SOCIAL AND ECONOMIC IMPACTS OF THE SOUTHEASTERN ANATOLIA PROJECT

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ΒY

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ABSTRACT

SOCIAL AND ECONOMIC IMPACTS OF THE SOUTHEASTERN ANATOLIA PROJECT

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This thesis is an assessment of socio-economic development of Southeastern Anatolia Region of Turkey after GAP Project. The aim of this study is to analyze and discuss impacts of the GAP Project and to evaluate achievements of the most important sustainable development project of Turkey.

Several social and economic indicators, like demographic structure, education, health, financial figures, industry, agriculture and energy, have been analyzed and evaluated in order to obtain reliable and realistic conclusions.

The main conclusion of this thesis states that Southeastern Anatolia Region has developed both socially and economically with the impacts of GAP Project. Rapid economic growth, increased agricultural and industrial activities are the evidences of this development. However, another conclusion of the study indicates that the achievements of GAP cannot ensure the expected socio-economic development of the Region. This conclusion shows the necessity of questioning the success of the governance and execution of the GAP Project.

Keywords: GAP, Sustainable development, Socio-economic impacts

GÜNEYDOĞU ANADOLU PROJESİNİN SOSYO-EKONOMİK ETKİLERİ

Erçin, Ali Ertuğ Yüksek Lisans, İnşaat Mühendisliği Bölümü Tez Yöneticisi: Prof. Dr. Doğan Altınbilek

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Bu tez Güneydoğu Anadolu Bölgesi'nde GAP Projesi sonrasında gerçekleşen sosyo-ekonomik gelişmelerin bir incelemesidir. Bu çalışmanın amacı GAP Projesinin sosyal ve ekonomik etkilerini araştırmak ve ayrıca Türkiye'nin en önemli sürdürülebilir kalkınma projesinin başarısını değerlendirmektir.

Güvenilir ve gerçekçi sonuçlara ulaşmak için nüfus, eğitim, sağlık, ekonomi, sanayi, tarım ve enerji gibi konularda çeşitli sosyo-ekonomik veriler incelenip değerlendirilmiştir.

Bu çalışmanın öngördüğü en önemli sonuç Güneydoğu Anadolu Bölgesi'nin GAP'ın etkisiyle sosyal ve ekonomik olarak hızla gelişmekte olduğudur. Hızlı ekonomik büyüme, artan endüstriyel ve tarımsal aktiviteler bu gelişmenin kanıtlarıdır. Buna rağmen, bu tezin öngördüğü diğer bir önemli sonuç ise projenin bölgede beklenen düzeyde kalkınmayı sağlayamadığıdır. Tezin bu önermesi GAP'ın yönetimsel ve uygulama olarak başarısının sorgulanması gerektiğinin bir göstergesidir.

Anahtar Kelimeler : GAP, Sürdürülebilir kalkınma, Sosyo-ekonomik gelişme

ÖΖ

To My Mother

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LIST OF ABBREVIATIONS

DSI	:	State Hydraulic Works
GAP	:	Southeastern Anatolia Project
GDP	:	Gross Domestic Product
GDPC	:	Gross Domestic Product per Capita
SIS	:	State Institute of Statistics (Devlet İstatistik
		Kurumu)
SPO	:	State Planning Organization (Devlet Planlama
		Teşkilatı)
Region	:	Southeastern Anatolia Region
Project	:	Southeastern Anatolia Project

CHAPTER 1

INTRODUCTION

Nowadays the sustainable development concept is one of the key elements of economic strength, improved living conditions and development of industry and trade. This term has become more popular and important through international organizations, governments, NGO's, and development agencies whose common aim is to eliminate the disparities between countries and regions.

For the last decades, development and economy of Turkey has been affected by problems aroused from regional disparities. By realization the importance of this issue, reduction of such regional disparities has become the major issue of the Turkish Government and other national institutes. Several studies and projects were conducted throughout the years to investigate and to find a solution to this problem.

One of the projects aimed to reduce the regional disparities in Turkey is Southeastern Anatolia Project (GAP), which has been realized since 1989 by the governmental and non-governmental organizations. GAP is defined as one of the most extended regional development projects among the other implemented in the world and referred as the 8th largest and 2nd wonder project in the world (Time Magazine, 1993).

GAP Administration, a governmental organization, which is in charge of coordination of the Project, defines the Project as follows:

"The South-eastern Anatolia Project (GAP) is a multi-sector, integrated regional development project launched in the region of Southeastern Anatolia, one of the relatively less developed regions of the country, comprising nine administrative provinces (Adıyaman, Batman, Diyarbakır, Gaziantep, Kilis, Mardin, Siirt, Şanlıurfa and Şırnak). As an integrated project, it goes beyond physical investments in such facilities as dams, power plants and irrigation schemes and encompasses activities and investments, in a coordinated manner, in many diverse fields including agricultural development, industry, rural and urban infrastructure, communication, education, health, culture, tourism and other social services["] (GAP Administration, 2003).

As outlined in the scope of the GAP Project, 'Sustainable Development' concept has become the major topic for regional development strategies. Assessment of the sustainability of these programs will help the authorities to change and improve the policies and strategies regarding to development.

The first and the major step in the assessment of sustainable development programs, like GAP, is the elaboration of the statistical data in a specific time period. The time range of data shall be selected to allow obtaining measurable comparisons of the situation before and after the execution of the development programs. The studies including this kind of an analysis not only show the major changes but also give realistic and descriptive conclusions for the direction as well as the success of the development.

Following this perspective as a guide, the scope of this thesis is diverted to the assessment of socio- economic development of the Southeastern Anatolia Region in order to observe the impacts of GAP Project, and to obtain reliable results about the success of it.

In this study, for achieving its target, not only the measurable data are assessed (gross domestic product, etc.), but also several social variables (population, education, health) are analyzed. This thesis is divided into eight main chapters:

- Chapter 1- Introduction
- Chapter 2 Social Development
- Chapter 3 Economic Development
- Chapter 4 Agricultural Development
- Chapter 5 Industrial Development
- Chapter 6 Energy
- Chapter 7 Results & Discussions
- Chapter 8 Conclusions

1.1 History of GAP Project

Southeastern Anatolia Region, including nine provinces; Adıyaman, Batman, Diyarbakır, Gaziantep, Kilis, Mardin, Siirt, Şanlıurfa and Şırnak, is one of the underdeveloped regions of Turkey. The area of the Region is equal to the 9.7 % of Turkey (7,538,500 ha). The two major rivers of Turkey, the Euphrates and Tigris, flow through the Region. As this part of Turkey receives less precipitation than others, utilization of the water sources of these rivers is vital to the development of the Region.

The brief history of GAP is summarized as follows:

- Atatürk first identified the idea of utilization of rich water sources of Tigris and the Euphrates Rivers. The first step was the foundation of the Electricity Studies Administration in 1936 for investigation of utilization of the rivers for energy production. The study began with "Keban Project" after establishment of observation stations to investigate the flow characteristics of the Euphrates River.
- For further investigation and new requirements; General Directorate of State Hydraulic Works (DSI) was established in 1954.

- "Euphrates Planning Authority" was established in 1961, and "Euphrates Basin Development Report" was prepared. In 1966, the "Downstream Euphrates Development Report" followed this report. Also, for Tigris River, Diyarbakır Regional Directorate of DSİ conducted a similar study.
- In 1977, these two basin projects were combined in the title of "Southeastern Anatolia Project", commonly known as GAP.
- In 1986, State Planning Organization took over the responsibilities of development activities in Southeastern Anatolia.
- The Southeastern Anatolia Project Regional Development Administration was established in 6 November 1989 (the Government Decree no. 388 in Force of Law, published in the Official Journal no. 20344).
- GAP Master Plan was prepared in 1989 accordingly.
- The first Master Plan was revised in 2000.

1.2 Objectives of GAP

The Southeastern Anatolia Project (GAP) is a multi-sector, integrated regional development project implemented in one of the less developed regions of Turkey including nine provinces. By the definition as an integrated project, the project aims not only economic progress in the Region but also the cultural and social development. For achieving its target, the investments and activities are directed to several diverse subjects including agriculture, industry, education, health, infrastructure, culture, tourism, and other social and cultural activities. The main target of the project is to eliminate regional disparities.

The overall objective of the Project is considered to lie a) in the improvement of the population's living and working conditions by providing efficient and sustainable investments, and b) in the protection of the environment and the natural resources. The outcomes of "Atatürk Dam" and the profits stemming from the Dam that saves resources and reconcile ongoing developments with a particularly vulnerable environment has been found as one of the major components of the Project to meet the overall objective. Therefore, the specific objective of the Atatürk Dam can be described as:

Project Objective

Sustainable improvements of the existing situation in the Region by providing sufficient and reliable water and energy services those are environmentally acceptable.

The objective of the Project can be divided into four sub-categories as:

- Agricultural development
- Industrial development
- Development in energy sector
- Social development

Agricultural Development: "Economic development in rural areas by increasing agricultural productivity; providing sufficient inputs to agroindustries; minimize rural migration tendencies in the region by enhancing employment opportunities and contributing to the production of exportable goods" (GAP Administration, 2003).

Industrial Development: "Promoting the image of the region and the motivation and welfare of its people by being the driving force in regional economic development on the one hand and creating demand for education/training and technological change; contributing to the elimination of regional development disparities by enhancing well-paid employment opportunities and contributing to such national objectives as export

promotion, foreign exchange earnings and savings" (GAP Administration, 2003).

Social Development: "Rising income levels of individuals parallel to agricultural development and changes in production and consumption relations will find reflection on social relations and modes of living and will also affect social development and change" (GAP Administration, 2003).

1.3 Sustainable Development Indicators

This study is mainly based on the statistical data gathered from several governmental and non-governmental organizations. These data are the baseline data for the analysis of achievements of GAP Project with yearby-year comparison of several variables described in the following parts.

The analyses of measurable and comparable socio-economic indicators are significant in determination of development levels. This kind of determination is the way to obtain results of the regional development programs like GAP, and to observe the success of the existing policies. The results obtained by this kind of analysis help authorities in revision of development policies and direct the future investments accordingly.

As accepted in the international studies, sustainable development is not only based on the measurement of individual income rise or growth of gross national domestic product. The combination of economic indicators with social and cultural variables forms the baseline data of assessment of sustainable development projects.

It is important to stress that the selection and analysis of the variables that are used in this thesis are subjective as the development is a multi-sided and wide concept.

1.4 Selected Variables

The variables selected in this study are determined to cover all aspects of the development concept and all components of GAP. In each

category several statistical data, some of which are related to each other, are used to obtain comparable and realistic results.

The data selected for the analysis are in a wide range, covering the years between 1980 and 2005, where possible. Some data are excluded from the analysis as a result of their unreliability. The first group of data indicates the situation before the Project and during the implementation of some major physical investments (Atatürk Dam, and irrigation systems). The second group of data represents the current situation of the Region. The comparison of these data sets indicates results of GAP Project, and outcomes of the physical investments (dams, power plants, irrigation schemes).

1.4.1 Social Variables

1.4.1.1 Population

The demographical variables used in the study include the numerical change in growth and distribution of the population from several points of view. For the analysis of the population concept total population, urban population rate, annual population growth rate, population density, average household size, age dependency ratio, and population movements are presented and analyzed.

Assessment of the population structure and its development trend is very important in obtaining the baseline data for the other indicators. The economic and social variables can be meaningful if they are elaborated considering the spatial distribution of the population.

1.4.1.2 Education

Education is the major indicator of social development. Progress in economic activities mostly depends on qualified labor force. In a society qualified labor force can be obtained by strong educational background. Therefore, increase of literacy ratio and education facilities plays an important role in the social component of development concept. For a clear understanding of the change in education system, literacy ratio, pre-school education, primary and secondary education and high education are analyzed.

1.4.1.3 Health

Developed health services are the major indicators of improved living standards. The number of personnel in health sector is also related with the socio-economic development of a region as the direction of settlement of qualified labor force is usually towards the developed areas.

The heath data include number of doctors, dentists, nurses, midwives, hospitals and their patient capacity, pharmacies as well as the infant mortality and child mortality rates.

1.4.2 Socio-economic Variables

1.4.2.1 Employment

The data about the employment cover the unemployment rate, employment by activity, by age and sex, and their contribution to Turkish economy and employment structure.

The employment by activity is an important indicator for defining the basic economic structure of a region. In the underdeveloped regions, like GAP, the percentage of employment in agricultural sector is always high. With social and economic development, this percentage become less and is replaced by employment in industry, finance and trade sectors. The increase of employment level in industry, finance and trade also has a positive impact to overall income figures.

1.4.2.2 Tourism

Tourism has both social and economic benefits. Today, a tourism center means more employment opportunities, better health and sanitation conditions, new economic activities and high-income levels. The change in the number of tourists, new employment generation, and new economic activities resulted from tourism activities are analyzed for the assessment of tourism sector.

1.4.3 Economic Variables

1.4.3.1 Financial Figures

Under the heading of financial figures income level, capital accumulation, incentives, public and private investments, export and import values are analyzed.

The gross national product and gross national product per capita are the main financial figures, which indicate the economic growth. The banking data and capital accumulation are the evidences of new investments, development of income standards, and macro-economic growth and strength. The numbers and values of intensives and public investments are the factors that are accelerating the socio-economic development.

1.4.3.2 Agriculture

As the main economic activity in GAP is agriculture and one of the aims of GAP project is the agricultural development, the assessment of the agricultural sector is very important. The increase in agricultural lands after the irrigation projects, change in crop-design and agricultural production, yield and output are some selected variables in order to analyze the development.

The change in agriculture technology is another variable that is assessed for understanding the new conditions in the Region.

1.4.3.3 Industry

Industrialization is the transformation of rural life society to a modern one. Industrial activities affect also social life, and economic structure. The development of industry has positive effects on other sectors, like agriculture, education, and infrastructure. For the assessment of industry sector, mainly the manufacturing industry is analyzed, as it is the most dominant industry inside the Region. The number of organized industrial zones, small industrial zones, value added from industrial activities, employment generation and effects of industrial activities to the other sectors are the main elements that are discussed in the analysis of industry.

1.4.4 Energy

The aim of investments in the framework of GAP project (dams and hydroelectric power plants) is to generate energy not only to the Region but also to the whole country.

The energy generated from the dams, their financial, political and environmental impacts are analyzed under the energy chapter.

1.5 Socio-economic Development of the Region

State Planning Organization studied the socio economic development of Turkey two times until today, in 1996 and 2003. In these studies, "Socioeconomic Development Ranking of Provinces", several social and economic variables were selected and socio-economic development of each province was assessed by scientific methods.

According to the study prepared in 1996, the most developed Region in Turkey was Marmara. Aegean Region was in the second place, and followed by Middle Anatolia, Mediterranean, Blacksea, Southeastern Anatolia, and Eastern Anatolia Regions. The order of this ranking was same in 2003 (Table 1.1).

As indicated in both reports published in 1996 and 2003, the socioeconomic development level of Southeastern Anatolia Region has not changed significantly. The socio-economic development index of the Region increased only a small amount, from -1.03631 to -1.01123 (SPO, 2003).

