	9096	31624147	335457	45151130	9575	29022244	4974	36312285
	1985	8298	29441327	289613	54703389	8974	26763179	196935	36920977
	1986	9058	33121931	134236	58479431	8766	26351314	133391	37697382
Mersin and Iskenderun	1979	1336	12666748	196423	24020176	1084	2512923	328	3524103
	1980	1248	9429458	331957	18032453	1263	2852237	1452	4180204
	1981	1564	4037132	289631	5275292	1528	3498729	1013	4450512
	1982	1850	2584834	448266	1796496	1857	4474987	1843	4844535
	1983	2046	3836025	433775	5698218	1643	5199710	976	6396592
	1984	1909	3811843	334258	5271713	1607	5054937	4974	6309632
	1985	1749	4734335	285613	5863747	1752	5593313	183125	7317366
	1986	1775	5230428	86263	6644080	1808	6186978	82251	6620635
	Mersin and Iskenderun Ports - Share of National International Shipping (%)								
	1979	27.52	62.80	99.90	88.28	22.32	17.19	0.04	22.77
	1980	25.66	59.76	93.82	81.35	24.44	18.53	0.25	19.82
	1981	26.95	21.43	83.57	19.87	27.30	22.17	0.18	22.05
	1982	22.90	10.09	77.19	5.53	23.17	19.29	100.00	19.92
	1983	24.06	15.65	89.74	16.85	20.58	21.81	15.31	18.04
	1984	20.99	12.05	99.64	11.68	16.78	17.42	100.00	17.38
	1985	21.08	16.08	98.62	10.72	19.52	20.90	92.99	19.82
	1986	19.60	15.79	64.26	11.36	20.63	23.48	61.66	17.56

Source: SIS Yearbook,1987.

	NATIONAL (in TL Billion, 1988)										GAP PROVINCES (in TL Billion, 1988)		
Transport Mode	1980 actual	1981 actual	1982 actual	1983 actual	1984 Bank est.	1980-84	1985 Est'd.Act	Fifth Plan 1985-89 Planned (1)	F.E.C. (2)	1987 Est'd.Act	1980 Est'd.Act	1985 Est'd.Act	1987 Est'd.Act
1. Railways	263.76	215.16	271.07	287.34	278.83	1316.15	201.60	1965.60	1018.08	125.40	0.00	4.37	2.48
2. Highways	690.48	702.45	688.73	712.35	627.00	3421.02	782.88	4418.40	1777.44	684.75	53.76	66.53 (3)	37.95 (3)
a) State and Provincial Roads	480.48	467.53	481.28	491.38	427.50	2348.17	588.00	2973.60	1199.52	511.50	36.96	53.09	31.18
b) Village and Community roads	210.00	234.93	207.45	220.98	199.50	1072.85	194.88	1444.80	577.92	173.25	16.80	13.44	6.60
3. Ports and shipping	119.28	129.09	144.75	192.74	143.45	729.32	117.60	1014.72	659.23	57.75			
4. Aviation	47.04	100.02	97.73	108.02	139.18	491.98	215.04	957.60	594.72	49.50	1.68	13.44	0.33
5. Pipelines	18.48	17.45	39.65	18.36	89.78	183.70	114.24	621.60	403.20	105.60	10.08	7.39 (4)	5.28 (4)
TOTAL	1139.04	1164.16	1241.93	1318.81	1278.23	6142.17	1431.36	8977.92	4452.67	1023.00	65.52	91.73	46.04

Source : World Bank - Adjusting Public Investment, Vol. 1, 1986, SPO and M/P Study.

1: As approved by Government

2: F.E.C denotes Foreing Exchange Component

3: Includes the National share of TETEK.

4: Iraq-Turkey II. Pipeline is exluded from the National and GAP sub-totals.

GAP's SHARE OF NATIONAL TRANSPORT PUBLIC SECTOR TRANSPORT INVESTMENTS

(%)

Transport Mode	1980 Est'd.Act	1985 Est'd.Act	1987 Est'd.Act
1. Railways	0.00	2.17	1.97
2. Highways	7.79	8.50	5.54
a) State and Provincal Roads	7.69	9.03	6.10
b) Village and Community roads	8.00	6.90	3.81
3. Ports and shipping	0.00	0.00	0.00
4. Aviation	3.57	6.25	0.67
5. Pipelines	54.55	6.47	5.00
TOTAL	5.75	6.41	4.50

Table D.17 Road Traffic Projection

Road	Control Section No.	1985 Average Daily Traffic Autos	Buses	Trucks	Passenger Car Unit	Projected Traffic in PCU's 1995	2000	2005	Additional Traffic* by GAP in PCU's	Average Annual Growth %
1.Adiyaman-SU/DI Road	360-06	262	9	228	973	1,530	1,924	2,426	44	4.8
2.Diyarbakir-Ergani	885-11	570	95	366	1,953	3,156	4,026	5,148	401	5.4
3.Diyarbakir-Silvan/Kozluk	360-09	680	730	622	4,736	7,902	10,239	13,293	346	5.4
4.Gaziantep-Birecik	400-23	1,703	224	3,732	13,571	20,826	25,855	32,149	1,667	4.7
5.Birecik-Sanliurfa	400-24	448	101	3,264	10,543	15,839	19,435	23,864	1,667	4.5
6.Sanliurfa-Viransehir	400-26	352	51	3,464	10,897	16,287	19,926	24,390	428	4.2
7.Sanliurfa-Hilvan	885-12	394	91	559	2,344	3,677	4,619	5,814	1,326	5.7
8.Hilvan-Diyarbakir	360-07	328	600	421	3,391	5,680	7,374	9,592	1,371	6.0
9.Viransehir-Nusaybin	400-28	202	56	2,852	8,926	13,328	16,296	19,934	429	4.2
10.Kiziltepe-Mardin	950-11	922	92	383	2,347	3,846	4,940	6,360	1,027	5.9
11.Mardin-Cinar	950-09	549	51	312	1,638	2,643	3,368	4,302	188	5.2
12.Kiziltepe-Nusaybin	400-29	361	30	2,949	9,298	13,903	17,014	20,831	809	4.3
13.Cizre-Silopi/Habur	430-01	198	32	3,007	9,315	13,880	16,951	20,709	688	4.2

* at full development

Source: General Directorate of Highways for the figures in 1985. The others were projected by the Consultant.

Table D.18 Populations of Places over 10,000 in 1985

PROVINCE	NAME OF PLACE	1965	1970	1975	1980	1985	
SANLIURFA	Muratli		5751	5780	7293	12976	GROUP 1
MARDIN	SILOPI	2645	2923	4460	6811	13071	CONSISTENTLY POSITIVE
SIIRT	KOZLUK	3742	4613	6197	10157	17421	(1965-1985)
SIIRT	SIRNAK	4936	7025	10587	10997	12141	GROUP 2
DIYARBAKIR	CERMIK	5420	6910	9749	9798	12566	CONSISTENTLY POSITIVE
ADIYAMAN	KAHTA	6885	9512	15602	16397	25510	(1975-1985)
SANLIURFA	CEYLANPINAR	12508	14350	20171	21679	25781	
GAZIANTEP	ISLAHIYE	13775	16892	20683	22082	29031	
MARDIN	CIZRE	8662	11137	15557	20003	29496	
DIYARBAKIR	ERGANI	10528	18544	21936	24218	33209	
MARDIN	MERKEZ	30974	33740	36629	39137	44085	
MARDIN	NUSAYBIN	7584	14994	23684	30982	45178	
GAZIANTEP	NIZIP	22675	30219	36190	38967	50067	
SIIRT	MERKEZ	25480	29544	35654	42291	53884	
ADIYAMAN	MERKEZ	22153	31263	43782	53219	71644	
SANLIURFA	MERKEZ	73498	100654	132934	147488	194969	
GAZIANTEP	MERKEZ	160152	227652	300882	374290	478635	
ADIYAMAN	BESNI	11625	12025	16313	15833	17763	GROUP 3
SANLIURFA	SURUC	9015	15033	20395	18892	25660	RECENT UPTURN
SANLIURFA	BIRECIK	15317	18392	20104	20081	25998	(1975-1985)
SANLIURFA	SIVEREK	27527	34146	40996	29464	48333	
GAZIANTEP	ARABAN	2303	3563	5381	8213	11176	GROUP 4
SIIRT	KURTALAN	3422	6097	7001	10442	12352	INCONSISTENTLY POSITIVE
SANLIURFA	AKCAKALE	4526	6096	7828	11184	15542	(1965-1985)
MARDIN	MIDYAD	10391	12987	16905	19951	22169	
DIYARBAKIR	BISMIL	4444	9403	12775	19059	24862	
MARDIN	KIZILTEPE	9589	16376	21531	30445	40852	
SANLIURFA	VIRANSEHIR	11063	17850	26244	40820	45329	
DIYARBAKIR	SILVAN	12158	18592	29599	43624	45825	
GAZIANTEP	KILIS	38095	43438	54055	58335	59876	
DIYARBAKIR	MERKEZ	102653	149566	169535	235617	305940	
MARDIN	DERIK	6684	11170	13292	15288	13975	GROUP 5
ADIYAMAN	GOLBASI	5044	9616	15103	20390	22153	DECREASING
SIIRT	BATMAN	24990	44991	64384	86172	110036	(1965-1985)
TOTAL POPULATION		710463	995064	1281918	1559619	1997505	

Source: SIS-Census of Population, PMU/SPO.
Note : Municipalities are capitalized.

Table D.19 Growth Characteristics of Population
(Places > 10,000 - 1985)

PROVINCE	NAME OF PLACE	Average Annual Growth (%) 1965 1970	1970 1975	1975 1980	1980 1985	1985 POPULATION	
SANLIURFA	Muratli		0.10	4.76	12.21	12976	GROUP 1
MARDIN	SILOPI	2.02	8.82	8.84	13.93	13071	CONSISTENTLY POSITIVE
SIIRT	KOZLUK	4.27	6.08	10.39	11.39	17421	(1965-1985)
SIIRT	SIRNAK	7.31	8.55	0.76	2.00	12141	GROUP 2
DIYARBAKIR	CERMIK	4.98	7.13	0.10	5.10	12566	CONSISTENTLY POSITIVE
ADIYAMAN	KAHTA	6.68	10.40	1.00	9.24	25510	(1975-1985)
SANLIURFA	CEYLANPINAR	2.79	7.05	1.45	3.53	25781	
GAZIANTEP	ISLAHIYE	4.16	4.13	1.32	5.62	29031	
MARDIN	CIZRE	5.16	6.91	5.16	8.08	29496	
DIYARBAKIR	ERGANI	11.99	3.42	2.00	6.52	33209	
MARDIN	MERKEZ	1.73	1.66	1.33	2.41	44085	
MARDIN	NUSAYBIN	14.61	9.57	5.52	7.84	45178	
GAZIANTEP	NIZIP	5.91	3.67	1.49	5.14	50067	
SIIRT	MERKEZ	3.00	3.83	3.47	4.96	53884	
ADIYAMAN	MERKEZ	7.13	6.97	3.98	6.13	71644	
SANLIURFA	MERKEZ	6.49	5.72	2.10	5.74	194969	
GAZIANTEP	MERKEZ	7.29	5.74	4.46	5.04	478635	
ADIYAMAN	BESNI	0.68	6.29	-0.60	2.33	17763	GROUP 3
SANLIURFA	SURUC	10.77	6.29	-1.52	6.32	25660	RECENT UPTURN
SANLIURFA	BIRECIK	3.73	1.80	-0.02	5.30	25998	(1975-1985)
SANLIURFA	SIVEREK	4.40	3.72	-6.39	10.41	48333	
GAZIANTEP	ARABAN	9.12	8.59	8.82	6.35	11176	GROUP 4
SIIRT	KURTALAN	12.25	2.80	8.32	3.42	12352	INCONSISTENTLY POSITIVE
SANLIURFA	AKCAKALE	6.14	5.13	7.40	6.80	15542	(1965-1985)
MARDIN	MIDYAD	4.56	5.41	3.37	2.13	22169	
DIYARBAKIR	BISMIL	16.17	6.32	8.33	5.46	24862	
MARDIN	KIZILTEPE	11.30	5.63	7.17	6.06	40852	
SANLIURFA	VIRANSEHIR	10.04	8.01	9.24	2.12	45329	
DIYARBAKIR	SILVAN	8.87	9.75	8.07	0.99	45825	
GAZIANTEP	KILIS	2.66	4.47	1.54	0.52	59876	
DIYARBAKIR	MERKEZ	7.82	2.54	6.80	5.36	305940	
MARDIN	DERIK	10.82	3.54	2.84	-1.78	13975	GROUP 5
ADIYAMAN	GOLBASI	13.77	9.45	6.19	1.67	22153	DECREASING
SIIRT	BATMAN	12.48	7.43	6.00	5.01	110036	(1965-1985)
TOTAL POPULATION		6.97	5.20	4.00	5.07	1997505	

Note : Municipalities are capitalized.

Table D.20 Population (1945-85) and Projections to 2005
(Trend)

PROVINCE	1945	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	200
ADIYAMAN			208755	233717	267288	303511	346892	367595	430728	480239	541758	604919	670
DIYARBAKIR	249949	293738	343903	401884	475916	581208	651233	778150	934505	1106869	1307482	1528950	1775
GAZIANTEP	290058	328343	376969	434579	511026	606540	715939	808697	966490	1142277	1338255	1552116	1788
MARDIN	234457	269490	305520	353411	397880	453092	519687	564967	652069	732374	830232	931567	1038
SIIRT	133627	156703	191234	232243	264832	320684	381503	445483	524741	631912	748094	876746	1020
SANLIURFA	263855	298394	348199	401919	450798	538131	597277	602736	795034	895129	1017706	1145835	1281
TOTAL REGION	1171946	1346668	1774580	2057753	2367740	2803166	3212531	3567628	4303567	4988800	5783527	6640133	757
RESIDUAL TURKEY	17618228	19600520	22290183	25697067	29023681	32802010	37135188	41169329	46360891	52054308	58128317	64618228	7187
TOTAL TURKEY	18790174	20947188	24064763	27754820	31391421	35605176	40347719	44736957	50664458	57043108	63911844	71258361	7944

GAP PROVINCES' ANNUAL RATE OF GROWTH (%)

PROVINCE	1945 1950	1950 1955	1955 1960	1960 1965	1965 1970	1970 1975	1975 1980	1980 1985	1985 1990	1990 1995	1995 2000	200 200
ADIYAMAN			2.28	2.72	2.57	2.71	1.17	3.22	2.20	2.44	2.23	2.09
DIYARBAKIR	3.28	3.20	3.17	3.44	4.08	2.30	3.63	3.73	3.44	3.39	3.18	3.04
GAZIANTEP	2.51	2.80	2.89	3.29	3.49	3.37	2.47	3.63	3.40	3.22	3.01	2.87
MARDIN	2.82	2.54	2.96	2.40	2.63	2.78	1.68	2.91	2.35	2.54	2.33	2.13
SIIRT	3.24	4.06	3.96	2.66	3.90	3.53	3.15	3.33	3.79	3.43	3.22	3.09
SANLIURFA	2.49	3.14	2.91	2.32	3.61	2.11	0.18	5.69	2.40	2.60	2.40	2.26
TOTAL REGION	2.82	5.67	3.01	2.85	3.43	2.76	2.12	3.82	3.00	3.00	2.80	2.67
RESIDUAL TURKEY	2.16	2.61	2.89	2.46	2.48	2.51	2.08	2.40	2.34	2.23	2.14	2.15
TOTAL TURKEY	2.20	2.81	2.89	2.49	2.55	2.53	2.09	2.52	2.40	2.30	2.20	2.20

GAP PROVINCES AS PERCENTAGE OF NATIONAL POPULATION (%)

PROVINCE	1945	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005
ADIYAMAN			0.87	0.84	0.85	0.85	0.86	0.82	0.85	0.84	0.85	0.85	0.84
DIYARBAKIR	1.33	1.40	1.43	1.45	1.52	1.63	1.61	1.74	1.84	1.94	2.05	2.15	2.24
GAZIANTEP	1.54	1.57	1.57	1.57	1.63	1.70	1.77	1.81	1.91	2.00	2.09	2.18	2.25
MARDIN	1.25	1.29	1.27	1.27	1.27	1.27	1.29	1.26	1.29	1.28	1.30	1.31	1.31
SIIRT	0.71	0.75	0.79	0.84	0.84	0.90	0.95	1.00	1.04	1.11	1.17	1.23	1.28
SANLIURFA	1.40	1.42	1.45	1.45	1.44	1.51	1.48	1.35	1.57	1.57	1.59	1.61	1.61
TOTAL REGION	6.24	6.43	7.37	7.41	7.54	7.87	7.96	7.97	8.49	8.75	9.05	9.32	9.53
RESIDUAL TURKEY	93.76	93.57	92.63	92.59	92.46	92.13	92.04	92.03	91.51	91.25	90.95	90.68	90.47
TOTAL TURKEY	100	100	100	100	100	100	100	100	100	100	100	100	100

Table D.21 Population Projections (Places 10000+ in 2005)
(Trend)

PROVINCE	MUNICIPALITY	1985	1990	1995	2000	2005	GROWTH INDEX 1985	1990	1995	2000	2005
ADIYAMAN	BESNI	17763	20517	22982	25488	28067	100	116	129	143	158
	KAHTA	25510	32001	39537	49128	49548	100	125	155	193	194
	GOLBASI	22153	30381	41057	55256	74173	100	137	185	249	335
	MERKEZ	71644	87091	109487	126587	148347	100	122	153	177	207
	TOTAL (10000+)	137070	169989	213063	256458	300135	100	124	155	187	219
	PROV. TOTAL	430728	489110	551650	615941	683132	100	114	128	143	159
DIYARBAKIR	HANI	9575	11443	13990	14568	16318	100	120	146	152	170
	CINAR	8049	10532	13686	17381	22153	100	131	170	216	275
	CERMIK	12566	14988	17538	20194	23538	100	119	140	161	187
	ERGANI	33209	41115	51601	62289	79019	100	124	155	188	238
	BISMIL	24862	37550	56386	82784	120201	100	151	227	333	483
	SILVAN	45825	77291	104418	139697	183357	100	169	228	305	400
	MERKEZ	305940	401581	499117	610529	748707	100	131	163	200	245
	TOTAL (10000+)	422402	594500	756735	947440	1193293	100	141	179	224	283
	PROV. TOTAL	934505	1106869	1307482	1528950	1775991	100	118	140	164	190
GAZIANTEP	YAVUZELI	4606	5469	6894	8640	10681	100	119	150	188	232
	OGUZELI	9547	10937	12723	14668	16783	100	115	133	154	176
	NURDAGI	5672	7960	11162	15472	21362	100	140	197	273	377
	ARABAN	11176	17646	26338	38880	57064	100	158	236	348	511
	ISLAHIYE	29031	35120	41955	49608	58267	100	121	145	171	201
	KILIS	59876	74548	84129	93959	104310	100	125	141	157	174
	NIZIP	50067	62208	74836	89137	105430	100	124	149	178	211
	MERKEZ	478635	627926	782089	972707	1202006	100	131	163	203	251
	TOTAL (10000+)	628785	828385	1033231	1274432	1575903	100	132	164	203	251
	PROV. TOTAL	966490	1142277	1338255	1552116	1788132	100	118	138	161	185
MARDIN	YESILLI	9798	11038	12165	13161	14241	100	113	124	134	145
	DERIK	13975	15697	17234	18084	18791	100	112	123	129	134
	MAZIDAGI	8269	10937	14193	18084	23241	100	132	172	219	281
	IDIL	8465	11140	14395	18486	23538	100	132	170	218	278
	SILOPI	13071	17216	22404	29135	37581	100	132	171	223	288
	MIDYAT	22169	26392	31548	37333	43885	100	119	142	168	198
	CIZRE	29496	35444	42477	50132	58350	100	120	144	170	198
	MERKEZ	44085	47799	52107	56261	60328	100	108	118	128	137
	KIZILTEPE	40852	54239	67872	83818	102884	100	133	166	205	252
	NUSAYBIN	45178	63293	89211	118549	163182	100	140	197	262	361
	TOTAL (10000+)	208826	293194	363607	443043	546020	100	140	174	212	261
	PROV. TOTAL	652069	749114	849147	952874	1062133	100	115	130	146	163
SIIRT	SASON	5821	6177	7907	9846	12263	100	106	136	169	211
	SIRNAK	12141	14886	17639	20897	24725	100	123	145	172	204
	BAYKAN	6665	9418	13179	18385	25713	100	141	198	276	386
	KURTALAN	12352	16000	21086	27025	34417	100	130	171	219	279
	KOZLUK	17421	34938	39182	42999	56372	100	201	225	247	324
	MERKEZ	53884	61774	69950	79368	90393	100	115	130	147	168
	BATMAN	110036	156460	213012	284569	381994	100	142	194	259	347
	TOTAL (10000+)	205834	284058	368777	464704	625876	100	138	179	226	304
	PROV. TOTAL	524741	631912	748094	876746	1020661	100	120	143	167	195
S.URFA	HILVAN	7907	9596	11068	12624	14363	100	121	140	160	182
	BOZOVA	9598	11342	13280	15673	17999	100	118	138	163	188
	BIRECIK	25998	28163	31325	33217	35143	100	108	120	128	135
	CEYLANPINAR	25781	28862	32440	36168	39955	100	112	126	140	155
	AKCAKALE	15542	20304	26409	34259	44405	100	131	170	220	286
	SURUC	25660	32126	38739	46566	55516	100	125	151	181	216
	SIVEREK	48333	56326	62859	70263	76908	100	117	130	145	159
	VIRANSEHIR	45329	66235	92096	129349	177245	100	146	203	285	391
	MERKEZ	194969	236776	302811	370457	448205	100	121	155	190	230
	TOTAL (10000+)	381612	480134	611029	748575	909740	100	126	160	196	238
	PROV. TOTAL	795034	869731	989005	1113347	1244951	100	109	124	140	157
REGION	TOTAL (10000+)	1984529	2650260	3346441	4134651	5150967	100	134	169	208	260
	PROV. TOTAL	4303567	4989013	5783633	6639974	7575000	100	116	134	154	176

Table D.22 Population Projections (Places 10000+ in 2005)
(ALTERNATIVE A)

PROVINCE	MUNICIPALITY	1985	1990	1995	2000	2005
ADIYAMAN	BESNI	17763	18256	21422	25129	29452
	KAHTA	25510	28475	36854	48436	51992
	GOLBASI	22153	27033	38271	54478	77832
	MERKEZ	71644	77494	102056	124804	155664
	TOTAL (10000+)	137070	151258	198603	252846	314940
	PROV. TOTAL	430728	508330	600600	709287	837255
DIYARBAKIR	HANI	9575	10230	13088	14400	17151
	CINAR	8049	9415	12804	17181	23283
	CERMIK	12566	13399	16408	19962	24739
	ERGANI	33209	36756	48275	61573	83051
	BISMIL	24862	41847	65760	102013	157487
	SILVAN	45825	86136	121778	172147	240235
	MERKEZ	305940	447534	582097	752346	980958
	TOTAL (10000+)	422402	644276	858821	1137784	1524441
	PROV. TOTAL	934505	1153888	1426404	1762457	2176673
GAZIANTEP	YAVUZELI	4606	4867	6430	8528	11226
	OGUZELI	9547	9733	11867	14478	17639
	NURDAGI	5672	7084	10411	15271	22452
	ARABAN	11176	15704	24565	38375	59976
	ISLAHIYE	29031	38961	48782	61039	76341
	KILIS	59876	82702	97819	115610	136667
	NIZIP	50067	69013	87014	109676	138135
	MERKEZ	478635	696608	909354	1196839	1574872
	TOTAL (10000+)	628785	911248	1187893	1548785	2034021
	PROV. TOTAL	966490	1185401	1455559	1786453	2191553
MARDIN	YESILLI	9798	9789	11320	12975	14968
	DERIK	13975	13920	16037	17828	19749
	MAZIDAGI	8269	9699	13207	17828	24427
	IDIL	8465	9879	13396	18225	24739
	SILOPI	13071	15267	20848	28724	39499
	MIDYAT	22169	23405	29358	36806	46124
	CIZRE	29496	31433	39527	49424	61327
	MERKEZ	44085	42390	48489	55466	63406
	KIZILTEPE	40852	59963	78733	103012	134798
	NUSAYBIN	45178	56130	83016	116875	171507
	TOTAL (10000+)	208826	271437	353361	456426	599574
	PROV. TOTAL	652069	774697	921441	1095469	1301761
SIIRT	SASON	5821	5463	7345	9698	12889
	SIRNAK	12141	13166	16384	20583	25986
	BAYHAN	6665	8329	12241	18109	27025
	KURTALAN	12352	14151	19586	26619	36172
	KOZLUK	17421	30899	36394	42353	59248
	MERKEZ	53884	54633	64973	78175	95005
	BATMAN	110036	172496	246649	349414	500489
	TOTAL (10000+)	205834	284884	395589	534389	755594
	PROV. TOTAL	524741	651698	810298	1007025	1250933
S.URFA	HILVAN	7907	11032	13179	15719	18818
	BOZOVA	9598	10459	12684	15654	18918
	CEYLANPINAR	25781	26616	30985	36124	41993
	BIRECIK	25998	32376	37298	41359	46045
	AKCAKALE	15542	18724	25223	34218	46671
	SURUC	25660	36932	46125	57980	72738
	SIVEREK	48333	64752	74844	87485	100765
	VIRANSEHIR	45329	76143	109656	161055	232227
	MERKEZ	194969	272197	360546	461260	587240
	TOTAL (10000+)	381612	537332	709393	909384	1163535
	PROV. TOTAL	795034	935286	1101540	1296741	1525825
REGION	TOTAL (10000+)	1984529	2800435	3703660	4839614	6392103
	TOTAL POPUL.	4303567	5209300	6315842	7657432	9284000

Table D.23 Population Projections (Places 10000+ in 2005)
(Alternative B)

PROVINCE	MUNICIPALITY	1985	1990	1995	2000	2005
ADIYAMAN	BESNI	17763	18928	21602	24647	28096
	KAHTA	25510	29522	37163	47506	49598
	GOLBASI	22153	28027	38593	53432	74249
	MERKEZ	71644	80345	102914	122408	148497
	TOTAL (10000+)	137070	156821	200273	247994	300440
	PROV. TOTAL	430728	489623	562664	646299	742022
DIYARBAKIR	HANI	9575	10589	13177	14101	16335
	CERMIK	12566	12728	12891	16824	22176
	CINAR	8049	13869	16519	19547	23562
	ERGANI	33209	38046	48602	60294	79100
	BISMIL	24862	40753	62287	93981	141116
	SILVAN	45825	83883	115346	158593	215262
	MERKEZ	305940	435827	551355	693109	878986
	TOTAL (10000+)	422402	635696	820177	1056449	1376536
	PROV. TOTAL	934505	1111423	1336306	1605942	1929090
GAZIANTEP	YAVUZELI	4606	5037	6473	8351	10692
	OGUZELI	9547	10075	11947	14177	16800
	NURDAGI	5672	7332	10481	14954	21384
	ARABAN	11176	16255	24732	37578	57122
	ISLAHIYE	29031	37942	46206	56233	68406
	KILIS	59876	80538	92653	106507	122460
	NIZIP	50067	67207	82418	101041	123776
	MERKEZ	478635	678385	861329	1102604	1411163
	TOTAL (10000+)	628785	890403	1129767	1433093	1831801
	PROV. TOTAL	966490	1141775	1363620	1627807	1942277
MARDIN	YESILLI	9798	10133	11397	12706	14256
	DERIK	13975	14409	16146	17458	18810
	MAZIDAGI	8269	10040	13297	17458	23265
	IDIL	8465	10226	13487	17846	23562
	SILOPI	13071	15803	20990	28127	37619
	MIDYAT	22169	24227	29557	36041	43930
	CIZRE	29496	32537	39795	48397	58409
	MERKEZ	44085	46451	48818	54314	60389
	KIZILTEPE	40852	58395	74575	94902	120786
	NUSAYBIN	45178	58101	83579	114447	163347
	TOTAL (10000+)	208826	280321	351639	441695	564372
	PROV. TOTAL	652069	746187	863239	998186	1153693
SIIRT	SASON	5821	6608	7395	9496	12276
	SIRNAK	12141	13628	16496	20155	24750
	BAYHAN	6665	8622	12324	17733	25740
	KURTALAN	12352	14648	19719	26066	34451
	KOZLUK	17421	31984	36641	41473	56429
	MERKEZ	53884	56551	65413	76551	90484
	BATMAN	110036	167984	233622	321902	448463
	TOTAL (10000+)	205834	300023	384215	503880	692592
	PROV. TOTAL	524741	627714	759116	917595	1108646
S.URFA	HILVAN	7907	10743	12483	14481	16862
	BOZOVA	9598	10827	12770	15329	18018
	CEYLANPINAR	25781	27550	31195	35374	39995
	BIRECIK	25998	31529	35328	38102	41259
	AKCAKALE	15542	19382	25394	33507	44450
	SURUC	25660	35966	43689	53415	65177
	SIVEREK	48333	63058	70892	80597	90290
	VIRANSEHIR	45329	74151	103864	148374	208086
	MERKEZ	194959	265077	341504	424942	526196
	TOTAL (10000+)	381612	527540	677119	844120	1050333
	PROV. TOTAL	795034	900866	1031962	1181584	1352272
REGION	TOTAL (10000+)	1984529	2790804	3563190	4527230	5816075
	TOTAL POPUL.	4303567	5017588	5916907	6977413	8228000

Table D.24 Population Projections (Places 10000+ in 2005)
(ALTERNATIVE C)

PROVINCE	MUNICIPALITY	1985	1990	1995	2000	2005
ADIYAMAN	BESNI	17763	18451	18563	20909	23531
	KAHTA	25510	28779	31934	40302	41541
	GOLBASI	22153	27322	33162	45329	62186
	MERKEZ	71644	78322	88433	103845	124373
	TOTAL (10000+)	137070	152873	172093	210384	251631
	PROV. TOTAL	430728	482969	547948	621379	704325
DIYARBAKIR	HANI	9575	10450	11462	12110	13849
	CINAR	8049	9617	11213	14448	18801
	CERMIK	12566	13686	14369	16786	19976
	ERGANI	33209	37544	42277	51779	67064
	BISMIL	24862	37918	51086	76098	112810
	SILVAN	45825	78048	94603	128416	172082
	MERKEZ	305940	405512	452205	561226	702670
	TOTAL (10000+)	417885	592776	677215	860864	1107253
	PROV. TOTAL	934505	1096320	1301356	1544019	1831085
GAZIANTEP	YAVUZELI	4606	4971	5631	7171	9065
	OGUZELI	9547	9942	10392	12175	14244
	NURDAGI	5672	7235	9117	12842	18130
	ARABAN	11176	16041	21513	32271	48430
	ISLAHIYE	29031	35303	37897	45533	54684
	KILIS	59876	74936	75991	86241	97896
	NIZIP	50067	62533	67597	81815	98947
	MERKEZ	478635	631198	706435	892803	1128096
	TOTAL (10000+)	628785	842159	934574	1170851	1469492
	PROV. TOTAL	966490	1126261	1327955	1565041	1843602
MARDIN	YESILLI	9798	9865	9914	10911	12087
	DERIK	13975	13990	14045	14992	15948
	MAZIDAGI	8269	9907	11566	14992	19725
	IDIL	8465	10091	11731	15326	19976
	SILOPI	13071	15595	18258	24155	31895
	MIDYAT	22169	23907	25710	30951	37245
	CIZRE	29496	32107	34616	41562	49521
	MERKEZ	44085	44845	45861	46643	51200
	KIZILTEPE	40852	54333	61164	76844	96557
	NUSAYBIN	45178	57334	72701	98284	138492
	TOTAL (10000+)	208826	271976	305567	374661	472646
	PROV. TOTAL	652069	736048	840661	959697	1095081
SIIRT	SASON	5821	6053	6351	8050	10281
	SIRNAK	12141	13282	14168	17087	20729
	BAYHAN	6665	8403	10585	15033	21558
	KURTALAN	12352	14275	16936	22097	28854
	KOZLUK	17421	31171	31471	35159	47262
	MERKEZ	53884	55114	56183	64896	75784
	BATMAN	110036	154365	189194	257304	354151
	TOTAL (10000+)	205834	282662	324888	419626	558620
	PROV. TOTAL	524741	619039	738915	881593	1051336
S.URFA	HILVAN	7907	9817	10238	11726	13480
	BOZOVA	9598	10493	11108	13164	15276
	BIRECIK	25998	27502	28975	30852	32982
	CEYLANPINAR	25781	26216	27135	30378	33910
	AKCAKALE	15542	18785	22089	28775	37687
	SURUC	25660	32867	35832	43251	52103
	SIVEREK	48333	55529	58143	65261	72179
	VIRANSEHIR	45329	67762	85186	120141	156346
	MERKEZ	194969	244437	280091	344085	420646
	TOTAL (10000+)	381612	493407	558799	687633	834609
	PROV. TOTAL	795034	888625	1004972	1136024	1283571
REGION	TOTAL (10000+)	1980012	2635854	2973134	3724020	4694251
	TOTAL POPUL.	4303567	4949262	5761807	6707753	7809000

Table D.25 Corridor Settlement Population Size Distribution

	1985				2005			
POPULATION SIZE	NO	%	POPUL.	%	NO	%	POPUL.	%
PLACES -201	110	12.9	14069	0.5	78	9.1	10120	0.2
PLACES 201-500	339	39.6	126615	4.8	277	32.4	96456	1.6
PLACES 501-2000	345	40.4	323586	12.4	421	49.2	411278	6.6
PLACES 2000+	61	7.1	2152691	82.3	79	9.2	5687231	91.7
TOTAL CORRIDOR	855	100	2616961	100	855	100	6205085	100

	1985	2005	Annual Growth Rate (%)
TOTAL CORRIDOR POPULATION	2616961	6205085	4.41
TOTAL REGION	4303567	7809000	3.02
PERCENT IN CORRIDOR (%)	60.81	79.46	

Table D.26 GAP Corridor Settlements Populations
Larger than 2000 in Year 2005

NO.	CORRIDOR	SETTLEMENT	1985 POPUL.	2005 POPUL.
1	13	Tepeustu	1507	2030
2	2	Doyran	1518	2045
3	6	Konacik	1529	2059
4	21	Tuzlagoze	1537	2070
5	2	Sariyaprak	1562	2104
6	17	Arikoy	1565	2108
7	1	Kocatepe	1601	2156
8	12	Ikikopru	1603	2159
9	7	Atli	1646	2217
10	3	Yolboyu	1677	2259
11	20	Sekerli	1699	2288
12	18	Ucagac	1703	2294
13	14	Ambar	1718	2314
14	14	Y.Salat	1761	2372
15	7	Yaban	1770	2384
16	19	Geldibuldu	1866	2513
17	18	Gokcebag	1915	2579
18	13	Girmeli	1917	2582
19	5	Burc	2181	2937
20	13	Duruca	2217	2986
21	15	Senkoy	2228	3001
22	21	Kiractepe	2328	3135
23	15	Gelinkaya	2466	3321
24	22	Samsat	2643	3560
25	20	Karakecili	2655	3576
26	15	Sogutlu	2675	3603
27	21	Yesilcevre	3038	4092
28	16	Hasankeyf	3073	4139
29	1	Sekili	3231	4352
30	2	Sambayat	3276	4412
31	15	Acirli	3357	4521
32	14	Tepe	3479	4686
33	1	Uluyati	3603	4853
34	15	Cavuslu	3677	4952
35	23	Kocakoy	3802	5121
36	18	ERUH	4260	5738
37	12	BESIRI	4571	6156
38	15	Kabala	4735	6377
39	16	GERCUS	5491	8159
40	17	DICLE	6097	9060
41	15	OMERLI	6221	9244
42	2	YAVUZELI	4606	10792
43	15	Yesilli	9798	14389
44	3	HILVAN	7907	16047
45	17	HANI	9575	16487
46	22	BOZOVA	9598	18186
47	8	CINAR	8049	22383
48	15	IDIL	8465	23781
49	17	CERMIK	12566	23781
50	18	SIRNAK	12141	24677
51	21	Baykan	6665	25664
52	2	BESNI	17763	28014
53	12	KURTALAN	12352	34351
54	13	SILOPI	13071	37970
55	1	BIRECIK	25998	39265
56	16	* MIDYAT	23155	51069
57	11	AKCAKALE	15542	44865
58	19	* KAHTA	28318	54662
59	21	KOZLUK	17421	56264
60	2	ARABAN	11176	57655
61	15	* CIZRE	33414	65374
62	7	* MARDIN	49767	70263
63	1	* SURUC	32310	72924
64	5	* ISLAHIYE	29353	65628
65	17	* ERGANI	33744	80716
66	20	* SIVEREK	49608	88180
67	18	* SIIRT	56267	94125
68	13	* KIZILTEPE	45499	122564
69	4	* KILIS	60229	117121
70	1	* NIZIP	52347	121531
71	14	* BISMIL	26838	137535
72	19	* ADIYAMAN	71772	148273
73	13	* NUSAYBIN	46579	167167
74	7	* VIRANSEHIR	48224	202775
75	6	* SILVAN	47359	207374
76	14	**BATMAN	121957	441143
77	7	**SANLIURFA	202105	510824
78	10	**DIYARBAKIR	323621	865484
79	1	**GAZIANTEP	486228	1355414
		TOTAL POPUL. 2000+	2152691	5687231
		TOTAL POPUL.	2182785	

Note 1 : Administrative centers are capitalized.
Note 2 : No villages within 5 km radius of Birecik.
(MAFRA 1/200000 Scale Village Road Map)
* Population includes villages within 5 km radius
** Population includes villages within 10 km radius

Table D.27

CORRIDOR A
(Gaziantep-Sanliurfa-Kiziltepe-Mardin)

Population		1985	2005
Places -500		24572	19280
Places 501-2000		47130	68119
Places +2000		949312	2462033
	Kocatepe		2156
	Atli		2217
	Yaban		2384
	Sekili	3231	4352
	Uluyati	3603	4853
	BIRECIK	25998	39265
*	MARDIN	49767	70263
*	SURUC	32310	62027
*	KIZILTEPE	45499	114949
*	NIZIP	52347	117795
**	VIRANSEHIR	48224	198031
**	SANLIURFA	202105	500769
**	GAZIANTEP	486228	1342972
TOTAL CORRIDOR POPULATION		1021014	2549432
TOTAL REGIONAL POPULATION		4303567	7809000
Percent in Corridor		23.72	32.65
No. of Places	-500	84	65
No. of Places	501-2000	59	75
No. of Places	+2000	10	13
Corridor Density (persons/km2)***			
Including admin. centers:		349	872
Excluding admin. centers:		26	35

Note 1: Administrative centers are capitalized.
Note 2: No villages within 5 km radius of Birecik.
(MAFRA 1/200000 Village Road Map)

* Villages within 5 km included.

** Villages within 10 km included.

*** 10 km corridor along main highway. Approx. area : 2922 km2.

Table D.28 CORRIDOR B
(Gaziantep-Sanliurfa-Diyarbakir)

Population	1985	2005
Places -500	17900	14530
Places 501-2000	34215	48916
Places +2000	1186958	3086289
Kocatepe		2156
Yolboyu		2259
Sekili	3231	4352
Uluyati	3603	4853
HILVAN	7907	16047
BIRECIK	25998	39265
* SURUC	32310	72924
* SIVEREK	49608	88180
* NIZIP	52347	121531
** DIYARBAKIR	323621	868484
** SANLIURFA	202105	510824
** GAZIANTEP	486228	1355414
TOTAL CORRIDOR POPULATION	1239073	3149735
TOTAL REGIONAL POPULATION	4303567	7809000
Percent in Corridor	28.79	40.33
No. of Places -500	64	51
No. of Places 501-2000	42	53
No. of Places +2000	10	12
Corridor Density (persons/km2)***		
Including admin. centers:	422	1074
Excluding admin. centers:	20	26

Note 1: Administrative centers are capitalized.
Note 2: No villages within 5 km radius of Birecik.
(MAPRA 1/200000 Village Road Map)
* Villages within 5 km included.
** Villages within 10 km included.
*** 10 km corridor along main highway. Approx. area : 2934 km2.

Table D.29 Corridor Populations and Densities

CORRIDOR	POPULATION 1985	DENSITY * (Persons/Km2)	DENSITY ** (Persons/Km2)
1	842390	752	39
2	625416	437	24
3	598788	333	9
4	549103	1248	6
5	526170	612	12
6	520459	400	21
7	381293	211	20
8	399640	425	19
9	378493	430	10
10	367955	669	19
11	227260	429	18
12	212400	303	25
13	177743	109	24
14	174981	227	34
15	169236	108	31
16	160912	214	14
17	143195	87	19
18	132320	97	19
19	118705	133	21
20	56392	83	10
21	45639	101	63
22	23735	31	19
23	14366	n.a.	28

Note: Some centers are included in more than one corridor, therefore corridor populations cannot be summed up.

* Includes administrative centers.
** Rural - Excludes administrative centers.

Table D.30 GAP Corridor Settlements with Populations Larger Than 10000 in 2005

NO.	CORRIDOR	Population Growth Code ***		SETTLEMENT	1985 POPUL.	2005 POPUL.	Percent Change	Last Update of Plan (Yr.)
1	7	B	*	MARDIN	49767	70263	141.18	1976
2	15	X		Yesilli	9798	14389	146.86	1977
3	1	C		BIRECIK	25998	39265	151.03	1985
4	2	C		BESNI	17763	28358	159.65	1982
5	18	B	*	SIIRT	56267	94125	167.28	1967
6	17	X		HANI	9575	16487	172.19	1963
7	20	C	*	SIVEREK	49608	88180	177.75	1970
8	17	B		CERMIK	12566	23781	189.25	1975
9	22	X		BOZOVA	9598	18186	189.48	1982
10	19	B	*	KAHTA	28318	54662	193.03	1981
11	4	D	*	KILIS	60229	117121	194.46	1967
12	15	C	*	CIZRE	33414	65374	195.65	1988
13	3	X		HILVAN	7907	16047	202.95	1986
14	18	B		SIRNAK	12141	24980	205.75	1983
15	19	B	*	ADIYAMAN	71772	148273	206.59	1988
16	16	D	*	MIDYAT	23155	51069	220.55	1986
17	5	B	*	ISLAHIYE	29353	65628	223.58	1967
18	1	C	*	SURUC	32310	72924	225.70	1982
19	1	B	*	NIZIP	52347	121531	232.16	1987
20	2	A		YAVUZELI	4606	10792	234.30	1980
21	17	B	*	ERGANI	33744	80716	239.20	1978
22	7	B	**	SANLIURFA	202105	510824	252.75	1988
23	10	A	**	DIYARBAKIR	323621	865484	267.44	1988
24	13	D	*	KIZILTEPE	45499	122564	269.38	1988
25	8	X		CINAR	8049	22383	278.08	1979
26	1	B	**	GAZIANTEP	486228	1355414	278.76	1976
27	15	X		IDIL	8465	23781	280.93	1985
28	12	D		KURTALAN	12352	34773	281.52	1985
29	11	D		AKCAKALE	15542	44865	288.67	1986
30	13	A		SILOPI	13071	37970	290.49	1972
31	21	A		KOZLUK	17421	56956	326.94	1985
32	13	B	*	NUSAYBIN	46579	167167	358.89	1958
33	14	E	**	BATMAN	121957	441143	361.72	1976
34	21	D		Baykan	6665	25980	389.80	1982
35	7	D	*	VIRANSEHIR	48224	202775	420.49	1980
36	6	D	*	SILVAN	47359	207374	437.88	1980
37	14	D	*	BISMIL	26838	137535	512.46	1986
38	2	D		ARABAN	11176	57655	515.88	1968
				TOTAL POPUL.	2071387	5536794	267.30	

Plan Update Information: PMU/SPO

Note : Administrative centers are capitalized.

* Population includes villages within 5 km. radius.

** Population includes villages within 10 km. radius.

*** A: Consistent Positive Growth (1965-85).
B: Consistent Positive Growth (1975-85)
C: Recent Upturn (1975-85)
D: Inconsistent Growth (1965-85)
E: Decreasing Growth (1965-85)
X: Population less than 10000 in 1985

Table D.31 Urban Land Take Estimates

	Municipality		1985 Actual Urban Popul.	Land Take Ha.	Density (Persons/Ha.)	2005 Estimated* Urban Popul.	Land Take Ha.	Incremental Land Requirement (Ha.) 1985 Densities	+10% Density	+20% Density
1	GAZIANTEP	Araban	11176	88.1	127	57655	454.5	366.4	325.1	290.6
2	DIYARBAKIR	Cermik	12566	42.9	293	23781	81.2	38.3	30.9	24.8
3	SANLIURFA	Akcakale	15542	181.3	86	44865	523.4	342.1	294.5	254.8
4	ADIYAMAN	Kahta	22510	191.1	118	50061	425.0	233.9	195.3	163.1
5	DIYARBAKIR	Bismil	24862	226.9	110	134297	1225.6	998.7	887.3	794.5
6	SANLIURFA	Suruc	25660	202.1	127	62027	488.5	286.4	242.0	205.0
7	SANLIURFA	Birecik	25998	66.2	393	39265	100.0	33.8	24.7	17.1
8	DIYARBAKIR	Ergani	33209	171.6	194	79838	412.5	240.9	203.4	172.2
9	MARDIN	Kiziltepe	40852	345.7	118	114949	972.7	627.0	538.6	464.9
10	MARDIN	Merkez	44085	302.4	146	60952	418.1	115.7	77.7	46.0
11	SANLIURFA	Viransehir	45329	176.4	257	198031	770.6	594.2	524.2	465.8
12	DIYARBAKIR	Silvan	45825	194.4	236	204860	869.1	674.7	595.7	529.8
13	SANLIURFA	Siverek	48333	518.4	93	85927	921.6	403.2	319.4	249.6
14	GAZIANTEP	Nizip	50067	189.9	264	117795	446.8	256.9	216.3	182.4
15	SIIRT	Merkez	53884	186.2	289	91329	315.6	129.4	100.7	76.8
16	ADIYAMAN	Merkez	71644	285.4	251	149883	597.1	311.7	257.4	212.2
17	SIIRT	Batman	110036	921.7	119	426792	3575.0	2653.3	2328.3	2057.4
18	SANLIURFA	Merkez	194969	839.1	232	500769	2155.2	1316.1	1120.2	956.9
19	DIYARBAKIR	Merkez	305940	817.2	374	836512	2234.4	1417.2	1214.1	1044.8
20	GAZIANTEP	Merkez	478635	1848.6	259	1342972	5186.9	3338.3	2866.7	2473.8
			1661122	7795.6	213	4622560	21693.5	14378.2	12362.4	10682.5

Note: Estimates of Urban Land Take are based on air photographs (1986) provided by PMU/SPO.
Estimated using 1985 densities.