	1996	2003
Marmara	1	1
Middle Anatolia	3	3
Mediterranean	4	4
Aegean	2	2
Blacksea	5	5
Eastern		
Anatolia	7	7
GAP	6	6

Table 1.1 Socio-economic Development Ranking of Regions in Turkey (SPO)

The unsuccessful situation of the Region in development ranking is also valid for its provinces. In the study of 1996, among the 76 provinces in Turkey, the ranking of GAP provinces were the lowest ones; Adıyaman in 60th, Batman 65th, Diyarbakır 57th, Mardin 66th, Siirt 68th, Şanlıurfa 59th and Şırnak 75th place (Table 1.2). Only the ranking of Gaziantep was high (25th).

Table 1.2 Socio-economic Development Ranking of Provinces of GAP (SPO)

	1996	2003	Change in Ranking
Adıyaman	61	60	1
Batman	65	65	0
Diyarbakır	57	58	-1
Gaziantep	25	19	4
Mardin	66	67	-1
Siirt	68	68	0
Şanlıurfa	59	63	-4
Şırnak	75	73	2
Kilis	-	54	-

The most important question to be answered is how the socioeconomic development has changed in Southeastern Anatolia after GAP Project. According to the study prepared in 2003, the answer is not encouraging. Only positive changes are observed in Gaziantep (25th to 19th place), and Şırnak (75th to 73rd place). These studies show an important result. Despite the changes, improvements of the conditions, and development of the Region; it is still the least developed region among the Turkey. When the situation is analyzed by province basis, a more negative result is observed. Instead of rising, rank of most of the provinces in GAP has become worse. Even the rank of Şanlıurfa, where most of the investments has been realized, has decreased. These results bring real doubts about the success of the Project.

CHAPTER 2

SOCIAL DEVELOPMENT

This chapter has a clear focus on social development of Southeastern Anatolia Region. The determination of social development is not simple as other sectors, as it is hard to obtain and analyze data in social sector. Another difficulty is the existence of wide range of variables and their subjectivity.

All available data related to the social development of Region were collected; reviewed and evaluated in this chapter. All data are classified in three main headings as Population, Education and Health. These subsectors are selected, as they are the main and key elements of a social life.

The collected and assessed data is organized as follows:

- Data on the population
- Data on the education
- Data on health services

2.1 Population

The size and characteristics of the population is the baseline of a development programs. Such programs are planned, organized and implemented according to the qualitative (education, development level of social structure etc.) and quantitative (size, sex, distribution, etc.) properties of population.

The success of development schemes is directly proportional to correct interpretation of population studies and analysis. As a result of this, a well- organized population survey and correct interpretation of the population data are the key elements in understanding the success and achievements of Southeastern Anatolia Project.

The demographic indicators used in the study mainly cover the size, spatial distribution, and movement of the population in Southeastern Anatolia Region (GAP). The population characteristics of GAP are analyzed for the years of 1980, 1985, 1990, 1997 and 2000 under the headings of total population, population growth rate, population density, rural and urban population structures, average household size, age dependency ratios, total fertility rates, and population movements (in and out migration). The data covered in this section are obtained from the results of General Population Censuses and some several surveys conducted by State Institute of Statistics (SIS).

2.1.1 Total Population

Total population of the Region increased from 4.35 million in 1985 to 6.6 million in 2000. The proportion of Region's population to Country's population has displayed a constant increase trend from the level of 8.58 % in 1985 to the level of 9.73 % in 2000 (Table 2.1 and Table 2.2).

The increase trend in Region's population has two major explanations; high fertility rate and economic development. Big household size (section 2.1.6) and high fertility rate are social characteristics of Southeastern Anatolia Region. Despite of the recent changes in household characteristics in the region (smaller household sizes); high fertility rate is still a reality. The development in economic activities and social facilities in the last two decades have also significant effects to the population size expand (new employment opportunities, thus decrease in out-migration and increase immigration from other regions).

		1985	1990	
REGIONS	Population	Share in	Population	Share in
		Turkey (%)		Turkey (%)
Mediterranean	6,124,316	12.09	7,026,489	12.44
Eastern Anatolia	5,168,660	10.20	5,348,512	9.47
Aegean	6,746,459	13.32	7,594,977	13.45
Middle Anatolia	9,185,555	18.13	9,913,306	17.55
Blacksea	7,993,636	15.78	8,136,713	14.41
Marmara	11,097,514	21.90	13,295,878	23.54
Southeastern Anatolia	4,348,318	8.58	5,157,160	9.13
TURKEY	50,664,458	100	56,473,035	100

Table 2.1 Population Progress in GAP and Turkey, 1985 and 1990 (SIS, 2004)

Table 2.2 Population Progress in GAP and Turkey, 1995 and 2000 (SIS, 2004)

	1995		2000		
REGIONS	Population	Share in Turkey (%)	Population	Share in Turkey (%)	
Mediterranean	7,875,119	12.78	8,723,839	12.86	
Eastern Anatolia	5,409,886	8.78	6,147,603	9.06	
Aegean	8,367,419	13.57	8,953,375	13.20	
Middle Anatolia	10,487,183	17.01	11,625,109	17.13	
Blacksea	8,088,787	13.12	8,439,355	12.44	
Marmara	15,462,944	25.08	17,351,417	25.58	
Southeastern Anatolia	5,952,662	9.66	6,604,205	9.73	
TURKEY	61,644,000	100	67,844,903	100	
	1980	1985	1990	2000	
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Adıyaman	367,595	430,728	513,131	623,811	
Batman ¹	-	-	344,669	456,734	
Diyarbakır	778,150	934,505	1,094,996	1,362,708	
Gaziantep	808,697	966,490	1,140,594	1,285,249	
Mardin	564,967	652,069	557,727	705,098	
Siirt	445,483	524,741	243,435	263,676	
Şanlıurfa	602,736	795,034	1,001,455	1,443,422	
Şırnak	-	-	262,006	353,197	
GAP	3,567,628	4,348,318	5,157,160	6,604,205	
GAP /TURKEY (%)	7.97	8.58	9.13	9.73	
TURKEY	44,736,957	50,664,458	56,473,035	67,803,927	

Table 2.3 Populations of Provinces of GAP (SIS, 2004)

The three provinces, Diyarbakır, Şanlıurfa and Gaziantep, have population over one million and are the metropolitan municipalities. According to the last census 2000, the population of Şanlıurfa was the population (1,443,422) and was followed by Diyarbakır (1,362,708), Gaziantep (1,285,249), Mardin (705,098), Adıyaman (623,811), Batman (456,734), Şırnak (353,197), and Siirt (263,676). Before 2000, for all census years Gaziantep, industrial centre of the Region, was the province with highest population (Table 2.3). However, this situation has changed in the last decade; both Diyarbakır and Şanlıurfa has become the two densely populated areas as these two provinces are the most affected ones among the others in the Region by the outcomes of GAP.

¹ Stated as a province after 1987

2.1.2 Population Growth Rate

Population growth rate indicates productivity strength, capital accumulation, development of technology, and thus effective usage of natural resources. The movement of the population is usually towards the relatively developed areas, which provide better opportunities in economic and social life.

The higher population growth rate also affects urbanization. Higher population growth and urbanization rate requires new investments for improving the living standards of the urban life and sanitation conditions; otherwise there would be no sustainable development. The high rate of population growth can only be meaningful if the related necessary investments covering the new population are planned, organized and implemented accordingly.

In the Region, the high population growth rate affects negatively the sustainable urbanization. The infrastructure of the urban centers is still not sufficient although several remediation projects have been implemented. Some major improvements in sanitation conditions of Gaziantep and Şanlıurfa was observed, however in the other parts of the poor sanitation conditions endangers the public health.

The required infrastructure investment to compensate the high population growth rate has not been realized until today under the scope of GAP. Although the improvement of sanitation conditions and infrastructure was envisaged in one of the aims of the Project in early 80's, these problems are tried be solved after the Candidate Status of Turkey to EU Membership has announced. Especially the provinces in Siirt, Batman the lack of these conditions results as serious problems to the public health.

REGIONS	1985-1990	1990-1995	1995-2000	1990-2000
MEDITERRANEAN	27.48	22.80	20.47	21.64
EASTERN ANATOLIA	6.84	2.28	25.57	13.92
AEGEAN	23.69	19.37	13.54	16.45
MIDDLE ANATOLIA	15.25	11.26	20.60	15.93
BLAKSEA	3.55	-1.18	8.49	3.65
MARMARA	36.15	30.20	23.05	26.62
SOUTHEASTERN ANATOLIA	34.12	28.69	20.77	24.73
TURKEY	21.71	17.52	19.17	18.35

Table 2.4 Annual Population Growth Rate in Turkey, ‰, (SIS, 2004)

The annual population growth rate of GAP is always higher than the average of Turkey. It was 34.12 ‰ between 1985 and 1990, 28.69 ‰ for the next five-year period (1990-1995), and 20.77 ‰ for 1995-2000. The annual population growth rate of the Region is second highest one for the period 1990-2000 after Marmara Region, which is the most developed region in Turkey both socially and economically.

	1980	1985	1990	2000
Adıyaman	11.59	31.70	35.01	19.53
Batman	-	-	-	28.14
Diyarbakır	35.61	36.62	31.70	21.87
Gaziantep	24.37	35.65	33.13	24.05
Mardin	16.71	28.68	25.87	23.44
Siirt	31.01	32.75	12.50	7.98
Şanlıurfa	1.82	55.38	46.16	36.55
Şırnak	-	-	-	29.86
TURKEY	20.65	24.88	21.71	18.28

Table 2.5 Population Growth Rate (‰) in the Provinces of GAP, (SIS, 2004)

The impacts of GAP in population development are very obvious in Şanlıurfa. The Atatürk Dam and related water utilization investments affected the population characteristics of Şanlıurfa significantly (Table 2.5). Between 1975 and 1980, the annual population growth rate in Şanlıurfa was only 1.82 ‰. However, during and after the realization of the investments of GAP Project (Atatürk Dam and irrigation schemes, increase in agricultural and industrial facilities), it increased to 55.38, 46.16, and 36.55 ‰ in 1985, 1990 and 2000 respectively. The population growth rate of the other provinces is also high, the changes of this rate between 1980 and 2000 in these provinces are; 7.94 ‰ in Adıyaman, -13.74 ‰ in Diyarbakır, -0.32 ‰ in Gaziantep, 6.73 ‰ in Mardin, and -23.02 ‰ in Siirt which is the only province with annual population growth rate lower than the average of Turkey.

2.1.3 Rural and Urban Population Structure

Urbanization is a significant indicator of demographical development. Urbanization mostly means better sanitation conditions, better health and education services, and new employment opportunities. However, high urbanization rate is not always means development. Sometimes it is the meaning of pollution, and increase in low-income areas without sufficient infrastructure. So, development in urbanization only can be identified as sustainable if the necessary infrastructure investments are carried out.

The urban (city) population of Southeastern Anatolia Region has increased from 2,873,801 in 1990 to 4,154,558 in 2000 (Table 2.6). The annual growth rate of the city population of the Region is the highest one in Turkey (36.86‰) between 1990 and 2000 (Figure 2.1). It is obvious that this high rate is not only due to the sustainable urbanization of the Region. The effect of political situation (migration as a result of terror events) forced the rural population to migrate to larger and safer settlement areas. This effect can be also seen in Eastern Anatolia Region, which has high annual city population growth rate (SPO, 2000). However, the reason for this change in two regions is different. In Eastern Anatolia, high city population growth rate mainly depend on rural to urban migration as a result of political status, as its

total annual growth rate is low, but city annual growth is high. On the contrary, in Southeastern Anatolia both total and city annual population growth rates are high 24.73 ‰ and 36.86 ‰ respectively (Table 2.4 and 2.6).

	1990		2000		Annual Populatic Growth R	n ate ‰
REGIONS	Urban ²	Rural ³	Urban	Rural	Urban	Rural
MEDITERRANEAN	4,051,596	2,974,893	5,239,500	3,484,339	25.71	15.81
EASTERN ANATOLIA	2,285.798	3,062,714	3,267,692	2,879,911	35.74	-6.15
AEGEAN	4,344,471	3,250,506	5,517,724	3,435,651	23.91	5.54
MIDDLE ANATOLIA	6,412,910	3,500,396	8,046,723	3,578,386	22.7	2.2
BLAKSEA	3,337,392	4,799,321	4,143,669	4,295,686	21.64	-11.09
MARMARA	10,350,307	2,945,571	13,739,470	3,611,947	28.33	20.39
SOUTHEASTERN ANATOLIA	2,873,801	2,283,359	4,154,558	2,449,647	36.86	7.03
TURKEY	33,656,275	22,816,760	44,109,336	23,735,567	27.04	3.95

Table 2.6 Urban and Rural Population in Turkey, (SIS, 2004)



Figure 2.1 Annual Growth Rate of Population by Region, 1990-2000, ‰

 ² Population of municipal area of province and district centers (Definition by SIS)
³ Population of sub-districts and villages (Definition by SIS)

In Southeastern Anatolia Region the proportion of urban population to total population was 55.72 % in 1990 and increased to % 62.91 in 2000. However, these ratios are below the average of Turkey, 59.60 % and 65.01% in 1990 and 2000 respectively (Figure 2.2).



Figure 2.2 Rate of Urban Population to Total Population

The city population ratio in provinces of GAP has increased after 1990. Among the region, Gaziantep has the highest city population rate according to census 2000 with 78.50 %. However, Adıyaman has the highest increase in city population ratio among the Region, around 22 % between 1980 and 2000. Şanlıurfa has the lowest increase in city population ratio as a result of high agricultural activities. However, this does not show the underdeveloped condition of Şanlıurfa, on the contrary both economically and socially the province is the second developed province after Gaziantep in the Region (SPO, 1996 and 2003).

The most developed province in the region Gaziantep has the lowest rural settlement ratio resulted from developed industrial activities and high employment ratio. Although the industrial activities in Batman and Siirt are not developed, the ratio of urban settlement for two provinces has increased as a result of political situation (from 56% to 66% and from 45% to 58% between 1990 and 2000 in Batman and Siirt respectively). The political problems and security problems in 90's were so high that people left their villages and migrated to city centers.

	1980	1985	1990	2000
Adıyaman	31.80	35.10	42.70	54.30
Batman	-	-	56.20	66.60
Diyarbakır	48.10	50.50	54.90	60.00
Gaziantep	63.40	66.50	72.00	78.50
Mardin	34.00	37.40	44.70	55.50
Siirt	41.30	45.20	45.20	58.20
Şanlıurfa	46.90	50.50	55.00	58.30
Şırnak	-	-	47.80	59.80
GAP	44.25	47.53	52.31	61.40
TURKEY	43.90	53.00	59.00	64.90

Table 2.7 City Population Rate in GAP, %, (SIS, 2004)

2.1.4 Age Dependency Ratio

The number of persons at "0-14" and "65 and over" age groups per 100 people at "15-64" age group defines age dependency ratio (SIS, 2004).

The age dependency ratio is very important as it shows the number of people, who needs support from economically active people (100 people). By a basic definition, "it is the economic dependency ratio, ratio of economically inactive population to economically active population" (State Planning Organization, Eastern Anatolia Master Plan, 2000, Volume I, p. 45).

	1980	1985	1990	2000
Adıyaman	118	110	99	78
Batman	-	-	113	99
Diyarbakır	113	108	101	87
Gaziantep	97	92	83	71
Mardin	123	118	112	92
Siirt	120	119	114	99
Şanlıurfa	114	107	101	88
Şırnak	-	-	109	97
GAP	114	109	104	89
TURKEY	78	72	65	55

Table 2.8 Age Dependency Ratio in GAP and in Turkey, %, (SIS, 2004)

Age dependency ratio is assumed as a development indicator, if it is less than 50 % (Eastern Anatolia Master Plan, State Planning Organization, 2000, Volume I p.45). Although the age dependency ratios in GAP are more than 50 % and average of Turkey, the regular decline in the ratios for the last two decades is seen from Table 2.8; from 114 in 1980 to 89 in 2000.

Gaziantep has the lowest age dependency ratio for all years between 1980 and 2000. The decrease in age dependency ratio of Adıyaman is the highest, from 118 to 78 %.

2.1.5 Population Density

The population density (population per one square kilometers) is an indicator of not only a population growth but also the attraction of provinces with developed economic and social activities. The population density increased very rapidly in the Region, from 54 to 89 in 1980 and 2000 respectively. Especially, in Şanlıurfa the population density was doubled between 1980 and 2000. This is an evidence of the attraction of the province by means of social and economic activities after the implementation of investments of GAP.

The new economic opportunities attract the nearby population to the province. Gaziantep is the most developed province of the Region regarding to industry (refer to Chapter 6) so the population density is much higher than other provinces in the Region.

	1980	1985	1990	2000
Adıyaman	48	57	67	82
Batman	-	-	73	98
Diyarbakır	51	61	71	90
Gaziantep	106	126	149	188
Mardin	44	51	63	80
Siirt	40	48	45	48
Şanlıurfa	32	43	54	75
Şırnak	-	-	37	49
GAP	54	64	70	89
TURKEY	58	65	73	88

Table 2.9 Population Densities in GAP and in Turkey, (SIS, 2004)

2.1.6 Average Household Size and Fertility Rate

The number of people with or without a family relationship who live in the same house or in the same part of a house who share their earnings and expenditures who take part in the management of the household and who render services to the household is called household (SIS, 2004).

The ratio of total population of households to total number of households is called as the average number of persons in the households

Household size is an important factor in determining the share and distribution of income. In larger families, the income share of each person are become less.

High fertility rate is a major factor negatively affecting the living conditions and health standards of women and children. Increase in number

of children in a family and decrease in time interval between successive births in a household, child mortality, the possibility of illness in the house increases, also nutrition conditions of children become less healthy and mental development of children is affected negatively. Another negative effect of small time interval of successive births is the unwillingness of the women to give a birth, which caused abortions, occurred in an unhygienic condition.

There are two kind of factors that has effects on fertility; social and cultural, economic. Social and cultural factors can be defined as the most significant factors among the others in fertility rates. To understand the fluctuations in fertility rates, the role of the women in family and in the society shall be examined deeply. The fertility rate is indirectly proportional to increase in educational facilities and opportunities, and increase in employment opportunities (except in agricultural sector and in house work). The fertility rate also depends on the economic income level of the family. High-income level decreases the fertility rates.

For the places where the traditional life standards are dominant in Turkey, fertility rates thus average household sizes are higher. Parallel to the economic and social development, modernization become more dominant in family life and core family style replace the traditional style. Due to these reasons, the average household sizes are indirectly proportional to development; this condition is also valid for fertility rates. Fertility rates are also an indicator for the education level (or can be defined as consciousness) of women. The literate women – more educated women and men- have limited number of children, or limit her family size due to economic and social reasons.

In Southeastern Anatolia average household size increase from 6.7% to 7% in 1980 and 2000 respectively. As stated before, average household size is indirectly proportional to development. However, a larger household type (big families) is a characteristic life style of the Region, and it is a part of Region's culture. Due to this condition, average household size cannot be an

indicator of the development of the Region. Also, the Region cannot be defined by underdeveloped only by considering these rates without considering social and cultural characteristics.

	1980	1985	1990	2000
Adıyaman	6.4	6.6	6.6	6.3
Batman	-	-	7.7	7.6
Diyarbakır	6.8	6.9	6.9	6.8
Gaziantep	5.9	5.9	5.7	5.2
Mardin	6.9	7.3	7.4	7.7
Siirt	7.5	7.8	7.8	7.5
Şanlıurfa	6.6	6.8	6.8	6.9
Şırnak	-	-	8.1	8.3
GAP	6.7	6.9	7.1	7.0
TURKEY	5.3	5.2	5	4.5

Table 2.10 Average Household Size in GAP and in Turkey, (SIS, 2004)

Table 2.11 Total Fertility Rate in Provinces of GAP, %, (SIS, 2004)

	1980	1985	1990	2000
Adıyaman	5.6	3.8	4.7	3.7
Batman	-	-	5.8	5.3
Diyarbakır	4.4	4.1	4.7	4.5
Gaziantep	4.4	3.8	3.6	3.8
Mardin	5.2	4.3	5.6	5
Siirt	4.7	4.8	6.3	6.1
Şanlıurfa	4.2	3.6	4.4	4.8
Şırnak	-	-	5.8	7.1
GAP	4.8	4.1	5.1	5.0
TURKEY	3.4	2.6	2.7	2.5

Total fertility rate is defined as the average number of live births that a women would have under the assumption that she survived to the end of her reproductive life (15 to 49 years of age) and bore according to a given age specific fertility rate (Provincial Indicators, 1980-2003, SIS).

The total fertility rate in the Region has -increased since 1980 except 1985. Only between 1980 and 1985, fertility rates decreased in each province. After 1985, again it gained an increase trend. This increase trend can be related to the low literacy ratio of women in the Region. Although one of the major targets of the GAP is the development of the women life, this target did not come to realization completely. The most important reason is the cultural characteristics of the Region. The difficulties in breaking the traditional women image in the Region (to be considered only as a housewife and a birth machine) prevented the development of women life as it had assumed.

2.1.7 Population movements

The person whose permanent resident at the census day is different from the permanent residence five years ago is defined as migrant population. Migrant population covers the population 5 years of age and over (SIS, 2004).

In Turkey, the migration from less developed areas to the industrial and trade centers or to the tourism centers is very common. The natural disasters, like floods, earthquakes, and the obligatory resettlement caused by large dam construction, or due to terror are the other major reasons for immigration in Turkey.

In 1990's the in and out migration structure of Southeastern Anatolia gained a new approach besides the normal (social and economic) facts. First of all, the type called "security migration" became a major reason for inhabitants to migrate. The terrorist events - whether willingly or unwillingly-forced local people (especially in rural areas) to migrate to safer places to larger cities or metropolitan settlements. In the report of Human Rights Watch

Organization, Helsinki, published in 1993, this situation was described as a dilemma to be faced by the local people in Southeastern Anatolia, the choice of being killed by PKK for being into cooperation with military forces or abandoning their village by the enforcement of military forces due to unwillingness for cooperation (Human Rights Watch/Helsinki, 1994). This type of migration was seen at the end of 80's and dominantly in 90's in the Region. However, in the new century, the situation has changed. The security problems were almost solved and this changed the direction of migration to the reverse situation. "Return to Villages" is the idea that is explaining the migration type in the new century (İlkkaracan P. & İ, 1998).

In Southeastern Anatolia, the change in economic face is the other major element in migration. After GAP investments, an economic based population movement is observed. Especially, big investments like Atatürk Dam and irrigation projects attracted the unemployed population to the Şanlıurfa Region. The developing industry prevents the out migration from the Region as well as increases population movement towards the Region both from urban areas and from other parts of Turkey. The incentives given by the government, new employment opportunities, developing health and education facilities is making the Region as a new resettlement area.

Net migration is the difference between in-migration and –outmigration for a specific area. If in-migration is more than out-migration, net migration is positive. Otherwise, it is negative. Net migration rate is the number of net migration per thousand persons who are able to migrate.

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	1975-1980			
	In- migration	Out- migration	Net migration	Net migration rate ‰
Adıyaman	10,982	22,353	-11,371	-34.7
Batman	-	-	-	-
Diyarbakır	32,604	48,399	-15,795	-24.2
Gaziantep	32,811	34,067	-1,256	-1.8
Mardin	12,792	41,711	-28,919	-59.8
Siirt	17,330	28,252	-10,922	-29.5
Şanlıurfa	16,184	51,437	-35,253	-60.1
Şırnak	-	-	-	-
GAP	111,721	203,866	-92,145	-34

Table 2.12 Population Movements in the Region, 1975-1980, (SIS, 2004)

Table 2.13 Population Movements in the Region, 19	980-1985, (SIS, 20	04)
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	1980-1985				
	In- migration	Out- migration	Net migration	Net migration rate ‰	
Adıyaman	14,552	28,166	-13,614	-35.4	
Batman	-	-	-	-	
Diyarbakır	40,225	52,775	-12,550	-16.1	
Gaziantep	37,007	41,263	-4,256	-5.2	
Mardin	22,620	40,115	-17,495	-31.2	
Siirt	18,217	36,449	-18,232	-41.7	
Şanlıurfa	27,559	42,068	-14,509	-20.9	
Şırnak	-	-	-	-	
GAP	160,180	240,836	-80,656	-22	

	1985-1990				
	In- migration	Out- migration	Net migration	Net migration rate ‰	
Adıyaman	19,370	36,742	-17,372	-37.5	
Batman	20,542	16,617	3,925	13.9	
Diyarbakır	46,883	79,095	-32,212	-34.8	
Gaziantep	52,589	53,070	-481	-0.5	
Mardin	21,281	56,031	-34,750	-70.2	
Siirt	10,960	42,271	-31,311	-140.7	
Şanlıurfa	30,660	57,460	-26,800	-30.0	
Şırnak	9,368	14,533	-5,165	-24.7	
GAP	211,653	355,819	-144,166	-33	

Table 2.14 Population Movements in the Region, 1985-1990, (SIS, 2004)

Table 2.15 Population Movements in the Region, 1	1995-2000, (SIS, 2004))
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	1990-2000				
	In- migration	Out- migration	Net migration	Net migration rate ‰	
Adıyaman	17,624	58,369	-40,745	-70.2	
Batman	20,133	38,165	-18,032	-45.2	
Diyarbakır	62,996	111,060	-48,064	-40.0	
Gaziantep	68,550	65,051	3,499	3.1	
Mardin	26,083	68,165	-42,082	-67.6	
Siirt	17,932	34,994	-17,062	-75.1	
Şanlıurfa	38,320	87,362	-49,042	-38.9	
Şırnak	28,457	22,507	5,950	21.8	
GAP	280,095	485,673	-205,578	-34	

2.1.8 Population Structure and Movements in Adıyaman

Although Adıyaman is not the most developed province in the GAP; but the population structure of the province shall be specially examined in order to see the physical effects of Atatürk Dam to the population of Adıyaman.

The main population characteristics of the province were given in the previous parts of population, which is summarized as follows:

		POPULATION
	CENTRAL	OF THE
YEARS	DISTRICTS	PROVINCE
1955	13,966	208,755
1960	16,487	233,717
1965	22,153	267,288
1970	31,263	303,511
1975	43,782	346,892
1980	53,219	367,595
1985	71,644	430,728
1990	101,576	522,439
1997	212,475	678,999
2000	338,939	623,811

Table 2.16 Population of Adıyaman Province (www.adiyaman.gov.tr)

From the 1955 to the year 2000 the population of the province is almost tripled from 208,755 to 623,811 inhabitants. The population of the province showed a constant increase trend according to the censuses 1985, 1990, 1997 and 2000. This increase was 59.45 % in 1985, 66.78 % in 1900, 112 % in 1997 and % 34 in 2000. The urban population increase in the province is much higher than the rural population growth. This high urban ratio is observed especially after 1990's which is mainly depend on the Atatürk Dam (www.adiyaman.gov.tr).

The impact of Atatürk Dam on the population structure and movement is very significant in the Adıyaman Province. After the construction of dam 12 villages and 46 districts with a total population of 58,645 (1990), was completely covered with water. As a result, these people abandoned their habitat and migrated to the other settlement areas, which accelerates the inmigration.

	Number o	of Settlements		
Name of the	(District a	and Villages)	Affected Population	
district	Completely	Partially	Completely	Partially
Central	15	27	2031	17324
Samsat	15	12	5201	6008
Kahta	18	20	5360	12994
Gerger	5	19		9727
Total	53	78	12592	46053

Table 2.17 Number of Villages and Districts Covered by Reservoir of Atatürk Dam (<u>www.adiyaman.gov.tr</u>)

The most interesting conclusion that can be driven from the population movement data of the province is the high rate of out-migration. The less developed industry and lack of employment opportunities in the region causes high amount of out-migration among the province. But urban population rate is high in Adıyaman despite of its underdeveloped economy and infrastructure. This urbanization is not as a result of the development of the province, on the contrary an obligatory population movement to urban settlements of the people affected by the Atatürk Dam reservoir.

2.2 Education

There is a strong relation between education level and sustainable development. The developing economy and social life needs sufficient number of educated and qualified labor force.

In Southeastern part of Turkey, the lack of qualified labor force is always a problem. The low ratio of school enrolment from primary to higher education, the gender inequality problem in school enrolment, lack of educational facilities and personnel are the main problems existing for a long time period.

One of the major components of GAP is the sustainable development in education system. This not only means a numeric increase in facilities but also development in cultural level among the Region. The aim of another component of the education projects under GAP is to find a solution to gender inequality problem inside Southeastern Anatolia. Although there were several project executed, and there should be new ideas to solve this specific problem, as it is not easy to break some traditions and change the social status of women.

In the study "Provincial Socio Economic Development Ranking" (Dincer B, 1996), conducted by State Planning Organization in 1996, the problems in education of the Region are clearly seen. According to the study, in the category of overall literacy ratio, the region has the lowest value among Turkey with 60.4 % (80.46 % in Turkey). This is even worse in the ratio of literate women, again having the lowest ratio; 44.77 % (71.95 % in Turkey). For the other components of education data, this situation is still valid; with 95.80 % primary education schooling ratio (97.10 % in Turkey), 27.51 % secondary education schooling ratio (46.52 % in Turkey), and 3.17 % higher education schooling ratio (4.72 % in Turkey). This data shows that Southeastern Anatolia had the least developed education system inside Turkey. However, one should keep in mind that this study was prepared in 1996 according to the educational data of the year 1990, and the impacts of a long-term development projects like GAP in education sector could not be

seen in a short time period. It will take several years to see the real impacts of the projects in education sector.

State Planning Organization was conducted a similar study in 2003 (Dincer B, Ozaslan M, Kavasoğlu T., 2003). According to the study, literacy ratio of the region has changed to 73.22 % (87.30 % in Turkey), ratio of literate women to 60.16 % (80.62 % in Turkey), primary education schooling ratio to 94.12 % (98.10 % in Turkey), secondary education schooling ratio to 33.92 % (57.41 % in Turkey), and higher education ratio to 4.99 % (8.42 % in Turkey). Although these results again shows that, Southeastern Anatolia Region is the least developed one in Turkey, the big difference in the ratios is very obvious. This study shows that education has been developing with a high acceleration and almost reached to the average of Turkey in each category.

The data used in the study of State Planning organization in 2003 cover only information until 2000. In order to understand the GAP education component, the data between 1986 and 2005 is collected and analyzed in this chapter. The education data used in this study covers literacy ratio, literacy by sex, primary, secondary education (teacher, enrolment and graduates), number of graduate population, number of students per school and teacher, number of libraries, books and population served. The data presented in this chapter are obtained from Ministry of National Education of Turkey (from annual questionnaire) and State Institute of Statistics (SIS). The main terms used in this chapter can be summarized as follows:

<u>Primary Education:</u> Primary education institutes include 5-year primary schools, 5-6 year private schools, and 8-year basic education and regional boarding schools. The system has changed to 8 years compulsory education with law no 4306 dated 18 August 1997 since 1997/1998-education year. It covers the age group of 6-13.