Table D.32 Industrial Sites

Location	Completed (1986) #	No.of Estab.	No.of Employees	Area(Ha)	Under Constr.(1987) #	No.of Estab.	No.of Employees	Area(Ha)	Planned #	No.of Estab.	No.of Employees	Area(Ha)
ADIYAMAN												
S.I.E									1	350	2100	
DIYARBAKIR												
S.I.E	1	331	1986									
S.I.E					1	298	1788	3				
S.I.E									1	100	600	
S.I.E					1	108	648					
S.I.E									1	100	600	
GAZIANTEP												
O.I.E	1	208		221								
O.I.E									1		700	
Kusget												
S.I.E					1	88	528	35				
S.I.E	1	1146	6876	14								
S.I.E	1	1218		17	1	1235	7410					
S.I.E					1	100	600					
S.I.E									1	400	2400	
S.I.E									1	70	420	
S.I.E									1	300	1800	
MARDIN												
O.I.E					1			300				
S.I.E	1	190	1140									
S.I.E									1	100	600	
SIIRT												
S.I.E									1	373	2238	
S.I.E									1	250	1500	
S.URFA												
S.I.E	1	320										
S.I.E					1	500	3000	100				
S.I.E									1	100	600	
S.I.E									1	100	600	
TOTAL	6	3413	10002	252	7	2329	13974	438	12	2243	14158	

Table D.33 Municipal Infrastructure Program
(Places 10,000+ in 1985)

PROVINCES	MUNICIPALITY	1985									2005	Target Population	
					H.H. with Water Acc't. **			H.H. without Water Acc't.					
		POP.	Average H.H. Size *	Total No.of H.H.	%	No.	Persons	%	No.	Persons	POP.	Upgrading ***	New Construc
ADIYAMAN	BESNI	17763	5.8	3063	75	2297	13322	25	766	4441	28014	13322	14692
	GOLBASI	22153	5.8	3819	75	2865	16615	25	955	5538	74031	16615	57416
	KAHTA	25510	5.8	4398	75	3299	19133	25	1100	6378	49453	19133	30321
	MERKEZ	71644	5.8	12352	75	9264	53733	25	3088	17911	148063	53733	94330
DIYARBAKIR	CERMIK	12566	6.5	1933	41	793	5152	59	1141	7414	23781	5152	18629
	BISMIL	24862	6.5	3825	41	1568	10193	59	2257	14669	134297	10193	124104
	ERGANI	33209	6.5	5109	41	2095	13616	59	3014	19593	79838	13616	66222
	SILVAN	45825	6.5	7050	41	2891	18788	59	4160	27037	204860	18788	186072
	MERKEZ	305940	6.5	47068	41	19298	125435	59	27770	180505	836512	125435	711077
GAZIANTEP	ARABAN	11176	5.5	2032	77	1565	8606	23	467	2570	57655	8606	49049
	ISLAHIYE	29031	5.5	5278	77	4064	22354	23	1214	6677	65100	22354	42746
	NIZIP	50067	5.5	9103	77	7009	38552	23	2094	11515	117795	38552	79243
	KILIS	59876	5.5	10887	77	8383	46105	23	2504	13771	116543	46105	70438
	MERKEZ	478635	5.5	87025	77	67009	368549	23	20016	110086	1342972	368549	974423
MARDIN	SILOPI	13071	6.1	2143	54	1157	7058	46	986	6013	37970	7058	30912
	DERIK	13975	6.1	2291	54	1237	7547	46	1054	6429	18985	7547	11439
	MIDYAD	22169	6.1	3634	54	1963	11971	46	1672	10198	44339	11971	32368
	CIZRE	29496	6.1	4835	54	2611	15928	46	2224	13568	58954	15928	43026
	KIZILTEPE	40852	6.1	6697	54	3616	22060	46	3081	18792	114949	22060	92889
	MERKEZ	44085	6.1	7227	54	3903	23806	46	3324	20279	60952	23806	37146
	NUSAYBIN	45178	6.1	7406	54	3999	24396	46	3407	20782	164871	24396	140475
SIIRT	SIRNAK	12141	7.5	1619	84	1360	10198	16	259	1943	24677	10198	14479
	KURTALAN	12352	7.5	1647	84	1383	10376	16	264	1976	34351	10376	23975
	KOZLUK	17421	7.5	2323	84	1951	14634	16	372	2787	56264	14634	41630
	MERKEZ	53884	7.5	7185	84	6035	45263	16	1150	8621	90220	45263	44957
	BATMAN	110036	7.5	14671	84	12324	92430	16	2347	17606	421609	92430	329179
SANLIURFA	AKCAKALE	15542	6.3	2467	66	1628	10258	34	839	5284	44865	10258	34607
	SURUC	25660	6.3	4073	66	2688	16936	34	1385	8724	62027	16936	45091
	CEYLANPINAR	25781	6.3	4092	66	2701	17015	34	1391	8766	40368	17015	23353
	BIRECIK	25998	6.3	4127	66	2724	17159	34	1403	8839	39265	17159	22106
	VIRANSEHIR	45329	6.3	7195	66	4749	29917	34	2446	15412	198031	29917	168114
	SIVEREK	48333	6.3	7672	66	5063	31900	34	2608	16433	85927	31900	54027
	MERKEZ	194969	6.3	30947	66	20425	128680	34	10522	66289	500769	128680	372089
REGIONAL TOTAL:		1984529	6.1	325194	66	213916	1297682	34	111278	686847	5378307	1297682	4080625

* Estimates based on Center H.H. sizes.
** Account ratios same as in Centers
*** To bring up to standards those deficient in 1985.

Source : Gas and Water Statistics, SIS, 1988.
Population Census, SIS, 1985.

Table D.34 Household Water Balance (1985)

Households with Accounts in 1985

PROVINCES	MUNICIPALITY	Water supplied			Water used	Balance *	
		m3/year	Gross l/person/day	Percent Loss	Net l/person/day	l/person/day	Total m3/day
ADIYAMAN	BESNI	627443	129.0	35	83.9	16.1	214.9
	GOLBASI	803961	132.6	35	86.2	13.8	229.8
	KAHTA	941924	134.9	40	80.9	19.1	364.9
	MERKEZ	3001909	153.1	40	91.8	78.2	4200.0
DIYARBAKIR	CERMIK	425451	226.2	60	90.5	9.5	49.0
	BISMIL	915110	246.0	60	98.4	1.6	16.5
	ERGANI	1266446	254.8	55	114.7	5.3	72.5
	SILVAN	1817844	265.1	55	119.3	0.7	13.4
	MERKEZ	15312611	334.5	45	183.9	66.1	8285.1
GAZIANTEP	ARABAN	372997	118.8	25	89.1	10.9	94.1
	ISLAHIYE	1089038	133.5	30	93.4	6.6	146.8
	NIZIP	2007768	142.7	40	85.6	84.4	3253.3
	KILIS	2454307	145.8	40	87.5	82.5	3803.3
	MERKEZ	25305596	188.1	45	103.5	146.5	54005.5
MARDIN	SILOPI	444689	172.6	45	94.9	5.1	35.8
	DERIK	479353	174.0	45	95.7	4.3	32.3
	MIDYAD	804613	184.1	50	92.1	7.9	94.9
	CIZRE	1108636	190.7	50	95.3	4.7	74.1
	KIZILTEPE	1597934	198.5	40	119.1	0.9	20.5
	MERKEZ	1740550	200.3	45	110.2	9.8	234.0
	NUSAYBIN	1789061	200.9	45	110.5	9.5	231.7
SIIRT	SIRNAK	409334	110.0	30	77.0	23.0	234.8
	KURTALAN	417327	110.2	25	82.6	17.4	180.0
	KOZLUK	613900	114.9	30	80.5	19.5	286.0
	MERKEZ	2180363	132.0	30	92.4	77.6	3513.1
	BATMAN	4859264	144.0	25	108.0	92.0	8501.3
SANLIURFA	AKCAKALE	540085	144.3	35	93.8	6.2	64.0
	SURUC	948143	153.4	35	99.7	0.3	5.1
	CEYLANPINAR	953163	153.5	35	99.8	0.2	4.1
	BIRECIK	962173	153.6	40	92.2	7.8	134.2
	VIRANSEHIR	1795774	164.5	40	98.7	21.3	638.1
	SIVEREK	1929885	165.7	30	116.0	4.0	126.8
	MERKEZ	9234840	196.6	50	98.3	101.7	13085.4
REGIONAL TOTAL:		89151492	123.1	42	109.4	78.8	102245.2

* Volume expansion need of existing system. Estimates based on Iller Bank Volume Standards

Population:	Volume: (l/person/day)
10,000 - 30,000	100
30,000 - 50,000	120
50,000 - 100,000	170
100,000 - 200,000	200
200,000 +	250

Table D.35 Municipal Infrastructure Needs
(For population needs of 2005)

PROVINCES	MUNICIPALITY	Drinking Water — Volume Need * (Upgrading of 1985 deficiency) (m3/day)	l/s	Drinking Water — Volume Need * (New volume need) (m3/day)	l/s	Sewerage — Volume Need ** (Upgrading of 1985 deficiency) (m3/day)	l/s	Sewerage — Volume Need ** (New volume need) (m3/day)	l/s	Treatment — Volume Need *** (m3/day)	l/s
ADIYAMAN	BESNI	214.9	2.5	1469.2	17.0	1976.8	22.9	2938.4	34.0	4915.2	56.9
	GOLBASI	229.8	2.7	9760.8	113.0	2350.8	27.2	19521.5	225.9	21872.3	253.2
	KAHTA	364.9	4.2	3638.5	42.1	3007.9	34.8	7276.9	84.2	10284.8	119.0
	MERKEZ	4200.0	48.6	18866.0	218.4	21734.5	251.6	37732.0	436.7	59466.5	688.3
DIYARBAKIR	CERMIK	49.0	0.6	1862.9	21.6	662.1	7.7	3725.8	43.1	4387.9	50.8
	BISMIL	16.5	0.2	24820.7	287.3	1068.8	12.4	49641.4	574.6	50710.2	586.9
	ERGANI	72.5	0.8	11257.8	130.3	1851.4	21.4	22515.6	260.6	24367.0	282.0
	SILVAN	13.4	0.2	46517.9	538.4	2294.8	26.6	93035.9	1076.8	95330.7	1103.4
	MERKEZ	8285.1	95.9	177769.2	2057.5	56214.0	650.6	355538.3	4115.0	411752.3	4765.7
GAZIANTEP	ARABAN	94.1	1.1	8338.4	96.5	1142.9	13.2	16676.8	193.0	17819.7	206.2
	ISLAHIYE	146.8	1.7	7266.8	84.1	2675.8	31.0	14533.7	168.2	17209.5	199.2
	NIZIP	3253.3	37.7	15848.7	183.4	16313.8	188.8	31697.4	366.9	48011.1	555.7
	KILIS	3803.3	44.0	14087.7	163.1	19247.6	222.8	28175.4	326.1	47423.0	548.9
	MERKEZ	54005.5	625.1	243605.8	2819.5	254153.8	2941.6	487211.5	5639.0	741365.3	8580.6
MARDIN	SILOPI	35.8	0.4	3709.4	42.9	813.1	9.4	7418.8	85.9	8231.9	95.3
	DERIK	32.3	0.4	1143.9	13.2	851.7	9.9	2287.7	26.5	3139.4	36.3
	MIDYAD	94.9	1.1	3884.1	45.0	1481.9	17.2	7768.3	89.9	9250.1	107.1
	CIZRE	74.1	0.9	7314.4	84.7	1815.1	21.0	14628.9	169.3	16444.0	190.3
	KIZILTEPE	20.5	0.2	18577.8	215.0	2708.6	31.3	37155.6	430.0	39864.2	461.4
	MERKEZ	234.0	2.7	6314.8	73.1	3558.6	41.2	12629.7	146.2	16188.3	187.4
	NUSAYBIN	231.7	2.7	28095.0	325.2	3622.6	41.9	56190.0	650.3	59812.6	692.3
SIIRT	SIRNAK	234.8	2.7	1447.9	16.8	1724.3	20.0	2895.7	33.5	4620.0	53.5
	KURTALAN	180.0	2.1	2877.0	33.3	1577.7	18.3	5754.1	66.6	7331.8	84.9
	KOZLUK	286.0	3.3	7077.2	81.9	2321.4	26.9	14154.3	163.8	16475.8	190.7
	MERKEZ	3513.1	40.7	7642.8	88.5	18234.0	211.0	15285.5	176.9	33519.5	388.0
	BATMAN	8501.3	98.4	82294.7	952.5	43989.8	509.1	164589.4	1905.0	208579.2	2414.1
SANLIURFA	AKCAKALE	64.0	0.7	4152.9	48.1	1217.7	14.1	8305.7	96.1	9523.4	110.2
	SURUC	5.1	0.1	7665.5	88.7	1708.8	19.8	15331.1	177.4	17039.9	197.2
	CEYLANPINAR	4.1	0.0	2802.3	32.4	1713.9	19.8	5604.6	64.9	7318.6	84.7
	BIRECIK	134.2	1.6	2652.8	30.7	2118.5	24.5	5305.5	61.4	7424.0	85.9
	VIRANSEHIR	638.1	7.4	33622.8	389.2	5504.4	63.7	67245.5	778.3	72749.9	842.0
	SIVEREK	126.8	1.5	9184.6	106.3	4208.4	48.7	18369.3	212.6	22577.7	261.3
	MERKEZ	13085.4	151.5	93022.4	1076.6	64992.2	752.2	186044.7	2153.3	251037.0	2905.5
REGIONAL TOTAL:		102245.2	1183.4	908592.5	10516.1	548857.9	6352.5	1817184.9	21032.2	2366042.8	27384.8

* To attain volumes/person as indicated by Iller Bank.
** Estimated as twice the water volume use.
*** The efficiency of existing sewerage systems is assumed to be 50% of necessary volumes.

PROVINCES	MUNICIPALITY	Popul. 1985	PROJECT TARGET					Length (km)		Year project prepared and cost estimates			
			Year	Popul.	m3/day	l/s	l/person/day	Mains	Distr.	Total	Year	TL, curr. (mill.)	TL, 1988 (mill.)	TL, mill. per l/s (1988 TL)
ADIYAMAN	Besni	17763	2004	17068	2160	25	127	3.3	18.0	21.3	1975	2.0	264.2	10.6 **
	Golbasi	22153	2011	51000	8813	102	173	3.5	75.0	78.5	1983	2,000.0	13,840.0	135.7
	Kahta	25510	2023	94000	16848	195	179	9.8	74.5	84.3	1987	3,500.0	5,775.0	29.6
	Merkez	71644	2014	176000	34906	404	198		153.0	153.0	1987	6,000.0	9,900.0	24.5
DIYARBAKIR	Cermik	12566	2012	27531	3456	40	126	5.8	20.0	25.8	1985	1,400.0	4,690.0	117.3
	Bismil	24862	2014	55889	8640	100	155	4.0	38.0	42.0	1985	1,500.0	5,025.0	50.3
	Ergani	33209	2020	15700	23328	270	1486	11.5	18.0	29.5	1978	130.0	7,520.5	27.9
	Silvan	45825	2012	109639	22464	260	205	1.2	29.0	30.2	1981	950.0	10,934.5	42.1
	Merkez	305940	2004	458000	75168	870	164	30.0	150.0	180.0	1976	900.0	100,206.0	115.2 *
GAZIANTEP	Araban	11176	2007	13820	1296	15	94	2.5	22.0	24.5	1985	360.0	1,206.0	80.4
	Islahiye	29031	2015	83750	15552	180	186	7.0	50.0	57.0	1985	1,280.0	4,288.0	23.8
	Nizip	50067	2020	145000	31104	360	215	10.0	35.0	45.0	1985	1,700.0	5,695.0	15.8
	Kilis	59876	2014	115000	21600	250	188	12.0	18.0	30.0	1987	12,500.0	20,625.0	82.5
	Merkez	478635	2022	2500000	614909	7117	246		100.0	100.0	1988	10,000.0	10,000.0	1.4
MARDIN	Silopi	13071	2021	43135	12269	142	284	13.0	34.0	47.0	1983	600.0	4,152.0	29.2
	Derik	13975	2007	34158	3715	43	109	3.0	20.0	23.0	1980	150.0	2,469.0	57.4
	Midyat	22169	2010	43568	10800	125	248	20.0	40.0	60.0	1983	8,000.0	55,360.0	442.9
	Cizre	29496	2008	42561	5011	58	118	2.0	25.0	27.0	1983	450.0	3,114.0	53.7
	Kiziltepe	40852	2010	47568	14688	170	309	6.5	140.0	146.5	1977	300.0	25,281.0	148.7
	Merkez	44085	2015	80575	20218	234	251	14.0	40.0	54.0	1987	35,000.0	57,750.0	246.8
	Nusaybin	45178	2015	123000	25574	296	208	17.5	76.0	93.5	1988	4,000.0	4,000.0	13.5
SIIRT	Sirnak	12141	2013	43431	5098	59	117	11.5	20.0	31.5	1981	625.0	7,193.8	121.9 **
	Kurtalan	12352	2005	17000	1555	18	91	1.3	15.0	16.3	1988	900.0	900.0	50.0
	Kozluk	17421	2006	15483	1555	18	100	4.2	14.0	18.2	1977	80.0	6,741.6	374.5 **
	Merkez	53884	2019	134000	28944	335	216	40.0	180.0	220.0	1984	25,000.0	118,250.0	353.0
	Batman	110036	2000	100000	38448	445	384	7.0	200.0	207.0	1988	2,500.0	2,500.0	5.6
SANLIURFA	Akcakale	15542	2021	64188	11232	130	175	1.5	62.0	63.5	1987	1,500.0	2,475.0	19.0
	Suruc	25660	2006	121500	21600	250	178	0.5	70.0	70.5	1977	10.0	842.7	3.4 **
	Ceylanpinar	25781	1998	33298	3629	42	109	1.0	30.0	31.0	1968	11.0	2,200.0	52.4 **
	Birecik	25998	2022	175707	13910	161	79	6.3	50.0	56.3	1983	1,200.0	8,304.0	51.6
	Viransehir	45329	2020	354674	80266	929	226	22.0	16.0	38.0	1988	3,000.0	3,000.0	3.2
	Siverek	48333	2003	92977	15638	181	168	28.5	80.0	108.5	1979	1,200.0	42,168.0	233.0
	Merkez	194969	2001	250586	51408	595	205	4.5	94.0	98.5	1972	9.0	1,125.0	1.9
REGIONAL TOTAL		1984529		5679806	1245802	14419		305	2007	2311		126,757.0	547,795.3	38.0

Source : Iller Bank

* In DSI program.

** Construction completed.

Table D.37 Drinking Water Investment Plan
(For servicing population needs of 2005)

PROVINCES	MUNICIPALITY	Drinking Water — Volume Need (Upgrading of 1985 deficiency) (m3/day)	l/s	(New volume need) (m3/day)	l/s	Cost Estimates (1988) UPGRADING (TL, mill.)	NEW CONSTRUCTION (TL, mill.)	TOTAL (TL, mill.)	
ADIYAMAN	BESNI	214.9	2.5	1469.2	17.0	26.3	179.7	206.0	*
	GOLBASI	229.8	2.7	9760.8	113.0	360.8	15,328.7	15,689.6	
	KAHTA	364.9	4.2	3638.5	42.1	125.1	1,247.2	1,372.2	
	MERKEZ	4200.0	48.6	18866.0	218.4	1,191.2	5,350.8	6,542.0	
DIYARBAKIR	CERMIK	49.0	0.6	1862.9	21.6	66.4	2,528.1	2,594.5	
	BISMIL	16.5	0.2	24820.7	287.3	9.6	14,435.7	14,445.2	
	ERGANI	72.5	0.8	11257.8	130.3	23.4	3,629.3	3,652.7	
	SILVAN	13.4	0.2	46517.9	538.4	6.5	22,642.9	22,649.4	
	MERKEZ	8285.1	95.9	177769.2	2057.5	11,044.8	236,983.0	248,027.7	
GAZIANTEP	ARABAN	94.1	1.1	8338.4	96.5	87.6	7,759.4	7,846.9	
	ISLAHIYE	146.8	1.7	7266.8	84.1	40.5	2,003.6	2,044.1	
	NIZIP	3253.3	37.7	15848.7	183.4	595.7	2,901.8	3,497.5	
	KILIS	3803.3	44.0	14087.7	163.1	3,631.6	13,451.8	17,083.4	
	MERKEZ	54005.5	625.1	243605.8	2819.5	23,752.4	107,141.4	130,893.9	**
MARDIN	SILOPI	35.8	0.4	3709.4	42.9	12.1	1,255.3	1,267.4	
	DERIK	32.3	0.4	1143.9	13.2	21.5	760.2	781.7	
	MIDYAD	94.9	1.1	3884.1	45.0	486.5	19,909.8	20,396.3	
	CIZRE	74.1	0.9	7314.4	84.7	46.0	4,545.3	4,591.3	
	KIZILTEPE	20.5	0.2	18577.8	215.0	35.2	31,976.1	32,011.3	
	MERKEZ	234.0	2.7	6314.8	73.1	668.3	18,037.8	18,706.1	
	NUSAYBIN	231.7	2.7	28095.0	325.2	36.2	4,394.2	4,430.5	
SIIRT	SIRNAK	234.8	2.7	1447.9	16.8	331.4	2,043.2	2,374.6	*
	KURTALAN	180.0	2.1	2877.0	33.3	104.2	1,665.0	1,769.1	
	KOZLUK	286.0	3.3	7077.2	81.9	1,239.9	30,678.6	31,918.5	*
	MERKEZ	3513.1	40.7	7642.8	88.5	14,352.8	31,224.3	45,577.1	
	BATMAN	8501.3	98.4	82294.7	952.5	552.8	5,351.0	5,903.8	
SANLIURFA	AKCAKALE	64.0	0.7	4152.9	48.1	14.1	915.1	929.2	
	SURUC	5.1	0.1	7665.5	88.7	0.2	299.1	299.3	*
	CEYLANPINAR	4.1	0.0	2802.3	32.4	2.5	1,698.9	1,701.4	*
	BIRECIK	134.2	1.6	2652.8	30.7	80.1	1,583.6	1,663.7	
	VIRANSEHIR	638.1	7.4	33622.8	389.2	23.8	1,256.7	1,280.5	
	SIVEREK	126.8	1.5	9184.6	106.3	342.0	24,765.8	25,107.8	
	MERKEZ	13085.4	151.5	93022.4	1076.6	5,755.2	40,912.6	46,667.8	**
REGIONAL TOTAL:		102245.2	1183.4	908592.5	10516.1	63,466.4	623,956.4	687,422.8	

* Construction completed. Costs are excluded from totals.
** Estimated using average l/s costs of TL mill. 38.0/l/s.

PROVINCE	MUNICIPALITY	POPULATION 1985	PROJECT TARGET Year	POPUL.	m3/day	l/s	l/person/day	Length (km)	Year project prepared and cost estimate Year	TL, curr. (mill.)	TL, 1988 (mill.)	TL mill. per l/s (1988 TL)
ADIYAMAN	BESNI	17763	2015	40000	8813	102	220	61	1985	390.0	1,306.5	12.8
	GOLBASI	22153	2015	60000	15638	181	261	72	1986	725.0	1,718.3	9.5
	KAHTA	25510	2021	90000	30758	356	342	93	1986	2,250.0	5,332.5	15.0
	MERKEZ	71644										
DIYARBAKIR	CERMIK	12566	2008	28500	5789	67	203	28	1980	10.0	164.6	2.5
	BISMIL	24862	2003	41587	14170	164	341					
	ERGANI	33209										
	SILVAN	45825	2003	95007	47002	544	495	73	1984	1,636.9	7,742.7	14.2
	MERKEZ	305940	2015	1069321	217987	2523	204		1984	1,800.0	8,514.0	3.4
GAZIANTEP	ARABAN	11176										
	ISLAHIYE	29031	2011	56474	14342	166	254	69	1981	200.0	2,302.0	13.9
	NIZIP	50067	2026	147000	69638	806	474	211	1985	2,300.0	7,705.0	9.6
	KILIS	59876	2023	150000	60048	695	400	230	1987	3,900.0	6,435.0	9.3
	MERKEZ	478635	2022	2500000	1335398	15456	534	1238	1985	24,000.0	80,400.0	5.2
MARDIN	SILOPI	13071	2024	104000	45101	522	434	85	1988	2,085.0	2,085.0	4.0
	DERIK	13975	2008	35183	7430	86	211	23	1981	59.0	679.1	7.9
	MIDYAT	22169	2011	50282	12096	140	241	66	1981	200.0	2,302.0	16.4
	CIZRE	29496										
	KIZILTEPE *	40852							1982	56.1	168.2	
	MERKEZ	44085	2015	99600	51926	601	521	96	1986	3,380.0	8,010.6	13.3
	NUSAYBIN	45178										
SIIRT	SIRNAK	12141	2022	54000	12528	145	232	36	1987	1,812.0	2,989.7	20.6
	KURTALAN	12352										
	KOZLUK	17421										
	MERKEZ	53884	2007	91781	27389	317	298		1976	40.9	4,552.9	14.4
	BATMAN	110036							1975	104.1	13,752.7	
SANLIURFA	AKCAKALE	15542	2022	85000	29376	340	346	99	1987	1,600.0	2,640.0	7.8
	SURUC	25660	2009	55717	14083	163	253	101	1978	100.7	5,825.1	35.7
	CEYLANPINAR	25781	2021	101700	34733	402	342	57	1986	936.5	2,219.4	5.5
	BIRECIK	25998	2021	85000	29635	343	349	51	1987	1,700.0	2,805.0	8.2
	VIRANSEHIR	45329	2013	108268	38016	440	351	145	1984	600.0	2,838.0	6.5
	SIVEREK	48333	2011	118789	41731	483	351	98	1981	650.0	7,481.5	15.5
	MERKEZ	194969	2013	800000	343354	3974	429	283	1982	1,400.0	12,642.0	3.2
REGIONAL TOTAL		1984529		6067209	2506982	29016		3212		51,936.1	192,611.7	6.6

Source : Iller Bank

* Construction completed in 1982.

Note : No data provided for items left blank.

Table D.39 Sewerage Investment Plan
(For servicing population needs of 2005)

PROVINCES	MUNICIPALITY	Sewerage Volume Need (Upgrading of 1985 deficiency) (m3/day)	l/s	(New volume need) (m3/day)	l/s	Cost Estimates (1988) UPGRADING (TL, mill.)	NEW CONSTRUCTION (TL, mill.)	TOTAL (TL, mill.)	
ADIYAMAN	BESNI	1976.8	22.9	2938.4	34.0	293.1	435.6	728.7	
	GOLBASI	2350.8	27.2	19521.5	225.9	258.3	2,144.9	2,403.2	
	KAHTA	3007.9	34.8	7276.9	84.2	521.5	1,261.6	1,783.1	
	MERKEZ	21734.5	251.6	37732.0	436.7	1,660.3	2,882.3	4,542.6	**
DIYARBAKIR	CERMIK	662.1	7.7	3725.8	43.1	18.8	105.9	124.8	
	BISMIL	1068.8	12.4	49641.4	574.6	81.6	3,792.1	3,873.7	**
	ERGANI	1851.4	21.4	22515.6	260.6	141.4	1,719.9	1,861.4	**
	SILVAN	2294.8	26.6	93035.9	1076.8	378.0	15,326.0	15,704.0	
	MERKEZ	56214.0	650.6	355538.3	4115.0	2,195.6	13,886.4	16,081.9	
GAZIANTEP	ARABAN	1142.9	13.2	16676.8	193.0	87.3	1,273.9	1,361.2	**
	ISLAHIYE	2675.8	31.0	14533.7	168.2	429.5	2,332.7	2,762.2	
	NIZIP	16313.8	188.8	31697.4	366.9	1,805.0	3,507.1	5,312.1	
	KILIS	19247.6	222.8	28175.4	326.1	2,062.7	3,019.4	5,082.1	
	MERKEZ	254153.8	2941.6	487211.5	5639.0	15,301.8	29,333.4	44,635.2	
MARDIN	SILOPI	813.1	9.4	7418.8	85.9	37.6	343.0	380.6	
	DERIK	851.7	9.9	2287.7	26.5	77.8	209.1	286.9	
	MIDYAD	1481.9	17.2	7768.3	89.9	282.0	1,478.4	1,760.4	
	CIZRE	1815.1	21.0	14628.9	169.3	138.7	1,117.5	1,256.1	**
	KIZILTEPE	2708.6	31.3	37155.6	430.0	206.9	2,838.3	3,045.2	* **
	MERKEZ	3558.6	41.2	12629.7	146.2	549.0	1,948.4	2,497.3	
	NUSAYBIN	3622.6	41.9	56190.0	650.3	276.7	4,292.3	4,569.0	**
SIIRT	SIRNAK	1724.3	20.0	2895.7	33.5	411.5	691.0	1,102.5	
	KURTALAN	1577.7	18.3	5754.1	66.6	120.5	439.5	560.1	**
	KOZLUK	2321.4	26.9	14154.3	163.8	177.3	1,081.2	1,258.6	**
	MERKEZ	18234.0	211.0	15285.5	176.9	3,031.1	2,541.0	5,572.0	
	BATMAN	43989.8	509.1	164589.4	1905.0	3,360.3	12,572.8	15,933.1	**
SANLIURFA	AKCAKALE	1217.7	14.1	8305.7	96.1	109.4	746.4	855.9	
	SURUC	1708.8	19.8	15331.1	177.4	706.8	6,341.3	7,048.1	
	CEYLANPINAR	1713.9	19.8	5604.6	64.9	109.5	358.1	467.7	
	BIRECIK	2118.5	24.5	5305.5	61.4	200.5	502.2	702.7	
	VIRANSEHIR	5504.4	63.7	67245.5	778.3	410.9	5,020.1	5,431.0	
	SIVEREK	4208.4	48.7	18369.3	212.6	754.5	3,293.2	4,047.7	
	MERKEZ	64992.2	752.2	186044.7	2153.3	2,393.0	6,850.0	9,243.0	
REGIONAL TOTAL:		548857.9	6352.5	1817184.9	21032.2	38,382.0	130,846.6	169,228.7	

* Construction completed. Costs are excluded from totals.
** Estimated using average l/s costs of TL mill. 6.6/l/s.

Table D.40 Sewerage Treatment Investment Plan
(For servicing population needs of 2005)

PROVINCES	MUNICIPALITY	Treatment Volume Need (m3/day)	Treatment Volume Need l/s	Cost Estimates (1988) TRICKLING FILTER (TL, mill.)	ACTIVATED SLUDGE (TL, mill.)	AERATION LAGOON (TL, mill.)
ADIYAMAN	BESNI	4915.2	56.9	461.4	856.4	264.8
	GOLBASI	21872.3	253.2	1,353.1	2,351.3	593.5
	KAHTA	10284.8	119.0	785.5	1,411.3	394.7
	MERKEZ	59466.5	688.3	2,781.8	4,625.6	1,019.2
DIYARBAKIR	CERMIK	4387.9	50.8	425.2	793.2	249.0
	BISMIL	50710.2	586.9	2,480.2	4,153.1	935.1
	ERGANI	24367.0	282.0	1,462.6	2,529.6	629.2
	SILVAN	95330.7	1103.4	3,908.6	6,365.4	1,315.4
	MERKEZ	411752.3	4765.7	11,217.6	17,126.8	2,901.2
GAZIANTEP	ARABAN	17819.7	206.2	1,167.3	2,047.0	531.3
	ISLAHIYE	17209.5	199.2	1,138.4	1,999.3	521.4
	NIZIP	48011.1	555.7	2,384.3	4,002.2	907.9
	KILIS	47423.0	548.9	2,363.2	3,969.0	901.8
	MERKEZ	741365.3	8580.6	17,137.1	25,494.8	3,987.0
MARDIN	SILOPI	8231.9	95.3	669.1	1,214.0	349.9
	DERIK	3139.4	36.3	334.0	632.4	207.8
	MIDYAD	9250.1	107.1	727.8	1,313.6	372.7
	CIZRE	16444.0	190.3	1,101.6	1,938.7	508.7
	KIZILTEPE	39864.2	461.4	2,085.3	3,529.1	821.0
	MERKEZ	16188.3	187.4	1,089.3	1,918.2	504.4
	NUSAYBIN	59812.6	692.3	2,793.5	4,643.8	1,022.4
SIIRT	SIRNAK	4620.0	53.5	441.3	821.3	256.1
	KURTALAN	7331.8	84.9	615.5	1,122.5	328.7
	KOZLUK	16475.8	190.7	1,103.2	1,941.2	509.2
	MERKEZ	33519.5	388.0	1,840.4	3,138.6	747.6
	BATMAN	208579.2	2414.1	6,871.6	10,810.9	2,008.6
SANLIURFA	AKCAKALE	9523.4	110.2	743.2	1,339.8	378.6
	SURUC	17039.9	197.2	1,130.3	1,985.9	518.6
	CEYLANPINAR	7318.6	84.7	614.7	1,121.1	328.4
	BIRECIK	7424.0	85.9	621.1	1,132.0	330.9
	VIRANSEHIR	72749.9	842.0	3,216.8	5,301.6	1,136.6
	SIVEREK	22577.7	261.3	1,384.4	2,402.4	603.8
	MERKEZ	251037.0	2905.5	7,853.1	12,254.6	2,220.2
REGIONAL TOTAL:		2366042.8	27384.8	84,302.5	136,286.8	28,305.8

Note: Estimated using cost curves in "Wastewater Treatment Plants, Syed R. Qasim, 1985".

Table D.41 Municipal Infrastructure Investments and Project Prioritization
(For servicing population needs of 2005)

PROVINCES	MUNICIPALITY	Investment Costs (TL mill., 1988) Sewerage Treatment	Drinking Water	Sewerage	Total	Population Growth Popul. 1985	Popul. 2005	Growth Index	Project Priorities and Cost ** Priority 1	Priority 2	Priority 3
ADIYAMAN	BESNI	264.8	206.0 *	728.7	993.5	17763	28014	1.6			3
	GOLBASI	593.5	15,689.6	2,403.2	18,686.2	22153	74031	3.3		2	
	KAHTA	394.7	1,372.2	1,783.1	3,550.0	25510	49453	1.9			3
	MERKEZ	1,019.2	6,542.0	4,542.6	12,103.8	71644	148063	2.1		2	
DIYARBAKIR	CERMIK	249.0	2,594.5	124.8	2,968.3	12566	23781	1.9			3
	BISMIL	935.1	14,445.2	3,873.7	19,254.0	24862	134297	5.4		2	
	ERGANI	629.2	3,652.7	1,861.4	6,143.2	33209	79838	2.4		2	
	SILVAN	1,315.4	22,649.4	15,704.0	39,668.9	45825	204860	4.5		2	
	MERKEZ	2,901.2	248,027.7	16,081.9	267,010.9	305940	836512	2.7	1		
GAZIANTEP	ARABAN	531.3	7,846.9	1,361.2	9,739.4	11176	57655	5.2		2	
	ISLAHIYE	521.4	2,044.1	2,762.2	5,327.6	29031	65100	2.2		2	
	NIZIP	907.9	3,497.5	5,312.1	9,717.4	50067	117795	2.4	1		
	KILIS	901.8	17,083.4	5,082.1	23,067.3	59876	116543	1.9			3
	MERKEZ	3,987.0	130,893.9	44,635.2	179,516.1	478635	1342972	2.8	1		
MARDIN	SILOPI	349.9	1,267.4	380.6	1,997.9	13071	37970	2.9		2	
	DERIK	207.8	781.7	286.9	1,276.4	13975	18985	1.4			3
	MIDYAD	372.7	20,396.3	1,760.4	22,529.4	22169	44339	2.0		2	
	CIZRE	508.7	4,591.3	1,256.1	6,356.1	29496	58954	2.0		2	
	KIZILTEPE	821.0	32,011.3	3,045.2 *	32,832.4	40852	114949	2.8		2	
	MERKEZ	504.4	18,706.1	2,497.3	21,707.9	44085	60952	1.4			3
	NUSAYBIN	1,022.4	4,430.5	4,569.0	10,021.9	45178	164871	3.6		2	
SIIRT	SIRNAK	256.1	2,374.6 *	1,102.5	1,358.6	12141	24677	2.0		2	
	KURTALAN	328.7	1,769.1	560.1	2,657.9	12352	34351	2.8		2	
	KOZLUK	509.2	31,918.5 *	1,258.6	1,767.8	17421	56264	3.2		2	
	MERKEZ	747.6	45,577.1	5,572.0	51,896.7	53884	90220	1.7			3
	BATMAN	2,008.6	5,903.8	15,933.1	23,845.6	110036	421609	3.8		2	
SANLIURFA	AKCAKALE	378.6	929.2	855.9	2,163.7	15542	44865	2.9		2	
	SURUC	518.6	299.3 *	7,048.1	7,566.6	25660	62027	2.4	1		
	CEYLANPINAR	328.4	1,701.4 *	467.7	796.0	25781	40368	1.6			3
	BIRECIK	330.9	1,663.7	702.7	2,697.3	25998	39265	1.5	1		
	VIRANSEHIR	1,136.6	1,280.5	5,431.0	7,848.1	45329	198031	4.4		2	
	SIVEREK	603.8	25,107.8	4,047.7	29,759.2	48333	85927	1.8	1		
	MERKEZ	2,220.2	46,667.8	9,243.0	58,131.0	194969	500769	2.6	1		
REGIONAL TOTAL:		28,305.8	687,422.8	169,228.7	856,651.5	1984529	5378307	(TL mill.)	554,099.4	184,963.6	117,588.5

* Construction completed. Totals exclude these figures.
** 1: Corridor settlements along Gaziantep - Diyarbakir.
2: Population growth index +2.0
3: Population growth index -2.0
Note: Estimates for treatment are based on the Aeration Lagoon type.

Figure D.1 Plains of the GAP Region

REPUBLIC OF TURKEY
SOUTHEASTERN ANATOLIA PROJECT
NIPPON KOEI CO. LTD AND YÜKSEL PROJE AŞ

APPENDIX E
PRESENT CONDITIONS AND EXISTING PROJECTS OF WATER RESOURCES DEVELOPMENT

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Appendix E : PRESENT CONDITIONS AND EXISTING PROJECTS OF WATER RESOURCES DEVELOPMENT

1. Water resource endowments

1.1 GAP Region and river basins

The GAP region is bordered in the east and northeast by the complex of mountains, and in the northwest by the Karaoglan Dag of the southern Taurus mountains which divides the Region from the upper Firat basins above Karakaya. In the west, a series of low mountains divide the Region from the catchment area of rivers flowing into the Mediterranean sea. In the south, the Mesopotamian plains extend through Syria and Iraq to the Persian Gulf.

The Firat (Euphrates) and the Dicle (Tigris) are the major rivers running through the Region. The Firat river have a catchment area of 102,876 km² above the Syrian border near Karkamis, of which about 22,100 km² or 22 % of the entire catchment area is within the Region between the Karakaya dam and the Syrian border.

The Dicle river occupies 30,200 km² in the Region out of its catchment area of 38,295 km². The remaining area is the upstream basin of the Botan river, the largest tributary of the Dicle river, running westward in mountainous areas in Van province.

Most of other small rivers drain Urfa-Mardin plains, which is the upper most part of the Mesopotamian plains. Some rivers running through Gaziantep plains are also flowing down into the Syrian territory. They are eventually flowing into these major rivers downstream of the border except a small part of Gaziantep province which is drained by the Churrus river of the Asi river system flowing into the Mediterranean sea. The catchment area of these small rivers occupy in total about 20,700 km² in the Region.

The lava volcano of the Karaca Dag (El.1,919 m) rising west of Diyarbakir divides the Firat river basin, the Dicle river basin and the Urfa-Mardin plains in the center of the Region. A large part of the Region between 400 m and 1,000 m is undulating rolling terrains scantly covered with vegetation. The lower plains along rivers and the Mesopotamian plains are extensively cultivated.

1.1.1 Firat river

The Firat river rises in the mountains of the southern Erzurum and drains the mountainous area in the upper part of the catchment area flowing to the southwest. It joins the Murat river, the largest tributary of the Firat river, just upstream of the Keban dam. The catchment area at the Keban dam is 64,092 km².

Below the Keban, it flows generally southward forming an s-shaped river course down to the Ataturk damsite. The river length between the Keban and the Ataturk dams is 346 km where the Firat forms a narrow valley. The Karakaya dam is located 166 km downstream of the Keban and installation of power plant is at the final stage. The Firat river flows southward in an open valley downstream of the Ataturk dam and runs 128 km down to the Syrian border. Two hydroelectric power development projects, the Birecik and the Karkamis, are being planned in this river section.

1.1.2 Dicle river

The Dicle river rises in the Karaoglan mountains which divide the Dicle river basin from the Murat river basin. The catchment area of the river is 38,295 km^2 at Cizre near the Syrian border and the river length is 430 km. It flows southward to Diyarbakir and turns east and then flows eastward gathering major tributaries of the Batman, Garzan and Botan rivers from the left bank. At Razuk just downstream of the confluence with the Botan river, it turns to the southeast and flows down to Cizre. Below Cizre it runs along the Syrian border and finally enters Iraq.

1.2 Meteoro-hydrological conditions

1.2.1 Meteoro-hydrological records

Meteorological observations are made by DMI(State Meteorological Service) and DSI(General Directorate of Hydraulic Works). There exist 103 meteorological and rainfall stations in the Region including 91 stations operated by DMI and 12 stations operated by DSI. DMI's observation in the Region started in 1929 at Diyarbakir, Gaziantep, Siirt, Sanliurfa, Siverek, Ergani and Kurtalan. Adiyaman, Kilis, Mardin and Cizre stations were established in 1930's. The DMI's meteorological stations are classified into the first class, the second class and rainfall stations. The first class stations observe rainfall, temperature, relative humidity, wind speed, sunshine hours and evaporation. The second class stations observe rainfall, temperature, relative humidity and wind speed though some of them observe other parameters as well. At present there are 17 first class meteorological stations and 17 second class stations in the Region. In addition to these meteorological stations, there are 57 rainfall stations throughout the Region operated by DMI. DSI is operating 12 meteorological stations at project sites in the Region, of which 7 stations observe meteorological parameters while the remaining 5 stations observe only rainfall.

Streamflow observations have been carried out by EIE (Electrical Power Resources Survey and Development Administration). Observations in the Region by EIE started in 1936 at Keban in the Firat river system and in 1945 at Diyarbakir, Besiri and Cizre in the Dicle river system. At present 15 stations are operated by

EIE in the Firat river below the Keban dam including 6 stations along the main stream and 9 stations on the tributaries of the Firat river. In the Dicle river basin, 10 stations are operated by EIE excluding those at the Zap and Hezil rivers, tributaries of the Dicle which flow out of the Region. DSI is also operating several streamflow stations at project sites though their operation periods are generally short.

Tables E.1 and E.2 show the list of streamflow stations in the Region. All the EIE stations presently operated and several major DSI's stations are shown together with several major stations already closed. Locations of the major stations are shown in Figure E.1.

1.2.2 General climate

The continental climate is dominant in the Region. It is characterized by two distinct seasons of a dry and hot summer and a cold and rainy winter. The western part of the Region, however, is influenced by the Mediterranean climate to some extent. Figure E.2 shows the average monthly rainfall and temperature at provincial centers. During four months from June to September, little rainfall occurs over the Region.

The long term average and the extreme of temperature at the provincial centers are shown below.

Station	Average (°C)	Maximum (°C)	Minimum (°C)	Number of days below 0 °C per year	Data Period
Adiyaman	16.4	44.0	-14.4	23.9	1962-1980
Gaziantep	14.5	42.8	-17.5	56.8	1940-1980
Urfa	18.0	46.5	-12.4	23.0	1929-1980
Diyarbakir	15.8	46.2	-24.2	61.4	1929-1980
Mardin	15.7	42.0	-13.4	34.3	1940-1980
Siirt	15.4	46.0	-12.4	44.9	1938-1980

The annual mean humidity in the Region is approximately 50 % ranging from 25-30 % in summer to 70-80 % in winter. Spatial variations are not significant, though Gaziantep has a little high humidity ranging from 40 % to 81 % with the annual average of 61 %.

The annual average wind velocity in the Region ranges from 0.9-1.2 m/sec in the lower plains to 4.1 m/sec at Siverek. The monthly average wind velocity at Sanliurfa ranges from 2.0 m/sec in November to 3.9 m/sec in July with the average of 2.8 m/sec. Average wind velocities are generally at the same level for Adiyaman, Gaziantep, Diyarbakir and Mardin, but they range from 1.4 m/sec to 2.0 m/sec at Siirt.

Pan evaporation has been observed at several stations. Annual pan evaporation ranges from 2400 mm at Cizre to 1,470 mm at Gaziantep.

Station	Annual pan evaporation (mm)	Record length (years)
Diyarbakir	1,935	33
Gaziantep	1,466	15
Cizre	2,424	16
Sanliurfa	2,048	23
Ceylanpinar	1,834	14
Elazig	1,519	15

Table E.3 summarizes average monthly meteorological parameters at the provincial centers.

1.2.3 Precipitation

The precipitation in the Region is caused generally by moist air masses flowing from the Mediterranean sea in winter and spring. In higher locations of the Region the precipitation in the winter falls in the form of snow and they stay on the ground for a long time. Snowmelt is one of the main causes of floods of the Firat and Dicle rivers. The Region receives little rainfall during summer months from June to September, contributing only to 1 to 2 percent of the annual precipitation amount.

The mean annual rainfall at DMI's station in the Region is shown in Table E.4. Based on the data, an isohytal map over the Region has been drawn as shown in Figure E.3.

The mean annual rainfall in the Region ranges from 280 mm at Mursitpinar, southwest of Sanliurfa near the Syrian border to 1,300 mm at Lice located at the foothills of the mountains dividing the Dicle river system from the Murat river system. The precipitation in the mountainous areas of the Batman river basin might be higher than that given in the isohytal map as the runoff records of the river indicate, because rainfall stations are scarcely located in these areas.

The mean annual precipitation over the Region was calculated to be 670 mm in depth or 48.9×10^9 m^3 : 660 mm in the Firat river basin, 800 mm in the Dicle river basin and 490 mm in the other small river basins.

The long term annual rainfall is shown in Table E.5 for the six provincial centers. Severe droughts occurred in 1970 and 1973 all over the Region.

1.2.4 Streamflow

(1) Hydrological analyses

Based on the observation records, runoffs of the Firat and Dicle rivers have been analyzed by several studies of DSI and EIE. Reference is made herein to the following latest studies done by EIE and EIE's annual publications on river discharges.

(1) Engineering Hydrology Report for Findikli-Belkis-Karkamis Projects, June 1978.
(2) Renewal of the above Engineering Hydrology, Report No.19, June 1981.
(3) Engineering Hydrology Report for Cizre and Ilisu dams on Dicle River, Report No.25, March 1980.

In the EIE's studies, discharges at major project sites are analyzed by using correlations among gauging stations.