<u>Secondary education</u>: Secondary education follows primary education and consists of vocational, general and technical schools which offer a minimum of 3-years of education

<u>Higher education:</u> Includes students in undergraduate, graduate and PhD. Programs and those in medical schools. The number of students enrolled in preparatory schools and undergraduate programs and the related academic staff include that of universities, faculties, two-year colleges and conservatories.

2.2.1 Literacy ratio

Literacy ratio, number of persons who know how to read and write per 100 persons 6 years of age and over (Provincial Indicators 1980-2003, SIS), is the most important data to be analyzed in order to understand the sustainable education development. There is a strong relation between education and socio-economic development. The literate part of the population means a more qualified labor force which effects directly the economic and industrial development.

The literacy ratio of GAP was 42.4% in 1980, 55.39% in 1985, 57.53 % in 1990 and 72.20 % in 2000 whereas the literacy ratio of Turkey was 67.48 %, 77.45 %, 80.49 % and 87.32 % in 1980, 1985, 1990 and 2000 respectively. Although the literacy ratio of the Region is under the average of Turkey for all years, the rate of increase of this rate is more than the Country especially after 1990 (Figure 2.3). This increase in the rate of change is important and its timing is very important to understand the effects of GAP Sustainable Development Program as the GAP investments are meant effective and dominant in the region after 1990 when the literacy ratio of the region has gained acceleration.

Among the Region, Gaziantep has the highest literacy ratio, which is very close to the average of Turkey because of its developed industry (both before and after GAP project). For the other provinces, the literacy ratio was almost doubled between 1980 and 2000. As it can be seen from Table 2.17 the rate of increase in literacy ratio reached its peak value between 1990 and 2000, the duration which GAP investments were mainly implemented.

	1980	1985	1990	2000
Adıyaman	43.95	61.90	67.36	79.87
Batman	-	-	57.62	70.97
Diyarbakır	41.18	52.24	56.26	69.59
Gaziantep	57.42	70.97	73.91	83.78
Mardin	36.23	48.07	54.12	71.22
Siirt	36.07	51.22	53.97	68.66
Şanlıurfa	38.00	47.92	56.21	67.74
Şırnak	-	-	40.80	65.75
SOUTHEASTERN				
ANATOLIA	42.14	55.39	57.53	72.20
TURKEY	67.48	77.45	80.49	87.32

Table 2.18 Ratio of Population by Literacy in GAP (SIS, 2005)



Figure 2.3 Comparison of Rate of Literacy between GAP and Turkey

The data about the literacy by sex is another social indicator in education. As the Region suffers from the uneducated women population, a slight increase in the ratio of literate women can be identified a success for the development policies.

Table 2.19 Literacy by Sex in GAP, %, (SIS, 2005)

	Women	Men	Total
1985	29,28	65,38	47,92
1990	38,66	72,79	56,21
2000	52,26	82,15	67,74

In 1985 only 29 % of women population is literate in the Region. This number is quite low and an evidence of the underdeveloped cultural structure of GAP. This ratio increased to 38 % in 1990 and doubled in 2000 with 52%. Although this ratio is far behind the ratio in Turkey in 2000, it is a huge progress fro the Region where traditional women role is dominant. This is the success of social development project under the framework of GAP.

2.2.2 Pre-school Education

In Turkey, pre-school education is not an obligatory education system for the children under the age of seven (primary education age). However, this kind of education is a process of systematic and conscious education, which provides rich environmental opportunities to mental and physical development of a child, and improves the emotional and social behavior of children (SPO, 2001).

In the region, one of the most important difficulties in development of education is for the children whose native language is Kurdish. These children could neither speak nor understand Turkish, which is the compulsory education language in Turkey, efficiently until the primary school age. These situations make these children unsuccessful in primary education and usually close the doors of higher education to them. Their parents are not willing to send them to higher education institutes because of their unsuccessful education life in primary schools. This problem in the region can be handled by increasing and promoting pre-school education, which can be solution to increase the enrolment to primary education thus to increase in literacy ratio.



Figure 2.4 Changes in Number of Schools in Pre-school Education in GAP

The number of schools in pre-school education in GAP has significantly increased after the education year of 2000/2001. Before 2000 the average school number is around 300, but after the new century it reached the numbers over 1000. It is a good result for the Region by means of improving its educational background. The results are similar in enrolment number. The number of enrolment in 2005 is five times greater than the enrolment in 1998 (Figure 2.5).



Figure 2.5 Changes in Number of Students in Pre-School Education In GAP

The success of education component of the sustainable development program of GAP, which aims to increase the literacy ratio, depend on the willingness of the parents on sending their children to schools. The development of pre-school education is the first step for this improvement.

2.2.3 Primary Education

Primary education is the one that is eight-year compulsory education system in Turkey, which has the most important role in education system. This education system has been carried out since education year of 1998/1999. Before that, primary education was five-year compulsory and followed by three years of secondary education, which has low enrolment ratio.

In GAP, the number of primary education school was increased from 4893 in 1986/1987 education year to 5822 in 1994/1995. After this period it shows a constant level until 1998/1999 educational year. However, the number of schools in primary education decreased after this education year to the level of 5000. The major reason for this decrease is the change in educational system in Turkey (5 year compulsory to 8 year compulsory

system). The new system requires fewer schools but more teachers and classrooms. So, this decrease in the number during that period does not mean the underdevelopment of education system in the Region. This situation is also can be seen from the change of number of school in Turkey.

Educational		
Year	Turkey	GAP
2004-2005	35,580	5,370
2003-2004	36,114	5,179
2002-2003	35,133	5,036
2001-2002	35,052	4,888
2000-2001	36,072	4,833
1999-2000	33,317	4,552
1998-1999	45,102	5,622
1997-1998	47,365	5,530
1996-1997	47,313	5,499
1995-1996	49,240	5,639
1994-1995	48,429	5,822
1993-1994	49,599	5,792
1992-1993	49,974	5,756
1991-1992	50,701	5,710
1990-1991	51,055	5,682
1989-1990	51,170	5,503
1988-1989	50,747	5,273
1987-1988	50,455	4,914
1986-1987	49,718	4,893

Table 2.20 Number of Schools in Primary Education, (SIS, 2005)

Education Year	Turkey	GAP
2004-2005	10,298,646	1,393,540
2003-2004	10,413,579	1,359,352
2002-2003	10,331,645	1,327,547
2001-2002	10,477,616	1,320,879
2000-2001	10,480,721	1,266,208
1999-2000	10,028,979	1,155,330
1998-1999	9,609,050	1,063,067
1997-1998	9,084,635	957,955
1996-1997	6,389,060	715,039
1995-1996	6,403,300	700,673
1994-1995	6,466,648	695,953
1993-1994	6,526,296	705,199
1992-1993	6,707,725	746,553
1991-1992	6,878,923	764,443
1990-1991	6,861,722	735,079
1989-1990	6,848,083	716,563
1988-1989	6,766,829	698,974
1987-1988	6,880,304	699,114
1986-1987	6,703,895	662,927

Table 2.21 Number of Enrolments in Primary Education, (SIS, 2005)

The number of students (enrolment) in primary education in the Region has increased from 662,927 in 1986/1987 educational year to 1,393,540 in 2004/2005 educational year (Table 2.21). This increase in enrolment is normal, as the population of the Region has significantly increased during this period. The most important part of this data is the schooling ratio for the age group of 7-15, which is the explanation of the literacy ratio.

Educational		
Year	Turkey	GAP
2004-2005	399,002	39,657
2003-2004	384,170	37,598
2002-2003	373,303	37,096
2001-2002	372,687	33,763
2000-2001	345,015	29,993
1999-2000	325,140	27,165
1998-1999	317,790	25,720
1997-1998	302,254	23,309
1996-1997	217,131	16,948
1995-1996	231,900	17,036
1994-1995	233,073	17,111
1993-1994	237,943	17,936
1992-1993	235,721	20,349
1991-1992	234,961	18,832
1990-1991	225,852	17,130
1989-1990	224,672	16,929
1988-1989	220,947	16,484
1987-1988	220,943	15,814
1986-1987	216,889	15,115

Table 2.22 Number of Teachers in Primary Education, (SIS, 2005)

The number of teachers is an important indicator affecting the development of education system. For a long period both Turkey and the Region has affected from the lack of sufficient number of teachers. Although this lacking is decreased, this is still a problem in the education system of the Region and of Turkey. The number of teachers in primary education is increased from 15,115 in 1986/1987 education year to 39,657 in 2004/2005 education year. However there are some fluctuations in these numbers. From 1986 to 1992 it was constantly increased and decreased until 1997. Between 1997 and 1998 it gained a high acceleration, and has showed a constant increase after this educational year. The most important reason for the decrease in 90's is the security problems in the Region. Despite of the

developing economy of the Region in 90's, teachers did not want to settle in the Region because of safety problems. In 1997/1998 the uniting of threeyear secondary education and five-year primary education under the name of new primary education system increased the number of teachers in primary education system significantly (Table 2.22). But the real increase in number of teachers has seen after 2001.

	TURKEY		GAP			
			FEMALE/			FEMALE/
Education	FEMALE	MALE	TOTAL	FEMALE	MALE	TOTAL
Year			(%)			(%)
2004-2005	4,858,578	5,440,068	47.18	620,898	772,642	44.56
2003-2004	4,891,897	5,521,682	46.98	594,747	764,605	43.75
2002-2003	4,828,218	5,503,427	46.73	570,294	757,253	42.96
2001-2002	4,880,555	5,597,061	46.58	564,123	756,756	42.71
2000-2001	4,845,590	5,635,131	46.23	530,324	735,884	41.88
1999-2000	4,599,795	5,429,184	45.87	478,820	676,510	41.44
1998-1999	4,360,624	5,248,426	45.38	436,861	626,206	41.09
1997-1998	4,083,749	5,000,886	44.95	390,000	567,955	40.71
1996-1997	3,013,550	3,375,510	47.17	312,909	402,130	43.76
1995-1996	3,033,082	3,370,218	47.37	304,076	396,597	43.40
1994-1995	3,065,485	3,401,163	47.40	305,530	390,423	43.90
1993-1994	3,092,337	3,433,959	47.38	308,560	396,639	43.76
1992-1993	3,163,808	3,543,917	47.17	321,858	424,695	43.11
1991-1992	3,238,599	3,640,324	47.08	323,549	440,894	42.32
1990-1991	3,229,822	3,631,900	47.07	308,428	426,651	41.96
1989-1990	3,225,259	3,622,824	47.10	299,803	416,760	41.84
1988-1989	NO INFORMATION					
1987-1988	3,244,250	3,636,054	47.15	289,671	409,443	41.43
1986-1987	3,159,307	3,544,588	47.13	273,200	389,727	41.21

Table 2.23 Number of Enrolments in Primary Education by Sex, (SIS, 2005)

In Southeastern Anatolia, the number of female students is quite significant. The cultural characteristics of the Region do not allow the girls to study in primary schools. There have been lots of projects implemented to improve the situation, but most of them cannot be successful. It is not easy to break some traditions about the social life and role of women. As clearly seen from Table 2.23 the ratio of female students in primary education is around 40 % for all education years. There have been only small changes and increases in recent years due to the special projects like, "Kardelenler", which is still an important social development movement for the Region. These kinds of projects are aimed towards the increase in female enrolment to primary education.

The number of students per teacher is a defining factor in education development. In Southeastern Anatolia, this ratio has become less throughout the years. Until 2000, it was around 40 students per teacher, and has decreased to 35 students per teacher in new century (Table 2.24). Despite of its decrease, this number is still higher than the average of Turkey (around 25-30). The effects of education development projects under GAP have been obvious newly in these years.

Table 2.24 Number of Students per Teacher in Primary Education, (SIS, 2005)

	Turkey	GAP
2004-2005	26	35
2003-2004	27	36
2002-2003	28	36
2001-2002	28	39
2000-2001	30	42
1999-2000	31	43
1998-1999	30	41
1997-1998	30	41
1996-1997	29	42
1995-1996	28	41
1994-1995	28	41
1993-1994	27	39
1992-1993	28	37
1991-1992	29	41
1990-1991	30	43
1989-1990	30	42
1988-1989	31	42
1987-1988	31	44
1986-1987	31	44

	Adıyaman	Diyarbakır	Gaziantep	Mardin	Siirt	Şanlıurfa	Batman	Şırnak
2004-2005	26	34	35	36	33	39	36	43
2003-2004	27	37	38	36	35	39	36	40
2002-2003	26	39	37	35	31	38	37	44
2001-2002	28	41	44	34	35	41	39	58
2000-2001	30	42	46	41	38	47	45	49
1999-2000	32	40	49	45	35	42	47	52
1998-1999	30	37	48	42	40	43	45	58
1997-1998	32	40	47	40	31	44	43	47
1996-1997	32	41	46	40	29	47	42	74
1995-1996	32	38	45	40	29	47	43	64
1994-1995	31	39	44	40	30	47	38	71
1993-1994	31	36	43	39	33	47	42	49
1992-1993	29	33	47	33	29	41	36	38
1991-1992	34	39	44	36	29	49	40	53
1990-1991	37	42	47	38	34	49	43	47
1989-1990	39	42	44	37	40	49	-	-
1988-1989	41	43	41	39	43	47	-	-
1987-1988	45	45	41	45	44	48	-	-
1986-1987	51	44	39	46	46	46	-	-

Table 2.25 Number of Students per Teacher in Primary Education in the Provinces of GAP, (SIS, 2005)

Among the provinces, in Adıyaman Province the number of students per teacher is lowest one. This province also showed a significant development in education between 1986 and 2005. The number of students per teacher in Adıyaman was the highest in 1986/1987 (51) and in 2004/2005 become the least one (26). Despite of its economic strength of Gaziantep, the development was not as big as Adıyaman (decreased from 47 to 35). The other provinces have similar data and increase/decrease trend in recent years (Table 2.25). The change in number of schools, teachers, enrolment (also by sex) for the years between 1986 and 2005 is shown in the following tables (Table 2.26, 2.27, 2.28, and 2.29):

Education Year	Adıyaman	Diyarbakır	Gaziantep	Mardin	Siirt	Şanlıurfa	Batman	Şırnak
2004-2005	742	1,035	610	614	332	1,308	380	241
2003-2004	753	1,005	611	605	320	1,312	351	222
2002-2003	740	985	553	582	296	1,306	346	228
2001-2002	755	895	534	552	278	1,356	319	199
2000-2001	744	871	532	531	280	1,356	311	208
1999-2000	709	1,001	480	439	188	1,315	222	198
1998-1999	786	1,171	740	690	273	1,372	348	242
1997-1998	803	1,188	689	686	367	1,371	153	273
1996-1997	790	1,160	667	667	357	1,339	356	163
1995-1996	782	1,157	681	662	356	1,331	364	306
1994-1995	794	1,141	843	663	354	1,322	365	340
1993-1994	776	1,141	843	664	351	1,319	363	335
1992-1993	757	1,136	842	660	348	1,312	366	335
1991-1992	745	1,119	841	649	348	1,306	367	335
1990-1991	746	1,106	845	641	347	1,306	363	328
1989-1990	738	1,094	841	889	713	1,228	-	-
1988-1989	724	1,031	823	883	701	1,111	-	-
1987-1988	713	981	810	866	639	1,112	-	-
1986-1987	693	972	787	836	598	1,007	-	-

Table 2.26 Number of Schools in Primary Education in the Provinces of GAP, (SIS, 2005)

The number of schools in Adıyaman, Diyarbakır, Şanlıurfa and Batman provinces has increased between 1986 and 2005. On the contrary the number of schools in Gaziantep, Mardin, Siirt and Şırnak has decreased in the same period (Table 2.26). However, during the same period number of enrolments has increased in all provinces (Table 2.27). This is very interesting data, which has got a definite explanation. For example, Gaziantep is the most developed province in the whole Region; however the number of schools in the province decreased after 1995 by 200 schools. If the Table 2.28 is examined, the increase in number of teachers can be seen easily despite of schools' number decrease.