In the Firat river system, the Keban is a key station, where discharge data are available since 1937. The discharges at the Keban station, however, have been affected by operation of the Keban dam since 1974. The natural runoff at the Keban station was estimated by correlating with the sum of discharges at five stations located on the tributaries flowing into the Keban dam. They are Dazlak (2167), Bagistas (2156), Melekbahce (2133), Logmar (2166) and Palu (2102). The total catchment area for these five stations are 54,027 km^2 against 63,874 km^2 of the Keban catchment.

Discharges during unrecorded periods or missing records of other major stations along the main stream of the river below the Keban have been estimated by using correlation between Keban, Karakaya, Dutluca and Belkiskoy discharges. Table E.6 shows the method employed for the estimates. Monthly natural streamflow data at major stations have been estimated for the period from 1937 water year (Oct. 1936 to Sep. 1937) to 1980 water year for the Firat river system.

Discharges of tributary basins for Adiyaman-Kahta, Adiyaman-Goksu-Araban and Gaziantep projects were estimated on the basis of runoff records at Fatopasa(No.2135), Meryem Usagi(No.21-93) and Danaoglu(No.2160), respectively. The discharge records for these stations are available for the period after 1966, 1968 and 1964, respectively.

For the Dicle river, Diyarbakir is the most reliable station having the longest records. Besiri discharges on the Garzan are also reliable after 1961. A complete set of discharge data at major stations and proposed dam sites have been prepared by using correlation with other stations as shown in Table E.7 for the period from 1946 water year to 1983 water year. EIE prepared the

data up to 1977 and they were extended in this study to 1983 by applying the same methodology.

Also referred to in these estimates are study reports of Dicle-Kralkizi project, Batman project, Batman-Silvan project, Cizre hydroelectric power project, Adiyaman-Kahata project, Adiyaman-Goksu-Araban project, Gaziantep project and Birecik hydroelectric power project.

(2) Potentials of streamflow

Potentials of streamflow of the Firat and Dicle river systems are summarized as follows on the basis of the above-mentioned runoff studies.

Firat river

The mean annual runoff at Belkiskoy (Birecik) near the Syrian border is estimated to be 30,377 x $10^6 m^3$ as the average of 1937-1980 period. The catchment area of the station is 100,702 km^2. During the period, the Firat river suffered from two serious drought periods. The first critical period occurred from 1958 to 1962 and the driest year was 1961. The annual runoff in 1961 was only 14,883 x $10^6 m^3$ or 49 percent of the mean annual for the 44 years. The second critical period was from 1970 to 1975 and 1973 was the driest year. In this year, the annual runoff was 62 percent of the mean annual. The wettest year was 1969 and the annual runoff was 53,548 x $10^6 m^3$ or 186 % of the mean annual.

Seasonal variation of river runoff is also remarkable. The highest runoff in an average year is observed in April while the lowest runoff occurs in September. The monthly runoff in an average year ranges from 275 percent to 33 percent of the annual mean, respectively. Figure E.4 shows monthly runoff in an average year, the driest year (1961) and the wettest year (1969) at Belkiskoy in the Firat river.

In tributary basins in Adiyaman and Gaziantep provinces, a severe drought occurred in 1973. Records, however, are not available before 1964 except Malpinar on the Goksu river where drought in 1973 was severer than in 1963.

Dicle river

In the Dicle river system, the Cizre station is the most downstream station on the main stream, where the catchment area is 38,295 km^2. The mean annual runoff at Cizre is estimated to be 16,800 x $10^6 m^3$ as the average of 1946-1983 period. The annual runoff variation of the Dicle river was similar to that of the Firat river. The first critical period occurred from 1958 to 1962 and the driest year was 1961 with the annual runoff of 7,891 x $10^6 m^3$ or 47 percent of the mean annual for the 38 years. The second critical period was from 1970 to 1975 and the annual runoff in 1973 was 9,667 x $10^6 m^3$ or 58 percent of the mean annual

flow. In the northern part of the Dicle river basin, however, the smallest annual runoff occurred in 1973. Only 39 percent of the mean annual flow was observed in that year at the Diyarbakir station. The wettest year was 1969 having annual runoff of 34,339 $10^6 m^3$ or 204 percent of the mean annual. The Dicle river has slightly larger variation of annual runoff than the Firat river.

Seasonal variation of river runoff at Cizre is also similar to that of the Firat river. Monthly runoff ranges from 260 percent in April to 23 percent in September. Figure E.4 shows the monthly runoff variation at Cizre in an average, the driest and the wettest years.

Figure E.5 shows the historical annual runoff for the observation periods at the above two stations. Table E.8 shows the annual runoff at major stations of these two rivers in an average and critical years.

Rainfall-runoff balance are given in Table E.9. Basin mean rainfalls were estimated from the isohytal map drawn on the basis of long term rainfall data of DMI's stations. The basin mean rainfall above the Keban was estimated from the arithmetic average of 77 stations in six provinces of Erzurum, Erzincan, Mus, Bingol, Tunceli and Elazig. In an average year, the Firat river basin receives 585 mm of annual rainfall as a basin mean over 100,700 km^2 and discharges surface runoff of 302 mm with a runoff coefficient of 52 %.

The basin mean rainfall in the Dicle river is estimated to be 785 mm at Cizre for the catchment area of 38,281 km^2 and the mean annual runoff is 439 mm. The runoff coefficient is calculated at 56 %. The actual basin mean rainfall of the Dicle river basin might be higher than estimated because rainfall stations are sparsely located in the mountainous areas where rainfall is expected to be higher than the lower plains.

1.2.5 Groundwater

The GAP region has good potentials for groundwater, especially in lower plains of Sanliurfa, Mardin and Diyarbakir provinces. At present these groundwater reserves serve for municipal water supply and small-scale irrigation purposes.

The groundwater potential has been investigated by DSI and annual safe yield was estimated in each province as follows:

Province	Yield (10^6 m^3/year)
Sanliurfa	1,202.0
Diyarbakir	190.0
Mardin	113.0
Gaziantep	15.0
Adiyaman	6.0
Siirt	0.0
Total	1,526.0

The DSI investigation for groundwater has been concentrated on more promising plains including Silopi, Nusaybin, Mardin-Kiziltepe, Ceylanpinar and Suruc as well as Harran. Confirmed yields are 100 million m^3/year for Silopi, 13 million m^3/year for Mardin-Kiziltepe, 277.4 million m^3/year for Ceylanpinar, and 90 million m^3/year for Suruc. No hydrogeological investigation has been made on the Dicle, Koctepe-Kozluca, Hasantepe and Idil plains, but geophysical surveys are proposed as a first step to be followed by establishment of investigation wells.

2. Water related organizations

Organizations related to water resources development are DSI (General Directorate of State Hydraulic Works), EIE (Electrical Power Resources Survey and Development Administration), TEK (Turkish Electrical Authority), Ministry of Energy and Natural Resources, Ministry of Agriculture, Forest and Rural Affairs, Municipalities and Provincial offices, and cooperatives. Their major functions related to water resources development are described as follows.

(1) DSI

DSI, under the Ministry of Public Works and Settlement, is the principal agency for water resources development including surface and ground water resources, for hydroelectric power, irrigation, flood and sediment control, river improvement and water supply and sewerage. It deals with planning, design, construction and operation and maintenance of facilities. There are some exceptions in hydroelectric power projects, small scale irrigation projects and small scale water supply projects. DSI carries out meteorological and hydrological measurements and mapping activities for water resources development. Groundwater potential investigations are also carried out extensively nationwide.

DSI consists of a central office and 25 regional directorates. The central office provides development policies and programs, makes necessary works for planning, design, implementation and operation and maintenance of projects. The Regional Directorates direct and supervise the implementation of programs and the

operation of facilities.

The GAP region is covered by three Regional Directorates. Diyarbakir Regional Directorate (Region X) covers the provinces of Diyarbakir, Siirt and Mardin. Sanliurfa Regional Directorate (Region XV) covers only the province of Sanliurfa. K.Maras Regional Directorate (Region XX) covers the provinces of K.Maras, Adiyaman, Gaziantep and Afsin. The Regional Directorates are divided into field divisions. In the Region, there are five field divisions in each province except the province of Siirt which is covered by a Diyarbakir field division.

Besides these Regional Directorates, there are two temporary Regional Directorates at the Ataturk dam (Region XVI) and the Karakaya dam (Region XXIV) for construction supervision works.

(2) EIE

EIE is in charge of hydrological and geological investigation and mapping works for hydroelectric power development projects. It is sometimes entrusted by DSI to execute engineering services of hydroelectric power development projects as well as multipurpose projects if the major purpose is hydroelectric power development in stages of reconnaissance, master planning, feasibility study and final design. They carry out these studies by themselves and/or further entrust to appropriate engineering consultant firms.

(3) Ministry of Energy and Natural Resources

The Ministry prepares a forecast of future national demand for the various forms of energy. The forecast is derived from a simulation model called "MAED" (Model for Analysis of the Energy Demand), which classifies final energy into electrical power and other forms of energy.

(4) TEK

TEK is responsible for supplying electrical energy throughout Turkey. TEK works out an electrical energy demand and supply balance study and prepares an optimum power development programme by using the WASP model (Wien Automatic System Planning Package), based on the power demand forecast given by the Ministry of Energy and Natural Resources.

Operation and maintenance of hydroelectric power plants and appurtenant facilities is also a task of TEK. After completion of these facilities by DSI, they are transferred to TEK. In case of multipurpose storage facilities, operation and maintenance works are allotted to DSI and TEK in accordance with their tasks.

(5) Ministry of Agriculture, Forestry and Rural Affairs

General Directorate for Rural Affairs of the Ministry of Agriculture, Forest and Rural Affairs is responsible for rural drinking water supply and small scale irrigation projects of which irrigation water supply capacity is smaller than 500 liter per second.

The village drinking water department of the General Directorate for Rural Affairs is assigned to provide hygienic and sufficient drinking water to villages. They carry out construction of water supply facilities such as wells, adits, conduits, motor pumps, treatment and collection facilities, and also operation and maintenance of completed village drinking water facilities.

The basin improvement and artificial lakes department of the General Directorate for Rural Affairs is assigned for construction of artificial lakes and related facilities for flood prevention, irrigation water supply and drinking water supply for animals. They are also responsible for planning, construction and improvement of irrigation facilities using up to 500 liter per second of irrigation water.

(6) Municipalities

Drinking water supply in urban area is a task of respective municipalities. If a municipality has over 100,000 population, it may entrust planning and construction works to DSI following necessary legislative procedures. Some municipalities, however, would carry out such works by themselves if they do not need assistance of the Central Government. Operation and maintenance works are carried out by municipalities in any cases.

(7) Provincial offices

Provincial offices support construction of drinking water supply systems in small towns and rural areas.

(8) Irrigation cooperatives

Management of irrigation water is sometimes entrusted to local farmers cooperatives once the water is made available at farm level. These cooperatives, formed under the relevant Turkish law, are responsible for the management of water at on-farm level. However, the success of the implementation of irrigation cooperatives has been limited.

3. Existing water resources facilities

Surface water facilities

Table E.10 shows the list of major water resources facilities in

the Region. It includes one storage type hydropower plant (Karakaya), two run-of-river hydropower plants (Cag Cag III and Botan) and three reservoirs for irrigation water supply (Devegecidi, Tahtakopru and Gozegol). The Karakaya dam was completed in 1987 and 900 MW of power plant is now in operation and an additional 900 MW is being put into operation. The Tahtakopru dam was built in 1975 on the Karasu river in the western corner of Gaziantep province for flood control and irrigation, but its beneficiary areas are located in Antakya province. The impact of the dam to the Region would be for fishery and recreational activities.

The Keban dam is located upstream of the Karakaya dam outside the Region but the huge storage capacity would considerably affect the planning of the Region's water resources development. The Kartalkaya reservoir in K.Maras province is also contributing to municipal water supply of Gaziantep.

In addition to these existing facilities, eight dams, five hydropower plants, a transfer tunnel and eight irrigation systems are under construction as listed also in Table E.10. The Hancagiz dam has just been completed.

Groundwater facilities

Some investigation and operation wells have been developed by DSI on selected plains. On the Ceylanpinar plain, 29 investigation, 35 operation and 21 drinking wells were opened by DSI since 1957 at hydrogeological survey stage. Irrigation areas served by wells opened by DSI are summarized.

Irrigation scheme	No.of wells	Irrigation area(decares)
Sanliurfa-Viransehir-Iki Circip	192	90,000
Sanliurfa-Ceylanpinar-Akrepli (TIGEM)	34	15,000
Sanliurfa-Viransehir-Beyazkule (TIGEM)	40	13,000
Sanliurfa-Ceylanpinar-Telhamut (TIGEM)	63	42,000
Habur pumped irrigation		35,000

Source : DSI

On the Harran plain, at hydrogeological survey stage 37 investigation, 52 drinking water and 2 operation wells were opened by DSI. The following districts are served by groundwater.

District (mahalle)	No.of operation wells	Year opened
Semsettin	57	1975
Güneran	31	1977
Birmuavi	57	1975
Sevimli, Bolatlar	80	1977
Yalinli, Tutluca	41	1975
Gozdegmez	43	1977
Gundas, Topcu	57	1977

The total area on Harran irrigated by DSI wells is 138,000 decares.

On the Suruc plain, 78 wells have been opened by DSI since 1960. The groundwater reserve, estimated at 90 million m^3/year, is totally utilized.

4. DSI water resources development plans

4.1 General

DSI prepared in 1980 a master plan for water resources development in the GAP region and identified 12 project schemes. The Karakaya project was separated from the Lower Firat project and now the development plan consists of the following 13 schemes.

1. Lower Firat Project
2. Karakaya Hydroelectric Power Project
3. Border Firat Project
4. Suruc-Baziki Project
5. Adiyaman-Kahta Project
6. Adiyaman-Goksu-Araban Project
7. Gaziantep Project
8. Dicle-Kralkizi Project
9. Batman Project
10. Batman-Silvan project
11. Garzan Project
12. Ilisu Project
13. Cizre Project

A brief explanation of these projects is given in the following. Outputs and performance of each project are based on the review made by the Consultant at this time by using a river simulation and analysis model. The review results are slightly different from the original DSI plan. Physical dimensions of facilities are those of the DSI plan. Locations of these schemes are shown in Figure E.6.

4.2 Lower Firat project

The Lower Firat project consists of the following seven schemes.

(1) Ataturk dam and hydroelectric power plant
(2) Sanliurfa tunnel
(3) Sanliurfa hydroelectric power plant
(4) Urfa-Harran irrigation
(5) Mardin-Ceylanpinar irrigation
(6) Siverek-Hilvan pumped irrigation
(7) Bozova pumped irrigation

(1) Ataturk dam and hydroelectric power plant

The Ataturk dam is the key structure for the lower Firat development. It is a multipurpose dam primarily for irrigation and hydropower generation and is being built on the main stream of the Firat river about 180 km downstream of the Karakaya dam, some 60 km northwest of Sanliurfa. The dam of 184 m height above the foundation would create a reservoir of 48,700 x $10^6 m^3$ in gross storage capacity. The active storage capacity is planned to be 19,300 x $10^6 m^3$ with 16 m drawdown.

The water in the Ataturk reservoir would be partly extracted through two lines of Sanliurfa tunnel to the Urfa-Harran and the Mardin-Ceylanpinar irrigation schemes. The Siverek-Hilvan, Bozova and Suruc-Baziki irrigation schemes would pump irrigation water from the reservoir. Small pumped irrigations are also planned in the Adiyaman-Kahta along the western shore of the reservoir.

The remaining water available in the reservoir is released through turbines to be installed at the toe of the dam. The planned installed capacity is 2,400 MW in total and it is expected to generate about 8,100 GWh of energy annually when the Urfa-Harran irrigation scheme would come into operation as the first stage development of irrigation schemes. The annual energy would be reduced as the other irrigation schemes are completed and it would become some 5,300 GWh after all the irrigation schemes depending on the Ataturk reservoir are completed.

The Ataturk dam would also contribute to the downstream hydropower plants planned in the Border Firat project by releasing regulated runoff throughout a year.

The series of dams along main stream of the Firat river, the Keban, the Karakaya and the Ataturk would largely regulate the Firat runoff and produce the firm annual runoff equivalent to 80 percent of the average annual runoff.

(2) Sanliurfa tunnel

The Sanliurfa tunnel would feed water from the Ataturk reservoir to the head of main canals of the Urfa-Harran lower plains and the Mardin-Ceylanpinar irrigation areas. It runs 26.4 km beneath the hilly lands from the offtake structures at southern shore of

the reservoir near Bozova to the outlet located some 5 km northeast of the city of Sanliurfa. It would have a capacity of 328 m^3/sec in total consisting of two lines of pressured water way with 7.62 m inner diameter.

The tunnel outlet is connected to the main feed canal of 328 m^3/sec which branches off Harran main canal and Mardin-Ceylanpinar main canal at 4.5 km from the outlet.

It is now under construction and scheduled to be completed in 1992.

(3) Sanliurfa tunnel hydroelectric power plant

A hydroelectric power plant is to be installed at the head of Harran main canal. The planned installed capacity is 50 MW using the potential head of 49.5 m between the main feed canal (El.505 m) and the head of Harran main canal (El.455.5 m) and the maximum discharge of 121 m^3/sec. Annual energy production would be 124 GWh.

(4) Urfa-Harran irrigation

The Urfa-Harran irrigation area is extending in the lower plains from south of the city of Sanliurfa to the Syrian border. The irrigation area is 141,535 ha in total composed of two sub systems: the Urfa irrigation with 43,041 ha and the Harran irrigation with 98,494 ha. The areas are to be served by network systems fed by the Sanliurfa tunnel. The total length of main canal system is 51 km and 161 km for Urfa and for Harran, respectively. Construction of this scheme was started in 1980 and is scheduled to be completed in 1992.

Beside this surface water irrigation, small scale groundwater irrigation systems have already been established in southern part of the plains near the Syrian border. They cover some 13,800 ha in total.

(5) Mardin-Ceylanpinar irrigation

The service area of the scheme is extending between Sanliurfa and Mardin provinces having the total area of 334,939 ha. It is divided into six sub-schemes including three gravity and three pumped irrigation units. The main canal system of the scheme is fed also by the Ataturk reservoir through the Sanliurfa tunnel. For the purpose of regulating the peak water demand, two reservoirs (Derik and Mardin) having 700 x $10^6 m^3$ of active capacity in total are planned to be built and connected to the network system.

The project is phased into two stages. The first stage development would cover 230,130 ha including three gravity and

one pumped irrigation units. The Mardin reservoir, two pumping stations and 400 km long main canal system would be constructed.

A feasibility study of the scheme has been completed.

Ceylanpinar groundwater irrigation areas are located in the southern part of the above scheme and some 9,000 ha of lands are served from wells. In total, 60,000 ha of land is reserved for irrigation by groundwater.

(6) Siverek-Hilvan pumped irrigation

Siverek-Hilvan irrigation area is located in the hilly lands extending in the northern part of Sanliurfa province. The areas are to be irrigated by water pumped from the Ataturk reservoir. In order to supply water to undulating hilly lands of 160,105 ha in total, seven pumping stations and 17 small reservoirs are planned in the network systems.

The scheme is still at a preliminary planning stage and project figures may be subject to change.

Among the planned reservoirs, the Hacihidir dam is under construction for irrigation of 2,080 ha and is scheduled to be completed in 1989.

(7) Bozova pumped irrigation

Bozova irrigation area is located in the hilly lands between towns of Hilvan and Bozova in Sanliurfa province. The command area is 69,702 ha (gross). The source of water is the Ataturk reservoir, but it is necessary to elevate water by 260 m above the reservoir water level by six steps of pumping.

Two run-of-river hydroelectric power plants are planned along the canal system. The total installed capacity is 6 MW and 16 GWh of annual energy would be produced.

The scheme is prepared for a feasibility study.

4.3 Karakaya hydroelectric power project

The Karakaya project is a single purpose project of hydroelectric power generation. It is located in the main stream of the Firat river about 166 km downstream of the Keban dam. The total installed capacity is 1,800 MW and the first stage installation of 900 MW was completed in 1987 and the remaining 900 MW is being installed.

The annual energy production was estimated at some 6,860 GWh including 6,220 GWh of firm energy and 640 GWh of secondary energy. These are slightly lower than the DSI original estimates

(Table E.10). The reservoir having a storage capacity of 5,580 x $10^6 m^3$ would regulate the Firat runoff and an incremental firm yield of the reservoir was estimated at 1,000 x $10^6 m^3$ a year when it is operated for power generation with 41 % plant factor.

4.4 Border Firat project

The Border Firat project consists of the following two hydroelectric power projects.

(1) Birecik hydroelectric power project
(2) Karkamis hydroelectric power project

(1) Birecik hydroelectric power project

The Birecik project is a dual purpose project for irrigation and hydroelectric power generation. The proposed Birecik damsite is located on the main stream of the Firat river about 92 km downstream of the Ataturk dam.

The Gaziantep irrigation project has been planned to take water mainly from the Birecik reservoir.

The planned installed capacity of the power plant is 672 MW in total using the potential head between the tail water of the Ataturk and the proposed Birecik damsite. The energy production would be affected by the operation of the Ataturk dam for irrigation water supply and an irrigation development of the Adiyaman-Goksu-Araban planned in the tributaries upstream of the Birecik as well as the Gaziantep project. According to the present river simulation and analysis, the annual energy of 2,439 GWh would be produced if the Ataturk dam and the Urfa-Harran irrigation are realized in the upstream. It would be reduced to 1,703 GWh when all the irrigation projects planned in the upstream of Birecik are completed.

The feasibility study of the project was completed in 1984.

(2) Karkamis hydroelectric power project

The Karkamis hydroelectric power project is a single purpose project for hydroelectric power generation. It is located 33 km downstream of the proposed Birecik damsite or 4.5 km upstream of the Syrian border. The power plant is planned to have a installed capacity of 180 MW in total using the available head of 11.6 m between Birecik and the proposed Karkamis damsite which is the possible lowest location of the Firat main river within the Country.

The expected annual energy is also affected by the irrigation development upstream of the damsite. It was estimated that the annual energy production would be 680 GWh, if only the Ataturk

dam and the Urfa-Harran irrigation are realized in the upstream. It would be reduced to 450 GWh when all the planned upstream irrigation projects are completed.

4.5 Suruc-Baziki project

The project area consists of Baziki plains and Suruc plains. Baziki plains are located along the Firat river near the Ataturk dam to the west of the town of Bozova. The irrigation area is planned to be 44,900 ha which would be irrigated mostly by gravity water taken from the Ataturk reservoir.

The Suruc irrigation area is located to the west of Urfa-Harran irrigation area and is extending on lower plains to the Syrian border. The total irrigation area is 101,600 ha. Water to the area is planned to be taken from the Ataturk reservoir by pumping and sent to the area across the high lands between Baziki and Suruc. Along the water way, three reservoirs(Tozluca, Aylan and Tasbasan) having 27 x $10^6 m^3$ of total active storage are to be built.

Nine pumping stations are required for the project. The total capacity would be 216 MW.

Four hydroelectric power plant are proposed along the water way to the Suruc irrigation area, three are to be installed at the proposed dams and one is of run-of-river type. The total installed capacity would be 44 MW and would produce 107 GWh annually.

4.6 Adiyaman-Kahta project

This is a multipurpose water resources development in the central and northern part of Adiyaman province extending on the right bank of the Ataturk reservoir. The project consists of five irrigation schemes, four storage type hydropower plants and one run-of-river type hydropower plant. Four irrigation schemes are served by dams and one is a pumped irrigation scheme depending on the Ataturk reservoir.

The irrigation area of all the schemes would amount to 77,409 ha in total including 47,810 ha served by the planned reservoirs and 29,599 ha of pumped schemes to depend on the Ataturk reservoir.

Among the following six dams to be built, two are for irrigation and two for hydropower generation . The remaining two have dual purposes for irrigation and hydropower generation.

Dam/ power plant	Purpose	Active storage($10^6 m^3$)	Irrigation area (ha)	Installed capacity (MW)
Gomikan	IR	40	7,762	
Camgazi	IR	44	6,121	
Kocali	IR,HP	265	21,605	40
Buyukcay	IR,HP	130	12,322	30
Sirimtas	HP	29		28
Kahta	HP	555		75
Fatopasa	HP	run-of river		22

To take water from the Ataturk reservoir, 17 pumping stations with 41,700 kW of capacity in total would be necessary and annual energy requirement is estimated at 109.5 GWh.

The total installed capacity of the five power plants would be 195 MW and the average annual energy is expected to be 509.1 GWh.

4.7 Adiyaman-Goksu-Araban project

The Adiyaman-Goksu-Araban project covers the southwestern part of Adiyaman province, the northeastern part of Gaziantep province and a small southeastern part of K.Maras province. The main purpose of the project is irrigation water supply to 72,000 ha in gross area as well as municipal water supply to Gaziantep. A run-of-river hydropower plant is also planned.

The Cataltepe dam is the key structure of the project. It is a 112 m high dam proposed on the Goksu river 7 km northeast of Golbasi and would create a reservoir with 627 x $10^6 m^3$ active capacity. Inflow to the reservoir is planned to be supplemented by diversion from Karanlikdere weir. Erkenek hydropower plant is proposed with 7.3 MW on the diversion water way.

Water in the Cataltepe reservoir would be sent to the irrigation areas by a main feeder canal of some 200 km length. Two dams (Harmancik and Catbogazi) are planned on small tributaries of the Karasu river near Araban having an active storage capacity of 420 x $10^6 m^3$ in total. These reservoirs are connected to the main feeder canal system and would store off-season water for release during a peak demand period.

The irrigation scheme consisting of seven units of irrigation area located in the three provinces will be supplied water from the three reservoirs through a main canal network some 500 km long in total.

A feasibility study of the project was completed in 1987.

4.8 Gaziantep project

The project area is located in the lower plains extending along Syrian border in the southern part of Gaziantep province covering 89,000 ha for irrigation.

The major source for irrigation water supply of the project is the Firat river which is planned to be pumped up from the reservoir to be created by the Birecik dam. The water taken from the Firat river at Belkis would be sent southwestward to Kilis through a main feeder canal system.

Four dams have been planned on small rivers along the main feeder canal. These dams and the main feeder canal would be connected into an integrated irrigation system. Among them, the Hancagiz has been completed and is planned to cover 7,300 ha of irrigation area. The construction started for the Kayacik dam with its diversion tunnel.

Dam	Active storage ($10^6 m^3$)	Planned irrigation area (ha)
Hancagiz	83	7,300
Kayacik	46	13,700
Kemlim	32	2,000
Seve	19	1,400

(Source: DSI report, 1987)

The irrigation scheme consists of nine sub-schemes and would be served by the integrated main canal system some 400 km long in total and nine major pumping stations.

Drinking water supply is also considered from the Seve reservoir to the town of Kilis.

4.9 Dicle-Kralkizi project

The Dicle-Kralkizi project is a water resources development of the right bank along the middle reaches of the Dicle river. Major facilities of the project are the Kralkizi and Dicle dams with hydroelectric power plants to be built on the Dicle river in series. The water taken at the Dicle dam would be sent to six units of irrigation areas through a main canal system including one gravity and five pumped irrigation systems. Excess water at the Dicle dam would be sent to the existing Devegecidi reservoir located northwest of Diyarbakir using the main canal system whenever storage space is available at the Devegecidi.

The irrigation system would cover 126,000 ha of new irrigation area including 52,000 ha of gravity and 74,000 ha of pumped irrigation. The existing Devegecidi irrigation area of 7,500 ha

would be expanded to 12,000 ha. The total length of main canal would be some 700 km.

Active storage of reservoirs and installed capacity of power plants are shown as follows.

Dam	Active storage ($10^6 m^3$)	Installed capacity (MW)	Status
Kralkizi	1,712	90	Under construction
Dicle	255	110	Under construction
Devegecidi	195	-	Operation

As these dams are to be operated for irrigation water supply during dry seasons, no water should in principle be released during winter. In this case, no firm power output would be expected from these power plants, although they can be operated for firm power as the DSI original plan.

4.10 Batman project

The Batman river has been developed since 1974. The Malabadi offtake weir built on the Batman river supplies irrigation water to Silvan and Sinan schemes on the right bank of the Batman river covering 8,000 ha in total.

The Batman project aims at expanding the irrigation area to the left bank of the Batman river and higher locations along the existing areas on the right bank and further to the left bank of the Dicle main stream upstream of the confluence with the Batman river.

The Batman dam is planned just upstream of the existing Malabadi weir and would collect abundant water from the catchment area of 4,105 km^2 and regulate by its active storage of 738 x $10^6 m^3$. A hydropower plant of 185 MW is also installed at the dam.

The reservoir would serve for new irrigation areas of 38,000 ha as well as the existing areas. The new irrigation area is planned to be 18,758 ha on the right bank and 18,986 ha on left bank of which 9,412 ha is a pumped irrigation area. The main canal length is planned to be 305 km.

The project is under construction and is scheduled to be completed in 1992.

4.11 Batman-Silvan project

The project area is extending in the undulating hilly lands on the left bank of the Dicle river covering 213,000 ha. In the recent study done by DSI (1986), however, the irrigation area is

planned to be 257,000 ha.

The project consists of two reservoirs as water resources facilities, a 300 km long main canal system and 25 pumping stations.

The Silvan dam is planned to be built on the Kulp river, a tributary of the Batman river, 34 km upstream of the Batman damsite. It would create a reservoir of 4,100 x $10^6 m^3$ active storage.

The Kayser dam is planned on the Kayser river, another tributary of the Batman river, 36 km upstream of the Batman river. It would have 530 x $10^6 m^3$ of active storage. The study of the dam is still being carried out and the plan has been suspended.

4.12 Garzan project

The Garzan irrigation project is located in the Garzan river basin in Siirt province. The basin is adjacent to the Batman river basin. The irrigation area is planned to be 60,000 ha.

As part of the project, development of 3,700 ha is going on under the Garzan-Kozluk irrigation project which would take water from the Garzan river at the Kozluk weir and from the Ceffan pond both to be built.

The Garzan dam is planned on the Garzan river about 5 km upstream of the Kozluk weir. Though the plan is still preliminary, it is a 170 m high dam and would create a reservoir having 435 x $106m^3$ active storage. A 90 MW hydropower plant would be installed at the damsite.

4.13 Ilisu project

The Ilisu project is a single purpose project for hydropower generation. It is planned on the main stream in the lower reaches of the Dicle river, about 50 km south of the city of Siirt. A dam of 36 m height would collect water from a catchment area of 35,509 km^2 and regulate by its active storage of 7,460 x $10^6 m^3$.

A hydropower plant is planned to be built at the foot of the dam and to have an installed capacity of 1,200 MW. The river simulation and analysis indicate that the annual energy to be generated would be 3,900 GWh of energy, but it would be decreased as the irrigation development upstream of the Ilisu is extended. It is estimated that the annual energy production would be 3,100 GWh after all the projects involved in the GAP is completed.

The feasibility study has been completed and it is in design stage.

4.14 Cizre project

The Cizre project comprises the Cizre dam and a hydropower plant, the Nusaybin-Cizre-Idil irrigation and the Silopi irrigation. The Cizre damsite is located 35 km downstream of the Ilisu dam, or 4 km northwest of the town of Cizre near the Syrian border. It is a multipurpose project for hydroelectric power development and for irrigation water supply to the Nusaybin-Cizre-Idil.

The Cizre power plant would have an installed capacity of 240 MW and generate 1,200 GWh annual energy. It would be reduced to 915 GWh when all the upstream irrigation development is completed.

The Nusaybin-Cizre-Idil project is located on the right bank of the Dicle river extending at the foothills of Mardin mountains along the Syrian border. The total irrigation area is 89,000 ha including 70,000 ha to be supplied water from the Cizre reservoir and 19,000 ha to be commanded by the CagCag III of which 6,900 ha has been completed and in operation.

The Silopi irrigation project is independent from the Cizre dam operation. It is located between the Dicle and the Hezil rivers, one of tributaries of the Dicle river flowing from the left bank of the Dicle river at some 40 km downstream of Cizre. It is planned to take water from the Hezil river. Two dams (Kirkemir and Hezil) are planned to be built on the Hezil river in series to regulate river flow for irrigation as well as for hydropower generation. In addition, three run-of-river type hydropower plants will be located along the diversion water way system for irrigation. The irrigation area is 32,000 ha in gross. Adjacent to the area, the Silopi-Nerdus irrigation covering 2,740 ha is under construction and is planned to be completed in 1989.

4.15 Groundwater irrigation

Irrigation by groundwater is also planned/considered by DSI on selected plains. To irrigate areas on the Nusaybin plain, hydrogeological investigation will be necessary. The groundwater potential in the north of Mardin-Kiziltepe plain can be utilized for irrigation, but in the south the depth of wells would reach 400-500 m. On the Ceylanpinar plain, areas in Hoyuk Tepe, Tiras Tepe and Sarnic Tepe locations may be irrigated entirely by groundwater.

On the Silopi plain, some 10,000 ha can be irrigated by groundwater with 350-400 wells of 30 l/sec capacity on an average. Groundwater irrigation is impossible in the east of Silopi plain, but the north and the east of the plain can be served by groundwater. Potential sources in the north and their yields are Hisar (189 l/sec), Derebasi (100 l/sec), Besir (167 l/sec), Besbin (388 l/sec), Zeristan (166 l/sec) and Nehrivan (188 l/sec). In the east of Cizre, west of the Nerdus stream, groundwater and surface water can be used conjunctively for irrigation.

Table E.1 Hydrological Stations in Firat River Basin

Station no.	Station name	Stream	Catchment area	Record period
2103	Keban	Firat main	63,874 km²	1936.8 up to date
2110	Komurhan	Firat main	78,462 km²	1961 - 1971
2105	Karakaya	Firat main	80,421 km²	1961.11 up to date
2140	Dutluca	Firat main	92,654 km²	1961.4 up to date
2170	Belkiskoy	Firat main	100,702 km²	1973.6 up to date
2114	Birecik	Firat main	100,916 km²	1947.12 up to date
2115	Malpinar	Goksu	3,990 km²	1953.2 up to date
2135	Fatopasa	Bulam/Kahta	166 km²	1962.12 - 1984
2160	Danaoglu	Nizip	1,020 km²	1968.12 up to date
2159	Haci Kamil	Cam Deresi	1,036 km²	1968.12 up to date
2132	Incirli	Culap	525 km²	1956.9 up to date
2123	Cinarkoy	Cagcag	864 km²	1953.11 up to date
2165	Hocakoy	Zerkan	490 km²	1968.11 up to date
21-93	Meryem Usagi	Goksu	1,916 km²	1964 - 1984
21-120	Horozkoy	Culap S.	507 km²	1966 - 1970
21-119	Kopruluk	Cavsak D.	306 km²	1966 - 1972
21-42	Anasi	Haci Kamil D.	993 km²	1961 - 1969
21-68	Kamutepe	Sacir S.	1,235 km²	1963 - 1972

Note: A more complete list of stations can be found elsewhere (e.g. Guneydogu Anadolu Projesi, DSI, Ankara, 1980).

Sources: The feasibility studies concerned

Table E.2 Hydrological Stations of Dicle River Basin

Station no.	Station name	Stream	Catchment area	Opeartion period	Organizati
26-01	Dipni	Dipni	1,397 km²	1960.1 - 1964.9	DSI
2602	Sinan	Batman	4,988 km²	1946 - 1964	EIE
2603	Besiri	Garzan	2,450 km²	1945 up to date	EIE
2605	Diyarbakir	Dicle main	5,799 km²	1945 up to date	EIE
2606	Cizre	Dicle main	38,295 km²	1945 up to date	EIE
26-09	Devegecidi	Devegecidi	1,607 km²	1960 up to date	DSI
2610	Baykan	Bitlis	640 km²	1954 up to date	EIE
2611	Rezuk	Dicle main	34,493 km²	1955 - 1975	EIE
2612	Malabadi	Batman	4,105 km²	1957 up to date	EIE
2613	Huseyincan	Batman	3,428 km²	1959 - 1961	EIE
2617	Cayonu	Dicle main	1,330 km²	1961 up to date	EIE
(26-02)			1,186 km²	1968.11 up to date	DSI
2618	Koprubasi	Ambar	976 km²	1968.11 up to date	EIE
2619	Cinar	Goksu	734 km²	1968 up to date	EIE
2623	Ilisu	Dicle main	35,517 km²	1970.3 up to date	EIE
2624	Pinarca	Kezer	1,170 km²	1971 up to date	EIE
2626	Billoris	Botan	7,989 km²	1945.11 up to date	EIE
26-46	Kemuk	Batman	2,620 km²	1977 up to date	DSI
2625	Girikhan	Hezil	1,127 km²	1971 up to date	EIE
26-17	Cavuslu	Pamukcay	485 km²	1962 - 1974	DSI

Note: A more complete list of stations can be found elsewhere (e.g. Guneydogu Anadolu Projesi, DSI, Ankara, 1980).

Sources : The feasibility reports concerned, EIE

Table E.3 General Climate Data at Provincial Centers

(1) Temperature (°C)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual mean
Adiyaman	3.7	5.4	9.3	13.9	19.2	24.9	29.0	28.5	25.5	18.9	12.1	6.3	16.4
Gaziantep	2.3	3.9	7.3	12.6	18.3	23.7	27.2	26.8	22.3	15.5	9.3	4.4	14.5
Sanliurfa	4.9	6.5	10.0	15.6	21.7	27.6	31.5	31.1	26.6	19.9	12.9	7.3	18.0
Diyarbakir	1.5	3.6	8.3	13.8	19.4	26.0	31.0	30.4	24.9	17.2	9.9	4.2	15.8
Mardin	2.4	4.8	7.3	12.9	18.7	25.4	29.6	29.4	24.9	18.1	11.1	4.9	15.7
Siirt	2.2	3.9	7.7	13.3	19.1	25.0	29.0	28.6	23.8	17.4	10.5	4.7	15.4

(2) Relative humidity (%)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
Adiyaman	73	71	62	52	47	29	24	23	30	46	59	73	49
Gaziantep	81	77	71	64	55	44	40	42	46	58	71	80	61
Sanliurfa	71	67	60	53	43	30	27	28	32	42	58	69	48
Diyarbakir	77	73	65	61	55	34	24	24	28	46	67	77	53
Mardin	76	70	64	57	46	33	30	32	36	47	59	70	52
Siirt	75	69	64	58	52	35	28	28	32	47	63	72	52

(3) Rainfall (mm)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Adiyaman	173.5	116.5	111.8	83.3	52.6	5.6	1.5	0.8	3.7	27.3	74.5	144.7	796
Gaziantep	106.0	82.3	71.6	52.4	27.0	6.2	1.2	1.8	2.7	27.8	54.0	100.7	534
Sanliurfa	101.9	69.5	63.7	50.9	25.4	2.6	0.5	0.3	0.9	19.9	40.5	85.7	462
Diyarbakir	77.0	66.7	64.8	74.0	44.9	6.4	0.8	0.5	2.3	28.2	52.4	73.1	491
Mardin	127.2	100.5	102.7	86.0	45.4	2.1	0.4	0.3	1.2	28.1	76.5	118.3	689
Siirt	108.9	98.1	106.5	108.2	66.4	8.5	0.6	0.3	4.5	46.4	83.2	97.8	730

(4) Wind speed (m/sec)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
Adiyaman	2.6	2.3	2.6	2.5	2.7	3.1	3.0	2.8	2.5	2.1	2.0	2.1	2.5
Gaziantep	2.0	2.1	2.3	2.3	2.2	3.0	3.3	2.6	1.9	1.4	1.3	1.6	2.2
Sanliurfa	2.4	2.6	2.8	2.7	2.7	3.7	3.9	3.3	3.0	2.2	2.0	2.0	2.8
Diyarbakir	2.2	2.7	2.9	2.6	2.4	3.2	3.7	3.3	2.8	2.2	1.6	1.7	2.6
Mardin	2.9	3.2	2.9	2.6	2.4	2.7	2.5	2.4	2.2	2.3	2.5	2.8	2.6
Siirt	1.4	1.7	2.0	2.0	1.8	2.0	2.0	2.0	2.0	1.8	1.5	1.4	1.8

(5) Evaporation (mm)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Adiyaman	-	-	-	120.9	180.1	276.8	354.4	330.0	249.6	146.3	69.3	-	-
Gaziantep	22.4	26.6	55.7	90.4	132.8	215.9	286.6	278.6	185.8	99.8	47.0	24.8	1,466
Sanliurfa	35.0	46.4	72.9	113.6	180.0	292.4	384.7	372.8	269.3	163.6	77.1	39.9	2,048
Diyarbakir	26.1	39.7	70.2	96.5	142.6	266.5	400.7	389.1	280.1	146.4	50.9	26.5	1,935
Mardin	-	-	-	-	266.0	383.0	444.0	400.0	300.7	180.0	-	-	-
Siirt	-	-	-	119.2	192.0	303.5	404.4	379.5	278.4	144.7	-	-	-

Sources : 1984 Bulletin, DMI and 1980 GAP, DSI

Table E.4 Mean Annual Rainfall at DMI's Stations

Province	Name of Station	Data Length (Year)	Mean Annual Raintall (mm)
SANLIURFA	S.Urfa	54*	470
	Akcakale	15*	331
	Viransehir	27*	540
	Siverek	50	548
	Birecik	28	375
	Ceylanpinar	31	330
	Bozova	19	407
	Hilvan	22	467
	Akziyaret	13	389
	Bogurtlen	13	395
	Camlidere	13	388
	Dagbasi	11	492
	Halfeti	16	490
	Kabahaydar	10	415
	Kanliavsar	10	366
	Karacadag	12	372
	Karakeci	9	376
	Mursitpinar	11	284
	Suruc	24	360
	Demirci	10*	587
ADIYAMAN			
	Adiyaman	48	783
	Besni	34	778
	Akincilar	14	697
	Akpinar	17	584
	Celikhan	23	882
	Gerger	17	1026
	Golbasi	9	811
	Kahta	23	675
	Narince	15	866
	Samsat	17	520
	Sencik	13	944
DIYARBAKIR			
	Diyarbakir	55*	495
	Ergani	20	779
	Hani	15	1050
	Kulp	22	1129
	Cermik	23	822
	Silvan	17	752
	Akcasir	9	1073
	Bismil	8	445
	Cinar	12	380
	Cungus	14	1055
	Dicle	21	886
	Hamzali	4	1198
	Lice	21	1306
	Mermer	9	721
	Hazro	13	1108
	Tepe	4	358
MARDIN			
	Mardin	47*	726
	Cizre	47	679
	Nusaybin	31	453
	Derik	15	707
	Kiziltepe	30	467
	Savur	20	476
	Akarsu	11	632
	Dargecit	13	709
	Gercus	15	704
	Haberli	11	908
	Idil	17	751
	Mazidagi	21	588
	Midyat	15	591
	Omerli	14	572
	Senyurt	17	390
	Kocatepe	9	374
	Kayapinar	9	563
GAZIANTEP			
	Gaziantep	51	561
	Kilis	54	520
	Islahiye	36	851
	Nizip	24	458
	Oguzeli	11	465
	Araban	17	545
	Barak	13	340
	Elbeyli	12	405
	Musabeyli	5	564
	Polateli	2	460
	Sakcagoz	6	744
	Yavuzeli	17	512
	Akcakoyunlu	3	328
SIIRT			
	Siirt	55*	722
	Batman	19	510
	Kurtalan	21	645
	Baykan	24	993
	Silvan	21	794
	Pervari	22	681
	Sirnak	23	805
	Aydinlar	14	648
	Besiri	21	597
	Eruh	20	819
	Kozluk	13	1039
	Sason	18	1259
	Yanarsu	5	815
	Doganca	8	629

Source : Annual Bulletin, DMI

Note: Longer records may be available for some stations, especially for those denoted by asterisk "*" (Guneydogu Anadolu Projesi, DSI, Ankara, 1980)

Table E.5 Long Term Rainfall at Provincial Centers

(Unit: mm)

	Gaziantep	Adiyaman	Sanliurfa	Diyarbakir	Mardin	Siirt
1931			432.0	379.0		546.8
1932			157.6	206.2		618.1
1933	824.2		416.1	466.1		788.3
1934	538.3			498.3		641.0
1935	894.9			531.1		877.7
1936	579.1			567.3		817.5
1937			354.6	379.9		624.1
1938		1006.0	584.3	487.8		806.7
1939	613.4	689.1	440.9	365.5	717.9	700.2
1940	692.3	922.0	535.6	491.8	497.4	687.2
1941	384.2	535.8	420.9	394.8	595.3	598.5
1942	642.7	718.0	543.7	591.0	881.4	920.2
1943	542.9	704.0	508.2	511.8	603.5	604.3
1944	677.7	873.9	494.8	660.5	682.7	738.6
1945	439.7	616.8	340.7	393.1	608.0	475.2
1946	607.7	880.7	462.0	627.7	794.7	615.3
1947	491.2	745.8	354.0	402.0	687.5	666.1
1948	689.1	897.4	438.4	592.1	810.3	837.5
1949	436.3	585.7	521.1	471.0	621.3	824.1
1950	476.1	647.8	527.5	583.4	597.5	1034.8
1951	583.3	480.3	425.3	498.3	660.0	1089.0
1952	542.7	607.6	460.4	460.9	789.8	1109.1
1953	725.0	1242.8	548.8	668.8	728.3	1082.9
1954	730.9	2062.2	790.9	649.5	1029.3	1042.7
1955	401.2	1069.6	414.3	503.0	667.6	656.5
1956	439.8	791.8	348.9	405.1	591.0	537.8
1957	424.7	1434.9	536.7	598.5	897.2	859.8
1958	346.9	658.7	373.8	438.9	470.2	596.2
1959	366.9	499.6	323.9	414.1	487.0	614.7
1960	451.4	675.8	449.8	355.4	472.7	524.0
1961	518.7	941.8	544.2	452.5	753.2	600.5
1962	461.5	738.5	423.5	434.2	499.8	604.6
1963	625.5	872.2	655.4	749.1	981.6	1229.1
1964	488.1	665.7	452.5	329.6	566.0	627.6
1965	640.9	746.9	491.4	475.8	732.8	696.9
1966	554.1	839.5	336.1	526.1	607.9	709.3
1967	714.4	1020.0	787.4	730.5	1188.1	1029.5
1968	802.5	977.0	618.3	662.2	1045.7	938.5
1969	677.1	1006.9	777.5	618.0	955.1	912.6
1970	330.6	443.7	254.9	236.0	411.2	430.8
1971	540.4	650.8	532.8	472.5	733.5	622.3
1972	568.1	555.1	410.2	505.1	772.9	697.9
1973	325.1	467.6	219.3	271.5	427.0	431.8
1974	584.7	686.6	460.2	508.1	712.3	474.0
1975	544.2	633.2	467.4	418.9	666.4	590.2
1976	766.3	1060.3	696.3	734.5	981.1	839.2
1977	490.6	570.6	375.6	441.8	524.6	573.9
1978	517.6	573.3	346.1	440.1	896.2	740.4
1979	518.4	691.2	488.5	566.9	759.3	766.1
1980	611.3	857.0	461.3	566.4	879.0	550.1
1981	586.5	881.7	521.7	536.3	878.6	810.6
1982	398.3	485.6	348.0	528.3	988.1	691.7
1983	521.1	720.9	509.1	469.4	630.4	696.8
1984	529.6	624.5	381.8	349.0	404.9	515.6
1985	478.6	534.4	462.0	555.5	744.0	722.3
Average	555.6	783.2	465.9	494.0	715.5	727.9