Years	Adıyaman	Diyarbakır	Gaziantep	Mardin	Siirt	Şanlıurfa	Batman	Şırnak
2004- 2005	115,510	298,088	279,623	153,316	67,391	287,688	111,351	80,573
2003- 2004	118,828	295,480	276,802	148,728	68,285	267,359	110,407	73,463
2002- 2003	119,062	287,640	267,547	143,378	61,871	266,223	110,525	71,301
2001- 2002	121,683	278,767	267,004	145,637	58,990	265,274	109,409	74,115
2000- 2001	120,603	260,303	262,599	138,429	55,331	258,735	101,615	68,593
1999- 2000	116,258	235,845	245,185	125,615	45,588	231,261	92,391	63,187
1998- 1999	107,973	219,328	227,720	114,943	43,158	216,265	81,115	52,565
1997- 1998	104,513	197,379	213,274	104,179	33,992	190,595	67,314	46,709
1996- 1997	79,367	138,483	164,308	77,590	26,216	141,815	50,376	36,884
1995- 1996	84,336	137,954	166,050	74,117	24,399	133,317	47,183	33,317
1994- 1995	84,988	122,249	183,410	76,182	22,828	134,097	45,609	26,590
1993- 1994	86,941	133,659	174,647	77,312	27,123	134,870	47,994	22,653
1992- 1993	86,585	151,805	179,882	79,396	29,764	145,388	51,078	22,655
1991- 1992	85,778	159,382	180,123	80,218	30,737	148,209	50,933	29,063
1990- 1991	83,768	152,070	176,611	76,488	30,091	143,850	48,315	23,886
1989- 1990	81,525	149,029	174,959	92,852	79,542	138,656	-	-
1988- 1989	75,713	145,682	173,213	99,661	81,822	122,883	-	-
1987- 1988	80,280	141,605	174,366	101,134	77,423	124,306	-	-
1986- 1987	78,382	135,487	168,890	93,831	72,812	113,525	-	-

Table 2.27 Number of Enrolments in Primary Education in the Provinces of GAP, (SIS, 2005)

Years	Adıyaman	Diyarbakır	Gaziantep	Mardin	Siirt	Şanlıurfa	Batman	Şırnak
2004- 2005	4,453	8,661	7,932	4,281	2,025	7,337	3,112	1,856
2003- 2004	4,384	7,946	7,334	4,181	1,938	6,924	3,046	1,845
2002- 2003	4,603	7,372	7,326	4,138	1,967	7,042	3,018	1,630
2001- 2002	4,354	6,804	6,116	4,288	1,667	6,414	2,838	1,282
2000- 2001	4,013	6,260	5,732	3,354	1,475	5,491	2,267	1,401
1999- 2000	3,609	5,837	4,954	2,820	1,314	5,455	1,967	1,209
1998- 1999	3,559	5,874	4,720	2,716	1,082	5,052	1,812	905
1997- 1998	3,262	4,939	4,498	2,583	1,103	4,373	1,553	998
1996- 1997	2,461	3,371	3,545	1,943	904	3,033	1,193	498
1995- 1996	2,627	3,618	3,654	1,845	840	2,834	1,094	524
1994- 1995	2,726	3,143	4,191	1,885	772	2,827	1,190	377
1993- 1994	2,807	3,756	4,103	1,963	822	2,893	1,130	462
1992- 1993	2,946	4,630	3,805	2,411	1,013	3,525	1,421	598
1991- 1992	2,516	4,126	4,066	2,221	1,046	3,037	1,273	547
1990- 1991	2,252	3,647	3,781	2,024	887	2,909	1,127	503
1989- 1990	2,073	3,547	4,011	2,516	1,974	2,808	-	-
1988- 1989	1,862	3,387	4,188	2,531	1,902	2,614	-	-
1987- 1988	1,776	3,116	4,294	2,259	1,756	2,613	-	-
1986- 1987	1,537	3,089	4,374	2,048	1,580	2,487	-	-

Table 2.28 Number of Teachers in Primary Education in the Provinces of GAP, (SIS, 2005)

2.2.4 Secondary Education

The secondary education in Turkey after 1997/1998 educational year is defined as the education follows primary education and consists of vocational, general and technical schools which offer a minimum of 3-years of education (SIS, Provincial Statistics 1980-2003). General high schools, vocational and technical (here after called as "vocational") are the types of secondary education.

In the Region, the transfer of students from primary education to the secondary education is not high, which result in decrease of qualified labor force. Especially the development of vocational education is significant as the number of technical personnel in the middle level (technicians) is the main human resource for industry. Today, the requirement of this kind of staff is quite much all around the Turkey, despite of low enrolment rate to vocational education.

	Turkey	GAP
2004-2005	6,837	431
2003-2004	6,931	405
2002-2003	6,212	373
2001-2002	6,367	365
2000-2001	6,291	354
1999-2000	6,000	328
1998-1999	5,963	335
1997-1998	5,624	310
1996-1997	5,360	297
1995-1996	4,987	274
1994-1995	4,713	275
1993-1994	4,511	266
1992-1993	4,239	254
1991-1992	4,012	239
1990-1991	3,743	215
1989-1990	3,365	197
1988-1989	3,079	181
1987-1988	2,934	169
1986-1987	2,783	160

Table 2.29 Total Number of Schools in Secondary Education in GAP and Turkey, (SIS, 2005)

Number of schools in secondary education (both general high schools and vocational and technical schools) was only 160 in 1986/1987 education year. It has displayed a constant increase trend afterwards and reached to 431 in 2004/2005 educational year (Table 2.29). These schools form 5.7 % in 1986/87 and 6.3 % in 2004/05 of the secondary education schools in Turkey.

Years	Adıyaman	Diyarbakır	Gaziantep	Mardin	Siirt	Şanlıurfa	Batman	Şırnak
2004- 2005	54	77	98	40	23	73	27	21
2003- 2004	60	67	98	40	22	70	24	24
2002- 2003	54	65	95	35	19	60	24	21
2001- 2002	52	65	93	35	18	67	21	14
2000- 2001	53	62	86	33	19	68	18	15
1999- 2000	50	58	79	33	15	61	20	12
1998- 1999	48	58	79	35	18	66	20	11
1997- 1998	44	55	71	34	17	60	19	10
1996- 1997	44	53	68	31	17	56	19	9
1995- 1996	40	52	61	29	16	50	17	9
1994- 1995	37	52	67	26	17	49	18	9
1993- 1994	35	54	65	25	15	45	18	9
1992- 1993	32	54	62	24	15	43	15	9
1991- 1992	28	51	58	25	17	38	14	8
1990- 1991	27	44	54	23	15	33	12	7
1989- 1990	26	40	52	25	24	30	-	-
1988- 1989	25	35	48	23	24	26	-	-
1987- 1988	23	34	41	22	23	26	-	-
1986- 1987	22	32	38	22	21	25	-	-

Table 2.30 Total Number of Schools in Secondary Education in the Provinces of GAP, (SIS, 2005)
Among the provinces included in GAP, the highest number of secondary education schools is in Gaziantep (38 in 1986/87 and 98 in 2004/05), with a average percentage of 23 (Table 2.30). Although Gaziantep has not got the highest population after 90's, by the effect of its developed economic and industrial structure the province has become the leader inside the Region considering educational development. The number of schools of secondary education in Şanlıurfa is not sufficient relative of its population (25 in 1986/87 and 73 in 2004/05). It is the most densely populated area, but it is in the third place in the ranking of secondary education school number among the Region. The number of schools in other provinces of the Region has also increased between 1986 and 2005.

	General High Schools		Vocational and Technical	
Years	Turkey	GAP	Turkey	GAP
2004-2005	2,990	214	3,847	217
2003-2004	2,727	192	4,204	213
2002-2003	2,552	179	3,660	194
2001-2002	2,635	172	3,732	193
2000-2001	2,747	168	3,544	186
1999-2000	2,656	159	3,344	169
1998-1999	2,598	157	3,365	178
1997-1998	2,412	145	3,212	165
1996-1997	2,300	137	3,060	160
1995-1996	2,196	129	2,791	145
1994-1995	2,137	135	2,576	140
1993-1994	2,167	132	2,344	134
1992-1993	2,020	127	2,219	127
1991-1992	1,888	114	2,124	125
1990-1991	1,778	106	1,965	109
1989-1990	1,627	103	1,738	94
1988-1989	1,506	97	1,573	84
1987-1988	1,436	91	1,498	78
1986-1987	1,344	88	1,439	72

Table 2.31 Number of General High Schools and Vocational Schools in GAP, (SIS, 2005)

The vocational and technical high schools have great importance in raising intermediate technical human capital that the region needs, thus the development in vocational education systems has a direct influence on labor force.

The number of vocational schools increased from 72 in 1866/87 education year to 217 in 2004/05 education year. In the distribution of secondary schools according to their types, 52 % is general high schools, while 48 % is vocational and technical schools, and this rate is 57/43 % in overall Turkey. As observed from Table 2.31, there has been less development in vocational and technical schools in GAP when compared to Turkey.

	Turkey	GAP
2004-2005	2,721,519	209,705
2003-2004	3,251,026	231,669
2002-2003	3,023,602	201,422
2001-2002	2,579,747	171,475
2000-2001	2,362,653	154,865
1999-2000	2,316,350	137,492
1998-1999	2,280,676	137,611
1997-1998	2,129,969	125,249
1996-1997	2,138,298	119,976
1995-1996	2,162,865	118,738
1994-1995	2,050,565	115,478
1993-1994	1,887,534	104,987
1992-1993	1,743,471	94,729
1991-1992	1,582,347	84,870
1990-1991	1,426,632	74,890
1989-1990	1,329,010	67,978
1988-1989	1,250,173	63,444
1987-1988	1,196,519	56,692
1986-1987	1,137,745	49,485

Table 2.32 Total Number of Enrolment in Secondary Education in GAP and Turkey, (SIS, 2005)

The number of enrolments in secondary education is changed from 49,485 in 1986/87 to 209,705 in 2004/05. The rate of increase in enrolment is much above the Turkey. The proportion of numbers of vocational and

technical school enrolment of Region to Turkey increased from 4.45 % to 7.7 %. The general tendency of lack of enrolment transfer from primary education to secondary education in the Region has a gained a different perspective after 90's. The enrolment transfer ratio has become higher after realization of GAP.

Years	Adıyaman	Diyarbakır	Gaziantep	Mardin	Siirt	Şanlıurfa	Batman	Şırnak
2004- 2005	24,011	46,258	52,136	20,036	7,431	32,405	14,751	7,899
2003- 2004	28,920	51,175	60,151	22,236	8,672	35,832	16,029	8,654
2002- 2003	27,828	45,673	47,781	19,125	7,128	32,991	14,938	5,958
2001- 2002	23,683	37,304	45,777	16,146	6,529	25,086	12,456	4,494
2000- 2001	21,655	34,818	39,906	14,202	5,958	22,484	11,333	4,509
1999- 2000	20,368	30,617	35,994	11,907	4,990	20,085	9,936	3,595
1998- 1999	21,187	30,514	35,015	12,574	6,029	20,367	8,555	3,370
1997- 1998	17,347	26,984	32,223	10,954	5,946	19,820	9,271	2,704
1996- 1997	17,132	26,731	32,642	9,759	4,775	18,365	8,225	2,347
1995- 1996	17,219	24,968	33,621	9,247	4,966	18,770	7,842	2,105
1994- 1995	15,852	24,256	35,208	9,130	4,485	17,817	6,937	1,793
1993- 1994	14,441	23,906	31,340	7,953	4,040	15,424	6,342	1,541
1992- 1993	12,111	22,999	28,384	6,921	3,571	13,315	6,195	1,233
1991- 1992	10,107	20,980	26,062	6,580	3,182	11,158	5,681	1,120
1990- 1991	8,411	18,099	24,188	5,766	2,767	9,599	5,115	945
1989- 1990	7,550	16,874	22,525	5,819	6,794	8,416	-	-
1988- 1989	6,498	16,334	20,865	5,572	6,234	7,941	-	-
1987- 1988	5,498	15,203	19,230	5,571	3,900	7,290	-	-
1986- 1987	5,045	14,411	18,253	5,606	2,674	3,496	-	-

Table 2.33 Total Number of Enrolments in Secondary Education in the Provinces of GAP, (SIS, 2005)

As similar to school numbers, Gaziantep is at the first place in comparison of numbers of enrolment. Diyarbakır, Şanlıurfa, Adıyaman, Mardin, Batman, Şırnak and Siirt follow Gaziantep.

When the distribution of students between general high schools and vocational schools is considered, the student enrolment in general schools is higher, which is similar to Turkey. However, this number is higher in Southeaster Anatolia Region. The reason for the negative altitude for the vocational education is the educational policy of Turkey against transfer of enrolment from vocational secondary education to higher education system. Another reason for the low enrolment rate in vocational education is the employment opportunities. Most of the graduates from these schools remain unemployed. The institutional transfer policy dominantly affects the enrolment in vocational education in overall of Turkey. The situation is same, even worse in GAP (Figure 2.6). The percentage of number of students in vocational education is around 30 %, which is behind Turkey (40 %). In addition to the general effects discussed above, the low ratio of female enrolment to vocational education affects the enrolment rate in the Region.



Figure 2.6 Percentage of Vocational Education Enrolment in GAP

The gender issue in enrolment of secondary education system is another main issue to be discussed in order to obtain reliable approaches to social development in the Region.

The female enrolment transfer from primary education to secondary education is quite low. As it can be seen from Figure 2.7, there is no change in the female student percentage throughout the years in the Region despite of the several projects about female education was implemented in the content of GAP. It was expected by the planners that day-by-day these ratios would be higher both in primary education and secondary education. Only some small changes were seen in primary education, but no movements in secondary education system.



Figure 2.7 Percentages of Female Students in Secondary Education in GAP

The following figures the distribution of secondary education enrolment by sex and by type in 1986/87 and 2003/04 education years is presented.



Figure 2.8 Secondary Education Enrolment Distributions by Sex and Type in 2003/04



Figure 2.9 Secondary Education Enrolment Distributions by Sex and Type in 1986/87

The Figure 2.8 and 2.9 shows that the female involvement is increased in general high school between 1986 and 2004. On the contrary the female enrolment in vocational education has decreased by percentage.

Among the Region the Gaziantep, as in total student number, has got the most enrolment number in vocational education (Table 2.34). However, if the percentage of vocational education enrolment in total student numbers is calculated, Şırnak and Siirt have the highest ratios with 75% and 58% according to the 2004/05 data. In Gaziantep this ratio is only 30%. Some provinces like Diyarbakır and Batman the proportions of vocational education enrolment are very low, around 15 %.

In investigation of female enrolment in total enrolment in secondary education, Gaziantep and Adıyaman have 39 %, Diyarbakır 30 %, Batman 34 %, Mardin 30%, Siirt and Şanlıurfa 27%, and Şırnak 25 %.

Years	Adıyaman	Diyarbakır	Gaziantep	Mardin	Siirt	Şanlıurfa	Batman	Şırnak
2004- 2005	5,255	5,102	12,492	4,165	2,722	6,932	1,871	3,383
2003- 2004	5,036	5,928	12,913	4,278	2,246	6,914	1,932	3,076
2002- 2003	4,804	5,696	11,596	4,043	1,720	5,684	1,465	2,359
2001- 2002	4,623	4,370	10,701	3,772	1,644	4,795	1,450	846
2000- 2001	3,925	4,884	10,291	3,125	1,740	4,755	1,627	663
1999- 2000	5,281	5,187	10,707	3,223	1,811	5,869	2,010	544
1998- 1999	6,359	6,638	10,971	3,513	2,200	6,891	2,676	1,015
1997- 1998	6,152	6,254	10,450	3,286	2,284	7,245	2,451	915
1996- 1997	6,328	6,699	10,552	3,427	2,309	7,437	2,554	947
1995- 1996	6,111	6,712	9,925	3,400	2,508	8,219	2,481	896
1994- 1995	5,487	6,795	11,228	3,294	1,850	7,642	2,330	453
1993- 1994	4,860	6,885	9,984	2,864	1,678	6,219	2,306	380
1992- 1993	4,044	6,540	8,910	2,399	1,555	5,084	2,494	239
1991- 1992	3,497	5,751	8,342	1,917	1,389	4,075	2,402	160
1990- 1991	3,131	5,278	7,344	1,810	1,238	3,426	2,235	100
1989- 1990	2,832	4,586	6,710	1,710	2,818	2,895	-	-
1988- 1989	2,447	4,355	6,044	1,653	2,504	2,560	-	-
1987- 1988	2,118	4,024	5,691	1,551	0	2,595	-	-
1986- 1987	1,954	3,726	5,374	1,488	1,965	2,536	-	-

Table 2.34 Number of Enrolments in Vocational Education in the Provinces of GAP, (SIS, 2005)

Years	Adıyaman	Diyarbakır	Gaziantep	Mardin	Siirt	Şanlıurfa	Batman	Şırnak
2004- 2005	9,359	16,441	20,489	5,929	2,006	8,813	4,952	1,991
2003- 2004	10,723	17,424	21,441	5,834	1,870	8,802	4,615	1,607
2002- 2003	9,715	15,469	17,182	4,675	1,326	7,858	4,134	1,015
2001- 2002	8,410	12,915	16,260	3,827	1,311	6,367	3,446	946
2000- 2001	7,187	11,891	13,955	3,181	1,165	5,916	2,956	725
1999- 2000	6,911	9,829	12,559	2,966	966	5,369	2,685	562
1998- 1999	6,930	10,264	12,140	2,940	1,060	5,296	2,143	533
1997- 1998	5,553	9,037	11,286	2,693	991	4,698	2,126	447
1996- 1997	5,417	8,256	10,659	2,227	937	4,172	1,781	345
1995- 1996	5,273	7,633	10,764	2,011	943	4,032	1,519	316
1994- 1995	4,820	7,200	10,991	1,875	943	3,558	1,246	225
1993- 1994	4,226	6,992	10,331	1,729	793	3,107	1,102	179
1992- 1993	3,321	6,334	9,279	1,491	779	2,577	1,003	153
1991- 1992	2,659	5,972	8,261	1,373	761	2,282	911	150
1990- 1991	2,326	4,929	7,530	1,161	687	2,060	821	125
1989- 1990	2,076	4,529	6,970	1,138	1,319	1,857	-	-
1988- 1989			No	o informa	tion			
1987- 1988	1,375	4,432	6,153	1,038	793	1,699	-	-
1986- 1987	1,252	4,021	5,760	1,236	1,297	1,546	-	-

Table 2.35 Total Number of Female Enrolments in Secondary Education in the Provinces of GAP, (SIS, 2005)

The number of teachers in secondary education in the Region increased from 3.987 in 1986/87 to 9,525 in 2004/05. However between these years there are fluctuations in the numbers (increases and decreases). Especially during nineties decrease in obvious, similar to primary education, due to imbalance political structure.

When it is compared with Turkey, the percentage of the Region has changed from 4% to 5 % from 1986 to 2005.

	Turkey	GAP
2004-2005	167,614	9,525
2003-2004	147,776	7,935
2002-2003	137,956	7,365
2001-2002	144,884	7,044
2000-2001	140,969	6,590
1999-2000	143,379	6,627
1998-1999	145,903	6,714
1997-1998	140,619	5,648
1996-1997	142,048	6,200
1995-1996	140,094	6,104
1994-1995	128,572	5,618
1993-1994	130,664	5,939
1992-1993	124,947	6,382
1991-1992	120,064	5,679
1990-1991	112,775	4,659
1989-1990	109,994	4,634
1988-1989	103,088	4,386
1987-1988	101,762	4,156
1986-1987	96,840	3,987

Table 2.36 Total Number of Teachers in Secondary Education in GAP, (SIS, 2005)

The most important data in observation of the development in secondary education system is number of students per teacher. This data is a defining indicator about the quality of the system. In 1986/87 education year, this proportion in the Region is same with that of Turkey, 12 students per teacher. After 1986, this number was above the average of Turkey (Table 2.37). Only in Gaziantep (19) and Adıyaman (20) this ratio is close to the average of Turkey. In the other provinces, especially in Batman (27) and Şırnak (25), it is much higher then the average (Table 2.38).

	Turkey	GAP
2004-2005	16	22
2003-2004	22	29
2002-2003	22	27
2001-2002	18	24
2000-2001	17	24
1999-2000	16	21
1998-1999	16	20
1997-1998	15	22
1996-1997	15	19
1995-1996	15	19
1994-1995	16	21
1993-1994	14	18
1992-1993	14	15
1991-1992	13	15
1990-1991	13	16
1989-1990	12	15
1988-1989	12	14
1987-1988	12	14
1986-1987	12	12

Table 2.37 Number of Students per Teacher in Secondary Education in GAP, (SIS, 2005)

Years	Adıyaman	Diyarbakır	Gaziantep	Mardin	Siirt	Şanlıurfa	Batman	Şırnak
2004- 2005	19	23	20	26	21	23	27	25
2003- 2004	28	30	27	36	18	30	34	48
2002- 2003	29	28	22	33	29	30	32	33
2001- 2002	25	23	23	31	23	23	30	29
2000- 2001	25	23	24	24	20	20	28	27
1999- 2000	22	20	23	19	18	18	25	26
1998- 1999	21	20	22	19	22	17	21	33
1997- 1998	19	21	24	23	25	20	31	34
1996- 1997	17	21	23	18	16	17	22	18
1995- 1996	17	20	23	18	16	19	22	17
1994- 1995	18	20	24	21	18	19	21	19
1993- 1994	14	19	21	17	14	16	21	11
1992- 1993	12	16	20	13	10	13	15	7
1991- 1992	13	15	18	13	12	15	15	7
1990- 1991	14	15	18	15	14	18	21	12
1989- 1990	13	14	15	14	16	15	-	-
1988- 1989	13	15	15	13	15	14		
1987- 1988	12	15	15	13	10	12	-	-
1986- 1987	12	15	15	13	8	6	-	-

Table 2.38 Number of Students per Teacher in Secondary Education in the provinces of GAP, (SIS, 2005)

The distribution of teachers between general high schools and vocational and technical schools is presented in Table 2.39. For all years the ratio of teacher working in general high schools is 60%.

	General High Schools		Vocational and Techinical		
Years	Turkey	GAP	Turkey	GAP	
2004-2005	93,209	6,515	74,405	3,010	
2003-2004	79,545	5,292	68,231	2,643	
2002-2003	77,253	5,262	60,703	2,103	
2001-2002	72,621	4,348	72,263	2,696	
2000-2001	71,502	3,902	69,467	2,688	
1999-2000	70,137	3,682	73,242	2,945	
1998-1999	71,344	3,786	74,559	2,928	
1997-1998	68,853	3,045	71,766	2,603	
1996-1997	69,864	3,288	72,184	2,912	
1995-1996	69,395	3,299	70,699	2,805	
1994-1995	66,628	3,144	61,944	2,474	
1993-1994	69,245	3,237	61,419	2,702	
1992-1993	67,258	3,499	57,689	2,883	
1991-1992	65,603	3,225	54,461	2,454	
1990-1991	63,858	2,827	48,917	1,832	
1989-1990	62,634	2,894	47,360	1,740	
1988-1989	58,046	2,725	45,042	1,661	
1987-1988	56,649	2,525	45,113	1,631	
1986-1987	53,635	2,448	43,205	1,539	

Table 2.39 Number of Teachers in Secondary Education Schools by Type in GAP, (SIS, 2005)

The number of students per teacher in general high schools shows a similar trend with overall of secondary education. It was same with average of Turkey (13) in 1986/87 and increased much higher than the average of Turkey (Table 2.40). However the number of students per teacher in vocational and technical education is almost same with the average of Turkey (Table 2.41).

	Turkey	GAP
2004-2005	18	25
2003-2004	27	36
2002-2003	26	31
2001-2002	23	32
2000-2001	21	32
1999-2000	20	28
1998-1999	18	26
1997-1998	17	28
1996-1997	17	24
1995-1996	17	24
1994-1995	17	24
1993-1994	16	22
1992-1993	15	18
1991-1992	14	18
1990-1991	13	18
1989-1990	12	16
1988-1989	12	16
1987-1988	12	16
1986-1987	13	13

Table 2.40 Number of Students per Teacher in General High Schools in the GAP, (SIS, 2005)

	Turkey	GAP
2004-2005	14	15
2003-2004	16	16
2002-2003	16	18
2001-2002	13	12
2000-2001	13	12
1999-2000	13	12
1998-1999	13	14
1997-1998	13	15
1996-1997	14	14
1995-1996	14	14
1994-1995	14	16
1993-1994	13	13
1992-1993	13	11
1991-1992	13	11
1990-1991	13	13
1989-1990	12	12
1988-1989	12	12
1987-1988	12	16
1986-1987	13	13

Table 2.41 Number of Students per Teacher in Vocational Schools in the GAP, (SIS, 2005)

2.2.5 Higher Education

One of the targets of Southeastern Anatolia Project (GAP) is to improve the universities in the Region. In this section the present condition of universities and other higher education institutes covering all nine provinces is analyzed.

Currently there are three universities in the Region namely;

- Harran University, Şanlıurfa
- Dicle University, Diyarbakır
- Gaziantep University

The percentage of university graduates in total population is very low in the Region. In 1980 the rate of university graduates in 25 years old and over population was only 1.28 %, where the average of Turkey is 3.60 %. This rate was 1.84 % in 1985, 2.44 % in 1990 and reached to 4.52 % in 2000.

Among the provinces of GAP, Kilis has the highest rate in terms of population having high education degree in 2000, with 5.88%, which is close to the average of Turkey (7.8%). Gaziantep has the second highest rate of university graduates, 4.79% in 2000. Adiyaman showed the biggest growth in university graduate percentage between 1980 and 2000, 3.69%.

Although the percentage of university graduates doubled between 1990 and 2000, Şırnak has the lowest rate among the Region (Table 2.42).

	1980	1985	1990	2000
Adıyaman	1.05	1.99	2.40	4.74
Batman	-	-	2.31	4.12
Diyarbakır	2.00	2.57	3.36	5.23
Gaziantep	2.11	2.44	3.09	4.79
Mardin	1.21	1.91	2.31	3.80
Kilis	-	-	-	5.88
Siirt	1.31	1.91	2.33	4.52
Şanlıurfa	1.29	2.03	2.22	3.92
Şırnak	-	-	1.53	3.71
GAP	1.28	1.84	2.44	4.52
Turkey	3.60	3.92	5.08	7.80

Table 2.42 Rate of University Graduates in 25 years old and over population, %, (SIS, 2005)

2.2.6 Libraries and Readers

In an education system, expand in number of libraries and readers are defining factors of cultural development.

In 1970 there were only 20 libraries in the Region that is very low when its population is considered. Until 1985 there was no significant change

in the number of libraries, however after 1985 it increased constantly and reached to 80 in 2005 (Figure 2.10). The increase in higher education facilities (universities) affects the demand for more and larger libraries. Similar to growth of the number of libraries; the number of books and readers has increased. In 1985 the average number of readers in libraries is around 944,000, which is the 21% of the total population. The percentage of number of readers in total population rose to 26 % in 1990 and 34% in 2000. The rise in number of libraries, books and readers in the Region is important as development of cultural level mainly depend on increase of these educational facilities.



Figure 2.10 Change in number of Libraries in GAP

The number of boos per library in the Region has also increased from the level of 6500 book per library in 1970 to 8000 books in 2003. The major increased is seen between 1980 and 1985; afterwards only small fluctuations were observed (Figure 2.11).



Figure 2.11 Change in number of Books per Library in GAP



Figure 2.12 Change in number of readers in Libraries in GAP

The three provinces, Adıyaman, Gaziantep, and Diyarbakır have the highest number of libraries in the Region, 15 libraries in each of them in 2003. The major change in the provinces of GAP in terms of number of libraries was observed after nineties (Table 2.43).