Source:Annual Bulletin, DMI

Table E.6 Evaluation of Hydrological Records in Firat River

Station no.	Station name	Stream	Catchment area	Available Record period	Evaluation
2103	Keban	Firat main	63,874 km²	1936.8 -1984	After 1974, Keban discharges have been affected by the operation of Keban resrvoir. Natural discharges at Keban were estimated from the relation between Keban and 5 stations upstream of Keban reservoir. They are Dazlak(2167), Bigistas(2156), Melekbahce(2133), Logna(2166) and Palu(2102)
2105	Karakaya	Firat main	80,421 km²	1961.11 -1984	1937-1959: correlation with 2103 1960-1980: calculated from relation among 2105,2110,2153,2114 and 2140 1974-1980: converteed to natural runoff
2140	Dutluca (Ataturk)	Firat main	92,654 km²	1961.4 -1984	1937-1959: correlation with 2103 and 2105 1960-1980: calculated from relation among 2103 and 2114 1974-1980: converteed to natural runoff
2170	Belkiskoy (Birecik)	Firat main	100,702 km²	1973.6 -1984	1937-1959: correlation with 2103, 2105 and 2140 1960-1973: multiplying an areal ration to 2114 discharges 1974-1980: converted to natural runoff
	Karkamis	Firat main	102,876 km²		1937-1980:Birecik discharges multiplied by 1.01
2115	Malpinar	Goksu	3,990 km²	1953.2 -1984	
2135	Fatopasa	Bulam/Kahta	166 km²	1962.12 -1984	
2160	Danaoglu	Nizip	1,020 km²	1968.12 -1984	
21-93	Meryem Usagi	Goksu	1,916 km²	1968 -1984	

Sources : The feasibility reports concerned

Table E.7 Evaluation of Hydrological Records in Dicle River Basin

Station no.	Station name	Stream	Catchment area	Available Record period	Estimated from
26-01	Dipni	Amini	1,397 km²	1960.1 - 1964.9	1946 -1960 : correlation with 2605 1965 -1984 : correlation with 2605 1966.Jan,1967.Mar and Apr,1968 Mar, 1969.Jan and Mar.: correlation with 2617
2602	Sinan	Batman	4,988 km²	1945 - 1964 1967 - 1968	1965 -1966 : correlation with 2612 1969 -1984 : correlation with 2612
2603	Besiri	Garzan	2,450 km²	1946 - 1960 1962 - 1984	1961 : correlation with 2606
2605	Diyarbakir	Dicle main	5,799 km²	1946 - 1952 1955 - 1984	1953 -1955 : correlation with 2603
2606	Cizre	Dicle main	38,295 km²	1969 - 1984	1946 -1955 : correlation with (2602+2603+2605+2626) 1955 -1968 : correlation with 2611
26-09	Devegecidi	Devegecidi	1,607 km²	1960.12- 1964.9 1972. 3- 1976.12	1946 -1960 : correlation with 2605 1964 -1984 : correlation with 2605
2611	Rezuk	Dicle main	34,493 km²	1955 - 1962 1964 - 1968 1972 - 1975	1946 -1955 : correlation with (2602+2603+2605+2626) 1969 -1971 : correlation with 2606 1975 -1984 : correlation with 2606
2612	Malabadi	Batman	4,105 km²	1961 - 1962 1965 - 1984	1946 -1960 : correlation with 2603 1963 -1964 : correlation with 2603
2613	Huseyincan	Batman	3,428 km²	1959 - 1961	
2617 (26-02)	Cayonu	Dicle main	1,330 km² 1,186 km²	1961.10- 1984 1968.11- 1984	1946 -1961 : correlation with 2605
2623	Ilisu	Dicle main	35,517 km²	-	1946 -1984 : areal ratio between 2606 and 2611
2626	Billoris	Botan	7,989 km²	1945 - 1984	--
	Dicle dam	Dicle main	3,216 km²	--	1945 -1984 : calculated from 2601, 2605, 2609 and 2617
26-46	Kemuk	Batman	2,620 km²	1977.4 - 1981.2 1982.11- 1984	1946 -1977 : correlation with 2612 1981 -1982 : correlation with 2612
2625	Girikhan	Hezil	1,127 km²	1971.10- 1984	1964 -1971 : Correlation with 2626

Sources : The feasibility reports concerned, EIE

Table E.8 Annual Runoff at Major Stations*

Station		Catchment area (Km^2)	Annual Runoff Volume (10^6 m^3) Average year	Critical Year 1961	Critical Year 1973
Firat River System					
Keban	(Firat main)	63,874	20,627	10,107	17,023
Karakaya	(Firat main)	80,421	23,717	12,252	14,492
Ataturk	(Firat main)	92,654	26,781	13,843	15,624
Belkiskoy	(Firat main)	100,702	30,377	14,883	18,835
Malpinar	(Goksu)	3,990	1,804	1,034	644
Dicle River System					
Diyarbakir	(Dicle main)	5,655	2,287	892	745
Rezuk	(Dicle main)	34,493	14,919	6,673	8,389
Cizre	(Dicle main)	38,281	16,718	7,885	9,667
Sinan	(Batman)	4,988	4,454	1,054	2,071
Billoris	(Botan)	7,989	4,524	3,042	3,897

* Prepared by the Consultant

Table E.9 Hydrological Balance at Major Points

	Balance point (basin name)	Catchment area (km^2)	Basin mean rainfall (mm)	Runoff depth (mm)	Runoff coefficient (%)	Loss (mm)
Firat						
	Keban	64092	614	323	53	291
	Karakaya	80358	575	296	51	279
	Keban-Karakaya sub-basin	16266	421	192	46	229
	Ataturk	92338	586	294	50	292
	Karakaya-Ataturk sub-basin	11980	663	276	42	387
	Birecik	100702	585	302	52	283
	Ataturk-Birecik sub-basin	8364	572	389	68	183
	Karkamis	102612	582	299	51	283
Dicle						
	Kiralkizi dam	1330	852	589	69	263
	Dicle dam	3216	879	607	69	272
	Dicle-Kiralkizi sub-basin	1886	897	620	69	277
	Devegecidi	1607	694	131	19	563
	Dicle-Diyarbakir sub-basin	832	628	180	29	448
	Diyarbakir	5655	789	409	52	380
	Batman dam	4105	1129	997	88	132
	Batman-Sinan sub-basin	883	727	474	65	253
	Sinan (Batman river)	4988	1058	904	85	154
	Besiri (Garzan river)	2450	975	644	66	331
	Billoris (Botan river)	7989	702	566	81	136
	Rezuk	34493	784	435	55	349
	Middle reaches (Diyarbakir-Rezuk)	5969	512	213	36	299
	Ilisu	35509	784	435	55	349
	Rezuk-Ilisu sub-basin	984	791	488	62	303
	Cizre	38281	786	439	56	347
	Ilisu-Cizre sub-basin	2772	810	471	58	339

Sources : The feasibility reports concerned

Table E.10 List of Water Resources Facilities

A- Existing facilities

Project	River system	Province	Purpose	Type	Projet group	Capacity(MW)	Energy(GWh)
1) Dam and HPP			(*)				
Karakaya (1st)	Firat	Diyarbakir	HP	Dam & HPP	Karakaya	900	3,500
Devegecidi	Dicle	Diyarbakir	IR	Dam	Dicle-Kralkizi		
Gozegol	Dicle	Diyarbakir	IR	Dam			
Cagcag-III	Firat	Mardin	HP	Run-of-river		14	42
Botan	Dicle	Siirt	HP	Run-of-river		2	6
Tahtakopru	Hatay	Gaziantep	IR	Dam			
Keban (**)	Firat	Elazig	HP	Dam & HPP		1,360	5,758
Kaltarkaya (**)	Ceyhan	K.Maras	IR,MW	Dam			

2) Irrigation system

	Province	Water source	Irrigation area (ha)
Nusaybin irrigation	Mardin	CagCag III	6,900
Devegecidi irrigation	Diyarbakir	Dam	7,500
Silvan irrigation	Diyarbakir	Weir	8,500
Ceylanpinar irrigation	Sanliurfa	Ground water	9,000
Akcakale irrigation	Sanliurfa	Ground water	13,800

B- Under construction facilities

1)Dam and HPP

	River	Province	Purpose	Type	Project	Capacity(MW)	Energy (GWh)
Karakaya(2nd)	Firat	Diyarbakir	HP	HPP	Karakaya	900	3,854
Ataturk	Firat	Sanliurfa	HP,IR	Dam & HPP	Lower Firat	2,400	8,100
Urfa tunnel	Firat	Sanliurfa	HP,IR,MW	Transfer tunnel & HPP	Lower Firat	48	124
Hacihidir	Firat	Sanliurfa	IR	Dam	Sirevek-Hilvan		
Batman	Dicle	Diyabakir	HP,IR	Dam & HPP	Batman	185	483
Dicle	Dicle	Diyabakir	HP,IR	Dam & HPP	Dicle-Kralki	110	298
Kralkizi	Dicle	Diyabakir	HP,IR	Dam & HPP	Dicle-Kralki	94	146
Hancagiz	Firat	Gaziantep	IR	Dam	Gaziantep		
Goksu	Dicle	Diyarbakir	IR	Dam			
Dumluca	Firat	Mardin	IR	Dam			

2)Irrigation system

	Province	Project group	Irrigation area (ha)
Batman irrigation	Diyarbakir	Batman	38,000
Dicle-Kralkizi irrigation	Diyarbakir	Dicle-Kralkizi	126,080
Urfa-Harran irrigation	Sanliurfa	Lower Firat	141,535
Kozuluk-Garzan irrigation	Siirt	Garzan	3,700
Silopi-Nerdus irrigation	Mardin	Cizre	2,740
Hacihidir irrigation	Sanliurfa	Siverek-Hilvan	2,080
Cinar-Goksu irrigation	Diyarbakir		3,582
Derik-Dumluca irrigation	Mardin		1,860

* HP: Hydroelectric power development, IR: Irrigation development
MW: Municipal water supply

** outside the region

Sources : The feasibility reports concerned

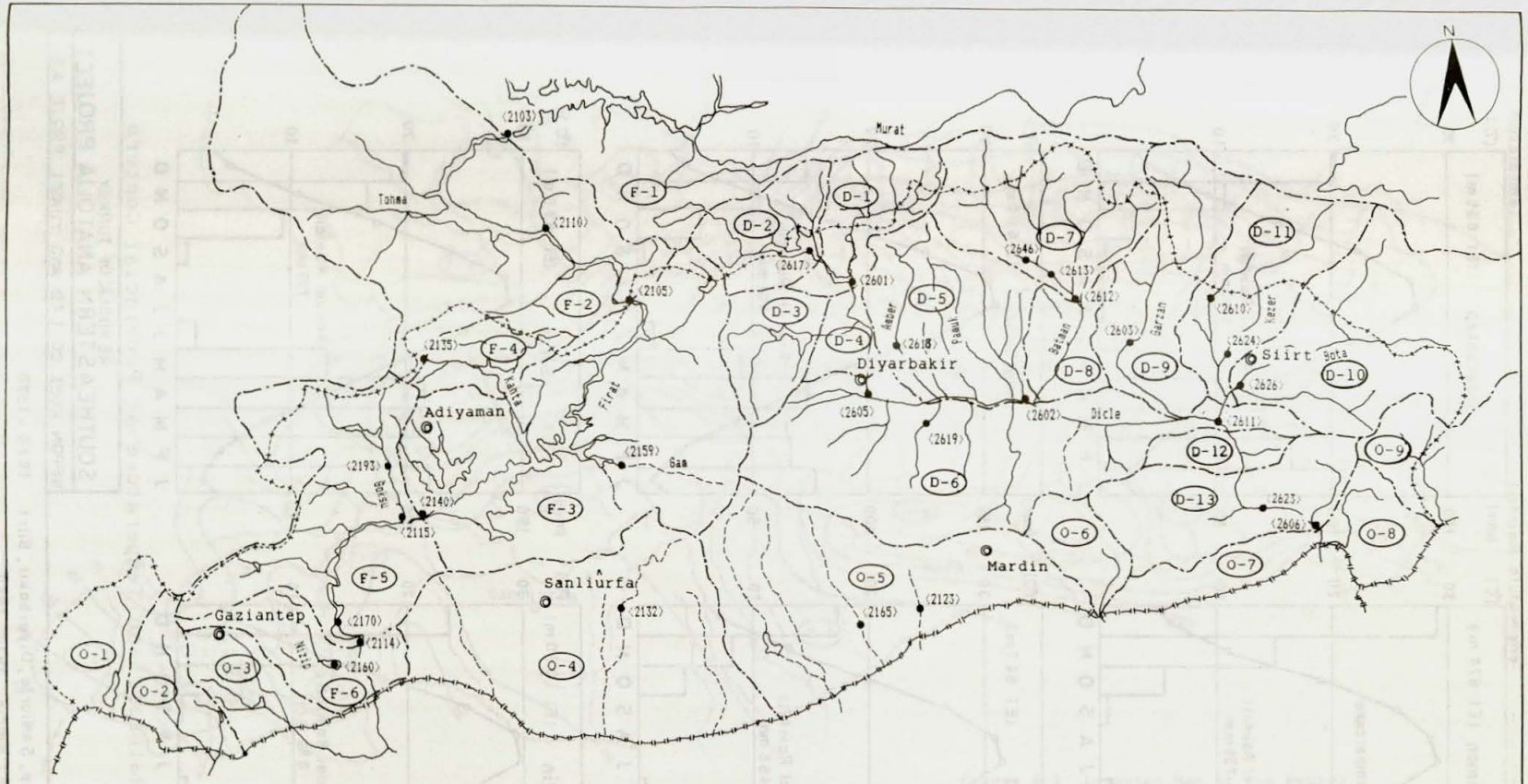

Figure E.1 Location Map of Hydrological Stations

Basin No.	Name of basin
F-1	Keban dam basin
F-2	Karakaya dam sub-basin
F-3	Ataturk dam sub-basin
F-4	Kahta dam basin
F-5	Birecik dam sub-basin
F-6	Karkamis dam sub-basin

Basin No.	Name of basin
D-1	Dicle dam basin
D-2	Kralkizi dam basin
D-3	Devegecidi dam basin
D-4	Diyarbakir sub-basin
D-5	Amber tributaries basin
D-6	Middle reaches tributaries basin
D-7	Batman dam basin
D-8	Batman river basin
D-9	Garzan river basin
D-10	Botan river upstream basin
D-11	Kezer river basin
D-12	Ilisu dam sub-basin
D-13	Cizre dam sub-basin

Basin No.	Name of basin
O-1	Karasu river
O-2	Gaziantep sub-basin(I)
O-3	Gaziantep sub-basin(II)
O-4	Urfa sub-basin
O-5	Mardin sub-basin(I)
O-6	Cag cag dam basin
O-7	Mardin sub-basin(II)
O-8	Silopi basin
O-9	Hezil river basin

<1234> : Station number

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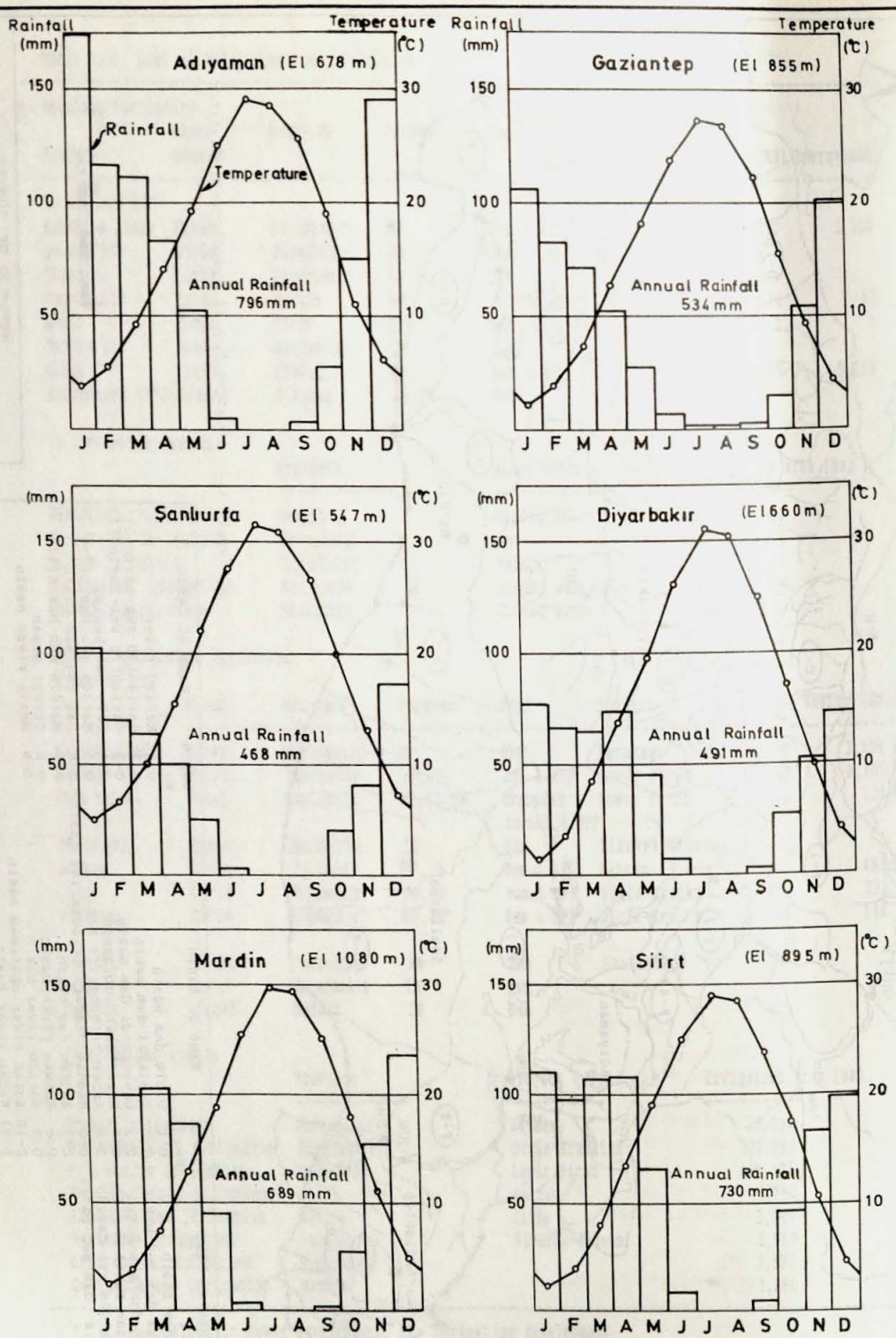

Figure E.2 Rainfall and Temperature at Provincial Centers

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Source: DMI, Gaziantep, Şanlıurfa, Diyarbakır, Siirt 1929-1980
Adıyaman, Mardin 1938-1980

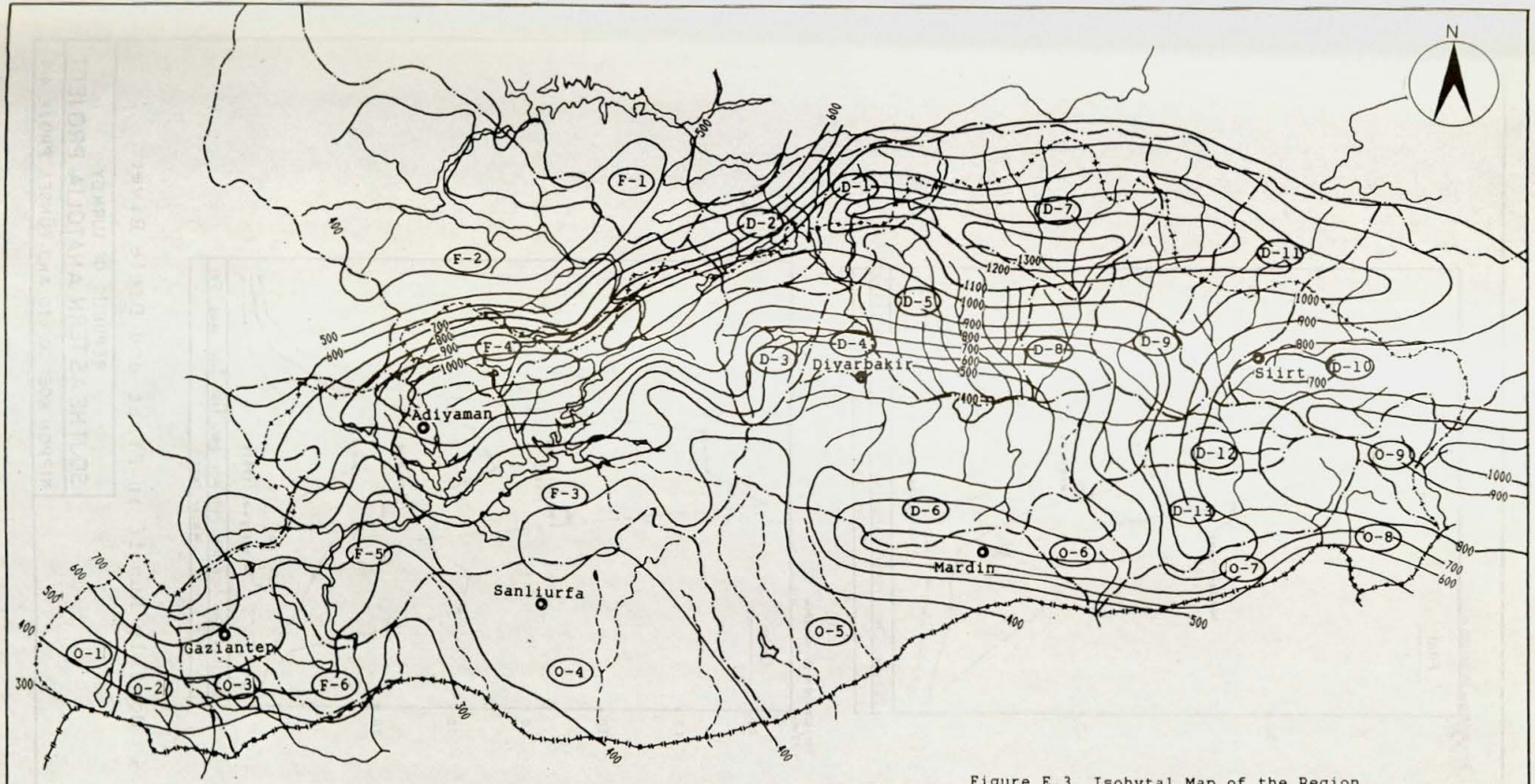

Figure E.3 Isohytal Map of the Region

Basin No.	Name of basin
F-1	Keban dam basin
F-2	Karakaya dam sub-basin
F-3	Ataturk dam sub-basin
F-4	Kahta dam basin
F-5	Birecik dam sub-basin
F-6	Karkamis dam sub-basin

Basin No.	Name of basin
D-1	Dicle dam basin
D-2	Kralkizi dam basin
D-3	Devegecidi dam basin
D-4	Diyarbakir sub-basin
D-5	Amber tributaries basin
D-6	Middle reaches tributaries basin
D-7	Batman dam basin
D-8	Batman river basin
D-9	Garzan river basin
D-10	Botan river upstream basin
D-11	Kezer river basin
D-12	Ilisu dam sub-basin
D-13	Cizre dam sub-basin

Basin No.	Name of basin
O-1	Karasu river
O-2	Gaziantep sub-basin(I)
O-3	Gaziantep sub-basin(II)
O-4	Urfa sub-basin
O-5	Mardin sub-basin(I)
O-6	Cag cag dam basin
O-7	Mardin sub-basin(II)
O-8	Silopi basin
O-9	Hezil river basin

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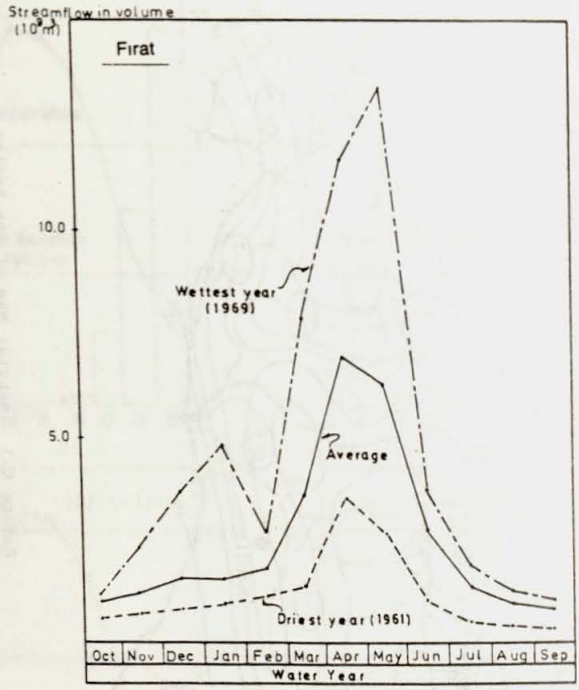

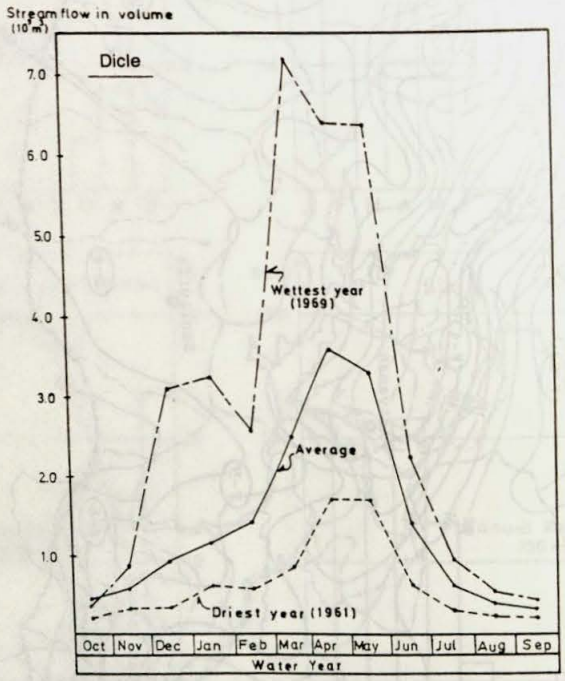

Figure E.4 Monthly Runoff in Firat and Dicle Rivers

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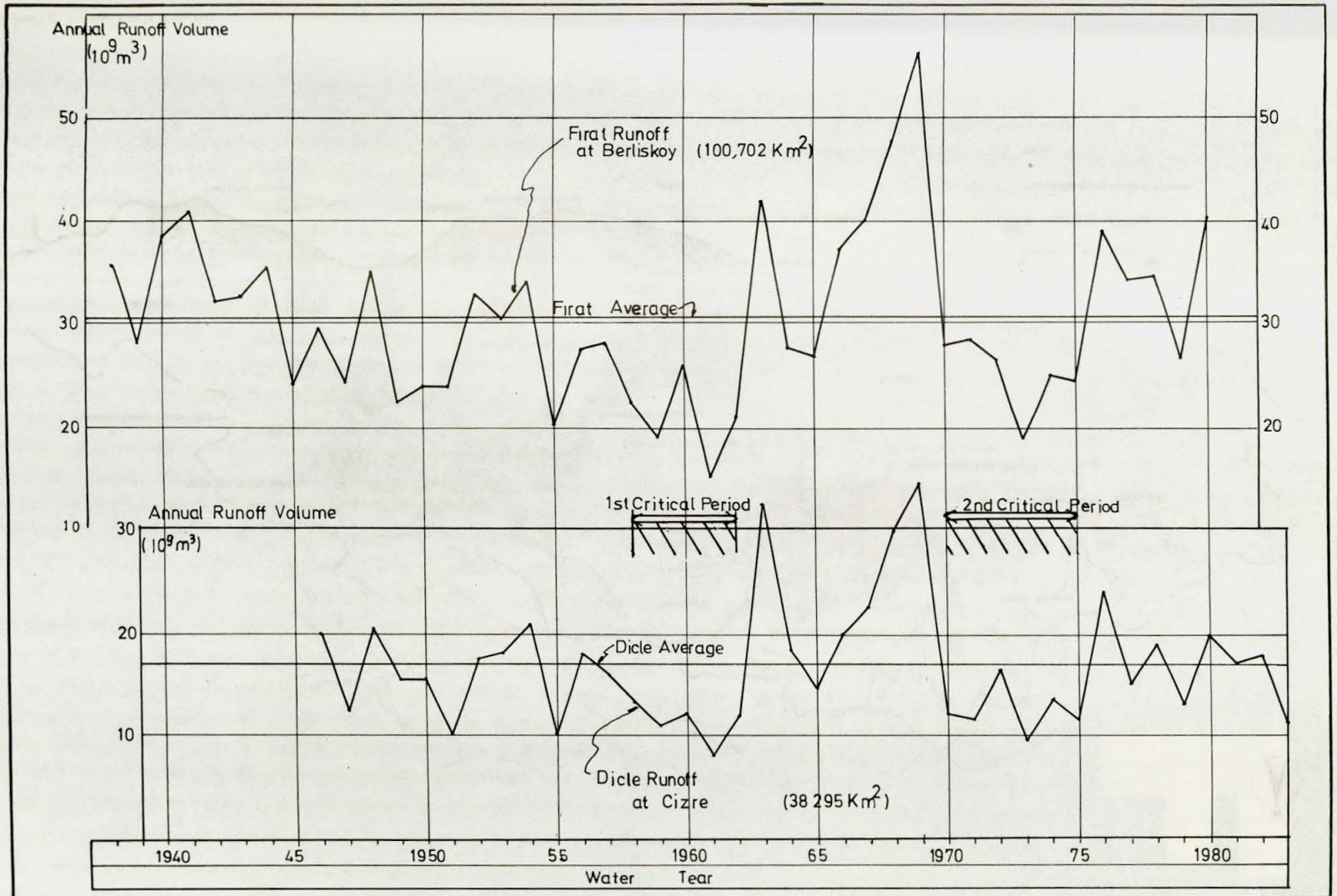

Figure E.5 Historical Annual Runoff in Firat and Dicle Rivers

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Figure E.6: Location Map of Water Resources Development Schemes in the Region

F

APPENDIX F
PRESENT CONDITIONS AND PROSPECTS OF ENERGY SECTOR

CONTENTS

TABLES

1. Present Conditions F-1
   1.1 Energy situation in Turkey F-1
   1.2 Energy policy and prospects in Turkey F-4
   1.3 Present energy situation in GAP region F-8

2. Energy Prospects in GAP Region F-10
   2.1 Energy demand structure and growth F-10
   2.2 Supply prospect F-12

Appendix F : PRESENT CONDITIONS AND PROSPECTS OF ENERGY SECTOR

1. Present Conditions

1.1 Energy situation in Turkey

(1) Energy demand and supply

Overall demand/supply

The total amount of primary energy consumed in Turkey, including non-commercial energy, was 44 million tons of oil equivalent (Mtoe) in 1986. The average annual growth of primary energy consumption was 4.2 % during 1975-86. The gross national product (GNP) increased at 4.0 % annually during the same period, implying the elasticity of energy demand to GNP 1.05. Per capita energy consumption increased from 703 kg of oil equivalent (koe) in 1975 to 861 koe in 1986.

Primary energy consumption by sector is given in Table F.1. The residential sector, including households and services, is the largest consumer accounting for 34 % of the total consumption in 1986, although its share is steadily decreasing. The industrial sector is slowly increasing its share to reach 25 % in 1986, followed by the transportation sector claiming 15 % in the same year.

As shown in Table F.2, petroleum is the most significant supplier of primary energy, contributing to 44 % of the total consumption in 1986. In the same year, coal including hard coal, lignite and asphaltite accounted for 30 % of the total energy use, non-commercial energy 19 % consisting of wood, animal and plant wastes and solar, hydropower and geothermal 6 %, and imported electricity and natural gas made up the balance.

In the past decade, the petroleum consumption has decreased its share and been replaced by a greater use of hydropower and lignite (primary for thermal power generation). The sharp increases in petroleum prices in 1970's, foreign exchange shortages and phasing out of subsidies for petroleum and its products are primarily responsible for this shift.

Domestic production of energy has been growing steadily, recording the average annual growth of 4.7 % during 1975-86 (Table F.3). However, the energy deficit represented by energy imports is growing. Nearly 50 % or 22.1 Mtoe of the national energy requirements in 1986 were met by imports, consisting of 90.2 % oil, 9.2 % coal and 0.3 % electricity. Detailed energy supply-demand balance in Turkey in 1986 are shown in Table F.4.

Petroleum products

Of the total consumption of petroleum products in Turkey, diesel oil accounts for the largest share (40-47 %, depending on data

sources), followed by fuel oil (27-39 %), motor gasoline (12-15 %), LPG (7-9 %) and kerosene (2 %). Almost all LPG and kerosene were consumed in 1985 by household and commercial/services sectors (International Energy Agency, Energy Statistics of OECD Countries, 1987). Over 98 % of motor gasoline and 72 % of diesel oil were consumed by transport sector. Agriculture consumed 26 % of diesel oil, and industry 2 %. Of fuel oil, 75 % was consumed by industry, 21 % by household and commercial/service sectors, and 4 % by transport sector.

Electricity

The present installed power capacity in Turkey is 10,100 MW, consisting of 6,200 MW thermal and 3,900 MW hydro (Table F.5). The share of hydro-electric power increased from 32 % in 1970 to 38 % in 1986. Lignite is increasing its contribution to thermal power generation (Table F.6).

Electricity generation increased from 34,200 GWh in 1985 to 39,700 GWh in 1986, of which the Turkish Electricity Authority (TEK) generated 90 %. Imports from USSR and Bulgaria accounted for 6 % of the consumption. Imports decreased sharply in 1986 (Table F.7). In 1986, 47 % of total gross generation was from lignite, 30 % from hydropower, 18 % from oil products, 3 % from natural gas, 2 % from hard coal and 0.1 % from geothermal sources (Table F.6).

Electricity accounted for 8.1 % of the total energy consumption in 1986. The share more than doubled since 1970. This is primarily due to the rapid growth of the industrial sector, which accounted for 64 % of the total electricity consumption in 1986. Electricity supply has been insufficient in meeting the demand since 1975 (Table F.7).

(2) Energy resources

Hydropower

Economically viable hydropower potential is estimated at 32,700 MW and annual energy of 118,000 GWh under average hydrological conditions. Only 12% of the potential has been developed.

Lignite

Proven and probable lignite reserves are 7.9 billion tons(Table F.8). Nearly half of the reserves are in the Afsin-Elbistan basin in the Southeastern part of Turkey, having very low quality (1,000 - 1,050 kcal/kg). Lignite is mined usually by open cut methods, but there are some underground mines near Beypazari. Lignite production is increasing as additional deposits are put in services, and a sevenfold increase was realized in the last 17 years. Lignite production was 42 million tons in 1986 or 8.9 Mtoe.

Coal

Total known hard coal reserves are estimated at 1,4 billion tons, all located in the northern Turkey (Zonguldak). Coal production has been declining as operations move to deeper, less accessible seams. Coal production was 3.5 million tons in 1986 or 2.2 Mtoe.

Crude oil

Proven recoverable oil reserves are 21 million tons. However, potential reserves that may become economically recoverable using enhanced oil recovery techniques currently tested could be as high as 30 million tons. Oil production has been declining over the last decade, as few discoveries have been made. TPAO (State-owned Turkish Petroleum Company) produced the highest 2.6 million tons in 1987, 10 % increase from 1986 production, which however did not much improve the Country's oil bills.

Natural gas

Proven recoverable gas reserves are 15 billion m^3 . In 1982, a large deposit of natural gas with the total estimated reserves of 12,800 million m3 was discovered at Hamitabat. However, this together with the minimal output from the Camurlu field in the southeast will not be sufficient for the role that the Government sees for gas in fuelling industrial growth and replacing sulfurous, smokey and slow-burning lignite as a clean fuel for power generation and home heating. The limited domestic production has been supplemented by imports from USSR.

Geothermal

There exist promising geothermal reserves in the Country. Probable reserves estimated on the basis of past studies and surveys are 31,000 MW for space heating and 4,500 MW for electricity generation. The most promising geothermal fields are concentrated mainly in the western Anatolia. Steam or hot water reservoirs capable of driving turbines have been found at Kizildere near Denizli, Seferihisar near Izmir, near Afyon and Tuzla near Canakkale. Power is already produced from a 22 MW geothermal unit at Kizildere, commissioned in 1984 as the Turkey's first such unit. The State Mineral Research and Prospecting Institute (MTA) is exploring other reserves at Kaynarca near Izmir.

Nuclear

No nuclear power plant exists in Turkey, but proven recoverable reserves of uranium are 8,800 tons and those of thorium are 380,000 tons.

(3) Organizations

The energy sector in Turkey is characterized by the dominance by Government owned enterprises and agencies. The Ministry of Energy and Natural Resources (MENR) has overall responsibility for the development of energy resources in Turkey. The Turkish Hard Coal

Enterprises (TTK), the Turkish Lignite Enterprises (TKI), the Turkish Petroleum Company (TPAO), and the Mineral Research and Prospecting Institute (MTA) have responsibility for extraction of respective fossil fuels and radioactive minerals. Identification, design and construction of hydroelectric projects is entrusted to the General Directorate of State Hydraulic Works (DSI). According to the protocol made with DSI, the General Directorate of Electrical Power Resources Survey (EIE) is responsible for carrying out hydrological studies and geotechnical investigations in order to evaluate the Nation's hydroelectrical potential and subsequently prepare feasibility and final design studies of identified hydroelectric projects. The Turkish Electricity Authority (TEK) is responsible for the generation, transmission and, since November 1982, the distribution of almost all the electricity sold in Turkey. TEK is also responsible for the implementation of the Government's program for rural electrification and the construction of all generating and transmission facilities, with the exception of hydroelectric plants for which DSI has responsibility.

Private sector participation in the supply of electricity was confined until 1983 to two small private utilities (CEAS and KEPEZ) and industrial companies which generated power for their own use. However, recent changes in Government energy policy now give greater encouragement to private sector participation in the development and production of energy. The Government is actively seeking ways to encourage both local and foreign private sector participation in geothermal development, lignite mining, hydroelectric projects and the construction and operation of power plants fired by imported fuels.

1.2 Energy policy and prospects in Turkey

(1) Energy policy

Overall policy

Energy consumption, development and industrialization are interrelated in energy economy. The energy is a very important element in boosting the development and in general for well-being of people. The most important elements in the future growth of energy demand will be the growth rate of economy as a whole and the growth rate of the relatively energy intensive industrial sector. On the other hand expected increases in the energy efficiencies of the economy would allow to control and manage the growth in final energy demand.

Recognizing the crucial importance of adequate energy supplies for balanced economic growth, the Government assigned a priority to the energy sector in the structural adjustment currently under way. To ensure these policy objectives, the current Fifth Five Year Development Plan (1985-1989) contains some broad objectives relevant to the energy sector including the following:

- priority will be given to domestic sources of energy provided that they are economically feasible; power plants based on lignite and hydro-electricity plants will be given priority;

- besides importing oil, it will also be necessary to import other primary energy inputs (coal and natural gas) and also perhaps electricity from neighboring countries;

- efforts to use renewable energy sources (solar, geothermal, and biogas) will be supported;

- private sector and foreign investment will be sought for exploration and development of oil reserves (on and off-shore);

- efficient distribution of electricity will be given priority; and

- electricity losses (incurred during generation, transmission and distribution) will be curtailed by imported technology and management operations.

Investment

The energy sector has recently become a priority sector for the public sector investment. It received 24 % of the total public sector investment in 1985. Also the energy sector was the second largest sector receiving foreign financing.

Turkey is one of few countries in the developing world to have invested considerable sums in research and development of alternative energy. The potentials of alternative energy have been evaluated in meeting the present and future domestic energy needs, including the new/renewable.

New/renewable energy

In the overall energy policy, the Government has been focusing its efforts also on new/renewable energy, particularly solar, geothermal and biogas. The Ministry of Energy and Natural Resources coordinates and supervises activities aimed at making solar energy to contribute more effectively to the national energy balance. EIE has been entrusted with the task of formulating and carrying out a national solar energy action program in close collaboration with all the related agencies and institutes. EIE is also responsible for keeping abreast of technologies related to wind energy.

Activities for the promotion and utilization of biogas are being conducted with the sponsorship of the Ministry of Agriculture,

Forestry and Rural Affairs. Nearly 300 family type biogas digestors were made by TOPRAKSU for demonstration and research purposes. A joint research and development project has been implemented with UNICEF to demonstrate biogas technology under different climatic conditions for wider propagation. A biogas plant of 35 m^3 capacity was designed for the eastern provinces. The General Directorate of Forestry is engaged in research on the fast growing trees for plantations.

Village electrification

The village electrification program constitutes a part of the Government's social policy for providing basic services to rural areas. By the end of 1986, 94 % of the villages in Turkey had been connected to the national grid (Table F.9). The Government's target is to electrify the remaining village by 1990.

(2) Energy prospects

Overall prospect

The Ministry of Energy and Natural Resources has been using a simulation model (Model for Analysis of Energy Demand ; MAED) to evaluate medium- and long-term demand for energy in Turkey. Primary energy demand and production forecast for the period 1988-2010 is given in Table F.10. Primary energy demand is projected to grow at an annual rate of 5.9%, while domestic primary energy production may grow only at 4.7%. Thus the gap between the demand and the supply will tend to enlarge, and increasing amount of demand will have to be met by imports.

Of all the domestic energy sources, lignite and hydropower will meet the respective demand fully. Lignite and hydropower production is expected to grow at 3.8% and 8.5% per annum, respectively. Demand for coal, natural gas, and petroleum will grow at 9.5%, 10.1% and 4.7% per annum, respectively. The incremental demand will be met largely by increasing imports.

Electricity

The growth in electricity demand averaged 9 % per annum during 1965-83. The percentage of population with public electricity supply increased from 51 % in 1970 to 78 % in 1983. Per capita annual electricity consumption increased from 207 kWh in 1970 to 690 kWh in 1987 (Table F.7).

According to the current medium- and long-term forecasts prepared by TEK's long-term generation plan, demand for electricity (GWh) and peak demand (MW) will grow respectively at 12 % per annum to 1990.Beyond 1990 TEK projects a growth in peak demand at 9.5 % per annum to 2000, followed by 7 % to 2010. This implies a continuation of the high (1.3-1.8) elasticities with respect to GDP and sectoral (primarily industrial) growth rates at least until 2000.

The Government clearly recognizes that the shift to indigenous energy sources will depend primarily on its ability to bring on-stream lignite and hydro based power in a more timely manner. In fact, the Fifth Plan targets, relating to a reduction in the energy deficit, depend critically on a 17.8 % annual rate of growth in lignite production and a 14.7 % annual rate of growth in hydroelectric power generation by the end of 1989.

Much of the pace will be set by hydroelectric power which already accounts for 30-40 % of Turkey's electricity outputs. There are more than 300 hydroelectric projects either under way or being actively promoted and the Government is processing more than 50 mainly small-scale applications with a view to using the private sector BOT (Build-Operate-Transfer) model. The greatest single contribution will come from the 2,400 MW Ataturk dam.

(3) Prospects for new/renewable energy

The following is mainly a direct reference to a comprehensive report recently made on the subject (C.Para, Ministry of Energy and Natural Resources, A. Ecevit, Middle East Technical University presented in "Alternative Energy Sources 7, Vol.6, Page 285-297, 1987").

Solar energy

Among the alternative energy sources currently under investigation, solar energy seems one of the most promising, and activities on means to promote the utilization of solar energy has become a matter of growing national concern. Turkey has on the average 2,600 hours sunshine per annum while the yearly average solar flux exceeds 5.8 GJ/m^2. The average yearly solar energy potential which could be assessed as low temperature heat is estimated at about 23 Mtoe and duration of solar radiation intensity over the Country is highly appropriate for all kinds of application.

At the present stage of development, the main activities comprise mostly low temperature applications. The main industrial attention is focussed on solar energy equipment manufacturing, particularly flat-plate solar collectors and/or complete systems for water heating. In other applications, studies are aimed at developing appropriate prototypes within the framework of economic, technical and social patterns prevailing in the Country. Solar house heating, solar drying, greenhouses heating, concentrating collectors, solar distillation and solar cells are in the demonstration stage.

Geothermal energy

Turkey is regarded as having considerable geothermal energy potential due to its favourable geographic and geological situation for formation of rich geothermal reservoirs. On the basis of a variety of studies through exploration and drilling

surveys conducted throughout the Country for drawing up an inventory of the total geothermal potential, it was concluded that 4,500 MW could be utilized for electricity generation and 31,100 MW from low enthalpy geothermal fields could be profitably utilized for heating purposes (Table F.8).

Wind energy

According to recent studies completed by EIE (Wind Energy Potential of Turkey, EIE Report, 85-1, Ankara, December,1984), about 20 % of the Country is available for non-electrical wind utilization while nearly 2 % is suitable for small scale electricity generation. Most of the wind energy utilization potential is in the Marmara and Southeastern regions according to the information of regional average annual wind power intensities in Turkey. As compared with other alternative energy, wind energy is considered to be relatively less economical in Turkey.

EIE has initiated studies into development of 1.1 MW wind turbine generators and also 1.4 kW solar battery system for remote areas. It is also planning to elect a 20 kW wind turbine generator on a farm near Bandirma. There is a possible scope for use in irrigation and small scale electricity production.

Biomass

Animal wastes provided almost 8.3 % of total final energy consumption in 1986. The main policy of the Government is focussed on multi-purpose utilization of agricultural wastes, namely as biogas production. With agricultural wastes included, the total biomass energy potential is estimated to be 9 Mtoe.

The total area of domestic woodlands amounts to 200 million ha and the yield per ha is about 1.5 m^3. Aiming at increased supply of wood energy, plantation of fast growing trees is under consideration.

1.3 Present energy situation in GAP region

(1) Energy demand and supply

Overall demand/supply

Reliable statistics on regional energy production and consumption are lacking except electricity.

The GAP region is becoming a significant producer of electricity with two major hydropower stations completed, viz. Keban (1,360 MW) and Karakaya (1,800 MW) and the Ataturk Dam under construction to provide an additional 2,400 MW by early 1990's. There are also coal/lignite thermal power plants. In addition, Cag cag III (run-of-river, 14.4 MW) is in operation, and Kralkizi (94 MW), Dicle (110 MW) and Batman (185.6 MW) in the Dicle River are under construction. After completion of all these plants by 1992, the installed capacity would be 5,960 MW with total annual

generation of 21,900 GWh providing 25% of electric energy supply in the Country in 1992 or 85% of energy production by hydroelectric power plants all over Turkey in that year. If all the power plants now in the planning or design stage in the Region are commissioned, the energy generation would be 25,000 GWh with 7,561 MW of installed capacity.