Year	Adıyaman	Diyarbakır	Gaziantep	Mardin	Siirt	Şanlıurfa	Batman	Şırnak
1970	2	4	5	2	2	5	-	-
1971	2	4	5	2	2	5	-	-
1972	2	4	5	3	2	5	-	-
1973	2	4	5	3	2	5	-	-
1974	2	4	6	3	2	5	-	-
1975	2	4	7	3	2	5	-	-
1976	4	4	9	2	2	7	-	-
1977	2	4	6	3	2	7	-	-
1978	2	7	6	3	2	6	-	-
1979	3	10	8	4	3	7	-	-
1980	2	6	6	3	2	6	-	-
1981	2	5	5	3	2	6	-	-
1982	4	5	5	3	3	6	-	-
1983	4	4	5	4	3	6	-	-
1984	4	4	6	4	4	6	-	-
1985	4	7	7	4	4	6	-	-
1986	4	7	7	4	4	6	-	-
1987	4	7	9	4	5	6	-	-
1988	4	8	9	5	5	6	-	-
1989	4	8	9	5	5	7	-	-
1990	4	9	11	3	4	7	2	2
1991	4	9	12	4	4	7	2	2
1992	5	10	12	4	4	7	2	3
1993	6	10	11	4	4	7	2	3
1994	18	10	11	4	4	7	3	4
1995	11	12	10	5	4	7	3	4
1996	13	12	10	5	4	9	4	4
1997	13	12	12	6	4	10	4	4
1998	14	13	14	7	5	10	4	4
1999	14	14	15	9	5	11	4	4
2000	15	14	18	9	5	11	5	4
2001	15	14	15	8	5	11	5	4
2002	15	13	15	8	5	10	5	4
2003	15	15	15	8	5	11	5	4

Table 2.43 Number of Libraries in the Provinces of GAP, (SIS, 2005)

Year	Adıyaman	Diyarbakır	Gaziantep	Mardin	Siirt	Şanlıurfa	Batman	Şırnak
1970	61,205	42,824	121,632	117,847	48,224	104,865	-	-
1971	81,336	48,615	76,055	106,612	62,398	139,357	-	-
1972	81,783	39,762	96,451	80,643	69,112	156,492	-	-
1973	59,791	42,196	114,111	38,412	57,909	150,856	-	-
1974	69,351	51,888	213,966	35,117	56,858	148,749	-	-
1975	67,038	55,980	250,733	37,025	71,168	151,100	-	-
1976	44,789	63,246	292,729	40,175	74,321	86,937	-	-
1977	63,756	56,909	379,814	46,072	54,764	76,896	-	-
1978	84,721	27,706	599,057	49,523	51,915	75,537	-	-
1979	48,107	35,333	801,677	43,918	49,665	109,120	-	-
1980	58,869	43,233	649,632	29,847	38,774	87,558	-	-
1981	71,747	66,642	143,005	37,293	31,426	118,229	-	-
1982	97,390	88,315	139,332	65,486	53,674	120,100	-	-
1983	155,011	130,403	145,928	64,613	67,264	138,150	-	-
1984	177,816	165,494	217,864	56,278	102,586	225,592	-	-
1985	195,190	144,689	208,949	57,977	137,486	200,355	-	-
1986	164,973	180,458	242,174	66,642	161,102	187,150	-	-
1987	174,207	189,554	319,717	73,139	171,822	188,775	-	-
1988	239,062	179,711	418,348	76,910	210,300	199,460	-	-
1989	228,605	175,461	319,947	87,252	173,784	190,295	-	-
1990	248,223	193,409	412,911	63,125	134,475	226,399	56,915	10,774
1991	273,503	199,866	521,323	110,499	123,461	234,770	68,600	15,935
1992	308,534	178,382	514,239	129,795	136,163	273,924	35,627	16,641
1993	324,032	160,738	544,895	120,794	140,923	319,518	124,552	23,389
1994	373,222	172,283	655,839	169,685	116,810	337,610	57,272	21,182
1995	330,228	176,185	695,024	171,171	71,186	277,339	52,446	25,153
1996	322,783	162,931	818,341	167,849	127,235	342,939	64,060	24,109
1997	458,384	187,800	762,951	179,097	129,199	325,690	75,489	52,441
1998	485,350	198,703	1,007,202	168,243	171,240	188,279	73,439	40,056
1999	534,939	221,854	972,989	222,212	196,741	139,616	78,439	42,901
2000	479,529	231,080	586,145	316,569	203,598	190,348	81,605	31,686
2001	439,166	275,344	647,988	247,360	198,973	232,842	113,417	18,364
2002	458,496	326,668	763,271	147,644	169,792	231,782	119,993	30,886
2003	410,812	265,431	677,438	300,530	168,665	312,733	78,259	56,141

Table 2.44 Number of Readers in the Provinces of GAP, (SIS, 2005)

2.3 Health

When the level of health services in Turkey is compared with developed countries, it is seen that Turkish socialized heath service system is lower. There are several factors affecting this, like lack of health facilities, personnel, and insufficient capacity of security systems.

In Southeastern Anatolia, beside the general reasons, the tendency of people to traditional health sources and unconsciousness about medicine usage that is resulted from low education level, make the health system weaker.

The level of health services is directly proportional to the level of social and economic development of a region. The increase in the number of health personnel means development as the tendency of such personnel in choosing a work place is usually towards to developed settlement centers. Infant mortality and child mortality rates are related to development of heath services, educational and cultural as well as other socio-economic factors. As a result the assessment of these parameters will help to conclude the development level of heath services of the Region.

The data analyzed in this study is obtained from State Institute of statistics and Ministry of Health of Turkey. The health data discussed in this chapter includes the number of doctors, hospitals, dentists, pharmacies, and infant mortality and child mortality rates.

2.3.1 General Situation

According to the study of socio-economic development of provinces in Turkey conducted by State planning organization in 1996, the South-eastern Anatolia Region was the less developed in health sector among all the regions in Turkey. As stressed in the study, the ranking of the Region for some selected parameters for defining the development level of the health sector are as follows:

• The number of doctors per 10000 people is 4.51 - ranked in the last place. The average in Turkey is 10.87.

- The number of dentists per 10000 people is 0.55 ranked in the lat place. The average in Turkey is 1.89.
- The number of pharmacies per 10000 people is 1.42- ranked in 6th place in front of Eastern Anatolia. The average of Turkey is 2.36.
- The number of beds in hospitals per 10000 people is 9.6 ranked in the last place. In Turkey, average is 21.9
- The infant mortality rate is 67 ‰, same with average of Turkey and ranked in fourth place after Marmara, Mediterranean, and Aegean Regions.

As clearly seen from the results of the study conducted in 1996, the region the most underdeveloped Region among the Turkey. Almost in all parameters in health sector, the Region is far behind the average of Turkey.

As the data used in that study belongs to 1990, this underdeveloped situation was before the GAP. For understanding the effects of GAP, one should have to analyze the data after 1990.

In 2003, State Planning Organization again conducted a similar survey for identifying the changes in the provinces of Turkey after the study of 1996, called Provincial Socio-Economic Ranking Study 2003. The results of that study covering the same health parameters are summarized as follows:

- The overall ranking of the Region in health sector is sixth place in front of Eastern Anatolia Region.
- The infant mortality rate is 48 ‰, in the sixth place (43 ‰ in Turkey)
- The number of doctors per 10000 people is 5.49, again in the last place (12.70 in Turkey)
- The number of dentists per 10000 people is 0.52, ranked as the last one (2.22 in Turkey)

- The number of pharmacies per 10000 people is 1.85, ranked as sixth (2.94 in Turkey)
- The number of beds in hospitals per 10000 people is 13.26; in the last place (23.04 in Turkey)

As the study prepared in 2003 with the data of 2000 indicates, the Region was again behind the average of Turkey in health parameters. Only small changes were observed.

This thesis assesses the situation with detailed data on same parameters between 1970 and 2005 (where possible). The date period is extended before 1990 and after 2000 in order to achieve more reliable results in development of health in the Region.

2.3.2 Hospitals

The main component of health system is the hospitals. The development of hospitals is very curial in development of health systems as they are the main health facilities that serve directly to the public in complicated health problems.

The number of hospital in the Region was 48 in 1970, and rose to 55 in 1980. Between 1981 and 1982, this number decreased by amount of 17 hospitals. After 1982, it has gained an increase trend again, and reached to 67 hospitals in 2004 (Table 2.45).

In 1980 the 6.7 % of total hospitals in Turkey were in the Region. If it is compared with population percentage of the Region, which is 7.97 in 1980, it is seen that the percentage of hospitals was below the percentage of hospitals. This is an evidence of relatively underdeveloped health system of the Region among Turkey. When this comparison is made after GAP Project, the situation is even worse. In 1985, the population percentage was 8.58 while the hospital percentage was 5.8, in 1990 population percentage was 9.13 with hospital percentage of 6.2, and in 2000 the difference between

population and hospital shares of the Region in Turkey was 3.8 (9.73 % to 5.9 %).

			GAP/
	Turkey	GAP	Turkey
1970	743	48	6.5
1971	758	49	6.5
1972	778	46	5.9
1973	790	48	6.1
1974	796	54	6.8
1975	798	54	6.8
1976	790	54	6.8
1977	772	52	6.7
1978	776	55	7.1
1979	822	56	6.8
1980	827	55	6.7
1981	831	54	6.5
1982	648	37	5.7
1983	646	38	5.9
1984	686	39	5.7
1985	736	43	5.8
1986	736	44	6.0
1987	756	47	6.2
1988	777	47	6.0
1989	812	48	5.9
1990	857	53	6.2
1991	899	56	6.2
1992	928	57	6.1
1993	962	58	6.0
1994	982	60	6.1
1995	1009	63	6.2
1996	1034	66	6.4
1997	1078	69	6.4
1998	1138	73	6.4
1999	1171	73	6.2
2000	1184	70	5.9
2001	1198	75	6.3
2002	1114	63	5.7
2003	1130	64	5.7
2004	1133	67	5.9

Table 2.45 Number of Hospitals in GAP, (SIS, 2005)

	Adıyaman	Batman	Diyarbakır	Gaziantep	Mardin	Kilis	Siiirt	Şanlıurfa	Şırnak
1970	5		12	12	5		6	8	
1971	5		13	12	5		6	8	
1972	5		11	11	5		6	8	
1973	4		13	12	5		6	8	
1974	4		17	12	5		6	10	
1975	4		17	12	5		7	9	
1976	4		15	14	5		7	9	
1977	4		16	12	5		7	8	
1978	5		16	13	5		7	9	
1979	5		16	13	5		7	10	
1980	5		15	13	5		7	10	
1981	4		16	13	5		7	9	
1982	2		10	11	5		4	5	
1983	2		10	11	5		4	6	
1984	3		10	9	5		4	8	
1985	4		10	10	5		6	8	
1986	4		11	10	5		6	8	
1987	4		13	11	5		6	8	
1988	4		12	11	5		6	9	
1989	4		12	10	5		7	10	
1990	4	3	14	10	5		3	10	4
1991	5	3	15	11	5		3	10	4
1992	5	3	15	11	5		3	11	4
1993	5	3	15	11	5		3	11	5
1994	5	3	15	12	5		3	12	5
1995	8	3	15	11	5	1	3	12	5
1996	8	3	15	12	5	1	3	13	6
1997	8	4	16	12	5	1	3	14	6
1998	9	4	17	13	5	1	4	14	6
1999	9	4	17	13	5	1	4	14	6
2000	10	4	17	9	5	1	4	14	6
2001	10	5	17	12	5	1	4	15	6
2002	7	5	11	12	5	1	5	13	4
2003	7	5	11	12	5	1	5	13	5
2004	7	5	11	12	6	1	6	14	5

Table 2.46 Number of Hospitals in provinces of GAP, (SIS, 2005)

When the number of hospitals is compared between the provinces of GAP, the order is same with population distribution (please refer to population section); the most of the hospitals are in Şanlıurfa (14 in 2004), then in Gaziantep (12) and Diyarbakır (11), follwed by Adıyaman (7), Mardin (6), Siirt (6), Şırnak (5), Batman (5) and Kilis (1).

In Gaziantep the number of hospitals has not changed between 1970 and 2004. So, it is not correct to relate the developed health system in Gaziantep to GAP Project. In terms of number of hospitals, the other provinces showed a positive change after GAP (Table 2.46).



Figure 2.13 Numbers of People per Hospitals in GAP and Turkey

The assessment of number of people per hospital is more meaningful than assessment of number of hospitals in the discussion of development of health system. Until 1982 the number of people per hospital was close to the average of Turkey, around 60,000 people (Figure 2.13). However, the gap between GAP and Turkey has increased by 20,000 people per hospital after 1981. The fast growth in population in the Region is the major reason for this increase. However, as a social development of GAP, this brings negative impacts to the Region.

As similar to the whole Region, the number of people per hospital has increased in every province in GAP. Only in Siirt this ratio is below the average of Turkey (Table 2.47).

"	diyaman	satman	Jiyarbakır	àaziantep	/ardin	(ilis	siiirt	anlıurfa	lırnak
1980	< 73 240	ш	□ 51 280	61 723	∠ 112.380	x	63 000	60 240	05
1981	94 000		49 925	63 815	115 340		65 143	69.678	
1982	194 050		82 860	78 155	118,680		117 800	132 560	
1983	200,300		85 950	80 991	122 140		121 725	116 750	
1984	137 833		89 160	102 578	125 700		125 775	92 550	
1985	106 725		92 480	95 670	129,360		86 650	97 825	
1986	110 325		86 845	98,890	99 780		38 450	102 613	
1987	114 250		75 846	92 927	102 400		38 933	107 463	
1007	119 225		94 917	92,927	105,400		30,333	100,400	
1000	100.550		04,017	30,004	103,000		04.014	100,033	
1989	122,550		87,550	109,230	107,840		34,214	94,280	
1990	126,917	113,688	77,790	100,284	110,846		80,928	98,966	64,885
1991	103,719	117,164	74,301	93,525	113,626		81,724	102,959	66,984
1992	105,918	120,694	76,012	95,909	116,437		82,493	97,307	69,119
1993	108,132	124,281	77,739	98,322	119,279		83,238	101,093	57,032
1994	110,359	127,922	79,481	92,366	122,151		83,955	96,212	58,798
1995	70,374	131,620	81,238	103,230	125,052	124,579	84,646	99,827	60,593
1996	71,790	135,387	83,018	96,926	127,998	123,014	85,319	95,562	52,020
1997	73,217	104,412	79,515	99,252	130,979	121,320	85,968	91,972	53,572
1998	66,353	107,318	76,433	93,783	133,981	119,485	64,938	95,265	55,145
1999	67,622	110,251	78,029	95,957	136,993	117,498	65,369	98,605	56,733
2000	61,996	113,203	79,623	141,752	140,009	115,356	65,767	101,989	58,335
2001	63,119	92,928	81,203	108,665	143,008	113,045	66,123	98,375	59,943
2002	91,762	95,305	127,930	111,015	146,004	110,578	53,155	117,223	92,339
2003	93,344	97,694	130,355	113,366	148,998	107,960	53,384	120,977	75,824
2004	94,918	100,097	132,777	115,721	126,661	105,194	44,657	115,860	77,791

Table 2.47 Number of People per Hospital in provinces of GAP, (SIS, 2005)

Another important data about health facilities is the number of beds in hospitals. By the increase of hospitals, the number of hospital beds has also increased in GAP from 3325 in 1970 to 8595 in 2004 (Table 2.48). The percentage of hospital beds in Turkey has also increased from 4.7 in 1970 to 5.0 in 2004. The major change in this ratio was seen between 1990 and 2000, by 0.7%. After 2000, it decreased by 0.5 %.

	Turkey	GAP	GAP/Turkey
1970	71486	3325	4.7
1971	74556	3294	4.4
1972	77312	3482	4.5
1973	81075	3411	4.2
1974	83458	3786	4.5
1975	81264	3876	4.8
1976	82945	3851	4.6
1977	83027	3795	4.6
1978	86526	5019	5.8
1979	96752	4426	4.6
1980	99117	4398	4.4
1981	97765	4437	4.5
1982	96138	4152	4.3
1983	99396	4786	4.8
1984	100496	4881	4.9
1985	103918	5026	4.8
1986	107152	5146	4.8
1987	111135	5612	5.0
1988	113010	5658	5.0
1989	116016	5668	4.9
1990	120738	5938	4.9
1991	123706	6308	5.1
1992	126611	6383	5.0
1993	131874	6423	4.9
1994	134665	6935	5.1
1995	136072	7445	5.5
1996	139919	7830	5.6
1997	144984	8058	5.6
1998	148987	8398	5.6
1999	153465	8378	5.5
2000	156549	8763	5.6
2001	159290	8488	5.3
2002	162235	8583	5.3
2003	164897	8638	5.2
2004	171888	8595	5.0

Table 2.48 Number of Beds in Hospitals GAP and Turkey, (SIS, 2005)

In the provinces of GAP, number of beds in hospitals has also risen. Although Şanlıurfa has more hospitals than all of the provinces in GAP, it bed number is not the highest one. On the contrary to hospital number, Gaziantep and Diyarbakır has the highest bed numbers in the Region (Gaziantep 2199 beds, Diyarbakır 2799 beds in 2004).