The electricity consumption within the Region is still low, with the share of 4.6% in the national consumption in 1986. Per capita electricity consumption is 350 kWh in the Region compared with the national average of some 650 kWh (667 kWh in 1986). The electricity consumption in the Region is given in Table F.11 by sector and compared with that in Turkey. Table F.12 gives more detailed electricity consumption data in the Region.

Progress of village electrification in Turkey is shown and compared with that in the Region in Table F.13. Only 16.3% of all the villages were electrified in the Region in 1980, while the corresponding figures for the Country was 50.7%. The village electrification ratio increased significantly to reach 94% for Turkey and 84% for the Region by 1986.

Wood and tezek (dried animal dung) are two main sources of energy for rural households in the Region. Relative importance of these energy sources varies among the six provinces. In some 90% of villages in Sanliurfa, tezek was preferred in 1980 as heating fuels, while in a significant majority of villages in the other five provinces, wood was preferred. Estimates have been made for the availability of tezek in the Region and in Turkey. Based on 1986 animal population data, the availability of tezek in the Region is estimated at 1.15 million tons or 9.1% of the total availability in Turkey (12.65 million tons).

Household sector

In household energy use, cooking usually claims the largest shares, followed by heating and lighting. Use of major fuels by rural households is indicated by Tables F.14, F.15 and F.16, which show the percentages of villages preferring different fuels for cooking and heating.

Wood and tezek are the main fuels for cooking and heating in rural households in the Region. Use of LPG for cooking is limited among rural households, but likely to increase in the future. For space heating in the Region, wood has the largest share (59%), followed by tezek (39%).

Other sectors

Use of petroleum products by various sectors in the Region may be inferred from the sales record of distributors (Tables F.17 and F.18). In 1986, the total consumption of petroleum products in the Region accounted for 3.8 % of the total in Turkey. Although slight differences are observed between data in the two tables,

the breakdown into products seems to be 49-54 % diesel oil, 22 % fuel oil, 12-14 % motor gasoline, 10-13 % LPG and 2-3 % kerosene. The shares of LPG and kerosene consumption are slightly higher in the Region than in Turkey as a whole, probably due to the more predominant use of these products for lighting and cooking in urban households in the Region. The lower share of fuel oil in the Region is most likely due to the lower degree of industrialization. The higher share of diesel oil is mainly attributable to its use for pumped irrigation.

(2) Energy resources

Conventional energy

The hydropower potentials of the Firat River and the Dicle River are estimated at 35,000 GWh and 12,000 GWh, or 30% and 10% of the Nation's potential. Asphaltite reserves in Turkey concentrate in the GAP region around Silopi and Sirnak in Siirt province. Estimated total reserve is 75 million tons. TKI produced 700,000 tons in recent years. The southeast of the Diyarbakir-Gaziantep basin on the fringes of the great Middle East oil field is the major oil producing area in Turkey, producing 98% of the total domestic production. However, yields are generally low for such fractured terrains.

New/renewable energy

According to the survey on the regional distribution of solar energy, the Southeastern part of the Country is found relatively well endowed with this energy (Solar Energy Potential of Turkey, EIE Report, 83-29, Ankara, June 1987). The GAP region is relatively favoured with wind energy, too. Probable geothermal energy potentials in the Eastern and the Southeastern regions are estimated to be 500 MW for electricity generation and 4,000 MW for heating (Proceedings of the New and Renewable Energy Resources Conference, EIE, Ankara,23-26 November, 1981). More manure will become available for biogas production, as the livestock sector develops and the use of tezek becomes less popular.

2. Energy Prospects in GAP Region

2.1 Energy demand structure and growth

(1) Demand structure

Final energy demand in the GAP region has been roughly estimated by supply source for 1986 and compared with the whole of Turkey.

Final energy demand by supply source in 1986, GAP region and Turkey

Source	Region			Turkey	
		10^3 toe*	(share %)	10^3 toe	(Share %)
Asphaltite	175,000 tons	75	(4)	260	(1)
Wood	1,500,000	450	(27)	5,271	(15)
Tezek	1,288,000	296	(17)	2,963	(8)
Plant waste	930,000	214	(13)	2,380	(7)
Petroleum	518,000	518	(31)	13,786	(39)
Electricity	1,559 GWh	4,134	(8)	2,884	(8)
Others(x)	---	0	(0)	7,838	(22)
Total		1,687	(100)	35,382	(100)

(*) Specific conversion factors for different forms of energy are shown in Table F.19.

(x) Include hard coal, coke, briquettes, lignite, jet fuel, naphtha, natural gas and city gas

The breakdown of the Region's consumption of petroleum products in 1986 is as shown.

Petroleum product	Consumption (toe)	Share in Turkey (%)
LPG	51,000	5.2
Kerosine	14,000	5.9
Motor gasoline	62,000	3.7
Diesel oil	277,000	5.1
Fuel oil	113,000	2.1
Total	518,000	3.8

(2) Demand growth

Demand prospects for alternative sources of energy in the Region are as follows. Electricity will grow at 8.0% per annum, the highest of all the energy sources. Petroleum will grow at 4.5% per annum, slightly lower than the expected national average. The growth of asphaltite and plant wastes will be respectively higher than the expected national average due to better availability of these resources in the Region, and 4.5% and 4% are taken as the average annual growth rate respectively. Use of wood will not much increase, and 2.5% is assumed for its growth rate. Use of tezek will not increase. Final energy demand for all these resources will become 3,500 thousand toe in 2005 from 1,687

thousand in 1985, representing the average annual growth rate of 3.7%.

The growth of final energy demand is highly correlated with the economic growth. The elasticity of energy demand to the economic growth is usually around 1.0. Taking a modest elasticity value of 0.8, the growth of final energy demand will be 5.4 % to attain the 6.8 % growth of the Region's economy. This means that the total final energy demand will become 4,800 thousand toe in 2005 and the demand for other alternative sources of energy will be 1,300 thousand toe.

2.2 Supply prospect

(1) Supply by source

Wood

Wood fuel supply in the Region in 1986 is estimated at 1.5 % of the total supply in Turkey (Table F.20). This corresponds to 350,000 tons of wood fuel, or 105,000 toe. This includes about 50 % of illicit cuttings. Potential supply capacity at present is estimated higher at 700,000 tons/year (Appendix A-1, Section 3. Forestry).

The General Directorate of Forestry conducted in 1984 a survey on fuel consumption for villages within 10 km distance from forests, covering 65 % of all the villages in Turkey. According to the survey results, 17,000,000 m^3 of fuel woods, or 5,100,000 toe, and 5,600 tons of charcoal were consumed by these villages (Table F.21). These figures correspond to the total woodfuel consumption in Turkey (Table F.3). Thus the low share of the Region's woodfuel consumption in the total consumption in Turkey reflects the limited accessibility to forests in the Region.

Tezek

Tezek is widely used as fuels of rural households in the East, Southeast and Central Anatolia regions. It is used in the eastern part of Mediterranean region, too. In other regions, either wood or lignite is more easily available.

According to the manure usage survey conducted in 1979 by the Ministry of Agriculture, Forestry and Rural Affairs, 33 % of manure was used as tezek in the Region, while the average in Turkey was 18 % (Table F.22).

Tezek availability has been estimated based on the livestock statistics (Table F.23). The Region accounted for 9.1 % of the total availability in Turkey in 1986. However, this may be an underestimate, since tezek is not used in some regions in Turkey. Thus supply capacity of tezek in 1986 in the Region is estimated at 10 % of the total consumption in Turkey. This corresponds to 1,300,000 tons of tezek or 299,000 toe.

Plant wastes

Supply capacity of plant wastes in the Region in 1986 is estimated at 9,300,000 tons or 2,100,000 toe (Table F.24). This corresponds only to 0.7 % of the national supply capacity. This estimate does not include cotton wastes.

Lignite

Lignite is widely used, preferred to wood and tezek, in many households in some regions. In the GAP region, only 2 % of all the villages preferred this fuel. Some deposits exist in Diyarbakir and in Adiyaman-Golbasi (53 million tons reserves), according to the Mineral Research and Exploration Institute (MTA).

Petroleum products

LPG is most commonly used as cooking fuel in urban households. The growth in LPG demand in the Region averaged 8.1 % per annum over the period 1975-86 as compared with 5.8 % in Turkey as a whole.

Kerosene has been used mainly for lighting in rural households where no grid electricity is available. Its use is declining as village electrification progresses. Kerosene sales in the Region were 9,952 tons in 1986, about 40 % of 1975 sales.

Asphaltite

Asphaltite has been widely used in the Region both for heating in households and as process heat mainly for cement industries. Reserves of asphaltite in the Country are concentrated in the Region around Silopi and Sirnak areas in Siirt.

Asphaltite consumption in the Region was 175,000 tons in 1986, accounting for 29 % of the total national consumption. About 85 % was used in sectors other than industry. The average annual growth of consumption was 9 % during 1980-86.

(2) Overall prospect

The demand for electricity (625 thousand toe in 2005) will increase its share to 18% of the total final energy. This corresponds to 7,300 GWh, while the total amount of electric energy to be generated by all the hydropower schemes of the GAP project could be 25,000 GWh. Development needs are in extension of transmission and distribution networks and stable and reliable supply for industries to be newly established.

Supply increase of petroleum will depends simply on import and securing of transport facilities. Supply expansion of asphaltite to meet the demand (173 thousand toe) will not face any serious problem. The total reserve of asphaltite in the Region is estimated at 75 million tons or 32.3 million toe, sufficient to

meet the demand in the next few decades, even if only 10% of the reserve is economically exploitable.

Availability of plant wastes will increase as the agricultural production expands. Availability of animal manure will also increase as the livestock sector develops, but the direct use as fuel will become less popular. At present, about 33% of the manure is used in the Region as tezek, while in Turkey the ratio is 18%. The tezek use will remain at the present level in the Region, if the ratio of manure use as tezek decreases to 15% level by 2005.

In order to fill in the gap between the projected demand and the expected supply by source outlined above, alternative sources of energy will have to be developed. Main options available in the Region are:

1. Small hydropower plants,
2. Afforestation with fast growing trees for fuelwood, and
3. New and renewable forms of energy, including solar, wind, biogas, and geothermal.

Table F.1 Primary Energy Consumption by Sector in Turkey : 1975-1987

(Unit: 1000 toe, % Share)

Sector	1975	1980	1983	1985	1986	1987*
Final Energy Consumption	23,989	28,146	31,057	33,824	35,591	41,215
	84.6%	82.9%	82.2%	81.5%	80.2%	82.3%
Industry	6,312	7,780	8,751	9,464	10,978	13,396
	22.3%	22.9%	23.2%	22.8%	24.7%	26.7%
Transportation	5,164	5,281	5,955	6,260	6,839	8,062
	18.2%	15.6%	15.8%	15.1%	15.4%	16.1%
Residential	11,055	13,155	13,808	15,079	15,087	16,750
	39.0%	38.8%	36.6%	36.4%	34.0%	33.4%
Agriculture	701	963	1,322	1,501	1,667	1,980
	2.5%	2.8%	3.5%	3.6%	3.8%	4.0%
Non-energy use	575	960	1,220	1,520	1,020	1,027
	2.0%	2.8%	3.2%	3.7%	2.3%	2.1%
Energy Transformation	4,359	5,801	6,703	7,653	8,801	8,875
	15.4%	17.1%	17.8%	18.5%	19.8%	17.7%
Primary Energy Consumption	28,348	33,946	37,760	41,477	44,392	50,090
	100%	100%	100%	100%	100%	100%

Note: * Data is provisional.

Source: Data offered by Ministry of Energy and Natural Resources, Ankara, February, 1988

Table P.4 General Energy Balance Sheet of Turkey : 1986

(Unit: 1000 tons of oil equivalent)

UNIT	HARD COAL	SECOND. COAL	LIGNITE	ASPHALTITE	WOOD	ANIM/PLANT WASTE	PETROLEUM	NATURAL GAS	CITY GAS	HYDROLIC	GEOTHERMAL	ELECTRICITY	SOLAR	TOTAL
DOMESTIC PRODUCTION(+)	2,151	0	8,919	261	5,271	3,201	2,514	407	0	2,652	10	0	1	25,387
IMPORT(+)	1,830	169	0	0	0	0	19,101	0	0	0	0	67	0	21,166
EXPORT(-)	1	0	0	0	0	0	1,761	0	0	0	0	0	0	1,762
INT.MARINE BUNKER(-)	0	0	0	0	0	0	501	0	0	0	0	0	0	501
OTHER DEFICIT(+)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STOCK CHANGE(+/-)	32	-176	32	0	0	0	(130)	0	0	0	0	0	0	-242
STATISTICAL ERR.(+/-)	0	0	-48	0	0	0	150	0	0	0	0	0	0	102
PRIMARY ENERGY SUPPLY	4,013	-7	8,903	261	5,271	3,201	19,373	407	0	2,652	10	67	1	44,150
PROD. OUTSIDE REFINERY	0	0	0	0	0	0	242	0	0	0	0			242
TOTAL ENERGY SUPPLY	4,013	-7	8,903	261	5,271	3,201	19,614	407	0	2,652	10	67	1	44,392
ENERGY TRANSFORMATION	687	160	4,631	1	0	0	3,479	366	45	2,652	10	2,818	0	8,801
ELECTR. POWER PLANT(-)	414	0	4,577	0	0	0	1,859	366	0	2,652	10	3,414	0	6,463
COAL GAS PLANT(-)	102	35	0	0	0	0	14	0	45	0	0	0	0	35
COKE PLANT(-)	126	77	0	0	0	0	0	0	0	0	0	0	0	49
BRIQUETTS PLANT(-)	0	48	0	0	0	0	0	0	0	0	0	0	0	-48
PETROLEUM RAFINERY(-)	0	0	0	0	0	0	1,092	0	0	0	0	0	0	1,092
OWN USE & LOSS(-)	45	0	54	1	0	0	515	0	0	0	0	596	0	1,209
SURPLUS/DEFICIT(+/-)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FINAL ENERGY CONSUMPTION	3,326	153	4,273	260	5,271	3,201	16,136	41	45	0	0	2,884	1	35,590
(SECTOR TOTAL)	3,326	153	4,273	260	5,271	3,201	16,136	41	45	0	0	2,884	1	35,590
INDUSTRY SECTOR	3,107	0	1,483	9	0	0	4,493	41	0	0	0	1,845	0	10,978
IRON & STEEL(+)	2,289	0	0	0	0	0	289	0	0	0	0	250	0	2,827
FERTILIZER(+)	0	0	138	0	0	0	210	0	0	0	0	56	0	404
Naphtha	0	0	0	0	0	0	210	0	0	0	0	0	0	210
CEMENT(+)	340	0	660	9	0	0	525	41	0	0	0	285	0	1,860
SUGAR(+)	25	0	180	0	0	0	184	0	0	0	0	37	0	427
PETROCHEM.(NAPHTHA)(+)	0	0	0	0	0	0	898	0	0	0	0	0	0	898
OTHER INDUSTRY(+)	453	0	505	0	0	0	2,178	0	0	0	0	1,217	0	4,353
TRANSPORT SECTOR	60	0	14	0	0	0	6,743	0	0	0	0	21	0	6,839
OTHER SECTORS	159	153	2,775	251	5,271	3,201	3,880	0	45	0	0	1,019	1	16,755
RESIDENTIAL & SERVICE(+)	159	153	2,775	251	5,271	3,201	2,237	0	45	0	0	995	1	15,088
AGRICULTURE(+)	0	0	0	0	0	0	1,643	0	0	0	0	24	0	1,667
NON-ENERGY USE	0	0	0	0	0	0	1,020	0	0	0	0	0	0	1,020
ELECTRICITY PROD.(GWh)	772.8		18,664.8				7,000.8	1,340.7		11,869.4	43.5			39,692.0
AVAILABLE POWER(MW)	197.7		3,601.4				2,021.1	400.0		3,877.5	15.0			10,112.7

Source: Base data offered by Ministry of Energy and Natural Resources, Ankara, March 22, 1988

Table F.5 Installed Capacity of Electric Power Plants in Turkey : 1970-1986

Year	Thermal	Hydraulic	Total		Per Capita
	MW	MW	MW	% increase	W
1970	1,509.5	725.4	2,234.9	13.6%	63
1971	1,706.3	871.6	2,577.9	15.3%	71
1972	1,818.7	892.6	2,711.3	5.2%	73
1973	2,207.1	985.4	3,192.5	17.7%	84
1974	2,282.9	1,449.2	3,732.1	16.9%	96
1975	2,407.0	1,779.6	4,186.6	12.2%	104
1976	2,491.6	1,872.6	4,364.2	4.2%	107
1977	2,854.6	1,872.6	4,727.2	8.3%	113
1978	2,987.9	1,880.8	4,868.7	3.0%	114
1979	2,987.9	2,130.8	5,118.7	5.1%	118
1980	2,987.9	2,130.8	5,118.7	0.0%	114
1981	3,181.3	2,356.3	5,537.6	8.2%	122
1982	3,556.3	3,082.3	6,638.6	19.9%	143
1983	3,695.8	3,239.3	6,935.1	4.5%	147
1984	4,584.3	3,874.8	8,459.1	22.0%	175
1985	5,244.3	3,874.8	9,119.1	7.8%	185
1986	6,235.2	3,877.5	10,112.7	10.9%	201

Source: Turkish Electricity Authority, "Summary of Electricity Statistics (End of 1986)", 1987

Table F.6 Gross Electric Energy Production by Primary Energy Source in Turkey : 1970-1986

(Unit: %)

Year	Thermal						Hydraulic	Total
	Coal	Lignite	Fuel oil	Diesel oil	Other fuels	Total		
1970	16.0	16.7	27.1	3.1	1.9	64.8	35.2	100.0
1971	14.8	15.6	39.8	1.4	1.7	73.3	26.7	100.0
1972	12.7	13.3	43.1	0.8	1.6	71.5	28.5	100.0
1973	12.1	14.0	47.0	4.3	1.6	79.0	21.0	100.0
1974	11.3	17.5	39.9	4.9	1.5	75.1	24.9	100.0
1975	9.1	17.2	30.1	4.4	1.4	62.2	37.8	100.0
1976	7.4	16.3	25.5	4.1	0.9	54.2	45.8	100.0
1977	6.2	17.6	26.9	6.5	1.1	58.3	41.7	100.0
1978	5.6	20.1	26.1	4.6	0.6	57.0	43.0	100.0
1979	4.7	23.9	22.7	2.4	0.6	54.3	45.7	100.0
1980	3.9	21.7	22.4	2.6	0.6	51.2	48.8	100.0
1981	3.6	21.3	21.1	2.5	0.4	48.9	51.1	100.0
1982	3.4	20.8	20.0	2.4		46.6	53.4	100.0
1983	2.9	28.5	23.2	3.9		58.5	41.5	100.0
1984	2.3	30.7	21.9	1.1	0.1 *1	56.1	43.9	100.0
1985	2.1	41.8	20.5	0.2	0.2 *2	64.8	35.2	100.0
1986	1.9	47.0	17.5	0.1	3.5	70.0	30.0	100.0

Notes: *1 TEK geothermal station
*2 TEK geothermal and natural gas stations by 1985

Source: Turkish Electricity Authority, "Summary of Elrctricity Statistics (End of 1986)", 1987

Table F.7 Electric Energy Consumption in Turkey : 1970-1987

(Unit: GWh)

Year	Gross Production	Plant Auxilia	Net Production	Import	Gross Consumption	Network Losses	Net Consumption		Per capita (kWh)*2
1970	8,623.0	448.4	8,174.6	-	8,174.6	866.8	7,307.8		207
1971	9,781.1	508.6	9,272.5	-	9,272.5	983.2	8,289.3		229
1972	11,241.9	584.6	10,657.3	-	10,657.3	1,130.0	9,527.3		257
1973	12,425.2	611.7	11,813.5	-	11,813.5	1,283.4	10,530.1		277
1974	13,477.0	631.4	12,845.6	-	12,845.6	1,486.9	11,358.7		291
1975	15,622.8	592.1	15,030.7	96.2	15,126.9	1,635.2	13,491.7		337
1976	18,282.8	823.7	17,459.1	332.2	17,791.3	1,712.4	16,078.9		393
1977	20,564.6	1,010.1	19,554.5	492.2	20,046.7	2,078.0	17,968.7		430
1978	21,726.1	1,225.9	20,500.2	621.0	21,121.2	2,187.4	18,933.8		444
1979	22,521.9	1,340.3	21,181.6	1,044.3	22,225.9	2,562.8	19,663.1		452
1980	23,275.4	1,393.9	21,881.5	1,341.2	23,222.7	2,824.5	20,398.2		459
1981	24,672.8	1,327.8	23,345.0	1,616.1	24,961.1	2,931.1	22,030.0		486
1982	26,551.5	1,420.5	25,131.0	1,773.4	26,904.4	3,317.6	23,586.8		509
1983	27,346.8	1,680.2	25,666.6	2,220.8	27,887.4	3,423.2	24,464.2	*1	517
1984	30,613.5	1,890.7	28,722.8	2,653.0	31,375.8	3,704.7	27,671.1	*1	573
1985	34,218.9	2,306.8	31,912.1	2,142.4	34,054.5	4,345.9	29,708.6	*1	603
1986	39,694.8	2,815.0	36,879.8	776.6	37,656.4	5,446.7	32,209.7	*1	625
1987	44,367.1	3,110.7	41,256.4	572.1	41,828.5	5,341.5	36,487.0	*3	690

Notes: *1 Data of net consumption is provisional.
*2 Per capita kW is calculated based on midyear population.
*3 Data (provisional) obtained from Ministry Energy and Natural Resources, Ankara, February, 1988

Source: Turkish Electricity Authority, "Summary of Elrctricity Statistics (End of 1986)", 1987

Table F.8 Primary Energy Reserves in Turkey (as of September, 1986

Energy Sources	Unit	Proven	Probable	Possible	Total
Hard coal	Million tons	175	433	769	1,377
Lignite	Million tons	5,911	1,873	126	7,910
Asphaltite	Million tons	38	29	8	75
Hydro	Twh/year	118	-	-	118
Crude oil	Million tons	20.8	-	-	20.8
Natural gas	Million cu.m.	15	-	-	15
Bituminous shale	Million tons	808	-	-	1,525
N. Uranium	1000 tons	8.8	717	-	8.8
Thorium	1000 tons	-	-	-	380
Geothermal	MW				
- Electricity		-	-	-	4,500
- Thermal		-	-	-	31,000
Solar	Million toe				
- Electricity		-	-	-	8.8
- Heat		-	-	-	26.4

Source: Data offered by Ministry of Energy and Natural Resources, Ankara, March, 1988

Table F.9 Development of Number of Villages with Electricity by Years

Year	Total Village	Village Electrified in the Year	Village with Electricity End Year	Percentage Electrified
1979	-	2,466	15,460	42.76
1980	36,155	2,885	18,345	50.74
1981	-	1,466	19,811	54.79
1982	-	2,221	22,032	60.94
1983	-	2,404	24,436	67.59
1984	-	2,079	26,515	73.34
1985	36,155	4,076	30,591	84.61
1986	-	3,294	33,885	93.72

Source: Turkish Electricity Authority, Electricity "Summary of Electricity Statistics (End of 1986)", 1987

Table F.10 Primary Energy Demand and Production Forecast in Turkey : 1988-2010

(Unit: Mtoe)

Item	1988	1989	1990	1995	2000	2010
I. DEMAND BY SECTOR						
Final Energy Demand	39.2	41.3	43.3	57.1	77.5	131.5
Industry	12.3	13.1	14	20.3	31.3	62.1
Transportation	7.4	7.8	8.2	10.7	14.7	25.8
Residential	16.7	17.3	17.9	21.7	25.2	34
Agriculture	1.9	2	2.2	3.1	4.7	6.7
Non-Energy Use	0.9	1	1	1.3	1.7	2.8
Energy Transformation	14.2	15.9	17.6	26.1	30.4	55.9
Primary Energy Demand	53.4	57.1	60.9	83.2	108	187.3
II. DEMAND BY SOURCE						
Coal	5.2	6.2	5.8	10.6	20.9	38
Lignite	12.1	13	13.3	20.1	22.9	27.2
Asphaltite	0.4	0.4	0.4	0.4	0.4	0.5
Natural Gas	1.8	2.7	3.6	5.6	6	15
Petroleum	20.9	20.7	22.7	27.3	34.7	57.5
Hydraulic	4.5	5.7	6.4	10.3	13.8	27.3
Wood	5.3	5.3	5.4	5.5	5.8	5.9
Amin.and Vegetab.Waste	3.2	3.1	3.1	2.8	2.4	1.9
Geothermal	0.02	0.02	0.02	0.05	0.05	4.2
Solar and Other	0.006	0.01	0.04	0.3	0.7	2.6
Nuclear						7.4
Total	53.4	57.1	60.8	83.0	107.7	187.5
III. PRODUCTION BY SOURCE						
Coal	2.6	2.7	2.7	3.7	4.6	4.6
Lignite	12.1	13.3	13.3	20.1	22.9	27.2
Asphaltite	0.4	0.4	0.4	0.4	0.4	0.5
Natural Gas	0.6	0.6	0.6	0.6	0.6	0.67
Petroleum	2.4	2.4	2.4	2.5	2.6	2.6
Hydraulic	4.5	5.7	6.4	10.3	13.8	27.3
Wood	5.3	5.3	5.4	5.5	5.8	5.9
Amin.and Vegetab.Waste	3.2	3.1	3.1	2.8	2.4	1.9
Geothermal	0.02	0.02	0.02	0.05	0.05	4.2
Solar and Other	0.006	0.01	0.04	0.3	0.7	2.6
Nuclear						7.4
Total	31.1	33.5	34.4	46.3	53.9	84.9

Source :Data offered by Ministry of Energy and Natural Reseurces, Ankara on February 16, 1988

Table F.11 Electric Power Consumption in GAP Region : 1979-1986

(Unit: Million KWh)

Province	Region (2)				Turkey (1)	
	1979	(2)/(1)	1986	(2)/(1)	1979	1986
Agriculture	10.8 1.6%	7.2%	75.6 4.8%	28.1%	149.0 0.8%	269.3 0.8%
Minning	28.7 4.2%	3.8%	4.3 0.3%	0.4%	750.7 3.8%	1,132.2 3.5%
Manufacturing	331.9 48.6%	2.8%	819.3 52.6%	4.2%	11,761.9 59.8%	19,472.4 60.5%
Services	120.5 17.6%	3.4%	293.2 18.8%	5.0%	3,509.6 17.8%	5,878.4 18.3%
Lighting	21.7 3.2%	7.5%	34.2 2.2%	7.7%	290.5 1.5%	443.9 1.4%
Households	170.0 24.9%	5.3%	332.2 21.3%	6.6%	3,201.3 16.3%	5,013.4 15.6%
Total	683.6 100.0%	3.5%	1,558.8 100.0%	4.8%	19,663.0 100.0%	32,209.6 100.0%
Population(1000)	3,473	8.0%	4,466	8.7%	43,530	51,546
Per Capita KWh	196.8		349.0		451.7	624.9

Source : Data offered by Turkish Electricity Authority, Ankara, March 25, 1988

Table P.12 Consumption of Electric Energy in GAP Region and in Turkey by Sector and Economic Activity : 1986

(Unit: GWh)

Economic Activity	Adiyaman	D.Bakir	G.Antep	Mardin	Siirt	S.Urfa	Region
Industry	52.8	76.3	313.9	213.1	77.9	89.6	823.6
- Coal and lignite mining	-	-	-	0.5	-	-	0.5
- Mining industryies other than coal and lignite mining	2.3	-	-	0.7	0.8	-	3.8
- Food, beverage and tobacco industries	3.0	14.8	31.4	6.1	5.7	7.9	68.9
- Manufacture of textiles, leather and clothing	9.9	14.7	143.4	1.5	-	9.2	178.7
- Manufacture of wood, paper and allied industries	0.1	0.5	2.3	-	-	-	2.9
- Manufacture of rubber products	-	-	7.3	-	-	-	7.3
- Manufacture of chemicals	24.7	0.1	2.1	151.4	55.2	68.3	301.8
- Manufacture of earthenware and cement	12.6	45.1	76.4	43.3	15.3	2.5	195.2
- Iron and steel basic industries	0.1	-	9.3	-	0.9	1.2	11.5
- Non-ferrous metal basic industries	0.1	-	-	9.6	-	-	9.7
- Manufacture of electrical machinery and transport equipment	-	1.1	4.0	-	-	0.5	5.6
- Manufactureing industries not elsewhere classified	-	-	37.7	-	-	-	37.7
Transportation & Communication	0.2	11.2	1.3	2.1	0.3	0.2	15.3
Residential	25.4	73.3	108.5	37.1	39.4	48.5	332.2
Commercial & Service	24.8	90.0	64.8	41.0	27.1	64.4	312.1
- Building and public works	-	0.5	4.0	0.1	0.7	22.2	27.5
- Public adminstration and public utilities	16.8	56.5	29.6	22.5	16.1	20.4	161.9
- Commerce, services and handicrafts	4.9	25.5	21.6	13.5	7.9	15.1	88.5
- Public illumination	3.1	7.5	9.6	4.9	2.4	6.7	34.2
Agriculture	1.3	-	11.5	2.9	-	59.9	75.6
Total	104.5	250.8	500.0	296.2	144.7	262.6	1558.8
(Province Share %)	(6.7)	(16.1)	(32.1)	(19.0)	(9.3)	(16.8)	(100)
Population	444,378	968,717	1,000,936	670,764	541,921	839,063	4,465,779
Per Capita (kWh)	235	259	500	442	267	313	349

Sources : Data offered by Turkish Electricity Authority, Ankara, March 25, 1988

Table F.13 Electrification of Villages in GAP Region : 1980 - 1986

Province	Total Village Number		Village Electrified		Electrification Percentage	
	1980 1)	1986 2)	1980 1)	1986 2)	1980 1)	1986 2)
Adiyaman	341	346	55	326	16.1%	94.2%
Diyarbakir	691	693	59	496	8.5%	71.6%
Gaziantep	588	600	245	598	41.7%	99.7%
Mardin	717	720	128	622	17.9%	86.4%
Siirt	496	499	54	334	10.9%	66.9%
S.Urfa	689	692	34	569	4.9%	82.2%
Region	3,522	3,550	575	2,945	16.3%	83.0%
Turkey	36,155	36,155	18,345	33,885	50.7%	93.7%

Source: 1)Village Inventry Survey, 1981
2)Turkish Electricity Authority, "Summary of Electricity Statistics (End of 1986)", 1987

Table F.14 Heating Fuels of Villages in GAP Region

A : First Preference, B : Second Preference

Province	Total No.of Village	Pre-ference	%	Heat Source: Coal	%	Wood	%	Oil	%	Tezek	%	Others	%
Adiyaman	341	A	100	5	1.5	236	69.2	-	-	93	27.3	7	2.1
		B	-	10		59		-		81		23	
Diyarbakir	691	A	100	5	0.7	329	47.6	-		375	54.3	-	
		B	-	5		135		-		52		1	
Gaziantep	588	A	100	13	2.2	503	85.5	-	-	72	12.2	-	-
		B	-	34		42		4		148		3	
Mardin	717	A	100	18	2.5	496	69.2	-	-	196	27.3	7	1.0
		B	-	53		60		-		161		39	
Siirt	496	A	100	19	3.8	457	92.1	-	-	20	4.0	-	-
		B	-	7		33		3		416		-	-
S.Urfa	689	A	100	6	0.9	61	8.9	-	-	622	90.3	-	-
		B	-	23		273		11		43		2	
Region	3522	A	100	66	1.9	2082	59.1	-	-	1378	39.1	14	0.4
		B	-	132		602		18		901		68	

Source : Village Inventory Study, 1981

Table F.15 Heating Equipment Usage by Village in GAP Region

A: First Preference
B: Second Preference

Province	Total Village Number		Heating Equipment									
			Stove		Ocak*		Tandir*		Electric heater		Others	
Adiyaman	341	A 100%	321	94%	20	6%	0	0%	0	0%	0	0%
		B	11		118		1		0		0	
Diyarbakir	691	A 100%	672	97%	12	2%	7	1%	0	0%	0	0%
		B	4		65		79		2		0	
Gaziantep	588	A 100%	575	98%	11	2%	2	0%	0	0%	0	0%
		B	9		197		40		4		0	
Mardin	717	A 100%	697	97%	5	1%	5	1%	0	0%	10	1%
		B	11		44		39		21		0	
Siirt	496	A 100%	470	95%	25	5%	1	0%	0	0%	0	0%
		B	23		403		16		2		0	
Urfa	689	A 100%	523	76%	161	23%	5	1%	0	0%	0	0%
		B	127		207		103		5		0	
Region	3,522	A 100%	3,258	92%	234	7%	20	1%	0	0%	10	0%
		B	185		1,034		278		34		0	

Note : * Ocak; fireplace with chimney arrangement, Tandir; heating arrangement made in a hole in the earth

Source : Village Inventory Study, 1981

Table F.16 Cooking Equipment Usage by Village in GAP Region

A: First Preference
B: Second Preference

Province	Total Village Number		Cooking Equipment															
			Ocak*		Kerosine		Tandir*		Firin		LPG		Electri		Sac*		Others	
Adiyaman	341	A 100%	264	77%	2	1%	1	0%	0	0%	67	20%	0	0%	7	2%	0	0%
		B	72		1						70				176			
Diyarbakir	691	A 100%	483	70%	90	13%	32	5%	0	0%	84	12%	0	0%	2	0%	0	0%
		B	44		25		158		13		206		1		132			
Gaziantep	588	A 100%	335	57%	1	0%	0	0%	0	0%	250	43%	0	0%	2	0%	0	0%
		B	227		4		10		3		270				32			
Mardin	717	A 100%	369	51%	31	4%	139	19%	0	0%	177	25%	0	0%	1	0%	0	0%
		B	66		125		261		2		138		7		89			
Siirt	496	A 100%	429	86%	38	8%	12	2%	0	0%	17	3%	0	0%	0	0%	0	0%
		B	47		276		97		1		25				36			
Urfa	689	A 100%	467	68%	13	2%	10	1%	0	0%	180	26%	0	0%	19	3%	0	0%
		B	132		156		52		4		111		3		222		1	
Region	3,522	A 100%	2,347	92%	175	5%	194	6%	0	0%	775	22%	0	0%	31	1%	0	0%
		B	588		587		578		23		820		11		687		1	

Note : * Ocak; fireplace with chimney arrangement, Tandir; oven for cooking made in a hole in the earth, Firin ; oven for cooking , sac ; sheet iron heated primarily for making bread

Source : Village Inventory Study, 1981

Table F.17 Oil Products Sales in GAP Region : 1986

(Unit: ton)

Province	LGP	Motor Gasoline	Kerosene	Diesel Oil	Fuel Oil*	Total
Adiyaman	5,498	3,980	397	22,111	401	32,387
Diyarbakir	10,532	12,283	2,983	60,296	55,431	141,525
Gaziantep	18,304	22,360	3,456	50,457	13,293	107,870
Mardin	6,754	5,961	343	15,268	13,476	41,802
Siirt	4,767	5,327	965	26,904	9,053	47,016
Urfa	9,302	10,081	1,808	33,095	2,703	56,989
Region (2)	55,157	59,992	9,952	208,131	94,357	427,589
Share (2)/(1)	5.2 %	3.5 %	4.5 %	3.9 %	3.1 %	3.8 %
Turkey (1)	1,051,227	1,706,124	223,550	5,329,614	3,053,406	113,363,921

Note: Fuel oil data appear to be inacurate since the data are based on information by distributers except for the record by refinery (see Table F.18).

Table F.18 Estimates of Oil Consumption in GAP Region : 1986

(Unit: ton)

Province	LPG	Motor Gasoline	Kerosine	Diesel Oil	Fuel Oil	Total
Adiyaman	3,671	4,551	822	29,611	288	38,943
Diyarbakir	10,105	9,763	2,252	61,545	66,302	149,967
Gaziantep	17,741	21,099	5,296	62,799	23,387	130,322
Mardin	6,047	8,054	690	28,850	8,933	52,574
Siirt	4,305	4,870	1,953	23,797	11,597	46,522
Urfa	9,354	13,327	3,470	70,411	2,636	99,198
Region (2)	51,223	61,664	14,483	277,013	113,143	517,526
Share (2)/(1)	5.2%	3.7%	5.9%	5.1%	2.1%	3.8%
Turkey (1)	978,000	1,676,000	247,000	5,465,000	5,420,000	13,786,000

Source: "Long Term Supply and Demand Forecast by Province", done by TPAO special study

Table F.19 Country Specific Conversion Factors in Turkey and Crude Oil Factors

Energy Sources	Unit	Equivalent to tonnes of oil*	Calorific Value
Hard coal	ton	0.61	6,100 kcal/kg
Lignite(heat&industry)	ton	0.30	3,000 kcal/kg
Lignite(power station)	ton	0.20	2,000 kcal/kg
Elbistan lignite	ton	0.11	1,100 kcal/kg
Asphaltite	ton	0.43	4,300 kcal/kg
Crude oil	ton	1.05	10,500 kcal/kg
Natural gas	1000 cu.m.	0.89	8,900 kcal/cu.m.
Electricity	1000 kwh	0.086	860 kcal/kwh
Primary electricity (hydro & geothermal)	1000 kwh	0.2234	2,234 kcal/kwh
Wood	ton	0.30	3,000 kcal/kg
Animal & plant waste	ton	0.23	2,300 kcal/kg
City gas	1000 cu.m.	0.42	4,200 kcal/cu.m.

Note: * Crude oil; 10,000 kcal/kg

Source: Data offered by Ministry of Energy and Natural Resources, Ankara, March, 1988

Table F.20 Estimates of Fuelwood Production in GAP Region (1986)

(Unit: m^3)

Area	Production	Share	1984
Turkey	12,238,138	100	12,009,000 (24,443,187)*1
Region			
-Maras *2	303,500	2.5	-
-Elazig *3	395,500	3.2	-
GAP Share of Forest & Bushes Area			
-Maras	22% *4		-
-Elazig	27% *4		-
GAP Capability	173,555	1.4	-

Note *1: Consumption of fuelwood by a result of survey in 1984 by OGM. The difference between OGM production statistics and the figure was considered as illicit deforestation by OGM.

*2: Maras Forestry Regional Directorate ; Adiyaman, Gaziantep, Hatay, Maras and Urfa

*3: Elazig Forestry Regional Directorate ; Bitlis, Diyarbakir, Elazig, Hakkari, Malataya, Mus, Siirt, Tunceli and Van

*4: "Status Bulltin, 1980", General Directorate of Land and Water

Source: 1986 Regional Directorate data offered by General Directorate of Forestry (OGM), Ankara, March, 1988

Table F.21 Fuel Consumption of Villages Close to and within 10 Km's Distance to Forest in Turkey : 1983

Household Number	Fuelwood (1000 cu.m.)	Charcoal (1000 tons)	Wood from land-owner (1000 cu.m.)	Byproduct of wood (1000 tons)
0-99	6,607	2.9	1,421	8.9
100-199	6,428	0.5	1,318	8.9
200-299	2,451	1.1	642	6.7
300-399	910	0.5	261	5.2
400-499	378	0.5	131	1.3
500 +	308	0.2	102	3.3
Total	17,083	5.6	3,876	34.3

Household Number	Lignite (1000 tons)	Tezek (1000 tons)	Nut shell (1000 tons)	LPG (1000 tons)
0-99	222	312	38	35
100-199	301	209	81	42
200-299	197	31	24	18
300-399	72	13	18	8
400-499	81	10	6	6
500 +	69	4	2	4
Total	941	579	168	113

Source: Turkiye'de Orman Koyluleri Tarafindan Tuketilen Yakacak Odun Anketi Ve Sonuclari, Forestry General Directrate, Ankara, 1986

Table F.22 Farm Manure Usage in GAP Region : 1979

(Unit: 1000 tons, wet)

Province	Total Production	Manure as Fertilizer	Manure as Tezek	Loss	Comment*2
Adiyaman	73	47	15	11	Not sold in
	100%	64%	21%	15%	market
Diyarbakir	1,390	278	973	139	Not commercially
	100%	20%	70%	10%	sold
Gaziantep	3,354	866	476	2,012	Sell.price(1979):
	100%	26%	14%	60%	1,800 kg/KRS
Mardin	468	193	81	194	Not commercially
	100%	41%	17%	41%	sold
Siirt*1	58,244	24,233	8,895	25,116	Not used
	100%	42%	15%	43%	
Urfa	593	16	380	197	Sell.price(1979):
	100%	3%	64%	33%	1,900 kg/KRS
Region(2)*1	64,122	25,633	10,820	27,669	
	5,878	1,400	1,925	2,553	
	100%	24%	33%	43%	
Share (2)/(1)		3.2%	10.9%		
Turkey(1)*1	97,785	43,302	17,689	37,741	
	100%	44%	18%	39%	

Note: *1 Province: Siirt is excluded for evaluation purposes (see Note*2)

*2 These comments are appeared in the survey report of Farm Manure Sales Price, prepared through questionnaire by Ministry of Agriculture, Forestry and Rural Affairs,1980

Source: Data and information obtained from Ministry of Energy and Natural Resources, Ankara, March, 1988

G

APPENDIX G
DETAILED DATA AND ANALYSIS ON SOCIAL SECTORS

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APPENDIX G: DETAILED DATA AND ANALYSIS ON SOCIAL SECTORS

G-1 Population, Migration and Labour Force

1. Population in the GAP region

Growth rates of the population of the GAP region has been continuously higher than the national average since 1945. In all the five yearly population surveys the Region has recorded an annual average growth rates between 2.12% and 5.67%. For the national population these have been 2.2% and 2.89%. The period between 1950 and 1955 is recorded to be highest because of the addition of Adiyaman province into the Region. Otherwise the highest rate would be the 1980-85 period which averaged 3.82% per annum average growth rate.

The population of the Region can be characterized as being mostly rural. The size distribution of the settlements where the population live clearly indicates the importance of those smaller centers with populations that are below 2,000. These places in 1985 comprised 96% of the settlements and contained 44% of the Region's population. Urban centers, most recently classified as being those places with populations greater than 20,000 made up 0.7% of the settlements and contained over 43% of the Region's population.

Significant population changes during the past 10 years have occurred in settlements with populations less than 2,000 and those with populations greater than 50,000.

In 1975, places with populations greater than 50,000 accounted for 22% of the regional population and in 1985 this percentage increased to 31%. During this same period population of places with populations less than 2,001 - villages - decreased from 52% percent to 44% of the total regional population.

Intermediate size centers, those with populations between 50,001 and 100,000 are very few in number. In 1975 there were only two centers within this group containing 3.7% of the Region's population. By 1985 the number of centers in this population group increased to four and the percentage of the population living in these places increased to 5.5% (Tables G.1 through Table G.3).

The Region's population in 1955 represented 7.4% of the national total. By 1985, this figure reached 8.5%. Due to high fertility rates (defined as the average annual number of babies born to 1,000 women by the end of their child-bearing ages of 15-49) in the Region, 6.9 per woman in 1975 and 7.0 per woman in 1980, this trend is expected to continue. In the next twenty years, with the development of the Region's economy and rising employment opportunities outmigration rates are expected to decrease. As

well, some inmigration from the surrounding provinces will occur.

1.1 Population projections

Regional natural population increase is not expected to change much in the next two decades. Improved health services and better nutrition will on the contrary be an added factor influencing the high growth rates of the population.

Social, cultural and economic values are important influences on the tendencies to have large families. The Region's economic development will have long term effects on the population's growth rate. In almost all cultures economic growth has resulted in lower population growth rates. This development will most likely occur in the Region as well. Population planning relying on incentive and disincentive policies do have impacts on population growth. However, economic growth and the subsequent improvements in the educational and health services probably will have a stronger impact on the prevailing fertility rates.

Planning policies related to economic development can be easily associated with spatial impacts. Population growth, based on various assumptions, when distributed spatially, will provide policy makers with a picture of the Region as it develops.

The population of the Region has been analyzed based on various development scenarios. Initially, trend projections have been estimated based on past growth characteristics and total provincial, urban/rural and major settlements' populations were projected until the year 2005. In these estimates lower growth rates were assumed towards the end of the GAP implementation period ending in the year 2005 (Tables G.4 through Table G.7)

Similar exercise was also carried out for each of the growth alternatives. In these estimates the implications of Alternative A, maximum irrigation, has resulted in the highest population growth rate of the Region (Tables G.8 through G.11). Alternative B, maximum power generation (Tables G.12 through G.14) and Alternative C, slower development (Table G.15 to G.17), follow Alternative A with slower growth rates.

The growth of places with projected populations larger than 10,000 in the year 2005 have been also estimated. These projections are predominantly based on the analysis of past population growth, proximity to transportation networks, surrounding general urban environment and proximity to planned irrigation areas. Table G.17, listing those places with projected populations of larger than 10,000 in the year 2005, shows the anticipated growth that may be realized as a consequence of recommended growth policies. These projections were used in the corridor and land-take/density analysis.

1.2 Validity of population projections

Population projections provide indicators of growth and magnitudes for policy and development planners in areas covering the urban and the rural areas of the Region. The use of these estimates, especially in a twenty year perspective, need to be carefully evaluated. Regional populations are influenced by internal and external factors. Influence of alternative places to live and work exist within the Region, as well as, outside of the Region. Therefore, such externalities will distort anticipated growth rates.

The use of these estimates will give planners approximate figures for determining associated needs. Since censuses are carried out on a quinquennial basis in Turkey, updating of projected estimates can be easily done. There are also other surveys which are carried out for specific objectives, which can be used to enrich existing data sources. Population growth, especially in the urban centers is the outcome of an industrialization process. Survey data pertaining to employment, household size, migration behaviour and educational levels can reinforce existing population statistics. With such inputs, more elaborate models can be built to stimulate the effects of alternative policies.

2. Migration

During the three quinquennial periods between 1965-80, the net migration for the GAP region as a whole had been negative. In other words, the GAP region consistently lost migrants between 1965 and 1980. Although there has been slight decrease in net out migration rate, this decrease has been very slight (Table G.18).

In all the three quinquennial periods, median net outmigration rates for the GAP region have always been larger than the respective rates for Turkey.

	GAP	Turkey	GAP/Turkey
1965-70	-3.23%	-3.01%	1.07
1970-75	-3.15%	-1.52%	2.07
1975-80	-2.90%	-1.40%	2.08

After 1970, the difference between net outmigration rates of the GAP region and Turkey has increased. In fact, the net outmigration rates for the GAP region after 1970 became twice as high as the rate for Turkey.

Gaziantep always had the largest net migration rate. Diyarbakir and Siirt are next highest to Gaziantep. Mean net migration rates of the three quinquennial periods for these three provinces are 0.69%, -1.61% and -1.67%, respectively (Table G.18).

Adiyaman, Sanliurfa and Mardin have the least net migration rates. In other words, these provinces have the largest net outmigration rates. Their respective mean net migration rates are -6.43%, 5.92% and -3.95%. In short, these three provinces located in the center of the Region have the largest net outmigration rates. Whereas, the province of Gaziantep which is located at the western part of the GAP, adjacent to the Cukurova region has the largest net migration rate. The other two provinces of Diyarbakir and Siirt which are located at the eastern part of the GAP have the next highest net migration rates following Gaziantep.

All provinces in the GAP region have always had net outmigration rates in each of the three quinquennial periods - except Gaziantep province. Gaziantep is the only province which has a positive net migration rate. During the period 1975-80, however, it had net outmigration with a rate that was close to zero (Table G-18). In the previous periods of 1965-70 and 1970-75, Gaziantep was the only province with positive net migration. During 1975-80 all GAP provinces had a negative net migration.

In conclusion it is clear that in terms of "netmigration" rates, Gaziantep is definitely the regional center, followed by Diyarbakir and Siirt. On the other hand, Sanliurfa (followed by Mardin and Adiyaman) has the largest net outmigration rate.

During the period considered in the analysis, the GAP region had increasingly larger net outmigration rates than the average for Turkey. On the other hand, the differences between provinces in the GAP region decreased. For example, for the GAP region the range for net migration rates between 1965 and 1980 decreased from 8.3, to 7.3 and 5.7 (Table G.18).

2.1 Origins and destinations of migrants: regional disaggregation

General spatial pattern

General pattern of migration to/from the GAP region is such that

(a) there is short distance intensive migration in the Region and between the bordering provinces (especially Cukurova region); and

(b) long distance migration between large urban centers in the western half of the country.

The latter results in a lopsided tunnellike shape if a line is drawn between Istanbul and Adiyaman and Hatay and Gaziantep. Within this tunnel-shape area, largest migration flows are to/from the three metropolises of Ankara, Istanbul, Izmir and Cukurova region.

Within this general pattern, provinces of destination for

outmigrants from the GAP region are much more in number and more diffuse than the provinces of origin for inmigrants to the GAP region. Migration matrices show that the migration to/from the GAP region is highly organized in terms of streams and counter-streams (Tables G.19 through G.21).

Out migration occurs primarily due to economic reasons. Low returns on conventional farming methods, small holding sizes, large household sizes and the insufficient access to seasonal work can be listed as the major reasons. The lack of social amenities is also a contributing factor in the tendencies of rural families to out migrate.

The development of the Region's urban centers, improvement of rural services and access to seasonal work will make life relatively more comfortable. Since not all farms will be benefiting from irrigation, there will continue to be conventional rain-fed agriculture. The surplus farm labor existing in the Region will find employment in the newly developing irrigated farming areas.

In the urban areas the growth of agro-industry related economic activities will offer further employment opportunities. Increasing incomes and improved social and physical environment in the Region's urban and rural areas will result in less out migration.

Migration in the GAP region, and between the GAP region and the adjacent provinces takes place especially between "bordering" provinces.

Origins and destinations of migrants: specific provinces

For intra-regional migration in the GAP region, Gaziantep, Diyarbakir, and Siirt are major destinations, and Mardin and Sanliurfa are the major provinces of origin of outmigrants. Migration takes place between adjacent provinces, such as from Sanliurfa and Adiyaman, to Gaziantep; from Mardin, Siirt and Sanliurfa, to Diyarbakir; from Diyarbakir and Mardin to Siirt, etc. (Tables G.19 through G.21).

Regional origin and destination of migrants: GAP as a region

About one-third of inmigration to the GAP is from the Region itself. This intra-regional migration together with inmigration from adjacent provinces constitute about 48% of all inmigration to provinces in the GAP region (Table G.22). On the other hand, about one-third of outmigration from the GAP is towards the three metropolitan areas of Ankara, Istanbul, and Izmir. Outmigration to the three metropolitan areas and to the Cukurova region is about 52% of total outmigration (Table G.23).

About 80% of net outmigration (net negative migration) from the GAP is to the three metropolitan areas and Cukurova region (Table

G.24). The GAP as a region receives net inmigration only from adjacent provinces, but this net inmigration (net positive migration) is very minor in size.

2.2 Some policy issues

General policy issues related to the GAP will be indicated briefly.

As a consequence of the GAP project, it is expected that the outmigration to Cukurova, to the three metropolitan areas and to various other large urban centers in western part of Turkey will decrease. On the other hand, an increase in the return migration of especially recent male migrants is expected.

The snowball effect of previous migrants (relatives, or friends) is extremely important. At least in the initial years, inmigration to the GAP region will be largely from bordering adjacent provinces. Also, intra-regional migration can be expected to increase significantly.

These facts indicate the necessity to plan and to start resettlement projects before spontaneous inmigration to the GAP region starts which would make the population composition of the Region much more unbalanced than it is presently. The resettlement projects may decrease the population pressure in some other regions of Turkey by decreasing migration to largest urban centers in the Country as well as facilitating more balanced population composition and integration in the GAP region. In such a case, land ownership pattern of the lands to be irrigated and lands to be allocated for resettlement becomes inevitably very important.

Migration rates to and from the Region have not been a subject of intense analysis. The implication of these population movements within the Region and in the remainder of Turkey have significant social and economic repercussions. Increased agricultural production capacities and industrialization in the other regions of Turkey has been the major catalyst for seasonal and permanent migration in GAP provinces.

Estimates of the number and the socio-economic characteristics of migrants by origin and destination have not been documented. Resettlement policies, training and accommodating the needs of these people should be based on sound analysis of needs. Since the expected number of seasonal migrants, return migrants and new migrants to the Region will be considerable, past census records and current population movements should be studied and up-coming/planned surveys should be prepared to accommodate these information needs to determine:

a) origins and destinations,

b) sex/age structures,
c) household characteristics
d) educational levels
e) occupations
f) human relation/connection within the Region and outside the Region, and
g) intention/preference on value-added activities in the Region.

Development planning in the GAP region will be highly effected by population movements. Housing, education, social/cultural, transportation and health needs of this population will be of significant magnitude. Based on sound analysis, relatively accurate estimations of needs can be determined. Prospective sub-regions and villages/urban places can be included in the phasing of investment plans and preparatory work can be initiated.

3. Labor force

The working age group population (15-64) in 1980 was 1.7 million, or 47 % of the total population. The comparable ratio in Turkey had been 56 % during the same period. At the provincial levels these were:

- 45.7 % in Adiyaman,
- 46.8 % in Diyarbakir,
- 50.6 % in Gaziantep,
- 44.6 % in Mardin,
- 45.5 % in Siirt and
- 46.7 % in Sanliurfa.

The comparable figures for each of the provinces in 1985 are:

- 47.5 % in Adiyaman,
- 48.0 % in Diyarbakir,
- 52.0 % in Gaziantep,
- 45.8 % in Mardin,
- 44.9 % in Siirt and
- 48.3 % in Sanliurfa.

The ratio of working age group population to the total population in all provinces but Siirt has increased. This indicates that the outmigrating tendencies of the working age group in all of the provinces, except Siirt has slowed down.

3.1 Sectoral employment

The labor force (12+ years of age and economically active as defined in the SIS Social and Economic Characteristics of the Population) of 1,527,845 of the Region in 1985 was made up of approximately 36 % of the population. Majority of this labor force is active in the agriculture and the services sectors. The

annual rate of increase in the total labor force during the period 1975-85 has been 1.97 % compared to the 2.97 % of the Region's population (Table G-25). The working population to the non-working population ratio was 1.8 in 1985. In 1975 and 1980 these ratios were 1.6 and 1.8 respectively (Tables G.26 through Table G.28).

Labor force active in the economy (13-64 year age group) is defined as those who are working or actively seeking employment. Provinces with highest employment participation rates (economically active within the 13-64 year age group) are Adiyaman and Mardin and those with the lowest rate is Gaziantep. Gaziantep's low participation rate has followed this trend during the period 1975-85.

The Region's participation rate for this age group during the previous three censuses have been continuously decreasing. For the years 1975, 1980 and 1985 these figures have been 75%, 70% and 67 %. Due to outmigration from the Region this tendency would be expected to continue, unless the Region's employment opportunities increases. Since the majority of this work force is fully active in the agriculture sector, technological developments with emphasis on farm mechanization will further add to the exodus from the Region (Tables G.26 through Table G.28).

The Region's economic development, including agriculture, manufacturing and the service sector will require increasing number of workers. The 12+ age group employment in 1985 had been approximately 1.5 million persons or approximately 36 % of the total population. In 2005 this figure is expected to reach over 2.7 million persons (Appendices A and B).

3.2 Policies for manpower development

Development of the local economy is a function of the quality of the work force in it. This generalization is valid for agricultural, manufacturing as well as for service workers. In the next 20 years, with or without the full implementation of the GAP, efficiency of workers will nevertheless influence the growth and development of the Region. Without qualified workers investments are bound to result in inefficient utilization and loss of resources.

Human factors in the development process must be accepted as an important element. Public and private institutions and private firms must participate in improving the skills of the existing labor force and plan for the training of those potential workers who will be joining the labor market. Since this is an on-going process, institution building for such long term objectives must be a policy issue which needs to be taken up immediately.

During the next two decades, on annual basis there will be a net

increment of at least 50,000-80,000 workers joining the work force. Majority of them will be made up of young persons resident of the GAP region with rural backgrounds. Some inmigration from the adjacent provinces as well as more distant provinces will occur. However, these inmigrants will most likely have some of the skills that may be lacking in the Region.

Training of the new joiners to the work force and to the Region will necessitate the organization of various training activities. Agricultural skills involving irrigated farming, operation, maintenance and repair of farm machinery, marketing of agricultural inputs and outputs will become highly demanded specializations within the next five to ten years. Support services for agriculture such as agricultural training, animal husbandry and agricultural credit specialists will find much opportunity in the Region.

The consequences of agricultural development will require the development of the transportation support services. Agro-industry activities will need engineers, chemists, administrators, electricians and mechanics. These developments will be taking place within the next three to five years. Necessary steps at the national and regional level need to be taken in order not to create bottlenecks during this period.

The establishment of productive capacities is only one of the inputs for the development of the GAP region. The human factor or the work force needs to be ready to use the newly created capacities. A comprehensive approach involving the planning of investments and the anticipated realization of those investments and their consequences must be carefully dealt with. An irrigation canal without an trained farmer, a product that can not be marketed properly because of incapable entrepreneurs and a factory that is not working at full capacity due to unqualified administrators or technical personnel will result in misallocation of scarce resources.

The existing work force and those that will be joining them need to be trained to provide the necessary abilities some of which have been listed above. Planning ahead, to anticipate the types and the numbers of required skilled labor and to provide the necessary policy framework for training facilities must be conducted in a multi-sectoral approach. Similar project regions such as the Cukurova, Corum-Cankiri and Erzurum must be carefully analyzed to determine comparable limiting factors that may confront the GAP region's manpower needs.

G-2. Education and Health Services

1. Overview of social service needs

In 1985 population of those living in places with population less than 5,000 and more than 5,000 were equivalent. There were 2.15 million persons living in each category. The number of places considered to be of rural character, populations less than 5,000, was 3,555 while the number of those with urban character, populations larger than 5,000 was 55. By 2005 the number of places in each population group will not be changed drastically, but the population of the urban settlements (5.3 million) will be twice as much as those of the rural ones (2.5 million).

These changes will shift the work load of social services to the urban areas. The policy implications of these population developments will require the improvement of the services oriented to the rural population. Urban growth will require the improvement of these services as well as the expansion of services.

At the provincial level, as shown below, this breakdown varies.

Population (2005)

Province		Urban	Rural	Total
Adiyaman		372,287	332,038	704,325
	%	(52.9)	(47.1)	(100)
Diyarbakir		1,289,532	541,553	1,831,085
	%	(70.4)	(29.6)	(100)
Gaziantep		1,476,495	367,107	1,843,602
	%	(80.1)	(19.9)	(100)
Mardin		633,151	461,930	1,095,081
	%	(57.8)	(43.2)	(100)
Siirt		702,065	349,271	1,051,336
	%	(66.8)	(33.2)	(100)
Sanliurfa		839,471	444,100	1,283,571
	%	(65.4)	(34.6)	(100)
Region		5,313,001	2,495,999	7,809,000
	%	(68.0)	(32.0)	(100)

Planning of social services needs to be relevant and deliverable. Local needs, based on careful analysis should be integrated into the programming of necessary activities.

The implementation of GAP will result in faster growth of some villages and centers. Needs as a consequence of widespread irrigated farming, agricultural mechanization, urbanization and industrialization will result in the demand foe newer types of

social amenities. The policy framework for the GAP region should not be seen in the light of uniform national policies. In the next 15 to 20 years the economic structure of the Region will change immensely.

Water borne diseases and illnesses, increased awareness for birth control, better maternal and infant care, specialized occupational training, college preparatory training and pre-school day care are some examples of needs that will be arising. Policies oriented towards these social needs must be carefully evaluated and priorities should be set according to the geographic distribution and anticipated developments within GAP.

2. Education

2.1 Present conditions

Human resources are the most valuable asset and one of the most important factors of development. It is essential that this potential be exploited to the maximum extent through education for the development of the GAP region.

The education system in Turkey consists of formal education and adult education. The formal education has five level:

. Pre-school education	for	3-4 years
. Primary schools	"	5 years
. Junior high schools	"	3 years
. High schools	"	3 years
. Higher education (universities)	"	4-6 years

Pre-school education in kindergartens for the 3 to 5 years age group and nursery classes for the 6 years age group. The target enrollment ratios for the Country are 6.0% for 1986/1987, 8.0% for 1987/88, and 10.0% for 1988/89. Pre-school education is particularly important for teaching Turkish.

National literacy rates have increased from 67% to 77% as indicated by the 1980 and 1985 National Population Census. The Region's population literacy ratio has been below the National average. In the latest ratios are indicated to be between 71% and 48%. The provincial breakdown is as shown below:

Gaziantep	: 70.6 %
Adiyaman	: 61.8 %
Diyarbakir	: 52.2 %
Siirt	: 50.7 %
Mardin	: 47.9 %
Sanliurfa	: 47.9 %

Participation ratios have been improving, although the targets set in the Fifth Five Year National Development Plan have not

been achieved. This is more so for the junior high school level performance.

Primary school education is compulsory in Turkey. Enrollment ratios in primary schools, including public primary schools, regional basic schools, regional boarding schools, primary schools for the disabled and private primary schools, are lower in the Region than the national average but steadily increasing.

Girls' enrollment increased at over 10% per annum between 1980/81 and 1986/87, increasing the share in the total girls enrollment in Turkey from 5.8% to 8.4%. The number of pupils per teacher is consistently higher in the Region and it has increased from 30 in 1980/81 to 41 in 1986/87, as compared with 20 and 31 in Turkey in respective years.

The number of students in different levels of schools is increasing more rapidly in the Region than in Turkey. Consequently, the shares of students in the Region to the national total are increasing more rapidly than the Region's population.

Region's share of students (%)

	1980/81	1986/87
Primary school	7.8	9.6
Junior high school	5.4	6.0
High school	5.8	6.0

There are vocational schools at junior high and high school levels. There exist only two classes of industrial vocational junior high schools in the Region with 100 students, while there are 46 classes with 2,400 students in Turkey in 1986/87. At high school level, there are 17 schools, 193 classes and 5,944 students at vocational schools in the Region, as compared with 342 schools, 5,132 classes and 189,349 students in Turkey in 1986/87. The Region's share of students is significantly lower for this category of education. Facilities are particularly lacking in rural areas.

There are 22 faculties and higher education institutes in the Region belonging to two universities: Dicle University and Gaziantep University. Seven of them will start accepting students during the 1988/89.

The adult education institutes in the Region consists of practical vocational schools for girls, adult education centers, apprentice training centers, domestic science schools, private teaching centers and courses, literacy campaign activities and mobile village courses.

Critical constraints which have yet to be removed may be summarized in the following way.

(1) Prevailing level of literacy and level of education are lower in the Region compared with the national average, especially for women, though level of education increased at a high rate between 1980-1985.

(2) In 1985, 88% of village population were living in places less than 2000 population and their average size is 545 in the Region. Most rural settlements (villages and sub-villages) have scattered settlement patterns. This affects negatively on the development of education.

(3) For existing village schools, both school buildings and educational equipment are insufficient. In under-developed parts of the Region it is even impossible to get vital educational materials such as books, notebooks, etc. due to economic inability of the families. In such areas efficiency in education will increase if such materials for education are provided by the State.

(4) In 1986-87 school attendancy ratios are still low.

Attaining development targets in the Region are subject to available resources (public and private). Public fixed investment in the Region should be increased. In order to allocate such limited available sources, main emphasis may be given to primary education parallelling the existing national policy. Enrollment ratio target of technical high schools should be increased in order to achieve the level comparable with the prevailing national level.

Regional education objectives need to be set based on realistic assumptions of expected needs as well as fulfilling the general national educational targets. The Region will be undergoing a major economic and social transformation during the next two decades, therefore policies need to be established in accordance with these expectations.

2.2 Prospects

(1) Projection

The standard of education and infrastructure to be attained in 2005 were projected with the consideration of the development target. The target reflects the principle that improvement of education service should aim at least at the attainment of the present national average by 2005. Specially, the enrollment ratios at schools of different levels should exceed the current national average by 2005.

In the analysis, first the school age population was estimated with a specified distribution of age groups coinciding with different levels of education. The calculation was based on the total population in the GAP region which was projected by socio-economic projection model (Scenario C: Slower development).

Second, the number of students was projected for each different level of education, setting enrollment ratios to be expected in 2005. With the number of students per class, projections were made for the number of classes to be achieved in 2005. The number of students per class was set with an assumption that a two shift system would be introduced at 100% for junior schools and 50% for senior high schools (general).

Table G.29 shows the result of projections for the standard of education and the number of classes to be achieved and to be added by 2005.

Primary schools
Enrollment ratio was targeted at 100% in 2005. According to the projection in Table G.29, no new classes will be further required by 2005, assuming 40 students per class. However, some critical problems have yet to be removed so as to attain the target.

Junior high schools
Enrollment ratio at technical schools should be raised from 2.8% to 20% in 2005, while that of the general school need to be increased from 24% to 60%.The classes to be added by 2005 will be 2,500 for general schools and nearly 1,500 for technical schools, assuming the introduction of a two shift system.

Senior high schools
The organized and extended occupational and technical senior high schools will be important to train the required number of relatively skilled workers for the development of the Region. The enrollment ratio of technical schools has been targeted at 19% and in the general school at 21%. The classes to be added will be 1,013 for general schools (assuming that 50% are operated on a two shift system) and 2,770 for technical schools.

Higher education
There are 11,000 students at the existing universities in the Region as of 1987. Assuming the enrollment ratio 12%, enrollment at universities will be about 76,000 in 2005.

(2) Measures for educational development

The constraints described in Section 1.1 can be overcome by taking effective measures. Among others, the following measures are recommended.

Boarding school system

Reinforcement of boarding school system will be effective in order to mitigate the constraints which come from the dispersed settlement pattern and the social environment in the less developed areas.

Boarding schools at the primary school levels in the Region have 7,652 pupils or 1.2% of total primary school pupils. The sex composition of boys and girls is 79% of boys and 21% of girls, as compared with the ratios of 58% and 42%, respectively, of the total primary school enrollment in the Region (1986-87 education year).

Ratio of unsuccessful students differs between 10-20% among provinces in the Region (Table G.30). This ratio is higher in rural areas. Level of unsuccessfullness is relatively higher for regional boarding schools than it is for regular schools.

Basic problems of boarding school at primary level may be summarized as follows:

- Both the parents and the children do not wish to separate from each other, especially in case of girls;
- Younger pupils suffer from psychological pressures due to difficulty of communication, attributing to their inability to speak Turkish;
- Throughout the school year teachers are obligated to take care of pupils all the day long; and
- Graduates from boarding schools tend to be discouraged, and most give up before advancing to higher education because of very limited family financial resources.

Village resettlement

The dam reservoirs will be displacing 71 village settlements, of which 62 are presently located in Adiyaman province and 9 in the Sanliurfa province. Most of these villages have schools that will need relocating. Policy objectives concerning the relocation and rebuilding of schools are currently being formulated by the Ministry of Education, Youth and Sports and Adiyaman and Sanliurfa Governorates.

As of January 25, 1989 construction activity had started only for the reconstruction of two schools and one faculty housing. The remaining school and faculty housing reconstruction are still being planned.

Construction of these schools and faculty housing need to be completed prior to the relocation of families and students since there are approximately 5,000 students and 150 teachers who will be affected by these relocation activities.

Bussing system

It is proposed that for day schools a bussing system be

established, replacing the boarding schools at primary level. This proposal can contribute to overcoming the problems described above and the constraints caused by the dispersed regional settlement pattern.

This system should be organized with school facilities to be located at the centers of village clusters of about 60 km radius (one hour) at maximum. Five or six school buses will need to transport the students to and from the schools. These schools will accommodate at least 300-400 students with 10 classes, modern training-aids and housing facilities for teachers. Pupils will be provided with textbooks and lunch meals.

Major advantages of this system are considered to be as follows:

- Pupils in 6-12 age group can go to school from their houses, and they will be relieved from psychological pressure;
- This will enable parents to send their daughters to schools;
- Teachers will be relieved from the burden of taking care of pupils on a 24 hour basis; and
- Parents will be encouraged to send their children to school that offers them lunch meal and textbooks that would be supplied free.

In addition, facilities for boarding houses can be utilized for those graduates who prepare for advancement to higher education.

The proposed system can be initiated as a pilot implementation in an area having no serious access problems. A candidate for the pilot implementation may be a rural district in Sanliurfa province, where average student population is approximately 380 with a geographic characteristic as described above. It may be possible to carry this pilot program in a village which also has a health center, serving a population of about 2,000-3,000.

3. Health services

3.1 Present conditions

Diseases

Prevalence of disease in the GAP region may be seen in Table G.31, which indicates the cases of infectious diseases by province for the years 1981 and 1987.

Infection rates in the Region were substantially higher than the national average. In 1981, the highest proportion was paratyphoid fever(23.0%), followed by dysentery(16.0%), malaria(15.9%), typhoid fever(15.2%), diphtheria(14.7%), poliomyelitis(12.2%), whooping cough(11.6%) and measles(10.7%).

In 1987, the highest recorded diseases in the Region is seen to

be typhoid fever(1,733 cases), followed by dysentery(1,430), infectious hepatitis(740), scarlet fever(477) and brucellosis(455). When these figures are compared to the cases in 1981, the following are observed:

- decreases in the cases of whooping cough, diphtheria, measles, polio and typhoid fever, and
- increases in the cases of meningitical infection, brucellosis, dysentery, infectious hepatitis, scarlet fever and typhoid fever.

The decreases in the cases above resulted from an extensive vaccination campaign conducted recently by the Ministry of Health and Social Assistance. In the Region, the number of children vaccinated increased from 343,754 in 1981 to 1,136,752 in 1987. The increases above may be partly attributed to stagnation of improvement in the sanitation devices.

Intra-regional difference was striking. Siirt had the highest infection rates for most major diseases in 1981, but the situation improved appreciable by 1987.

Health facilities and manpower

Primary health services in Turkey aim at providing medical care and protecting the health of the population in all the settlements. There are three types of dispensaries and medical units as follows.

A_1 type dispensary for a province center serving 50,000 people with four doctors and six health personnel.

D_1 type dispensary for a district center serving 30,000 people with two doctors and four health personnel.

Village type dispensary to serve 7,000 to 8,000 people with one doctor and three health personnel.

Medical unit to serve 2,000 to 2,500 people and having one midwife.

As of the end of 1987, there exists 250 dispensaries, 1,502 medical units, and 340 medical doctors in the Region. The number of facilities seems adequate in the light of the above criteria, but doctors and health personnel as well as equipment are not sufficient (Table G.32). Doctors are in short especially in Adiyaman and Sanliurfa provinces.

As of 1987, there existed 47 hospitals of which 36 are State hospitals and 11 other hospitals. Adiyaman and Mardin have only State hospitals. (Table G.33). In Turkey the number of hospital beds per 10,000 population was 23.7 in 1986, and 24.1 in 1987. The corresponding figures in the Region in 1987 are 7.2 in Adiyaman, 24.8 in Diyarbakir, 13.7 in Gaziantep, 5.8 in Mardin,

6.4 in Siirt and 7.6 in Sanliurfa.

Despite these low levels in the Region, bed occupancy ratios are low. This was due to (1) insufficient personnel, (2) inadequate medical equipment, and (3) lack of sufficient knowledge of the capabilities offered for most treatments in the Region's health facilities on part of the population. Many persons prefer to use facilities outside of the Region anticipating for better services.

There were 701 doctors engaged in the hospitals in the Region in 1987 - 467 specialist and 234 general practitioner.

Rural sanitation

The prevalence of infectious diseases related to digestive organs in the Region is largely attributable to rural sanitation, especially due to the rural drinking water supply. Table G.34 indicates the situation of drinking water supply in rural settlements of the Region in 1987.

According to the same table, the rural settlements without drinking water supply were 3,442, which accounts for 40.6 % of total rural settlements. This ratio increases to 63.8 % if those with inadequate water supply are also included. On a population basis, 30 % of rural population in the Region did not enjoy hygienic potable drinking water supply at all in 1987.

About half of the settlements in Diyarbakir and Siirt did not have a proper potable water source; 39.3 % of rural population in Siirt province did not have potable water. Following Siirt, provinces with highest inadequate potable water are Diyarbakir (38.6%), Mardin (30.3%) and Sanliurfa (27.9%).

Table G.35 summarizes the Region's potable water situation and the toilet facilities in 1980. Although the data are rather outdated, it shows that 3,733 houses had improved potable water and 40,783 houses had chlorinated potable water. On the other hand, the number of households with toilets were much fewer. The number of houses with improved toilets were 1,820 or 4.0 % and those with newly installed facilities were 915 or 2.3 % of the total.

Mother and child care activities

Mother and child care can contribute to decreasing both the birth and death rates of children as well as death of mothers at child birth. It is an essential part of preventive health care.

Consultation is an important component of mother and child care activities, especially in less developed regions where the education level is generally lower. Information and consultation are given to women or couples who visit dispensaries and medical units. Doctors or health personnel pays visits to families who

live in remote areas.

Mother and child care activities mainly consist of the following:
- family planning
- mother health control activities including appropriate advices to pregnant women, and
- child health control activities including prevention of diarrhea, vaccination and health control.

Table G.36 presents the situation of modern contraceptive methods in 1986. Cases using condom was 21,271 followed by 17,394 of the birth control pill and 13,082 of the IUD (extraction) in the Region. The dissemination of modern contraceptive methods in the Region reflected the similarity of the Region's contraceptive use to that of the Nation's.

3.2 Prospects

(1) Projection

Number of facilities for public health service and health personnel to be required in 2005 was projected, taking into account the present situation and such a development principle that the levels of health facilities and personnel should at least reach the current national average by 2005.

Facilities for public health services

Numbers of facilities to be required for primary health services were projected by province, based on the following criteria:

- A_1 type dispensary per 50,000 population,
- D_1 type dispensary per 30,000 population, and
- Village type dispensary per 10,000 population.

For the purpose of projection, the number of population in the above criteria was assumed to apply to provincial center, district center and the other settlements respectively. The result of projection is shown in Table G.37.

According to the same table, A_1 type dispensary should be increased by 40 of which 21 will be established in Gaziantep province, followed by 10 in Diyarbakir and 7 in Sanliurfa. D1 type dispensary should be increased by 29 in each of the provinces except for Adiyaman. Village type dispensary should be increased by 85 of which 32 are to be located in Mardin, 20 in Siirt, 19 in Diyarbakir and 14 for Adiyaman. None will be necessary in Gaziantep and in Sanliurfa.

Requirement of hospitals in 2005 was projected for university hospitals and for others respectively. In 2005, 25 hospital beds per 10,000 population should have been attained for the Region. The number of beds for university hospitals is expected to

increase from 1,500 (including those under construction) in 1987, to 2,000 in 2005.
The result of the projection is shown in Table G.38. By 2005, 11,845 of hospital beds should be newly established of which 451 will be for university hospitals and 11,394 for other hospital facilities.

Health personnel

Health personnel that would be required in 2005 was projected for doctors, nurses and midwives, by type of health services.

Requirement of health personnel for hospitals was assumed to reach the national average of 1987:

- Doctors: 15 % of beds in 2005 (Number of beds: 11,845),
- Nurses and midwives: 31 % of beds in 2005.

The following criteria were applied for determining the required number of health personnel for dispensaries in 2005:

Health Personnel Requirement per Unit	1987	2005
Doctors in dispensary A_1 type	4	4
Doctors in dispensary D_1 type	2	2
Doctors in dispensary village type	1	1
Other health personnel in dispensary		
Other health personnel in A_1 type	6	6
Other health personnel in D_1 type	4	4
Other health personnel in village type	3	3

Table G.39 shows the result of these estimates. About 1,500 doctors would be necessary in the Region by 2005 (1,155 for hospitals and 310 for dispensaries). Nurses and midwives posted in the dispensaries need to be increased from 663 (1987) to 1,424 in 2005. Those posted in the hospitals need to be increased 3,672 by 2005.

G-3 Communication

1. Development of communication

1.1 National communication policies

Telecommunication services have developed in three main stages in Turkey. Up to 1967 the services had been all of local character. Services that had been provided were poor in quality. Urban and rural telephone, telegraph and telex services were inefficient due to the outmoded technology. The system depended totally on imported technology.

During the period between 1967-1983, in accordance with the import substitution policy accepted by the PTT, new capacities were developed to carry out major repairs to produce spare parts and to assemble equipment.

PTT has meanwhile established NETAS CO. in participation with the NORTHERN ELECTRIC TELECOM. CO. (Canada) for the co-production of equipment. In parallel to this State initiatives private concerns were also encouraged to invest in this industry.

After 1983 a new policy was adapted, giving priority to modern digital technology, encouragement of foreign capital investment and/or its participation with local firms. The following are the main achievements of this policy following 1983:

-Teletas Co. PTT participation (1983): Telecom equipment
-ITT Co. System 12 Digital Switching System
-SIEMENS. EWDS DIGITAL :Telephone Equipment
-NETAS & ITT (Joint Venture) : Small Capacity Analog Electric Switching System

During this period domestically produced industry installed capacity is recorded in respective statistics to have increased by 150% and geographical coverage area increase by 100%. The capacity developed during the last four years is expected to meet the needs of local demand represented by PTT and the rate of increase of switching capacity is ahead of network expansion that is being put into service.

1.2 Development of communication in GAP

These developments have effected the GAP region somewhat slower. The quality of the present level of communication services, with the exception of the major centers are insufficient. These insufficiencies will become even more pronounced as the Region's urban population and economy increases rapidly.

Modern telecommunication systems are highly capital intensive. These systems require fewer but highly qualified personnel to

operate and maintain them. As far as the appropriate technology that is concerned, the present local technology is accepted to be appropriate for the next decade.

These services include hard-wiring of a network that serves various needs. Tele-facsimile, telex, telegraph and telephone information systems depend on this network. Since manually operated switching systems have become inadequate to meet the existing demand, electronic switching systems with greater capacities are being installed to replace the existing out-moded systems.

1.3 Communication investments in GAP provinces

The GAP region's administrative centers (district, provincial centers, 1985) will have been provided with automatic switching systems by the end of 1988. Telephone communications have also been provided to almost all of the Region's villages, with some exceptions in the provinces of Diyarbakir, Mardin and Siirt (Tables G.40 and G.41). Present telephone service needs of the Region is expected to be met by the end of 1988.

Investment plans of the PTT telephone systems are conducted on short range basis. Due to the rapid change in technology, decisions are based on demand and the required plans are made according to the most recent affordable and existing technologies.

In the GAP Region in 1985 total switching capacity had been 91,850 lines. The number of connections in 1985 had been 82,762 of which 42,977 (52%) and 39,785 (48%) respectively had been for office and residential use. The total switching capacity increased to reach 215,332 in 1988, 24% increase from the previous year.

Of the 3,567 villages in the Region, 3,456 had been provided with telephones by the end of 1988. Also by the end of 1988, 369 hamlets had been provided with telephones.

The corridor extending from Gaziantep to Diyarbakir (Kinked Axis) possesses most of the communications capacity of the Region's system. The expected capacity expansion needs and the subsequent investment requirements for each major urban center along the Kinked Axis and the other regional investment needs has been shown in Tables G.42 and G.43.

2. Needs for communication development

2.1 Investment requirements

Investment requirements are estimated for each of the plan periods based on information of most current investment

estimates of PTT.

Costs

Annual Investment Plan 1988 foresees an additional line capacity of 1,025,950 with the following costs by items:

	10^6 TL
All PTT office and switch buildings	42.0
Data processing, training, and Radio-link building and equipment	16.4
2500 line capacity of telex	6.8
Long distance telecom	160.6
1,025,950 lines of switch capacity	275.1
Principal and local lines	248.0
Total cost	748.8
Cost per line	0.73

Unit costs

Comparative unit cost per line is reported to be US$ 1,000 by international standards. Technological changes suggest that the international unit cost is a more realistic base for these estimates.

PTT investments

Trend Projection (10^9 TL)

	1980	1981	1982	1983	1984	1985	1986	1987	1988
In Current Prices	13	24	37	67	124	238	453	748	842
In mid-1988 Prices	181	247	311	419	521	714	1065	1237	842

Source : PTT 1987 Annual Report
1988 Annual Investment Program (SPO)

Assumptions

National PTT Investments are assumed to increase at 4.5 % per annum throughout the period based on the 1981-85 annual average increases. The GAP would receive investment allocations based on its share of the total population in each of the plan periods; that is 8.6 % in VI, 8.8 % in VII and 10 % in VIII Plan Periods respectively.

GAP Investments in 1988 Prices (10^9 TL)	VI.Plan	VII.Plan	VIII.Plan	Total
	318.8	406.6	575.8	1301.2

2.1 Switching capacity increases

Expected growth of telecommunication needs depend on demand. As summarized below, the period since 1985 has resulted in more than doubling of the switching capacity of these facilities in the Region and at the national level as well. The national switching capacity had increased from 2.6 million in 1985 to 5.8 million by the end of 1987. National plans and investment programs have

emphasized this need. Also, 75% of the expansion requirements have been successfully provided from PTT's own resources.

CAPACITY EXPANSION

PROVINCE	1985	1988	GROWTH %
ADIYAMAN	7,440	14,210	190
DIYARBAKIR	18,580	41,500	223
GAZIANTEP	37,530	92,100	245
MARDIN	7,930	17,250	218
SIIRT	9,840	17,000	172
SANLIURFA	10,530	35,250	335
REGIONAL TOTAL	91,850	217,310*	237
TURKEY	2,566,947	5,809,774	226

* Actual realization was 215,332.

3. Summary

The telecommunication infrastructure, with its quality and compatibility with national and international systems is one of the essential needs of the development process. The national policy towards improving the GAP region's communications infrastructure can be seen in the growth of the switching capacity between 1985 and 1988.

The scattered settlement characteristic of the Region is a restrictive factor in the drive towards improving this basic need. Growth of urban centers and the gradual concentration of the population in fewer settlements will make these investments more cost effective. Some apartment buildings have as many households as there are in some of the Region's villages. The sector's high investment needs for expanding its services to as many households and as many businesses with the most economic technological methods in urban centers can be justified. In rural areas this may not be so.

Newer technologies may need to be researched for providing efficient communications services in the GAP region. The region has over 3,500 villages and approximately 4,000 sub-villages. Almost all villages have been provided with a single line telephone service. Very few of the sub-villages benefit from these services. Economic growth and social change in many of these villages will result in higher service demands. The conventional transmission methods may not be sufficient for these increasing demands.

Table 6.1 Population of Administrative Centers and Other Settlemants

Provinces	1980 Adm. Ctr.	%	Other Places	%	Total Population	%	1985 Adm.Ctr	%	Other Places	%	Total Population	%
ADIYAMAN	116986	31.82	250609	68.18	367595	100	150991	35.05	279737	64.95	430728	100
DIYARBAKIR	378578	48.65	399572	51.35	778150	100	472055	50.51	462450	49.49	934505	100
GAZIANTEP	512918	63.43	295779	36.57	808697	100	642938	66.52	323552	33.48	966490	100
MARDIN	192085	34.00	372882	66.00	564967	100	244000	37.42	408069	62.58	652069	100
SIIRT	183804	41.26	261679	58.74	445483	100	237014	45.17	287727	54.83	524741	100
SANLIURFA	305741	50.73	296995	49.27	602736	100	401450	50.49	393584	49.51	795034	100
REGIONAL TOTAL	1690112	47.37	1877516	52.63	3567628	100	2148448	49.92	2155119	50.08	4303567	100
RESIDUAL TURKEY	17954895	43.61	23214434	56.39	41169329	100	24717309	53.31	21643582	46.69	46360891	100
TURKEY	19645007	43.91	25091950	56.09	44736957	100	26865757	53.03	23798701	46.97	50664458	100

Provinces	Administrative Centers 1980	Administrative Centers 1985	Annual Growth (%)	Other Places 1980	Other Places 1985	Annual Growth (%)	Total 1980	Total 1985	Annual Growth (%)
ADIYAMAN	116986	150991	5.24	250609	279737	2.22	367595	430728	3.22
DIYARBAKIR	378578	472055	4.51	399572	462450	2.97	778150	934505	3.73
GAZIANTEP	512918	642938	4.62	295779	323552	1.81	808697	966490	3.63
MARDIN	192085	244000	4.90	372882	408069	1.82	564967	652069	2.91
SIIRT	183804	237014	5.22	261679	287727	1.92	445483	524741	3.33
SANLIURFA	305741	401450	5.60	296995	393584	5.79	602736	795034	5.68
REGIONAL TOTAL	1690112	2148448	4.92	1877516	2155119	2.80	3567628	4303567	3.82
RESIDUAL TURKEY	17954895	24717309	6.60	23214434	21643582	-1.39	41169329	46360891	2.40
TURKEY	19645007	26865757	6.46	25091950	23798701	-1.05	44736957	50664458	2.52

Table 6.2 Settlement Size Distribution in GAP Provinces

1975

Settlement Size	ADIYAMAN N	ADIYAMAN Pop.	DIYARBAKIR No.	DIYARBAKIR Pop.	GAZIANTEP No.	GAZIANTEP Pop.	MARDIN No.	MARDIN Pop.	SIIRT No.	SIIRT Pop.	SANLIURFA No.	SANLIURFA Pop.	REGION No.	REGION Pop.
-2000	336	221160	681	358542	581	244488	704	320610	495	222296	685	295290	3482	1662386
2001-5000	10	29866	8	27666	17	41571	20	64531	7	24878	6	15606	68	204118
5001-10000	1	5066	4	31180	3	18070	1	6948	4	23704	5	45714	18	130682
10001-20000	3	47018	1	12775			3	45754	1	10587			8	116134
20001-50000	1	43782	2	51535	2	56873	3	81844	1	35654	4	107733	13	377421
50001-100000					1	54055			1	64384			2	118439
100001+			1	169535	1	300882					1	132934	3	603351
TOTAL	351	346892	697	651233	605	715939	731	519687	509	381503	701	597277	3594	3212531

1980

Settlement Size	ADIYAMAN N	ADIYAMAN Pop.	DIYARBAKIR No.	DIYARBAKIR Pop.	GAZIANTEP No.	GAZIANTEP Pop.	MARDIN No.	MARDIN Pop.	SIIRT No.	SIIRT Pop.	SANLIURFA No.	SANLIURFA Pop.	REGION No.	REGION Pop.
-2000	336	222686	685	383331	587	258376	703	324796	495	251228	686	281499	3492	1721916
2001-5000	12	33841	10	28665	14	40587	18	51327	10	34196	5	13104	69	201720
5001-10000	1	5229	6	43636	2	16060	5	33039			2	11232	16	109196
10001-20000	2	32230	1	19059			2	35239	3	31596	4	59048	12	177172
20001-50000	1	20390	2	67842	2	61049	4	120566	1	42291	3	90365	13	402503
50001-100000	1	53219			1	58335			1	86172			3	197726
100001+			1	235617	1	374290					1	147488	3	757395
TOTAL	353	367595	705	778150	607	808697	732	564967	510	445483	701	602736	3608	3567628

1985

Settlement Size	ADIYAMAN N	ADIYAMAN Pop.	DIYARBAKIR No.	DIYARBAKIR Pop.	GAZIANTEP No.	GAZIANTEP Pop.	MARDIN No.	MARDIN Pop.	SIIRT No.	SIIRT Pop.	SANLIURFA No.	SANLIURFA Pop.	REGION No.	REGION Pop.
-2000	338	244996	679	424883	583	273345	696	331065	493	271718	674	342418	3463	1888425
2001-5000	13	41605	15	41839	15	43405	24	67206	9	29698	16	40523	92	264276
5001-10000	1	7057	6	45382	3	20955	6	44972	3	17491	2	17505	21	153362
10001-20000	1	17763	1	12566	1	11176	2	27046	3	41914	2	28518	10	138983
20001-50000	2	47663	3	103895	1	29031	5	181780			5	171101	16	533470
50001-100000	1	71644			2	109943			1	53884			4	235471
100001+			1	305940	1	478635			1	110036	1	194969	4	1089580
TOTAL	356	430728	705	934504	606	966490	733	652069	510	524741	700	795034	3610	4303567

Table G.3 Settlement Size Distribution in GAP Region

Settlement Size	1975 No.	1975 Pop.	1980 No.	1980 Pop.	1985 No.	1985 Pop.
-2000	3482	1662386	3492	1721916	3463	1888425
2001-5000	68	204118	69	201720	92	264276
5001-10000	18	130682	16	109196	21	153362
10001-20000	8	116134	12	177172	10	138983
20001-50000	13	377421	13	402503	16	533470
50001-100000	2	118439	3	197726	4	235471
100001+	3	603351	3	757395	4	1089580
TOTAL	3594	3212531	3608	3567628	3610	4303567

Percent of Total

Settlement Size	1975 No.	1975 Pop.	1980 No.	1980 Pop.	1985 No.	1985 Pop.
-2000	96.88	51.75	96.78	48.27	95.93	43.88
2001-5000	1.89	6.35	1.91	5.65	2.55	6.14
5001-10000	0.50	4.07	0.44	3.06	0.58	3.56
10001-20000	0.22	3.62	0.33	4.97	0.28	3.23
20001-50000	0.36	11.75	0.36	11.28	0.44	12.40
50001-100000	0.06	3.69	0.08	5.54	0.11	5.47
100001+	0.08	18.78	0.08	21.23	0.11	25.32
TOTAL	100	100	100	100	100	100

Table 6.4 Population (1945-85) and Projections to 2005 (Trend)

PROVINCE	1945	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005
ADIYAMAN			208755	233717	267288	303511	346892	367595	430728	489110	551650	615941	683133
DIYARBAKIR	249949	293738	343903	401884	475916	581208	651233	778150	934505	1106869	1307482	1528950	1775991
GAZIANTEP	290058	328343	376969	434579	511026	606540	715939	808697	966490	1142277	1338255	1552116	1788132
MARDIN	234457	269490	305520	353411	397880	453092	519687	564967	652069	749114	849147	952874	1062133
SIIRT	133627	156703	191234	232243	264832	320684	381503	445483	524741	631912	748094	876746	1020661
SANLIURFA	263855	298394	348199	401919	450798	538131	597277	602736	795034	869731	989005	1113347	1244951
TOTAL REGION	1171946	1346668	1774580	2057753	2367740	2803166	3212531	3567628	4303567	4989014	5783634	6639974	7575000
RESIDUAL TURKEY	17618228	19600520	22290183	25697067	29023681	32802010	37135188	41169329	46360891	52054094	58128210	64618387	71874343
TOTAL TURKEY	18790174	20947188	24064763	27754820	31391421	35605176	40347719	44736957	50664458	57043108	63911844	71258361	79449343

GAP PROVINCES' ANNUAL RATE OF GROWTH (%)

PROVINCE	1945 1950	1950 1955	1955 1960	1960 1965	1965 1970	1970 1975	1975 1980	1980 1985	1985 1990	1990 1995	1995 2000	2000 2005
ADIYAMAN			2.28	2.72	2.57	2.71	1.17	3.22	2.57	2.44	2.23	2.09
DIYARBAKIR	3.28	3.20	3.17	3.44	4.08	2.30	3.63	3.73	3.44	3.39	3.18	3.04
GAZIANTEP	2.51	2.80	2.89	3.29	3.49	3.37	2.47	3.63	3.40	3.22	3.01	2.87
MARDIN	2.82	2.54	2.96	2.40	2.63	2.78	1.68	2.91	2.81	2.54	2.33	2.19
SIIRT	3.24	4.06	3.96	2.66	3.90	3.53	3.15	3.33	3.79	3.43	3.22	3.09
SANLIURFA	2.49	3.14	2.91	2.32	3.61	2.11	0.18	5.69	1.81	2.60	2.40	2.26
TOTAL REGION	2.82	5.67	3.01	2.85	3.43	2.76	2.12	3.82	3.00	3.00	2.80	2.67
RESIDUAL TURKEY	2.16	2.61	2.89	2.46	2.48	2.51	2.08	2.40	2.34	2.23	2.14	2.15
TOTAL TURKEY	2.20	2.81	2.89	2.49	2.55	2.53	2.09	2.52	2.40	2.30	2.20	2.20

GAP PROVINCES AS PERCENTAGE OF NATIONAL POPULATION (%)

PROVINCE	1945	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005
ADIYAMAN			0.87	0.84	0.85	0.85	0.86	0.82	0.85	0.86	0.86	0.86	0.86
DIYARBAKIR	1.33	1.40	1.43	1.45	1.52	1.63	1.61	1.74	1.84	1.94	2.05	2.15	2.24
GAZIANTEP	1.54	1.57	1.57	1.57	1.63	1.70	1.77	1.81	1.91	2.00	2.09	2.18	2.25
MARDIN	1.25	1.29	1.27	1.27	1.27	1.27	1.29	1.26	1.29	1.31	1.33	1.34	1.34
SIIRT	0.71	0.75	0.79	0.84	0.84	0.90	0.95	1.00	1.04	1.11	1.17	1.23	1.28
SANLIURFA	1.40	1.42	1.45	1.45	1.44	1.51	1.48	1.35	1.57	1.52	1.55	1.56	1.57
TOTAL REGION	6.24	6.43	7.37	7.41	7.54	7.87	7.96	7.97	8.49	8.75	9.05	9.32	9.53
RESIDUAL TURKEY	93.76	93.57	92.63	92.59	92.46	92.13	92.04	92.03	91.51	91.25	90.95	90.68	90.47
TOTAL TURKEY	100	100	100	100	100	100	100	100	100	100	100	100	100

Table 6.5 Population of Places < 5001, 1975-85 and Trend Projections to 2005 (I)

Settlement Size	1975	1980	1985	1990	1995	2000	2005	1985	1990	1995	2000	2005
	ADIYAMAN							GROWTH INDEX				
Places < 5001	251026	256527	286601	303203	320768	339349	359898	100	106	112	118	126
Other places	95866	111068	144127	185907	230882	276592	323234	100	129	160	192	224
TOTAL POPULATION	346892	367595	430728	489110	551650	615941	683132	100	114	128	143	159
	DIYARBAKIR											
Places < 5001	386208	411996	466722	496572	528332	562122	598965	100	106	113	120	128
Other places	265025	366154	467783	610297	779150	966828	1177026	100	130	167	207	252
TOTAL POPULATION	651233	778150	934505	1106869	1307482	1528950	1775991	100	118	140	164	190
	GAZIANTEP											
Places < 5001	286059	298963	316750	334074	352346	371618	392834	100	105	111	117	124
Other places	429880	509734	649740	808203	985909	1180498	1395298	100	124	152	182	215
TOTAL POPULATION	715939	808697	966490	1142277	1338255	1552116	1788132	100	118	138	161	185
	MARDIN											
Places < 5001	385141	376123	398270	417190	437009	457769	480406	100	105	110	115	121
Other places	134546	188844	253799	331924	412138	495105	581727	100	131	162	195	229
TOTAL POPULATION	519687	564967	652069	749114	849147	952874	1062133	100	115	130	146	163
	SIIRT											
Places < 5001	247174	285424	301416	320984	341822	364013	388535	100	106	113	121	129
Other places	134329	160059	223325	310928	406272	512733	632126	100	139	182	230	283
TOTAL POPULATION	381503	445483	524741	631912	748094	876746	1020661	100	120	143	167	195
	SANLIURFA											
Places < 5001	310896	294603	382941	408210	435147	463862	495361	100	107	114	121	129
Other places	286381	308133	412093	461521	553858	649485	749590	100	112	134	158	182
TOTAL POPULATION	597277	602736	795034	869731	989005	1113347	1244951	100	109	124	140	157
	GAP REGION											
Places < 5001	1866504	1923636	2152701	2280234	2415424	2558733	2716000	100	106	112	119	126
Other places	1346027	1643992	2150866	2708779	3368209	4081241	4859000	100	126	157	190	226
GAP POPULATION	3212531	3567628	4303567	4989013	5783633	6639974	7575000	100	116	134	154	176

Table 6.6 Population of Places < 5001, 1975-85 and Trand Projections to 2005 (II)

ADIYAMAN								Percent of Total (%)						
Settlement Size	1975	1980	1985	1990	1995	2000	2005	1975	1980	1985	1990	1995	2000	2005
Places < 5001	251026	256527	286601	303203	320768	339349	359898	72.4	69.8	66.5	62.0	58.1	55.1	52.7
Other places	95866	111068	144127	185907	230882	276592	323234	27.6	30.2	33.5	38.0	41.9	44.9	47.3
TOTAL POPULATION	346892	367595	430728	489110	551650	615941	683132	100	100	100	100	100	100	100
DIYARBAKIR														
Places < 5001	386208	411996	466722	496572	528332	562122	598965	59.3	52.9	49.9	44.9	40.4	36.8	33.7
Other places	265025	366154	467783	610297	779150	966828	1177026	40.7	47.1	50.1	55.1	59.6	63.2	66.3
TOTAL POPULATION	651233	778150	934505	1106869	1307482	1528950	1775991	100	100	100	100	100	100	100
GAZIANTEP														
Places < 5001	286059	298963	316750	334074	352346	371618	392834	40.0	37.0	32.8	29.2	26.3	23.9	22.0
Other places	429880	509734	649740	808203	985909	1180498	1395298	60.0	63.0	67.2	70.8	73.7	76.1	78.0
TOTAL POPULATION	715939	808697	966490	1142277	1338255	1552116	1788132	100	100	100	100	100	100	100
MARDIN														
Places < 5001	385141	376123	398270	417190	437009	457769	480406	74.1	66.6	61.1	55.7	51.5	48.0	45.2
Other places	134546	188844	253799	331924	412138	495105	581727	25.9	33.4	38.9	44.3	48.5	52.0	54.8
TOTAL POPULATION	519687	564967	652069	749114	849147	952874	1062133	100	100.0	100.0	100.0	100.0	100.0	100.0
SIIRT														
Places < 5001	247174	285424	301416	320984	341822	364013	388535	64.8	64.1	57.4	50.8	45.7	41.5	38.1
Other places	134329	160059	223325	310928	406272	512733	632126	35.2	35.9	42.6	49.2	54.3	58.5	61.9
TOTAL POPULATION	381503	445483	524741	631912	748094	876746	1020661	100	100	100	100	100	100	100
SANLIURFA														
Places < 5001	310896	294603	382941	408210	435147	463862	495361	52.1	48.9	48.2	46.9	44.0	41.7	39.8
Other places	286381	308133	412093	461521	553858	649485	749590	47.9	51.1	51.8	53.1	56.0	58.3	60.2
TOTAL POPULATION	597277	602736	795034	869731	989005	1113347	1244951	100	100	100	100	100	100	100
GAP REGION														
Places < 5001	1866504	1923636	2152701	2280234	2415424	2558733	2716000	58.1	53.9	50.0	45.7	41.8	38.5	35.9
Other places	1346027	1643992	2150866	2708779	3368209	4081241	4859000	41.9	46.1	50.0	54.3	58.2	61.5	64.1
GAP POPULATION	3212531	3567628	4303567	4989013	5783633	6639974	7575000	100	100	100	100	100	100	100

Table 6.7 Population of Places > 10000 , Trend Projections to 2005

PROVINCE	MUNICIPALITY	1985	1990	1995	2000	2005	GROWTH INDEX 1985	1990	1995	2000	2005
ADIYAMAN	BESNI	17763	20517	22982	25488	28067	100	116	129	143	158
	KAHTA	25510	32001	39537	49128	49548	100	125	155	193	194
	GOLBASI	22153	30381	41057	55256	74173	100	137	185	249	335
	MERKEZ	71644	87091	109487	126587	148347	100	122	153	177	207
	TOTAL (10000+)	137070	169989	213063	256458	300135	100	124	155	187	219
	PROV. TOTAL	430728	489110	551650	615941	683132	100	114	128	143	159
DIYARBAKIR	HANI	9575	11443	13990	14568	16318	100	120	146	152	170
	CINAR	8049	10532	13686	17381	22153	100	131	170	216	275
	CERMIK	12566	14988	17538	20194	23538	100	119	140	161	187
	ERGANI	33209	41115	51601	62289	79019	100	124	155	188	238
	BISMIL	24862	37550	56386	82784	120201	100	151	227	333	483
	SILVAN	45825	77291	104418	139697	183357	100	169	228	305	400
	MERKEZ	305940	401581	499117	610529	748707	100	131	163	200	245
	TOTAL (10000+)	422402	594500	756735	947440	1193293	100	141	179	224	283
	PROV. TOTAL	934505	1106869	1307482	1528950	1775991	100	118	140	164	190
GAZIANTEP	YAVUZELI	4606	5469	6894	8640	10681	100	119	150	188	232
	OGUZELI	9547	10937	12723	14668	16783	100	115	133	154	176
	NURDAGI	5672	7960	11162	15472	21362	100	140	197	273	377
	ARABAN	11176	17646	26338	38880	57064	100	158	236	348	511
	ISLAHIYE	29031	35120	41955	49608	58267	100	121	145	171	201
	KILIS	59876	74548	84129	93959	104310	100	125	141	157	174
	NIZIP	50067	62208	74836	89137	105430	100	124	149	178	211
	MERKEZ	478635	627926	782089	972707	1202006	100	131	163	203	251
	TOTAL (10000+)	628785	828385	1033231	1274432	1575903	100	132	164	203	251
	PROV. TOTAL	966490	1142277	1338255	1552116	1788132	100	118	138	161	185
MARDIN	YESILLI	9798	11038	12165	13161	14241	100	113	124	134	145
	DERIK	13975	15697	17234	18084	18791	100	112	123	129	134
	MAZIDAGI	8269	10937	14193	18084	23241	100	132	172	219	281
	IDIL	8465	11140	14395	18486	23538	100	132	170	218	278
	SILOPI	13071	17216	22404	29135	37581	100	132	171	223	288
	MIDYAT	22169	26392	31548	37333	43885	100	119	142	168	198
	CIZRE	29496	35444	42477	50132	58350	100	120	144	170	198
	MERKEZ	44085	47799	52107	56261	60328	100	108	118	128	137
	KIZILTEPE	40852	54239	67872	83818	102884	100	133	166	205	252
	NUSAYBIN	45178	63293	89211	118549	163182	100	140	197	262	361
	TOTAL (10000+)	208826	293194	363607	443043	546020	100	140	174	212	261
	PROV. TOTAL	652069	749114	849147	952874	1062133	100	115	130	146	163
SIIRT	SASON	5821	6177	7907	9846	12263	100	106	136	169	211
	SIRNAK	12141	14886	17639	20897	24725	100	123	145	172	204
	BAYKAN	6665	9418	13179	18385	25713	100	141	198	276	386
	KURTALAN	12352	16000	21086	27025	34417	100	130	171	219	279
	KOZLUK	17421	34938	39182	42999	56372	100	201	225	247	324
	MERKEZ	53884	61774	69950	79368	90393	100	115	130	147	168
	BATMAN	110036	156460	213012	284569	381994	100	142	194	259	347
	TOTAL (10000+)	205834	284058	368777	464704	625876	100	138	179	226	304
	PROV. TOTAL	524741	631912	748094	876746	1020661	100	120	143	167	195
S.URFA	HILVAN	7907	9596	11068	12624	14363	100	121	140	160	182
	BOZOVA	9598	11342	13280	15673	17999	100	118	138	163	188
	BIRECIK	25998	28163	31325	33217	35143	100	108	120	128	135
	CEYLANPINAR	25781	28862	32440	36168	39955	100	112	126	140	155
	AKCAKALE	15542	20304	26409	34259	44405	100	131	170	220	286
	SURUC	25660	32126	38739	46566	55516	100	125	151	181	216
	SIVEREK	48333	56326	62859	70263	76908	100	117	130	145	159
	VIRANSEHIR	45329	66235	92096	129349	177245	100	146	203	285	391
	MERKEZ	194969	236776	302811	370457	448205	100	121	155	190	230
	TOTAL (10000+)	381612	480134	611029	748575	909740	100	126	160	196	238
	PROV. TOTAL	795034	869731	989005	1113347	1244951	100	109	124	140	157
REGION	TOTAL (10000+)	1984529	2650260	3346441	4134651	5150967	100	134	169	208	260
	TOTAL POPUL.	4303567	4989013	5783633	6639974	7575000	100	116	134	154	176

Table 6.8 Alternative Population Growth in GAP Provinces

	ALTERNATIVE A					GROWTH INDEX				
PROVINCE	1985	1990	1995	2000	2005	1985	1990	1995	2000	2005
ADIYAMAN	430728	508330	600600	709287	837255	100	118	139	165	194
DIYARBAKIR	934505	1153888	1426404	1762457	2176673	100	123	153	189	233
GAZIANTEP	966490	1185401	1455559	1786453	2191553	100	123	151	185	227
MARDIN	652069	774697	921441	1095469	1301761	100	119	141	168	200
SIIRT	524741	651698	810298	1007025	1250933	100	124	154	192	238
SANLIURFA	795034	935286	1101540	1296741	1525825	100	118	139	163	192
TOTAL REGION	4303567	5209300	6315843	7657433	9284000	100	121	147	178	216
RESIDUAL TURKEY	46360891	51833808	57596001	63600927	70165343	100	112	124	137	151
TOTAL TURKEY	50664458	57043108	63911844	71258361	79449343	100	113	126	141	157

	ALTERNATIVE B					ALTERNATIVE B				
PROVINCE	1985	1990	1995	2000	2005	1985	1990	1995	2000	2005
ADIYAMAN	430728	489623	562664	646299	742022	100	114	131	150	172
DIYARBAKIR	934505	1111423	1336306	1605942	1929090	100	119	143	172	206
GAZIANTEP	966490	1141775	1363620	1627807	1942277	100	118	141	168	201
MARDIN	652069	746187	863239	998186	1153693	100	114	132	153	177
SIIRT	524741	627714	759116	917595	1108646	100	120	145	175	211
SANLIURFA	795034	900866	1031962	1181584	1352272	100	113	130	149	170
TOTAL REGION	4303567	5017587	5916907	6977414	8228000	100	117	137	162	191
RESIDUAL TURKEY	46360891	52025521	57994937	64280947	71221343	100	112	125	139	154
TOTAL TURKEY	50664458	57043108	63911844	71258361	79449343	100	113	126	141	157

	ALTERNATIVE C					ALTERNATIVE C				
PROVINCE	1985	1990	1995	2000	2005	1985	1990	1995	2000	2005
ADIYAMAN	430728	482969	547948	621379	704325	100	112	127	144	164
DIYARBAKIR	934505	1096320	1301356	1544019	1831085	100	117	139	165	196
GAZIANTEP	966490	1126261	1327955	1565041	1843602	100	117	137	162	191
MARDIN	652069	736048	840661	959697	1095081	100	113	129	147	168
SIIRT	524741	619039	738915	881593	1051336	100	118	141	168	200
SANLIURFA	795034	888625	1004972	1136024	1283571	100	112	126	143	161
TOTAL REGION	4303567	4949262	5761808	6707754	7809000	100	115	134	156	181
RESIDUAL TURKEY	46360891	52093846	58150036	64550607	71640343	100	112	125	139	155
TOTAL TURKEY	50664458	57043108	63911844	71258361	79449343	100	113	126	141	157

ALTERNATIVE A: MAXIMUM IRRIGATION
ALTERNATIVE B: MAXIMUM POWER GENERATION
ALTERNATIVE C: SLOWER DEVELOPMENT

Table 6.9 Population of Places < 5001, 1975-85 and Projections to 2005 for Alternative A (I)

Settlement Size	1975	1980	1985	1990	1995	2000	2005	Percent of Total (%) 1975	1980	1985	1990	1995	2000	2005
ADIYAMAN														
Places < 5001	251026	256527	286601	310901	337262	365857	397711	72.4	69.8	66.5	61.2	56.2	51.6	47.5
Other places	95866	111068	144127	197429	263338	343430	439544	27.6	30.2	33.5	38.8	43.8	48.4	52.5
TOTAL POPULATION	346892	367595	430728	508330	600600	709287	837255	100	100	100	100	100	100	100
DIYARBAKIR														
Places < 5001	386208	411996	466722	506294	549221	595788	647137	59.3	52.9	49.9	43.9	38.5	33.8	29.7
Other places	265025	366154	467783	647594	877183	1166669	1529536	40.7	47.1	50.1	56.1	61.5	66.2	70.3
TOTAL POPULATION	651233	778150	934505	1153888	1426404	1762457	2176673	100	100	100	100	100	100	100
GAZIANTEP														
Places < 5001	286059	298963	316750	343606	372740	404343	439460	40.0	37.0	32.8	29.0	25.6	22.6	20.1
Other places	429880	509734	649740	841795	1082819	1382110	1752093	60.0	63.0	67.2	71.0	74.4	77.4	79.9
TOTAL POPULATION	715939	808697	966490	1185401	1455559	1786453	2191553	100	100	100	100	100	100	100
MARDIN														
Places < 5001	385141	376123	398270	432038	468670	508407	552347	74.1	66.6	61.1	55.8	50.9	46.4	42.4
Other places	134546	188844	253799	342659	452771	587062	749414	25.9	33.4	38.9	44.2	49.1	53.6	57.6
TOTAL POPULATION	519687	564967	652069	774697	921441	1095469	1301761	100	100	100	100	100	100	100
SIIRT														
Places < 5001	247174	285424	301416	326972	354695	384769	418226	64.8	64.1	57.4	50.2	43.8	38.2	33.4
Other places	134329	160059	223325	324726	455603	622256	832707	35.2	35.9	42.6	49.8	56.2	61.8	66.6
TOTAL POPULATION	381503	445483	524741	651698	810298	1007025	1250933	100	100	100	100	100	100	100
SANLIURFA														
Places < 5001	310896	294603	382941	415410	450631	488839	531119	52.1	48.9	48.2	44.4	40.9	37.7	34.8
Other places	286381	308133	412093	519876	650909	807902	994706	47.9	51.1	51.8	55.6	59.1	62.3	65.2
TOTAL POPULATION	597277	602736	795034	935286	1101540	1296741	1525825	100	100	100	100	100	100	100
GAP REGION														
Places < 5001	1866504	1923636	2152701	2335221	2533218	2748003	2986000	58.1	53.9	50.0	44.8	40.1	35.9	32.2
Other places	1346027	1643992	2150866	2874079	3782624	4909429	6298000	41.9	46.1	50.0	55.2	59.9	64.1	67.8
GAP POPULATION	3212531	3567628	4303567	5209300	6315842	7657432	9284000	100	100	100	100	100	100	100

Table 6.10 Population of Places < 5001, 1975-85 and Trend Projections to 2005 for Alternative A (II)

Settlement Size	1975	1980	1985	1990	1995	2000	2005	GROWTH INDEX 1975	1980	1985	1990	1995	2000	2005
ADIYAMAN														
Places < 5001	251026	256527	286601	310901	337262	365857	397710	100	102	114	124	134	146	158
Other places	95866	111068	144127	197429	263338	343430	439545	100	116	150	206	275	358	458
TOTAL POPULATION	346892	367595	430728	508330	600600	709287	837255	100	106	124	147	173	204	241
DIYARBAKIR														
Places < 5001	386208	411996	466722	506294	549221	595788	647137	100	107	121	131	142	154	168
Other places	265025	366154	467783	647594	877183	1166669	1529536	100	138	177	244	331	440	577
TOTAL POPULATION	651233	778150	934505	1153888	1426404	1762457	2176673	100	119	143	177	219	271	334
GAZIANTEP														
Places < 5001	286059	298963	316750	343606	372740	404343	439460	100	105	111	120	130	141	154
Other places	429880	509734	649740	843710	1085171	1384997	1756467	100	119	151	196	252	322	409
TOTAL POPULATION	715939	808697	966490	1185401	1455559	1786453	2191553	100	113	135	166	203	250	306
MARDIN														
Places < 5001	385141	376123	398270	432038	468670	508407	552346	100	98	103	112	122	132	143
Other places	134546	188844	253799	343911	454260	588832	752351	100	140	189	256	338	438	559
TOTAL POPULATION	519687	564967	652069	774697	921441	1095469	1301761	100	109	125	149	177	211	250
SIIRT														
Places < 5001	247174	285424	301416	326972	354695	384769	418226	100	115	122	132	144	156	169
Other places	134329	160059	223325	325779	456912	623883	835562	100	119	166	243	340	464	622
TOTAL POPULATION	381503	445483	524741	651698	810298	1007025	1250933	100	117	138	171	212	264	328
SANLIURFA														
Places < 5001	310896	294603	382941	415410	450631	488839	531120	100	95	123	134	145	157	171
Other places	286381	308133	412093	521387	652689	809997	998004	100	108	144	182	228	283	348
TOTAL POPULATION	597277	602736	795034	935286	1101540	1296741	1525825	100	101	133	157	184	217	255
GAP REGION														
Places < 5001	1866504	1923636	2152701	2335221	2533218	2748003	2986000	100	103	115	125	136	147	160
Other places	1346027	1643992	2150866	2874079	3782624	4909429	6298000	100	122	160	214	281	365	468
GAP POPULATION	3212531	3567628	4303567	5209300	6315842	7657432	9284000	100	111	134	162	197	238	289

Table 6.11 Population of Places > 10000, Projections to 2005 for Alternative A

PROVINCE	MUNICIPALITY	1985	1990	1995	2000	2005	GROWTH INDEX 1985	1990	1995	2000	2005
ADIYAMAN	BESNI	17763	18256	21422	25129	29452	100	103	121	141	166
	KAHTA	25510	28475	36854	48436	51992	100	112	144	190	204
	GOLBASI	22153	27033	38271	54478	77832	100	122	173	246	351
	MERKEZ	71644	77494	102056	124804	155664	100	108	142	174	217
	TOTAL (10000+)	137070	151258	198603	252846	314940	100	110	145	184	230
	PROV. TOTAL	430728	508330	600600	709287	837255	100	118	139	165	194
DIYARBAKIR	HANI	9575	10230	13088	14400	17151	100	107	137	150	179
	CINAR	8049	9415	12804	17181	23283	100	117	159	213	289
	CERMIK	12566	13399	16408	19962	24739	100	107	131	159	197
	ERGANI	33209	36756	48275	61573	83051	100	111	145	185	250
	BISMIL	24862	41847	65760	102013	157487	100	168	264	410	633
	SILVAN	45825	86136	121778	172147	240235	100	188	266	376	524
	MERKEZ	305940	447534	582097	752346	980958	100	146	190	246	321
	TOTAL (10000+)	422402	644276	858821	1137784	1524441	100	153	203	269	361
	PROV. TOTAL	934505	1153888	1426404	1762457	2176673	100	123	153	189	233
GAZIANTEP	YAVUZELI	4606	4867	6430	8528	11226	100	106	140	185	244
	OGUZELI	9547	9733	11867	14478	17639	100	102	124	152	185
	NURDAGI	5672	7084	10411	15271	22452	100	125	184	269	396
	ARABAN	11176	15704	24565	38375	59976	100	141	220	343	537
	ISLAHIYE	29031	38961	48782	61039	76341	100	134	168	210	263
	KILIS	59876	82702	97819	115610	136667	100	138	163	193	228
	NIZIP	50067	69013	87014	109676	138135	100	138	174	219	276
	MERKEZ	478635	696608	909354	1196839	1574872	100	146	190	250	329
	TOTAL (10000+)	628785	911248	1187893	1548785	2034021	100	145	189	246	323
	PROV. TOTAL	966490	1185401	1455559	1786453	2191553	100	123	151	185	227
MARDIN	YESILLI	9798	9789	11320	12975	14968	100	100	116	132	153
	DERIK	13975	13920	16037	17828	19749	100	100	115	128	141
	MAZIDAGI	8269	9699	13207	17828	24427	100	117	160	216	295
	IDIL	8465	9879	13396	18225	24739	100	117	158	215	292
	SILOPI	13071	15267	20848	28724	39499	100	117	160	220	302
	MIDYAT	22169	23405	29358	36806	46124	100	106	132	166	208
	CIZRE	29496	31433	39527	49424	61327	100	107	134	168	208
	MERKEZ	44085	42390	48489	55466	63406	100	96	110	126	144
	KIZILTEPE	40852	59963	78733	103012	134798	100	147	193	252	330
	NUSAYBIN	45178	56130	83016	116875	171507	100	124	184	259	380
	TOTAL (10000+)	208826	271437	353361	456426	599574	100	130	169	219	287
	PROV. TOTAL	652069	774697	921441	1095469	1301761	100	119	141	168	200
SIIRT	SASON	5821	5463	7345	9698	12889	100	94	126	167	221
	SIRNAK	12141	13166	16384	20583	25986	100	108	135	170	214
	BAYHAN	6665	8329	12241	18109	27025	100	125	184	272	405
	KURTALAN	12352	14151	19586	26619	36172	100	115	159	216	293
	KOZLUK	17421	30899	36394	42353	59248	100	177	209	243	340
	MERKEZ	53884	54633	64973	78175	95005	100	101	121	145	176
	BATMAN	110036	172496	246649	349414	500489	100	157	224	318	455
	TOTAL (10000+)	205834	284884	395589	534389	755594	100	138	192	260	367
	PROV. TOTAL	524741	651698	810298	1007025	1250933	100	124	154	192	238
S.URFA	HILVAN	7907	11032	13179	15719	18818	100	140	167	199	238
	BOZOVA	9598	10459	12684	15654	18918	100	109	132	163	197
	CEYLANPINAR	25781	26616	30985	36124	41993	100	103	120	140	163
	BIRECIK	25998	32376	37298	41359	46045	100	125	143	159	177
	AKCAKALE	15542	18724	25223	34218	46671	100	120	162	220	300
	SURUC	25660	36932	46125	57980	72738	100	144	180	226	283
	SIVEREK	48333	64752	74844	87485	100765	100	134	155	181	208
	VIRANSEHIR	45329	76143	109656	161055	232227	100	168	242	355	512
	MERKEZ	194969	272197	360546	461260	587240	100	140	185	237	301
	TOTAL (10000+)	381612	537332	709393	909384	1163535	100	141	186	238	305
	PROV. TOTAL	795034	935286	1101540	1296741	1525825	100	118	139	163	192
REGION	TOTAL (10000+)	1984529	2800435	3703660	4839614	6392103	100	141	187	244	322
	TOTAL POPUL.	4303567	5209300	6315842	7657432	9284000	100	121	147	178	216

Table 6.12 Population of Places < 5001, 1975-85 and Projections to 2005 for Alternative B (I)

Settlement Size	1975	1980	1985	1990	1995	2000	2005	Percent of Total (%) 1975	1980	1985	1990	1995	2000	2005
ADIYAMAN														
Places < 5001	251026	256527	286601	297639	309103	321008	332038	72.4	69.8	66.5	60.8	54.9	49.7	44.7
Other places	95866	111068	144127	191984	253561	325291	409984	27.6	30.2	33.5	39.2	45.1	50.3	55.3
TOTAL POPULATION	346892	367595	430728	489623	562664	646299	742022	100	100	100	100	100	100	100
DIYARBAKIR														
Places < 5001	386208	411996	466722	484698	503366	522753	541553	59.3	52.9	49.9	43.6	37.7	32.6	28.1
Other places	265025	366154	467783	626725	832940	1083189	1387537	40.7	47.1	50.1	56.4	62.3	67.4	71.9
TOTAL POPULATION	651233	778150	934505	1111423	1336306	1605942	1929090	100	100	100	100	100	100	100
GAZIANTEP														
Places < 5001	286059	298963	316750	328950	341619	354776	367107	40.0	37.0	32.8	28.8	25.1	21.8	18.9
Other places	429880	509734	649740	812825	1022001	1273031	1575170	60.0	63.0	67.2	71.2	74.9	78.2	81.1
TOTAL POPULATION	715939	808697	966490	1141775	1363620	1627807	1942277	100	100	100	100	100	100	100
MARDIN														
Places < 5001	385141	376123	398270	413609	429539	446083	461930	74.1	66.6	61.1	55.4	49.8	44.7	40.0
Other places	134546	188844	253799	332578	433700	552103	691763	25.9	33.4	38.9	44.6	50.2	55.3	60.0
TOTAL POPULATION	519687	564967	652069	746187	863239	998186	1153693	100	100	100	100	100	100	100
SIIRT														
Places < 5001	247174	285424	301416	313025	325081	337601	349271	64.8	64.1	57.4	49.9	42.8	36.8	31.5
Other places	134329	160059	223325	314689	434035	579994	759375	35.2	35.9	42.6	50.1	57.2	63.2	68.5
TOTAL POPULATION	381503	445483	524741	627714	759116	917595	1108646	100	100	100	100	100	100	100
SANLIURFA														
Places < 5001	310896	294603	382941	397690	413007	428914	444100	52.1	48.9	48.2	44.1	40.0	36.3	32.8
Other places	286381	308133	412093	503176	618955	752670	908172	47.9	51.1	51.8	55.9	60.0	63.7	67.2
TOTAL POPULATION	597277	602736	795034	900866	1031962	1181584	1352272	100	100	100	100	100	100	100
GAP REGION														
Places < 5001	1866504	1923636	2152701	2235611	2321715	2411135	2496000	58.1	53.9	50.0	44.6	39.2	34.6	30.3
Other places	1346027	1643992	2150866	2781977	3595192	4566278	5732000	41.9	46.1	50.0	55.4	60.8	65.4	69.7
GAP POPULATION	3212531	3567628	4303567	5017588	5916907	6977413	8228000	100	100	100	100	100	100	100

Table 6.13 Population of Places < 5001, 1975-85 and Projections to 2005 for Alternative B (II)

Settlement Size	1975	1980	1985	1990	1995	2000	2005	1975	1980	1985	1990	1995	2000	2005
	ADIYAMAN							GROWTH INDEX						
Places < 5001	251026	256527	286601	297639	309103	321008	332038	100	102	114	119	123	128	132
Other places	95866	111068	144127	191984	253561	325291	409984	100	116	150	200	264	339	428
TOTAL POPULATION	346892	367595	430728	489623	562664	646299	742022	100	106	124	141	162	186	214
	DIYARBAKIR													
Places < 5001	386208	411996	466722	484698	503366	522753	541553	100	107	121	126	130	135	140
Other places	265025	366154	467783	626725	832940	1083189	1387537	100	138	177	236	314	409	524
TOTAL POPULATION	651233	778150	934505	1111423	1336306	1605942	1929090	100	119	143	171	205	247	296
	GAZIANTEP													
Places < 5001	286059	298963	316750	328950	341619	354776	367107	100	105	111	115	119	124	128
Other places	429880	509734	649740	812825	1022001	1273031	1575170	100	119	151	189	238	296	366
TOTAL POPULATION	715939	808697	966490	1141775	1363620	1627807	1942277	100	113	135	159	190	227	271
	MARDIN													
Places < 5001	385141	376123	398270	413609	429539	446083	461930	100	98	103	107	112	116	120
Other places	134546	188844	253799	332578	433700	552103	691763	100	140	189	247	322	410	514
TOTAL POPULATION	519687	564967	652069	746187	863239	998186	1153693	100	109	125	144	166	192	222
	SIIRT													
Places < 5001	247174	285424	301416	313025	325081	337601	349271	100	115	122	127	132	137	141
Other places	134329	160059	223325	314689	434035	579994	759375	100	119	166	234	323	432	565
TOTAL POPULATION	381503	445483	524741	627714	759116	917595	1108646	100	117	138	165	199	241	291
	SANLIURFA													
Places < 5001	310896	294603	382941	397690	413007	428914	444100	100	95	123	128	133	138	143
Other places	286381	308133	412093	503176	618955	752670	908172	100	108	144	176	216	263	317
TOTAL POPULATION	597277	602736	795034	900866	1031962	1181584	1352272	100	101	133	151	173	198	226
	GAP REGION													
Places < 5001	1866504	1923636	2152701	2235611	2321715	2411135	2496000	100	103	115	120	124	129	134
Other places	1346027	1643992	2150866	2781977	3595192	4566278	5732000	100	122	160	207	267	339	426
GAP POPULATION	3212531	3567628	4303567	5017588	5916907	6977413	8228000	100	111	134	156	184	217	256

Table 6.14 Population of Places > 10000, Projections to 2005 for Alternative B

PROVINCE	MUNICIPALITY	1985	1990	1995	2000	2005	GROWTH INDEX 1985	1990	1995	2000	2005
ADIYAMAN	BESNI	17763	18928	21602	24647	28096	100	107	122	139	158
	KAHTA	25510	29522	37163	47506	49598	100	116	146	186	194
	GOLBASI	22153	28027	38593	53432	74249	100	127	174	241	335
	MERKEZ	71644	80345	102914	122408	148497	100	112	144	171	207
	TOTAL (10000+)	137070	156821	200273	247994	300440	100	114	146	181	219
	PROV. TOTAL	430728	489623	562664	646299	742022	100	114	131	150	172
DIYARBAKIR	HANI	9575	10589	13177	14101	16335	100	111	138	147	171
	CERMIK	12566	12728	12891	16824	22176	100	101	103	134	176
	CINAR	8049	13869	16519	19547	23562	100	172	205	243	293
	ERGANI	33209	38046	48602	60294	79100	100	115	146	182	238
	BISMIL	24862	40753	62287	93981	141116	100	164	251	378	568
	SILVAN	45825	83883	115346	158593	215262	100	183	252	346	470
	MERKEZ	305940	435827	551355	693109	878986	100	142	180	227	287
	TOTAL (10000+)	422402	635696	820177	1056449	1376536	100	150	194	250	326
	PROV. TOTAL	934505	1111423	1336306	1605942	1929090	100	119	143	172	206
GAZIANTEP	YAVUZELI	4606	5037	6473	8351	10692	100	109	141	181	232
	OSUZELI	9547	10075	11947	14177	16800	100	106	125	148	176
	NURDAGI	5672	7332	10481	14954	21384	100	129	185	264	377
	ARABAN	11176	16255	24732	37578	57122	100	145	221	336	511
	ISLAHIYE	29031	37942	46206	56233	68406	100	131	159	194	236
	KILIS	59876	80538	92653	106507	122460	100	135	155	178	205
	NIZIP	50067	67207	82418	101041	123776	100	134	165	202	247
	MERKEZ	478635	678385	861329	1102604	1411163	100	142	180	230	295
	TOTAL (10000+)	628785	890403	1129767	1433093	1831801	100	142	180	228	291
	PROV. TOTAL	966490	1141775	1363620	1627807	1942277	100	118	141	168	201
MARDIN	YESILLI	9798	10133	11397	12706	14256	100	103	116	130	145
	DERIK	13975	14409	16146	17458	18810	100	103	116	125	135
	MAZIDAGI	8269	10040	13297	17458	23265	100	121	161	211	281
	IDIL	8465	10226	13487	17846	23562	100	121	159	211	278
	SILOPI	13071	15803	20990	28127	37619	100	121	161	215	288
	MIDYAT	22169	24227	29557	36041	43930	100	109	133	163	198
	CIZRE	29496	32537	39795	48397	58409	100	110	135	164	198
	MERKEZ	44085	46451	48818	54314	60389	100	105	111	123	137
	KIZILTEPE	40852	58395	74575	94902	120786	100	143	183	232	296
	NUSAYBIN	45178	58101	83579	114447	163347	100	129	185	253	362
	TOTAL (10000+)	208826	280321	351639	441695	564372	100	134	168	212	270
	PROV. TOTAL	652069	746187	863239	998186	1153693	100	114	132	153	177
SIIRT	SASON	5821	6608	7395	9496	12276	100	114	127	163	211
	SIRNAK	12141	13628	16496	20155	24750	100	112	136	166	204
	BAYHAN	6665	8622	12324	17733	25740	100	129	185	266	386
	KURTALAN	12352	14648	19719	26066	34451	100	119	160	211	279
	KOZLUK	17421	31984	36641	41473	56429	100	184	210	238	324
	MERKEZ	53884	56551	65413	76551	90484	100	105	121	142	168
	BATMAN	110036	167984	233622	321902	448463	100	153	212	293	408
	TOTAL (10000+)	205834	300023	384215	503880	692592	100	146	187	245	336
	PROV. TOTAL	524741	627714	759116	917595	1108646	100	120	145	175	211
S.URFA	HILVAN	7907	10743	12483	14481	16862	100	136	158	183	213
	BOZOVA	9598	10827	12770	15329	18018	100	113	133	160	188
	CEYLANPINAR	25781	27550	31195	35374	39995	100	107	121	137	155
	BIRECIK	25998	31529	35328	38102	41259	100	121	136	147	159
	AKCAKALE	15542	19382	25394	33507	44450	100	125	163	216	286
	SURUC	25660	35966	43689	53415	65177	100	140	170	208	254
	SIVEREK	48333	63058	70892	80597	90290	100	130	147	167	187
	VIRANSEHIR	45329	74151	103864	148374	208086	100	164	229	327	459
	MERKEZ	194969	265077	341504	424942	526196	100	136	175	218	270
	TOTAL (10000+)	381612	527540	677119	844120	1050333	100	138	177	221	275
	PROV. TOTAL	795034	900866	1031962	1181584	1352272	100	113	130	149	170
REGION	TOTAL (10000+)	1984529	2790804	3563190	4527230	5816075	100	141	180	228	293
	TOTAL POPUL.	4303567	5017588	5916907	6977413	8228000	100	117	137	162	191

Table G.15 Population of Places < 5001, 1975-85 and Projections to 2005 for Alternative C (I)

Settlement Size	1975	1980	1985	1990	1995	2000	2005	1975	1980	1985	1990	1995	2000	2005
	ADIYAMAN							Percent of Population (%)						
Places < 5001	251026	256527	286601	297639	309103	321008	332038	72.4	69.8	66.5	61.6	56.4	51.7	47.1
Other places	95866	111068	144127	185330	238845	300371	372287	27.6	30.2	33.5	38.4	43.6	48.3	52.9
TOTAL POPULATION	346892	367595	430728	482969	547948	621379	704325	100	100	100	100	100	100	100
	DIYARBAKIR													
Places < 5001	386208	411996	466722	484698	503366	522753	541553	59.3	52.9	49.9	44.2	38.7	33.9	29.6
Other places	265025	366154	467783	611622	797990	1021266	1289532	40.7	47.1	50.1	55.8	61.3	66.1	70.4
TOTAL POPULATION	651233	778150	934505	1096320	1301356	1544019	1831085	100	100	100	100	100	100	100
	GAZIANTEP													
Places < 5001	286059	298963	316750	328950	341619	354776	367107	40.0	37.0	32.8	29.2	25.7	22.7	19.9
Other places	429880	509734	649740	797311	986336	1210265	1476495	60.0	63.0	67.2	70.8	74.3	77.3	80.1
TOTAL POPULATION	715939	808697	966490	1126261	1327955	1565041	1843602	100	100	100	100	100	100	100
	MARDIN													
Places < 5001	385141	376123	398270	413609	429539	446083	461930	74.1	66.6	61.1	56.2	51.1	46.5	42.2
Other places	134546	188844	253799	322439	411122	513614	633151	25.9	33.4	38.9	43.8	48.9	53.5	57.8
TOTAL POPULATION	519687	564967	652069	736048	840661	959697	1095081	100	100	100	100	100	100	100
	SIIRT													
Places < 5001	247174	285424	301416	313025	325081	337601	349271	64.8	64.1	57.4	50.6	44.0	38.3	33.2
Other places	134329	160059	223325	306014	413834	543992	702065	35.2	35.9	42.6	49.4	56.0	61.7	66.8
TOTAL POPULATION	381503	445483	524741	619039	738915	881593	1051336	100	100	100	100	100	100	100
	SANLIURFA													
Places < 5001	310896	294603	382941	397690	413007	428914	444100	52.1	48.9	48.2	44.8	41.1	37.8	34.6
Other places	286381	308133	412093	490935	591965	707110	839471	47.9	51.1	51.8	55.2	58.9	62.2	65.4
TOTAL POPULATION	597277	602736	795034	888625	1004972	1136024	1283571	100	100	100	100	100	100	100
	GAP REGION													
Places < 5001	1866504	1923636	2152701	2235611	2321715	2411135	2496000	58.1	53.9	50.0	45.2	40.3	35.9	32.0
Other places	1346027	1643992	2150866	2713651	3440092	4296618	5313000	41.9	46.1	50.0	54.8	59.7	64.1	68.0
GAP POPULATION	3212531	3567628	4303567	4949262	5761807	6707753	7809000	100	100	100	100	100	100	100

Table 6.16 Population of Places < 5001, 1975-85 and Projections to 2005 for Alternative C (II)

ADIYAMAN								GROWTH INDEX						
Settlement Size	1975	1980	1985	1990	1995	2000	2005	1975	1980	1985	1990	1995	2000	2005
Places < 5001	251026	256527	286601	297639	309103	321008	332038	100	102	114	119	123	128	132
Other places	95866	111068	144127	185330	238845	300371	372287	100	116	150	193	249	313	388
TOTAL POPULATION	346892	367595	430728	482969	547948	621379	704325	100	106	124	139	158	179	203
DIYARBAKIR														
Places < 5001	386208	411996	466722	484698	503366	522753	541553	100	107	121	126	130	135	140
Other places	265025	366154	467783	611622	797990	1021266	1289532	100	138	177	231	301	385	487
TOTAL POPULATION	651233	778150	934505	1096320	1301356	1544019	1831085	100	119	143	168	200	237	281
GAZIANTEP														
Places < 5001	286059	298963	316750	328950	341619	354776	367107	100	105	111	115	119	124	128
Other places	429880	509734	649740	797311	986336	1210265	1476495	100	119	151	185	229	282	343
TOTAL POPULATION	715939	808697	966490	1126261	1327955	1565041	1843602	100	113	135	157	185	219	258
MARDIN														
Places < 5001	385141	376123	398270	413609	429539	446083	461930	100	98	103	107	112	116	120
Other places	134546	188844	253799	322439	411122	513614	633151	100	140	189	240	306	382	471
TOTAL POPULATION	519687	564967	652069	736048	840661	959697	1095081	100	109	125	142	162	185	211
SIIRT														
Places < 5001	247174	285424	301416	313025	325081	337601	349271	100	115	122	127	132	137	141
Other places	134329	160059	223325	306014	413834	543992	702065	100	119	166	228	308	405	523
TOTAL POPULATION	381503	445483	524741	619039	738915	881593	1051336	100	117	138	162	194	231	276
SANLIURFA														
Places < 5001	310896	294603	382941	397690	413007	428914	444100	100	95	123	128	133	138	143
Other places	286381	308133	412093	490935	591965	707110	839471	100	108	144	171	207	247	293
TOTAL POPULATION	597277	602736	795034	888625	1004972	1136024	1283571	100	101	133	149	168	190	215
GAP REGION														
Places < 5001	1866504	1923636	2152701	2235611	2321715	2411135	2496000	100	103	115	120	124	129	134
Other places	1346027	1643992	2150866	2713651	3440092	4296618	5313000	100	122	160	202	256	319	395
GAP POPULATION	3212531	3567628	4303567	4949262	5761807	6707753	7809000	100	111	134	154	179	209	243

Table 6.17 Population of Places > 10000, Projection to 2005 for Alternative C

PROVINCE	MUNICIPALITY	1985	1990	1995	2000	2005	GROWTH INDEX 1985	1990	1995	2000	2005
ADIYAMAN	BESNI	17763	19612	22099	24892	28014	100	110	124	140	158
	KAHTA	25510	30590	38017	47978	49453	100	120	149	188	194
	GOLBASI	22153	29041	39479	53963	74031	100	131	178	244	334
	MERKEZ	71644	83250	105278	123625	148063	100	116	147	173	207
	TOTAL (10000+)	137070	162493	204872	250457	299561	100	119	149	183	219
	PROV. TOTAL	430728	482969	547948	621379	704325	100	112	127	144	164
DIYARBAKIR	HANI	9575	11107	13645	14416	16487	100	116	143	151	172
	CINAR	8049	10222	13349	17200	22383	100	127	166	214	278
	CERMIK	12566	14547	17106	19984	23781	100	116	136	159	189
	ERGANI	33209	39907	50329	61642	79838	100	120	152	186	240
	BISMIL	24862	40304	60817	90593	134297	100	162	245	364	540
	SILVAN	45825	82959	112623	152876	204860	100	181	246	334	447
	MERKEZ	305940	431029	538339	668126	836512	100	141	176	218	273
	TOTAL (10000+)	417885	630076	806208	1024838	1318158	100	151	193	245	315
	PROV. TOTAL	934505	1096320	1301356	1544019	1831085	100	117	139	165	196
GAZIANTEP	YAVUZELI	4606	5284	6703	8537	10792	100	115	146	185	234
	OGUZELI	9547	10567	12372	14494	16957	100	111	130	152	178
	NURDAGI	5672	7691	10854	15288	21583	100	136	191	270	381
	ARABAN	11176	17050	25611	38418	57655	100	153	229	344	516
	ISLAHIYE	29031	37525	45115	54206	65100	100	129	155	187	224
	KILIS	59876	79652	90466	102668	116543	100	133	151	171	195
	NIZIP	50067	66468	80473	97399	117795	100	133	161	195	235
	MERKEZ	478635	670916	840994	1062861	1342972	100	140	176	222	281
	TOTAL (10000+)	628785	871465	1092454	1368509	1728151	100	139	174	218	275
	PROV. TOTAL	966490	1126261	1327955	1565041	1843602	100	117	137	162	191
MARDIN	YESILLI	9798	10628	11802	12990	14389	100	108	120	133	147
	DERIK	13975	15114	16720	17848	18985	100	108	120	128	136
	MAZIDAGI	8269	10531	13769	17848	23482	100	127	167	216	284
	IDIL	8465	10726	13966	18245	23781	100	127	165	216	281
	SILOPI	13071	16576	21736	28755	37970	100	127	166	220	290
	MIDYAT	22169	25411	30607	36847	44339	100	115	138	166	200
	CIZRE	29496	34128	41209	49479	58954	100	116	140	168	200
	MERKEZ	44085	46024	50553	55528	60952	100	104	115	126	138
	KIZILTEPE	40852	57752	72815	91481	114949	100	141	178	224	281
	NUSAYBIN	45178	60942	86549	117005	164871	100	135	192	259	365
	TOTAL (10000+)	208826	287832	359726	446025	562674	100	138	172	214	269
	PROV. TOTAL	652069	736048	840661	959697	1095081	100	113	129	147	168
SIIRT	SASON	5821	5858	7561	9584	12240	100	101	130	165	210
	SIRNAK	12141	14117	16866	20341	24677	100	116	139	168	203
	BAYHAN	6665	8931	12601	17896	25664	100	134	189	269	385
	KURTALAN	12352	15174	20162	26307	34351	100	123	163	213	278
	KOZLUK	17421	33133	37465	41856	56264	100	190	215	240	323
	MERKEZ	53884	58582	66884	77257	90220	100	109	124	143	167
	BATMAN	110036	164078	225231	306315	421609	100	149	205	278	383
	TOTAL (10000+)	205834	285084	379211	489971	665024	100	139	184	238	323
	PROV. TOTAL	524741	619039	738915	881593	1051336	100	118	141	168	200
S.URFA	HILVAN	7907	10625	12188	13959	16047	100	134	154	177	203
	BOZOVA	9598	11356	13224	15671	18186	100	118	138	163	189
	BIRECIK	25998	31182	34494	36729	39265	100	120	133	141	151
	CEYLANPINAR	25781	28897	32303	36164	40368	100	112	125	140	157
	AKCAKALE	15542	20330	26297	34256	44865	100	131	169	220	289
	SURUC	25660	35570	42658	51489	62027	100	139	166	201	242
	SIVEREK	48333	62364	69218	77691	85927	100	129	143	161	178
	VIRANSEHIR	45329	73335	101412	143026	198031	100	162	224	316	437
	MERKEZ	194969	262158	333442	409625	500769	100	134	171	210	257
	TOTAL (10000+)	381612	518815	657158	808670	993275	100	136	172	212	260
	PROV. TOTAL	795034	888625	1004972	1136024	1283571	100	112	126	143	161
REGION	TOTAL (10000+)	1980012	2755764	3499628	4388471	5566843	100	139	177	222	281
	TOTAL POPUL.	4303567	4949262	5761807	6707753	7809000	100	115	134	156	181

Table 6.18 Netmigration to/from Provinces in GAP Region, 1965-70, 70-75 and 75-80

	Adiyaman	Diyarbakir	Gaziantep	Mardin	Siirt	S.Urfa	Total GAP region (n=6) Un-weighted mean	Median	Range	Turkey (n=67) Median
1965-70	-7.443% * (18) **	-1.058% (63)	0.880% (81)	-3.740% (45)	-1.040% (64)	-3.925% (43)	-2.721% (53)	-3.23%	8.323 (63)	-3.009%
1970-75	-8.661% (7)	-1.578% (51)	1.329% (87)	-2.804% (34)	-1.340% (54)	-7.965% (9)	-3.504% (40)	-3.15%	7.321 (80)	-1.519%
1975-80	-3.176% (31)	-2.194% (46)	-0.155% (72)	-5.316% (16)	-2.632% (37)	-5.855% (13)	-3.221% (36)	-2.90%	5.700 (33)	-1.396%
Mean for three periods	-6.427% (19)	-1.610% (53)	0.685% (80)	-3.953% (32)	-1.671% (52)	-5.915% (22)	-3.150% (43)		7.112 (61)	

Source: a) Kocaman, Tuncer and Ilhan Ozaltin (1986) Sosyal Yapi-1: Turkiye'de Nufus Yapisindaki Gelismeler ve Uluslararasi Karsilastirmalar, Ankara: DPT No: 2054-SPB: 396

b) Yener, Samira (1977) 1965-1970 Doneminde Illerarasi Gocler ve Gocedenlerin Nitelikleri. Ankara: DPT No: 1528-SPB:293

c) Yener, Samira (1984) "1970-1975 Doneminde Illerarasi Gocler". Ankara: DPT. Unpublished Paper

Notes: * Net migration rate (which is equal to number of netmigrants divided by mid-period de facto enumerated population)

** Percentile ordering of net migration rates. Sixty-seven provinces of Turkey are all included in the calculations.

Table G.19 Inmigration to Provinces in GAP Region, 1975-80: from each 67 provinces

Outmigration from provinces		Inmigration to GAP region						Total GAP region
		02 Adiyaman	21 Diyarbakir	27 Gaziantep	47 Mardin	56 Siirt	63 S.Urfa	
02	Adiyaman	(310,947)*	295	1,883	118	186	327	2,809
21	Diyarbakir	80	(610,895)	367	1,311	2,382	786	4,926
27	Gaziantep	731	318	(651,511)	202	159	1,453	2,863
47	Mardin	129	5,328	432	(456,309)	3,289	1,221	10,399
56	Siirt	137	2,278	342	1,850	(347,781)	179	4,786
63	S.Urfa	587	3,141	6,921	626	171	(552,759)	11,446
Total GAP Region n=5		1,664	11,360	9,945	4,107	6,187	3,966	37,229
01	Adana	1,582	1,359	2,941	1,040	701	1,711	9,334
03	Afyon	142	115	94	94	54	82	581
04	Agri	74	200	206	53	75	69	677
05	Amasya	54	97	50	50	32	55	338
06	Ankara	433	2,468	1,656	777	679	963	6,976
07	Antalya	84	320	167	165	157	139	1,032
08	Artvin	26	50	51	28	38	30	223
09	Aydin	46	130	107	64	138	83	568
10	Balikesir	111	556	212	96	115	175	1,265
11	Bilecik	7	170	51	21	37	56	342
12	Bingol**	44	1,087	129	52	48	79	1,439
13	Bitlis**	19	370	241	372	3,674	880	5,556
14	Bolu	18	64	46	32	58	67	285
15	Burdur	17	61	50	42	34	60	264
16	Bursa	50	275	171	125	74	164	859
17	Canakkale	35	118	72	232	93	67	617
18	Cankiri	18	54	18	25	26	29	170
19	Corum	28	84	76	60	35	53	336
20	Denizli	110	272	170	57	42	121	772
22	Edirne	67	231	230	91	65	96	780
23	Elazig**	204	2,215	335	172	158	155	3,239
24	Erzincan	35	90	199	34	12	61	431
25	Erzurum	62	274	398	89	103	154	1,080
26	Eskisehir	51	388	140	95	107	116	897
28	Giresun	50	92	85	43	25	39	334
29	Gumushane	8	51	40	28	19	23	169
30	Hakkari**	25	54	72	69	70	35	325
31	Hatay	191	283	1,332	273	158	587	2,824
32	Isparta	53	126	82	77	44	77	459
33	Icel	738	467	730	259	166	1,165	3,525
34	Istanbul	1,287	2,421	2,798	940	1,087	1,230	9,763
35	Izmir	202	1,438	586	774	368	463	3,831
36	Kars	124	263	309	133	91	291	1,211
37	Kastamonu	30	48	59	21	42	31	231
38	Kayseri	96	279	288	104	65	132	964
39	Kirklareli	59	155	155	76	199	58	702
40	Kirsehir	38	101	52	41	23	45	300
41	Kocaeli	39	181	120	72	71	105	588
42	Konya	130	575	347	240	164	178	1,634
43	Kutahya	24	104	72	107	64	56	427
44	Malatya**	1,117	483	886	143	176	170	2,975
45	Manisa	48	218	140	159	173	169	907
46	K.Maras**	948	165	4,296	88	74	228	5,799
48	Mugla	44	141	54	98	48	44	429
49	Mus**	36	520	229	54	268	59	1,166
50	Nevsehir	42	78	100	74	23	50	367
51	Nigde	46	83	136	59	42	88	454
52	Ordu	61	104	60	58	105	62	450
53	Rize	40	23	45	41	70	42	261
54	Sakarya	27	70	86	39	56	70	348
55	Samsun	37	206	108	96	115	107	669
57	Sinop	14	56	65	29	42	20	226
58	Sivas	89	249	248	86	94	118	884
59	Tekirdag	78	173	186	46	65	46	594
60	Tokat	45	60	83	53	64	165	470
61	Trabzon	55	141	109	74	57	116	552
62	Tunceli	39	250	64	26	40	97	516
64	Usak	12	49	91	32	26	38	248
65	Van**	68	297	597	169	292	131	1,554
66	Yozgat	38	68	109	40	28	323	606
67	Zonguldak	23	124	237	98	74	95	651
Fr. provinces outside of GAP n=61		9,318	21,244	22,866	8,685	11,143	12,218	85,474
Total inmigration		10,982	32,604	32,811	12,792	17,330	16,184	122,703

Source: D.I.E., Domestic Migration by Permanent Residence (1975-80), Ankara

Notes: * Numbers in the parenthesis refer to non-migrant population in the provinces. They are not included in the figures for inmigration.

** Provinces which are adjacent to GAP region: Bingol, Bitlis, Elazig, Hakkari, Malatya, K.Maras, Mus, Van.

Table 8.20 Outmigration from Provinces in GAP Region, 1975-80: to each 67 provinces

Inmigration to provinces		Outmigration from GAP region						Total GAP region
		02 Adiyaman	21 Diyarbakir	27 Gaziantep	47 Mardin	56 Siirt	63 S.Urfa	
02	Adiyaman	(310,947)*	60	731	129	137	587	1,664
21	Diyarbakir	295	(610,895)	318	5,328	2,278	3,141	11,360
27	Gaziantep	1,883	367	(651,511)	432	342	6,921	9,945
47	Mardin	118	1,311	202	(456,309)	1,850	626	4,107
56	Siirt	186	2,382	159	3,289	(347,781)	171	6,187
63	S.Urfa	327	786	1,453	1,221	179	(552,759)	3,966
Total GAP Region n=5		2,809	4,926	2,863	10,399	4,786	11,446	37,229
01	Adana	3,352	3,152	3,604	4,010	1630	8,636	24,384
03	Afyon	238	236	104	159	45	131	913
04	Agri	39	134	91	79	40	60	443
05	Amasya	96	115	75	64	65	91	506
06	Ankara	562	3,728	2,065	1,743	1,306	1,889	11,293
07	Antalya	106	809	435	867	628	542	3,387
08	Artvin	26	88	62	39	39	37	291
09	Aydin	109	308	237	322	1,098	346	2,420
10	Balikesir	136	995	315	269	252	200	2,167
11	Bilecik	52	190	72	97	48	77	536
12	Bingol**	60	525	39	52	39	53	768
13	Bitlis**	35	255	60	81	1,964	167	2,562
14	Bolu	38	171	87	109	110	162	677
15	Burdur	49	96	91	118	62	54	470
16	Bursa	131	1,948	612	456	515	769	4,431
17	Canakkale	52	267	127	246	94	141	927
18	Cankiri	69	60	69	43	38	63	342
19	Corum	75	78	61	56	36	73	379
20	Denizli	458	285	144	158	149	120	1,314
22	Edirne	67	262	186	188	64	161	928
23	Elazig**	130	1,399	275	209	253	246	2,512
24	Erzincan	52	199	188	35	22	76	572
25	Erzurum	99	263	290	92	90	169	1,003
26	Eskisehir	133	935	238	265	211	260	2,042
28	Giresun	15	108	98	56	42	86	405
29	Gumushane	24	66	57	30	19	35	231
30	Hakkari**	24	77	72	151	186	20	530
31	Hatay	333	1,032	3,542	1,891	860	2,955	10,613
32	Isparta	62	197	118	180	84	128	769
33	Icel	3,605	3,040	2,431	1,843	1,761	6,527	19,207
34	Istanbul	3,229	7,193	6,460	5,514	5,202	5,581	33,179
35	Izmir	396	5,422	1,427	6,295	1,335	3,364	18,239
36	Kars	43	249	153	100	69	451	1,065
37	Kastamonu	18	113	81	104	60	91	467
38	Kayseri	63	368	497	365	149	246	1,688
39	Kirklareli	33	172	118	104	120	92	639
40	Kirsehir	59	57	94	88	52	60	410
41	Kocaeli	142	677	341	519	376	387	2,442
42	Konya	167	1,053	548	603	227	472	3,070
43	Kutahya	68	194	132	181	85	171	831
44	Malatya**	2,784	584	513	157	239	344	4,621
45	Manisa	118	757	244	1,052	941	523	3,635
46	K.Maras**	1,102	210	2,458	194	126	844	4,934
48	Mugla	56	220	152	184	67	111	790
49	Mus**	51	617	87	95	362	80	1,292
50	Nevsehir	28	65	104	94	65	175	531
51	Nigde	82	185	274	148	126	119	934
52	Ordu	62	149	111	97	66	90	575
53	Rize	29	76	49	35	60	63	312
54	Sakarya	48	241	122	184	143	281	1,019
55	Samsun	44	344	146	134	146	170	984
57	Sinop	32	84	92	39	41	59	347
58	Sivas	129	185	168	170	98	117	867
59	Tekirdag	104	211	141	75	163	267	961
60	Tokat	54	124	80	60	81	162	561
61	Trabzon	54	2,079	128	88	105	394	2,848
62	Tunceli	38	81	37	29	43	99	327
64	Usak	126	75	70	63	71	57	462
65	Van**	71	357	229	160	872	184	1,873
66	Yozgat	38	123	102	79	76	358	776
67	Zonguldak	49	190	201	394	150	305	1,289
To provinces outside of GAP n=61		19,544	43,473	31,204	31,312	23,466	39,991	188,990
Total inmigration		22,353	48,399	34,067	41,711	28,252	51,437	226,219

Source: D.I.E., Domestic Migration by Permanent Residence (1975-80), Ankara

Notes: * Numbers in the parenthesis refer to non-migrant population in the provinces. They are not included in the figures for outmigration.

** Provinces which are adjacent to GAP region: Bingol, Bitlis, Elazig, Hakkari, Malatya, K.Maras, Mus, Van.

Table G.21 Netmigration to/from Provinces in GAP Region, 1975-80: from/to each 67 provinces

To/from provinces		02 Adiyaman	21 Diyarbakir	27 Gaziantep	47 Mardin	56 Siirt	63 S.Urfa	Total GAP region
02	Adiyaman	*	215	1,152	-11	49	-260	1,145
21	Diyarbakir	-215	*	49	-4,017	104	-2,355	-6,434
27	Gaziantep	-1,152	-49	*	-230	-183	-5,468	-7,082
47	Mardin	11	4,017	230	*	1,439	595	6,292
56	Siirt	-49	-104	183	-1,439	*	8	-1,401
63	S.Urfa	260	2,355	5,468	-595	-8	*	7,480
Total GAP Region n=5		-1,145	6,434	7,082	-6,292	1,401	-7,480	0
01	Adana	-1,770	-1,793	-663	-2,970	-929	-6,925	-15,050
03	Afyon	-96	-121	-10	-65	9	-49	-332
04	Agri	35	66	115	-26	35	9	234
05	Amasya	-42	-18	-25	-14	-33	-36	-168
06	Ankara	-129	-1,260	-409	-966	-627	-926	-4,317
07	Antalya	-22	-489	-268	-702	-471	-403	-2,355
08	Artvin	0	-38	-11	-11	-1	-7	-68
09	Aydin	-63	-178	-130	-258	-960	-263	1,852
10	Balikesir	-25	-439	-103	-173	-137	-25	-902
11	Bilecik	-45	-20	-21	-76	-11	-21	-194
12	Bingol**	-16	562	90	0	9	26	671
13	Bitlis**	-16	115	181	291	1,710	713	2,994
14	Bolu	-20	-107	-41	-77	-52	-95	-392
15	Burdur	-32	-35	-41	-76	-28	6	-206
16	Bursa	-81	-1,673	-441	-331	-441	-605	-3,572
17	Canakkale	-17	-149	-55	-14	-1	-74	-310
18	Cankiri	-51	-6	-51	-18	-12	-34	-172
19	Corum	-47	6	15	4	-1	-20	-43
20	Denizli	-348	-13	26	-101	-107	1	-542
22	Edirne	0	-31	44	-97	1	-65	-148
23	Elazig**	74	816	60	-37	-95	-91	727
24	Erzincan	-17	-109	11	-1	-10	-15	-141
25	Erzurum	-37	11	108	-3	13	-15	77
26	Eskisehir	-82	-547	-98	-170	-104	-144	-1,145
28	Giresun	35	-16	-13	-13	-17	-47	-71
29	Gumushane	-16	-15	-17	-2	0	-12	-62
30	Hakkari**	1	-23	0	-82	-116	15	-205
31	Hatay	-142	-749	-2,210	-1,618	-702	-2,368	-7,789
32	Isparta	-9	-71	-36	-103	-40	-51	-310
33	Icel	-2,867	-2,573	-1,701	-1,584	-1,595	-5,362	-15,682
34	Istanbul	-1,942	-4,772	-3,662	-4,574	-4,115	-4,351	-23,416
35	Izmir	-194	-3,984	-841	-5,521	-967	-2,901	-14,408
36	Kars	81	14	156	33	22	-160	146
37	Kastamonu	12	-65	-22	-83	-18	-60	-236
38	Kayseri	33	-89	-209	-261	-84	-114	-724
39	Kirklareli	26	-17	37	-28	79	-34	63
40	Kirsehir	-21	44	-42	-47	-29	-15	-110
41	Kocaeli	-103	-496	-221	-447	-305	-282	-1,854
42	Konya	-37	-478	-201	-363	-63	-294	-1,436
43	Kutahya	-44	-90	-60	-74	-21	-115	-404
44	Malatya**	-1,667	-101	373	-14	-63	-174	-1,646
45	Manisa	-70	-539	-104	-893	-768	-354	-2,728
46	K.Maras**	-154	-45	1,838	-106	-52	-616	865
48	Mugla	-12	-79	-98	-86	-19	-67	-361
49	Mus**	-15	-97	142	-41	-94	-21	-126
50	Nevsehir	14	13	-4	-20	-42	-125	-164
51	Nigde	-36	-102	-138	-89	-84	-31	-480
52	Ordu	-1	-45	-51	-39	39	-28	-203
53	Rize	11	-53	-4	6	10	-21	-51
54	Sakarya	-21	-171	-36	-145	-87	-211	-671
55	Samsun	-7	-138	-38	-38	-31	-63	-315
57	Sinop	-18	-28	-27	-10	1	-39	-121
58	Sivas	-40	64	80	-84	-4	1	17
59	Tekirdag	-26	-38	45	-29	-98	-221	-367
60	Tokat	-9	-64	3	-7	-17	3	-91
61	Trabzon	1	-1,938	-19	-14	-48	-278	-2,296
62	Tunceli	1	169	27	-3	-3	-2	189
64	Usak	-114	-26	21	-31	-45	-19	-214
65	Van**	-3	-60	368	9	-580	-53	-319
66	Yozgat	0	-55	7	-39	-48	-35	-170
67	Zonguldak	-2	-66	36	-296	-76	-210	-638
To/From provinces outside of GAP n=61		-10,226	-22,229	-8,338	-22,627	-12,323	-27,773	-103,516
Total netmigration		-11,371	-15,795	-1,256	-28,919	-10,922	-35,253	-103,516

Source: D.I.E., Domestic Migration by Permanent Residence (1975-80), Ankara

Notes: * Non-migrant population.

** Provinces which are adjacent to GAP region: Bingol, Bitlis, Elazig, Hakkari, Malatya, K.Maras, Mus, Van.

Table 6.22 Inmigration to Provinces in GAP Region, 1975-80: by Region of Origin and by Sex Ratio****

Origin	Adiyaman		Diyarbakir		Gaziantep		Mardin		Siirt		S.Urfa		Total GAP region ***	
	No. of inmig.	Sex ratio	No. of inmig.	Sex ratio	No. of inmig.	Sex ratio	No. of inmig.	Sex ratio	No. of inmig.	Sex ratio	No. of inmig.	Sex ratio	No. of inmig.	Sex ratio
GAP region (n=5)	1,664 (15.1%)	114.7	11,360 (34.7%)	107.3	9,945 (30.2%)	109.5	4,107 (31.9%)	120.2	6,187 (35.6%)	88.2	3,966 (24.3%)	117.4	37,229 (30.2%)	109.6
Adjacent** provinces (n=8)	2,461 (22.3%)	106.9	5,191 (15.9%)	110.9	6,785 (20.6%)	108.2	1,119 (8.7%)	162.7	4,772 (27.4%)	138.6	1,737 (10.7%)	129.8	22,065 (17.9%)	126.2
Cukurova region (n=3)	2,511 (22.8%)	130.6	2,109 (6.4%)	135.9	5,003 (15.2%)	109.3	1,572 (12.2%)	153.5	1,025 (5.9%)	137.3	3,463 (21.2%)	142.5	15,683 (12.7%)	134.9
01 Adana	1,582	128.6	1,359	140.1	2,941	107.6	1,040	157.4	701	123.2	1,711	116.9	9,334	
31 Hatay	191	127.4	283	135.8	1,332	102.1	273	103.7	158	146.9	587	123.2	2,824	
33 Icel	738	135.8	467	124.5	730	132.6	259	215.9	166	207.4	1,165	209.8	3,525	
Metropolitan* areas (n=3)	1,922 (17.5%)	246.3	6,327 (19.3%)	145.0	5,040 (15.3%)	157.0	2,491 (19.3%)	185.7	2,134 (12.3%)	176.4	2,656 (16.3%)	169.9	20,570 (16.7%)	180.1
06 Ankara	433	184.9	2,468	133.5	1,656	151.3	777	171.7	679	199.1	963	169.0	6,976	
34 Istanbul	1,287	292.4	2,421	164.3	2,798	164.5	940	205.3	1,087	171.1	1,230	177.0	9,763	
35 Izmir	202	169.3	1,438	136.1	586	140.2	774	178.4	368	155.6	463	154.4	3,831	
Other provinces (n=47)	2,424 (22.3%)		7,617 (23.6%)		6,038 (18.6%)		3,503 (27.9%)		3,212 (18.8%)		4,362 (27.5%)		27,156 (22.5%)	
Total inmigration	10,982 (100%)	145.8	32,604 (100%)	125.0	32,811 (100%)	122.8	12,792 (100%)	158.7	17,330 (100%)	136.8	16,184 (100%)	142.6	122,703 (100%)	138.6

Source: Table 6.19

Notes: * Provinces of Ankara, Istanbul and Izmir
** Provinces which are adjacent to GAP region: Bingol,Bitlis,Elazig,Hakkari,Malatya,K.Maras, Mus, Van
*** Unweighted mean
****Sex ratio means number of male per hundred females

Table 6.23 Outmigration from Provinces in GAP Region, 1975-80: by Region of Destination

Destination	Adiyaman		Diyarbakir		Gaziantep		Mardin		Siirt		S.Urfa		Total GAP region ***	
	No. of outmig.	Sex ratio	No. of outmig.	Sex ratio	No. of outmig.	Sex ratio	No. of outmig.	Sex ratio	No. of outmig.	Sex ratio	No. of outmig.	Sex ratio	No. of outmig.	Sex ratio
GAP region (n=5)	2,809 (12.6%)	113.3	4,926 (10.2%)	126.4	2,863 (8.4%)	110.2	10,399 (24.9%)	108.7	4,786 (16.9%)	107.7	11,446 (22.3%)	108.0	37,229 (16.5%)	112.4
Adjacent** provinces (n=8)	4,257 (19.0%)	103.7	4,024 (8.3%)	131.9	3,733 (10.9%)	125.8	1,099 (2.6%)	167.4	4,041 (14.3%)	112.9	1,938 (3.8%)	115.1	19,092 (8.4%)	126.1
Cukurova region (n=3)	7,290 (32.6%)	112.7	7,224 (14.9%)	126.3	9,577 (28.1%)	109.7	7,744 (18.6%)	129.8	4,251 (15.0%)	133.3	18,118 (35.2%)	115.1	54,204 (23.9%)	121.2
01 Adana	3,352	104.5	3,152	121.2	3,604	111.5	4,010	126.6	1,630	125.8	8,636	112.1	24,384	
31 Hatay	333	120.5	1,032	131.9	3,542	109.6	1,891	137.3	860	147.8	2,955	123.0	10,613	
33 Icel	3,605	120.1	3,040	130.0	2,431	107.2	1,843	129.5	1,761	137.0	6,527	115.6	19,207	
Metropolitan* areas (n=3)	4,187 (18.7%)	197.4	16,343 (33.8%)	132.3	9,952 (10.9%)	139.1	13,552 (32.5%)	139.4	7,843 (27.8%)	142.9	10,834 (21.1%)	137.8	62,711 (27.7%)	148.2
06 Ankara	562	191.2	3,728	131.1	2,065	140.1	1,743	152.6	1,306	125.6	1,889	131.2	11,293	
34 Istanbul	3,229	209.6	7,193	136.7	6,460	138.5	5,514	149.6	5,202	145.7	5,581	145.0	33,179	
35 Izmir	396	130.2	5,422	127.5	1,427	135.5	6,295	128.0	1,335	150.5	3,364	130.3	18,239	
Other provinces (n=47)	3,810 (17.0%)		15,882 (32.8%)		7,942 (23.3%)		8,917 (21.4%)		7,331 (25.9%)		9,101 (17.7%)		52,983 (23.4%)	
Total out-migration	22,353 (100%)	129.6	48,399 (100%)	145.9	34,067 (100%)	130.0	41,711 (100%)	139.6	28,252 (100%)	133.1	51,437 (100%)	124.9	226,219 (100%)	133.9

Source: Table 6.20

Notes: * Provinces of Ankara, Istanbul and Izmir
** Provinces which are adjacent to GAP region: Bingol,Bitlis,Elazig,Hakkari,Malatya,K.Maras, Mus, Van
*** Unweighted mean

Table G.24 Netmigration to/from Provinces in GAP Region, 1975-80: by Region of Origin and Destination

	Adiyaman	Diyarbakir	Gaziantep	Mardin	Siirt	S.Urfa	Total GAP region
GAP region (n=5)	-1,145 (10.1%)	6,434 (-41.0%)	7,082 (-599.7%)	-6,292 (21.8%)	1,401 (12.9%)	-7,480 (21.3%)	0
Adjacent** provinces (n=8)	-1,796 (15.8%)	-1,167 (-7.4%)	-3,052 (-258.4%)	20 (-0.1%)	731 (-6.7%)	-201 (0.6%)	2,973 (2.9%)
Cukurova region (n=3)	-4,779 (42.1%)	-5,115 (32.6%)	-4,574 (387.3%)	-6,172 (21.4%)	-3,226 (29.7%)	-14,655 (41.7%)	-38,521 (37.4%)
01 Adana	-1,770	-1,793	-663	-2,970	-929	-6,925	-15,050
31 Hatay	-142	-749	-2,210	-1,618	-702	-2,368	-7,789
33 Icel	-2,867	-2,573	-1,701	-1,584	-1,595	-5,362	-15,682
Metropolitan* areas (n=3)	-2,265 (19.9%)	-10,016 (63.9%)	-4,912 (415.9%)	-11,061 (38.4%)	-5,709 (52.6%)	-8,178 (23.3%)	-42,141 (40.9%)
06 Ankara	-129	-1,260	-409	-966	-627	-926	-4,317
34 Istanbul	-1,942	-4,772	-3,662	-4,574	-4,115	-4,351	-23,416
35 Izmir	-194	-3,984	-841	-5,521	-967	-2,901	-14,408
Other provinces (n=47)	-1,386 (11.9%)	-8,265 (51.9%)	-1,904 (154.9%)	-5,414 (18.5%)	-4,119 (37.4%)	-4,739 (13.1%)	-25,827 (24.6%)
Total netmigration	-11,371 (100%)	-15,795 (100%)	-1,256 (100%)	-28,919 (100%)	-10,922 (100%)	-35,253 (100%)	-103,516 (100%)

Source: Tables G.19 and G.20

Notes: * Provinces of Ankara, Istanbul and Izmir
** Provinces which are adjacent to GAP region: Bingol,Bitlis,Elazig,Hakkari, Malatya, K.Maras, Mus, Van.

Table 6.25 GAP Region Sectoral Employment, 1975-1980-1985

Economic Sector	Total GAP Employment			Percent of Total Employ.			Annual Growth Rate (%)		
	1975	1980	1985	1975	1980	1975	1975 1980 (5 yrs)	1980 1985 (5 yrs)	1975 1985 (10 yrs)
Agriculture	966023	920829	1086676	76.88	71.67	71.12	-0.95	3.37	1.18
Mining	3121	4529	3079	0.25	0.35	0.20	7.73	-7.43	-0.13
Manufact	49660	67700	76437	3.95	5.27	5.00	6.39	2.46	4.41
El/Gas/Water	436	909	1221	0.03	0.07	0.08	15.83	6.08	10.85
Construction	54408	43778	49322	4.33	3.41	3.23	-4.25	2.41	-0.98
trades	37097	47883	61802	2.95	3.73	4.05	5.24	5.24	5.24
Transp/Commun	26183	30275	37861	2.08	2.36	2.48	2.95	4.57	3.76
Banks/Insur.	2961	6398	5891	0.24	0.50	0.39	16.66	-1.64	7.12
Business/Pers. Serv.	28535	35826	50784	2.27	2.79	3.32	4.66	7.23	5.93
Public Serv.	88058	126722	154771	7.01	9.86	10.13	7.55	4.08	5.80
TOTAL EMPLOYMENT	1256481	1284849	1527845	100.00	100.00	100.00	0.45	3.53	1.97
TOTAL POPULATION	3212531	3567628	4303567				2.12	3.82	2.97
PERCENT IN WORK FORCE	39.11	36.01	35.50						

Source : Census of the Social and Economic Characteristics of the Population, SIS.

Note : Employment not adequately identified have been dispersed proportionately to the remaining sectors.

Table 6.26 Age Group Population in GAP Provinces, 1975

AGE GROUP	ADIYAMAN	DIYARBAKIR	GAZIANTEP	MARDIN	SIIRT	SANLIURFA	GAP REGION
0 - 12	156003	290322	290420	238858	181985	261448	1419036
13 - 14	15116	29383	35422	20646	15063	27226	142856
15 - 64	163646	310185	362599	241568	173556	286799	1538353
64 +	12127	21343	27498	18615	10899	21804	112286
TOTAL	346892	651233	715939	519687	381503	597277	3212531

Percent of Total Population (%)

0 - 12	45.0	44.6	40.6	46.0	47.7	43.8	44.2
13 - 14	4.4	4.5	4.9	4.0	3.9	4.6	4.4
15 - 64	47.2	47.6	50.6	46.5	45.5	48.0	47.9
64 +	3.5	3.3	3.8	3.6	2.9	3.7	3.5
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: SIS

Table 6.27 Age Group Populations in GAP Provinces, 1980

AGE GROUP	ADIYAMAN	DIYARBAKIR	GAZIANTEP	MARDIN	SIIRT	SANLIURFA	GAP REGION
0-12	168551	351055	326583	265521	211447	271270	1594427
13-14	17048	38567	41160	25185	19756	28127	169843
15-64	168129	364017	409175	252275	202441	281554	1677591
64+	13867	24511	31779	21986	11839	21785	125767
TOTAL	367595	778150	808697	564967	445483	602736	3567628

Percent of Total Population (%)

0-12	45.9	45.1	40.4	47.0	47.5	45.0	44.7
13-14	4.6	5.0	5.1	4.5	4.4	4.7	4.8
15-64	45.7	46.8	50.6	44.7	45.4	46.7	47.0
64+	3.8	3.1	3.9	3.9	2.7	3.6	3.5
	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: SIS

Table 6.28 Age Group Population in GAP Provinces, 1985

AGE GROUP	ADIYAMAN	DIYARBAKIR	GAZIANTEP	MARDIN	SIIRT	SANLIURFA	GAP REGION
0 - 12	189619	413131	380425	302607	248123	349671	1883576
13 - 14	21940	48414	50920	31049	24533	38591	215447
15 - 64	204613	448376	502195	298570	235333	383836	2072923
65 +	14556	24584	32950	19843	16752	22936	131621
TOTAL	430728	934505	966490	652069	524741	795034	4303567
Percent of Total Population (%)							
0 - 12	44.0	44.2	39.4	46.4	47.3	44.0	43.8
13 - 14	5.1	5.2	5.3	4.8	4.7	4.9	5.0
15 - 64	47.5	48.0	52.0	45.8	44.8	48.3	48.2
65 +	3.4	2.6	3.4	3.0	3.2	2.9	3.1
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: SIS

Table 6.29 Projection of Students and Classes in 2005

	Population distribution	School age population 1000	Enrollment ratio	No. of students 1000	Student per class	No. of existing classes	No. of classes under construction	Required classes in 2005	Additional classes by 2005
Pre-school education	0.12	937.1	0.10	93.7	25	600	0	3,748	3,148
Primary school	0.15	1,132.3	1.00	1,132.3	40	28,076	635	28,308	0
Jr. high school(general)	0.08	585.7	0.60	351.4	80	1,891	0	4,393	2,502
Jr. high school(technical)			0.20	117.1	70	238	0	1,673	1,435
Senior high school(gen.)	0.07	538.8	0.21	113.2	60	815	58	1,886	1,013
Senior high school(tec.)			0.19	102.4	35	491	216	3,477	2,770
Higher education*	0.08	632.5	0.12	75.9		11,000	0	75,903	64,903
Total		3,826.4		1,986.0			909		

* Estimated for number of student
Two shift system is assumed 100% for junior high, 50% for senior high(gen.)

** Projection by the Consultant

Table G.30 Ratio of Unsuccessful Student in Primary Schools, 1986-87 Education Year

	Public school	Basic school	Regional boarding sc.	Blinds school	Private school	Ratio of 1 shift sc.
Adiyaman	0.10	0.14	0.10			0.31
Urban	0.09	0.14	0.10			
Rural	0.11	0.15				
Diyarbakir	0.14		0.22		0.07	0.27
Urban	0.12	0.14	0.22			
Rural	0.16					
Gaziantep	0.13	0.10	0.12	0.11	0.004	0.04
Urban	0.13	0.06	0.12			
Rural	0.12	0.17	0.12			
Mardin	0.15		0.12			0.24
Urban	0.14		0.12			
Rural	0.15	0.16	0.10			
Siirt	0.13		0.23			0.21
Urban	0.09	0.10	0.23			
Rural	0.15					
Sanliurfa	0.17	0.15	0.12			0.21
Urban	0.16	0.15	0.12			
Rural	0.19	0.23	0.11			

Source : MEYS, Statistics of Education Youth and Sport 1986-1987

Table 6.31 Distribution of Selected Notified Infection Diseases by Province,1981 and 1987

(1) 1981

Diseases	Total Country	Adiyaman	Diyarbakir	Gaziantep	Mardin	Siirt	Sanliurfa	Region	Share in Turkey %
Wooping Cough	2,661	27	116	22	15	90	38	308	11.6
Meniningococal Infection	1,027	2	7	15	5	13	2	44	4.3
Brucellosis	438		22			14	6	42	9.6
Diphtheria	136		7	9		2	2	20	14.7
Dysentery	1,068	17	21	2	6	116	9	171	16.0
Infectious Hepatitis	18,665	33	136	196	19	93	82	559	3.0
Measles	26,547	229	1,087	73	601	667	185	2,842	10.7
Scarlet Fever	4,422	9	134	4	31	32	38	248	5.6
Rabies	31							0	0.0
Paratyphoid Fever	880	80	9	7		106		202	23.0
Poliomyelitis	148			4		9	5	18	12.2
Malaria	54,415	928	2,284	974	2,428	2,017	4	8,635	15.9
Anthrax	591					7	3	10	1.7
Typhoid Fever	2,402	2	178	24	28	131	1	364	15.2
Tuberculosis	25,232	337	419	537	377	135	99	1,904	7.5

(2) 1987

Diseases	Adiyaman	Diyarbakir	Gaziantep	Mardin	Siirt	Sanliurfa	Region
Wooping Cough	9	6	0	0	3	0	18
Meniningococal Infection	15	30	87	10	8	36	186
Brucellosis	92	50	155	18	96	44	455
Diphtheria	0	5	0	0	0	2	7
Dysentery	28	555	530	44	108	165	1,430
Infectious Hepatitis	121	151	278	42	63	85	740
Measles	4	39	38	9	12	13	115
Scarlet Fever	108	51	198	14	73	33	477
Rabies	0	0	0	0	0	0	0
Paratyfhied Fever	4	0	46	46	127	64	287
Poliomyelitis	0	0	1	1	0	1	3
Anthrax	1	1	0	1	2	0	5
Typhoid Fever	91	861	251	106	292	132	1,733

Source : SSYB

Table 6.32 Number of Dispensaries, Medical Units and Health Personnel, 1987

Province	No. of dispensaries	No. of health personnel							No. of medical units	No. of midwives
		Doctors	Dentists	Farmasists	Health clerk	Health technician	Nurses	Midwives		
Adiyaman	30	31	-	-	30	6	43	28	163	106
Diyarbakir	49	81	-	-	36	26	96	103	287	119
Gaziantep	48	57	2	-	37	3	41	49	300	227
Mardin	51	80	2	-	43	16	56	51	283	201
Siirt	28	45	-	-	24	11	53	25	174	133
Sanliurfa	44	46	-	-	28	5	50	68	285	157
Total	250	340	4	-	198	67	339	324	1502	944
Share(%)	1.9	8.9	4.9	-	6.9	11.9	10.0	8.9	9.4	8.6
Turkey	13070	3812	81	146	2858	563	3378	3640	15981	11004

Source : SSYB 1987, November

Table 6.33 Number of Hospitals, Beds and Personnel, 1987

Province	No. of hospitals		No. of beds	Beds per 10,000 population	Bed occupancy ratio(%)	No. of physicians	
	State	Others				Specialist	Practitionner
Adiyaman	4	0	299	7.2	43.9	21	12
Diyarbakir	8	5	1927	24.8	45.3	197	148
Gaziantep	7	4	1401	13.7	60	92	32
Mardin	5	0	290	5.8	37.8	30	10
Siirt	5	1	165	6.4	33.7	54	9
Sanliurfa	7	1	564	7.6	36.1	73	23
Total	47		4646			467	234
Turkey*	7 36			20.8			

* Figures in 1986

Source : SSYB

Table G.34 Drinking Water Supply in Rural Settlements, 1987 *

	Adequate supply		Inadequate Supply		No Supply		Total	
	No. of Settlements	Percent of Served Population	No.	Percent	No.	Percent	No.	Percent
Adiyaman	465	56.5	140	20.8	372	22.7	977	100.0
Diyarbakir	552	36.6	330	24.8	951	38.6	1,833	100.0
Gaziantep	590	67.1	98	16.5	180	16.4	868	100.0
Mardin	243	24.9	510	44.8	414	30.3	1,167	100.0
Siirt	418	44.6	123	16.1	518	39.3	1,059	100.0
Sanliurfa	802	39.3	762	32.8	1,007	27.9	2,571	100.0
Total (%)	3,070 (36,2)	42.7	1,963 (23.2)	27.4	3,442 (40.6)	29.9	8,475 (100.0)	100.0

Note *: 1987 inventory
Source: TZDK (Agricultural Supplies Organization,
Occupational Training Gournal Publications,
GAP 1. Urfa - Harran Development Symposium.

Table G.35 Selected Sanitation Activities of Health Center, 1980

	Potable Water		Toilets	
	No.of houses improved	No.of houses chlorinated	No.of houses improved	No.of houses chlorinated
Adiyaman	100	1,890	97	28
Diyarbakir		1,983		5
Mardin	2,677	1,384	894	555
Siirt	251	713	240	240
Sanliurfa	705	6,718	589	87
Total*	3,733	12,688	1,820	915
Share (%)	21.7	31.1	4.0	2.3
Turkey	17,245	40,783	45,517	39,964

* Exclusive of Gaziantep province

Table 6.36 Utilization of Modern Contraceptive Methods,1986

	I U D	Pill	Condom
Adiyaman	1,249	2,546	4,947
Diyarbakir	2,304	7,134	6,059
Gaziantep	5,274	2,518	2,328
Mardin	211	528	346
Siirt	3,370	3,781	6,720
Sanliurfa	674	887	871
Total	13,082	17,394	21,271
Share (%)	6.3	9.0	5.9
Turkey	207,688	192,628	359,415

Table 6.37 Estimation of Dispenceries and Health Units by Province,2005

Type	Adiyaman	Diyarbakir	Gaziantep	Mardin	Siirt	Sanliurfa	Total
A1							
Requirement	3	16	27	1	2	10	59
Existing	2	6	6	1	1	3	19
Under construction	0	0	0	0	0	0	0
Additional	1	10	21	0	1	7	40
D1							
Requirement	6	18	12	15	19	16	86
Existing	5	11	6	12	12	10	56
Under construction	1	0	0	0	0	0	1
Additional	0	7	6	3	7	6	29
Village type							
Requirement	38	51	13	70	40	30	242
Existing	23	32	36	38	15	31	175
Under construction	1	0	0	0	5	0	6
Additional	14	19	0	32	20	0	85

* Estimated by the Consultant

Table 6.38 Estimation of Requirement for Hospitals, 2005

	No. of existing beds('87)	No. of beds under construction	No. of beds to be required	No. of beds to be added
University hospital	549	1,000	2,000	451
Other hospital	4,477	1,652	17,523	11,394
Total	5,026	2,652	19,523	11,845

* Projection by the Consultant

Table 6.39 Estimation of Requirement of Health Personnel, 2005

	Doctor			Nurse and midwife		
	Existing in 1987	Requirement in 2005	Additional by 2005	Existing in 1987	Requirement in 2005	Additional by 2005
Hospital	622	1777	1155	-	3672	-
Dispensary	340	650	310	663	1424	761
A1 type	-	236	-	-	354	-
D1 type	-	172	-	-	344	-
Village type	-	242	-	-	726	-

* Projection by the Consultant

Table 6.40 Telephone Service in GAP Region Villages

PROVINCE	No.of Villages (1985)	1983		1984		1985		1986		1987 (1)	
		No	%	No	%	No	%	No	%	No	%
ADIYAMAN	349	73	21	90	26	134	38	155	44	349	100
DIYARBAKIR	693	41	6	44	6	113	16	273	39	621	90
GAZIANTEP	600	20	3	79	13	270	45	600	100	600	100
MARDIN	721	75	10	151	21	231	32	262	36	628	87
SIIRT	499	37	7	37	7	98	20	140	28	457	92
ŞANLIURFA	692	61	9	71	10	172	25	229	33	690	100
REGION	3554	307	9	472	13	1018	29	1659	47	3345	94
TURKEY	36022	10272	29	12098	34	16000	44	23238	65	36442	100

(1) Contains estimates
SOURCE : PTT Statistics 1986
PTT Annual Report 1987

Table 6.41 Estimation of Capacity Growth by Respective Plan Periods

CORRIDOR Settlement	1988 (1) Switching Capacity	Growth (%)	Demand(2) 1989	VI PLAN PERIOD (1990-1995) 1990	1991	1992	1993	1994
Gaziantep Mkz.	54000	(5.9%)	57186	60560	64133	67917	71924	76167
Birecik	2000	(2.7%)	2054	2109	2166	2225	2285	2347
Nizip (1985)	11250	(5.0%)	11813	12403	13023	13674	14358	15076
Suruc	2000	(5.1%)	2102	2209	2322	2440	2565	2696
Sanliurfa Mkz.	24500	(5.5%)	25848	27269	28769	30351	32021	33782
Hilvan	500	(4.2%)	521	543	566	589	614	640
Siverek	1500	(3.5%)	1553	1607	1663	1721	1782	1844
Diyarbakir Mkz.	29500	(5.8%)	31211	33021	34936	36963	39107	41375
Sub Total	125250		132287	139722	147579	155881	164655	173926
Other	92060	(6.1%)	97676	103634	109956	116663	123779	131330
Total	217310		229962	243356	257534	272544	288434	305256

CORRIDOR Settlement	VII PLAN PERIOD (1995-1999) 1995	1996	1997	1998	1999	VIII PLAN PERIOD (2000-2005) 2000	2001	2002	2003	2004	2005
Gaziantep Mkz.	80661	85420	90460	95797	101449	107435	113774	120486	127595	135123	143095
Birecik	2410	2475	2542	2611	2681	2753	2828	2904	2983	3063	3146
Nizip (1985)	15830	16621	17452	18325	19241	20203	21214	22274	23388	24557	25785
Suruc	2833	2977	3129	3289	3457	3633	3818	4013	4218	4433	4659
Sanliurfa Mkz.	35640	37600	39668	41850	44151	46580	49141	51844	54696	57704	60878
Hilvan	667	695	724	754	786	819	854	889	927	966	1006
Siverek	1908	1975	2044	2116	2190	2267	2346	2428	2513	2601	2692
Diyarbakir Mkz.	43775	46313	49000	51842	54848	58030	61395	64956	68724	72710	76927
Sub Total	183724	194078	205020	216583	228804	241720	255369	269796	285042	301157	318188
Other	139341	147841	156859	166427	176579	187351	198779	210905	223770	237420	251903
Total	323065	341918	361879	383011	405384	429071	454149	480700	508812	538576	570090

1) Switching capacities are assumed to be fully used (Supply equals demand).
2) Demand increases are based on population growth rates.
Note :Expected growth rates are based on population growth rates of administrative centers larger than 2000

Table 6.42 Additional Demand for Switching Capacity by 5 year Plan Periods

CORRIDOR Settlement	1988 Switching Capacity	Growth (%)	1989	Plan Period VI. PLAN	VII. PLAN	VIII. PLAN	TOTAL
Gaziantep Mkz.	54000	(5.9%)	3186	18981	25282	41646	89095
Birecik	2000	(2.7%)	54	293	334	465	1146
Nizip (1985)	11250	(5.0%)	563	3264	4165	6544	14535
Suruc	2000	(5.1%)	102	594	761	1202	2659
Sanliurfa Mkz.	24500	(5.5%)	1348	7934	10370	16726	36378
Hilvan	500	(4.2%)	21	119	146	220	506
Siverek	1500	(3.5%)	52	291	346	502	1192
Diyarbakir Mkz.	29500	(5.8%)	1711	10164	13474	22078	47427
Sub Total	125250		7037	41640	54878	89384	192938
Other Settlements	92060	(6.1%)	5616	33654	45250	75323	159843
Total	217310		12652	75294	100128	164707	352780

Table 6.43 PTT Switching Capacity, 1985 - 88

GAP Provinces		1985 Popul.	Actual Capacity 1985 Auto.	Manual	Total	Estimated Capacity 1988 Total
Sanliurfa	Sb.ve Ac.ler (12)			350	350	500
"	Hilvan	7907		200	200	500
"	Bozova	9598		200	200	500
"	Akcakale	15542		200	200	500
"	Suruc	25660		590	590	2000
"	Ceylanpinar	25781		340	340	1000
"	Birecik	25998		680	680	2000
"	Halfeti	30700		210	210	250
"	Viransehir	45329		760	760	2000
"	Siverek	48333	3000		3000	1500
"	Merkez	194969	4000		4000	24500
					10530	35250
Adiyaman	Sb.ve Ac.ler (14)			410	410	1000
"	Samsat	11346		50	50	100
"	Besni	17763	1000		1000	1100
"	Celikhan	20752		180	180	380
"	Golbasi	22153		710	710	2000
"	Kahta	25510		920	920	2000
"	Gerger	32618		170	170	380
"	Merkez	71644	4000		4000	7250
					7440	14210
Diyarbakir	Sb.ve Ac.ler (7)			600	600	
"	Cinar	8049		180	180	500
"	Hani	9575		180	180	500
"	Cungus	20238		180	180	250
"	Hazro	21656		170	170	250
"	Bismil	24862	1000		1000	1500
"	Ergani	33209	1000		1000	3000
"	Dicle	37082		200	200	500
"	Silvan	45825		630	630	4000
"	Kulp	46977		180	180	250
"	Lice	47024		260	260	1000
"	Merkez	305940	14000		14000	29500
"	Egil					250
					18580	41500
Mardin	Sb.ve Ac.ler (17)			820	820	
"	Omerli	6221		190	190	500
"	Mazidagi	8269		180	180	500
"	Idil	8465		180	180	500
"	Midyat	22169	1000		1000	1000
"	Cizre	29496		560	560	2000
"	Savur	39751		160	160	500
"	Kiziltepe	40852	1000		1000	4000
"	Gercus	42361		190	190	250
"	Merkez	44085	3000		3000	7000
"	Nusaybin	45178		650	650	1000
					7930	17250
Siirt	Sb.ve Ac.ler (8)			400	400	
"	Sason	5821		190	190	500
"	Baykan	6665		190	190	500
"	Sirnak	12141		250	250	500
"	Kutalan	12352		460	460	1000
"	Kozluk	17421		180	180	500
"	Beseri	25410		180	180	500
"	Sirvan	26354		110	110	250
"	Pervani	26205		190	190	250
"	Eruh	43527		190	190	500
"	Merkez	53894	4500		4500	4500
"	Batman	110036	3000		3000	8000
					9840	17000
Gaziantep	Org.san.		1000		1000	1000
"	Kusget		2000		2000	5000
"	Barak			160	160	250
"	Sb.ve Ac.ler (33)			2100	2100	2100
"	Yavuzeli	4606		160	160	500
"	Oguzeli	9547		270	270	1250
"	Araban	11176		340	340	500
"	Islahiye	29031	2500		2500	5000
"	Nizip	50067	3000		3000	11250
"	Kilis	59876	4000		4000	11250
"	Merkez	478635	22000		22000	54000
					37530	92100
Regional Total			75000	16500	91850	217310
TURKEY		50664458	2166000	400947	2566947	5808774

Source: PTT Statistics, 1986 and personal contacts with Regional PTT Administrators for the 1988 data.