	Adıyaman	Batman	Diyarbakır	Gaziantep	Mardin	Kilis	Siiirt	Şanlıurfa	Şırnak
1970	190		1000	1210	270		310	345	
1971	190		1010	1169	270		310	345	
1972	190		1210	1157	270		310	345	
1973	160		1000	1201	270		310	470	
1974	160		1330	1201	270		310	515	
1975	160		1330	1256	270		320	540	
1976	160		1305	1256	270		320	540	
1977	160		1200	1205	270		320	640	
1978	180		1762	1747	270		320	740	
1979	235		1718	1331	270		320	552	
1980	235		1690	1331	270		320	552	
1981	235		1741	1331	270		320	540	
1982	225		1576	1281	270		290	510	
1983	225		2100	1281	270		290	620	
1984	275		2100	1316	270		290	630	
1985	310		2125	1381	270		310	630	
1986	325		2115	1406	300		355	645	
1987	325		2466	1406	400		355	660	
1988	325		2480	1428	400		355	670	
1989	325		2480	1303	400		455	705	
1990	325	175	2595	1328	400		255	705	155
1991	375	175	2680	1488	475		255	705	155
1992	375	175	2680	1488	475		255	780	155
1993	400	175	2680	1488	475		255	780	170
1994	550	180	2680	1770	475		255	855	170
1995	585	180	2855	1865	475	190	255	855	185
1996	585	180	2855	2120	475	190	255	955	215
1997	585	234	2870	2120	475	190	255	1114	215
1998	660	234	2880	2245	475	190	285	1214	215
1999	660	214	2880	2245	475	190	285	1214	215
2000	715	214	2880	2525	475	190	285	1264	215
2001	715	244	2680	2320	475	190	285	1364	215
2002	780	294	2655	2320	500	190	315	1344	185
2003	780	294	2680	2320	500	190	315	1344	215
2004	780	330	2799	2199	406	164	300	1447	170

Table 2.49 Number of Beds in Hospitals in the provinces of GAP, (SIS, 2005)

The distribution of population per beds in hospital is more above the average of Turkey. In the Region the average number of people per hospital bed is around 800, where 500 in Turkey. Despite of high number of people in hospital beds, the decrease trend is observed after 1990 (Figure 2.14).



Figure 2.14 Numbers of People per Beds in Hospitals in GAP and Turkey

Diyarbakır, Kilis and Gaziantep are close to the average of Turkey in number of people per hospital bed. On the contrary Şırnak, Batman and Mardin are much above the average of Turkey (Table 2.50). The development in Adıyaman in this ratio is more than the rest of the provinces. The number of people per hospital bed in Adıyaman decreased from 2000 to 800 in 20 years.

	Adıyaman	Batman	Diyarbakır	Gaziantep	Mardin	Kilis	Siiirt	Şanlıurfa	Şırnak
1970	1585		574	496	1664		1022	1542	
1971	1627		584	531	1710		1059	1582	
1972	1671		499	554	1757		1096	1615	
1973	2038		618	552	1806		1135	1211	
1974	2093		475	571	1856		1175	1128	
1975	2149		486	564	1908		1179	1099	
1976	2185		511	579	1947		1218	1107	
1977	2211		576	619	1980		1256	936	
1978	1988		407	437	2013		1295	811	
1979	1540		432	588	2047		1336	1089	
1980	1558		455	603	2081		1378	1091	
1981	1600		459	623	2136		1425	1161	
1982	1725		526	671	2198		1625	1300	
1983	1780		409	695	2262		1679	1130	
1984	1504		425	702	2328		1735	1175	
1985	1377		435	693	2396		1677	1242	
1986	1358		452	703	1663		650	1273	
1987	1406		400	727	1280		658	1303	
1988	1456		410	740	1314		666	1344	
1989	1508		424	838	1348		526	1337	
1990	1562	1949	420	755	1386		952	1404	1674
1991	1383	2009	416	691	1196		961	1460	1729
1992	1412	2069	425	709	1226		971	1372	1784
1993	1352	2131	435	727	1256		979	1426	1677
1994	1003	2132	445	626	1286		988	1350	1729
1995	962	2194	427	609	1316	656	996	1401	1638
1996	982	2256	436	549	1347	647	1004	1301	1452
1997	1001	1785	443	562	1379	639	1011	1156	1495
1998	905	1835	451	543	1410	629	911	1099	1539
1999	922	2061	461	556	1442	618	917	1137	1583
2000	867	2116	470	505	1474	607	923	1130	1628
2001	883	1904	515	562	1505	595	928	1082	1673
2002	824	1621	530	574	1460	582	844	1134	1997
2003	838	1661	535	586	1490	568	847	1170	1763
2004	852	1517	522	631	1872	641	893	1121	2288

Table 2.50 Number of People per Bed in Hospitals in the provinces of GAP, (SIS, 2005)

2.3.3 Health Personnel

Doctors, nurses and other health employees are classified as qualified labor force. Their numerical increase is in the direction settlement areas that have better socio-economic conditions. So, change in number of health personnel is an indication of development in social life.

The number of doctors in GAP has increased from 422 in 1970 to 4230 in 2002. The percentage of GAP in Turkey in terms of number of doctors changed 1.4 % between 1970 and 2002 (Table 2.51). The change in number of nurses is also positive, from 439 in 1970 to 3145 in 2002. However, the percentage of nurses of GAP in Turkey did not change significantly only by 0.2% in 32 years. If the change in the percentages of number of doctors and nurses of the Region in Turkey after GAP project is considered, no major change is observed. Both percentages are increased and decreased time to time.

On the provincial bases, the major change is observed in Adıyaman. The number of doctors in Adıyaman increased 15 times between 1970 and 2002. But, for the period after GAP Project, Şanlıurfa showed the biggest change both in the numbers of doctors and nurses, increased by 150 % (Table 2.52 and 2.53).

	DOCTOR	S		NURSES			
			GAP /			GAP/	
	Turkey	GAP	Turkey	Turkey	GAP	Turkey	
1970	13 843	422	3.0	8 796	439	5.0	
1971	16 514	480	2.9	9 436	472	5.0	
1972	16 284	489	3.0	11 358	554	4.9	
1973	18 511	741	4.0	13 410	712	5.3	
1974	20 868	731	3.5	12 641	717	5.7	
1975	21 714	703	3.2	14 806	785	5.3	
1976	23 388	654	2.8	16 566	844	5.1	
1977	23 920	821	3.4	19 859	954	4.8	
1978	25 230	660	2.6	20 966	1014	4.8	
1979	26 298	528	2.0	23 797	1155	4.9	
1980	27 241	576	2.1	26 880	1280	4.8	
1981	28 411	610	2.1	29 459	1515	5.1	
1982	30 956	837	2.7	33 354	1755	5.3	
1983	32 263	1097	3.4	33 354	1794	5.4	
1984	34 195	731	2.1	30 261	1536	5.1	
1985	36 427	1185	3.3	30 854	1544	5.0	
1986	37 442	1310	3.5	32 452	1743	5.4	
1987	38 829	1449	3.7	34 855	1808	5.2	
1988	42 502	1487	3.5	38 903	2009	5.2	
1989	46 708	1963	4.2	43 374	2104	4.9	
1990	50 639	2397	4.7	44 984	2169	4.8	
1991	53 264	2224	4.2	47 540	2264	4.8	
1992	56 985	2247	3.9	50 456	2346	4.6	
1993	61 050	2279	3.7	54 268	2508	4.6	
1994	65 832	2605	4.0	56 280	2589	4.6	
1995	69 349	2751	4.0	64 243	3059	4.8	
1996	70 947	2652	3.7	64 526	3145	4.9	
1997	73 659	2962	4.0	67 265	4012	6.0	
1998	77 344	3039	3.9	69 246	4118	5.9	
1999	81 988	3608	4.4	70 270	4099	5.8	
2000	85 116	3630	4.3	71 600	4011	5.6	
2001	90 757	3853	4.2	75 879	3919	5.2	
2002	95 190	4230	4.4	79 059	4110	5.2	

Table 2.51 Number of Doctors and Nurses in GAP and Turkey, (SIS, 2005)

	Adıyaman	Batman	Diyarbakır	Gaziantep	Mardin	Kilis	Siiirt	Şanlıurfa	Şırnak
1970	21		193	91	41		33	43	
1971	21		236	107	37		34	45	
1972	19		248	109	35		34	44	
1973	15		470	124	41		46	45	
1974	21		440	134	45		42	49	
1975	27		338	193	48		36	61	
1976	27		301	193	45		31	57	
1977	38		407	220	49		40	67	
1978	43		252	181	67		46	71	
1979	37		162	136	77		48	68	
1980	34		170	159	68		66	79	
1981	37		171	170	81		67	84	
1982	52		226	205	110		92	152	
1983	66		456	244	98		90	143	
1984	77		153	171	114		88	128	
1985	81		350	359	126		90	179	
1986	109		440	390	123		88	160	
1987	111		498	367	146		109	218	
1988	110		526	362	145		114	230	
1989	124		788	473	170		150	258	
1990	142	82	1002	548	146		111	290	76
1991	175	87	787	575	165		87	277	71
1992	166	104	696	603	170		110	308	90
1993	217	82	654	684	158		97	330	57
1994	242	99	750	715	179		134	331	155
1995	244	122	872	673	209	57	111	395	68
1996	220	125	798	673	203	58	100	410	65
1997	256	141	855	730	239	85	97	481	78
1998	251	136	854	788	228	83	99	506	94
1999	289	180	972	913	292	105	129	595	133
2000	309	175	957	967	249	114	118	618	123
2001	324	171	1060	1022	252	124	120	672	108
2002	347	188	1133	1156	276	139	134	736	121

Table 2.52 Number of Doctors in the provinces of GAP, (SIS, 2005)

	Adıyaman	Batman	Diyarbakır	Gaziantep	Mardin	Kilis	Siiirt	Şanlıurfa	Şırnak
1970	23		185	123	37		24	47	
1971	22		214	132	31		29	44	
1972	32		233	140	43		47	59	
1973	38		275	163	76		75	85	
1974	47		216	166	89		72	127	
1975	45		274	185	96		53	132	
1976	54		253	220	110		71	136	
1977	70		275	264	125		82	138	
1978	89		288	285	136		76	140	
1979	103		321	309	162		99	161	
1980	96		399	313	159		131	182	
1981	102		499	298	194		175	247	
1982	104		666	385	224		151	225	
1983	142		643	377	234		171	227	
1984	150		446	356	208		189	187	
1985	134		532	363	164		163	188	
1986	148		651	427	208		120	189	
1987	254		563	403	182		120	286	
1988	208		764	455	200		126	256	
1989	216		793	450	237		163	245	
1990	234	86	821	422	210		87	260	49
1991	274	102	883	442	214		81	221	47
1992	275	101	949	451	203		99	226	42
1993	311	104	942	497	213		116	271	54
1994	322	106	952	522	216		113	291	67
1995	331	121	1109	569	276	63	134	379	77
1996	329	140	1037	600	287	91	148	420	93
1997	395	168	1281	739	368	105	202	600	154
1998	408	202	1270	787	390	98	193	607	163
1999	414	231	1298	826	367	84	176	560	143
2000	430	218	1335	667	345	109	165	609	133
2001	421	204	1255	808	317	85	158	551	120
2002	439	208	1265	1014	321	69	157	518	119

Table 2.53 Number of Nurses in the provinces of GAP, (SIS, 2005)

The comparison of number of doctors and nurses per 10,000 people gives more realistic about the development in health personnel. In the Region, no major change is observed in number of doctors per 10,000 people until 1985. In 1985 this ratio was approximately 3 doctors. Afterwards, it displayed an increase trend and reached to 6 doctors per 10,000 people. Despite a positive change in the ratio, it is always lower than the average of Turkey (4 in 1970, 7 in 1985, and 14 in 2002). The gap between the average ratios of Turkey and GAP has also increased after 1985 (Figure 2.15). So, it is not true to relate the growth in GAP in these variables to the impacts of GAP. The major factor is the overall development of Turkish health system.



Figure 2.15 Number of Doctors per 10,000 People in GAP and Turkey

The change in number of nurses per 10,000 people in the Region is more than the doctors, and it is closer to the average of Turkey. In 1970, only two nurses were available to 10,000 people in the Region. It rose to 4 nurses in 1985 and 6 nurses in 2002. But similar to doctors, gap between average number of nurses per 10,000 people in Turkey and GAP has increased.


Figure 2.16 Number of Nurses per 10,000 People in GAP and Turkey

The number of doctors per 10,000 people in Kilis is the highest one, which is almost same with the average of Turkey. The development in this ratio in Kilis also very important from 5 doctors in 1995 to 13 doctors in 2002. Şırnak has the lowest ratio in GAP with three doctors in 2002. The growth in other provinces between 1985 and 2002 is as follows; 3 doctors in Adıyaman, one doctor in Batman, 4 doctors in Diyarbakır, 5 doctors in Gaziantep, two doctors in Mardin, 3 doctors in Siirt, and 3 doctors in Şanlıurfa (Table 2.54). However, these increases in number of doctors per 10,000 people cannot be identified as an achievement when the population growth in GAP is considered.

On the nurses' part, Diyarbakır has the highest number of nurses per 10,000 people with 9 nurses. Despite of high hospital and doctor number, the ratio in nurses is quite low in Şanlıurfa, 3.48 nurses in 2002. Şırnak has the lowest nurse ratio in the Region with 3.22 nurses (Table 2.55). Similar to the ratio of doctors, the major development in nurse ratio was observed in Adıyaman, increased almost eight times from 1970 to 2002. When the changes in nurse ratios after GAP Project is considered, Adıyaman is again showed the biggest development among the Region.

	Adıyaman	Batman	Diyarbakır	Gaziantep	Mardin	Kilis	Siiirt	Şanlıurfa	Şırnak
1970	0.70		3.36	1.52	0.91		1.04	0.81	
1971	0.68		4.00	1.72	0.80		1.04	0.82	
1972	0.60		4.11	1.70	0.74		1.00	0.79	
1973	0.46		7.61	1.87	0.84		1.31	0.79	
1974	0.63		6.96	1.96	0.90		1.15	0.84	
1975	0.79		5.23	2.72	0.93		0.95	1.03	
1976	0.77		4.51	2.65	0.86		0.80	0.95	
1977	1.07		5.89	2.95	0.92		1.00	1.12	
1978	1.20		3.52	2.37	1.23		1.11	1.18	
1979	1.02		2.18	1.74	1.39		1.12	1.13	
1980	0.93		2.21	1.98	1.21		1.50	1.31	
1981	0.98		2.14	2.05	1.40		1.47	1.34	
1982	1.34		2.73	2.38	1.85		1.95	2.29	
1983	1.65		5.31	2.74	1.60		1.85	2.04	
1984	1.86		1.72	1.85	1.81		1.75	1.73	
1985	1.90		3.78	3.75	1.95		1.73	2.29	
1986	2.47		4.61	3.94	2.47		3.81	1.95	
1987	2.43		5.05	3.59	2.85		4.67	2.54	
1988	2.32		5.17	3.43	2.76		4.82	2.55	
1989	2.53		7.50	4.33	3.15		6.26	2.74	
1990	2.80	2.40	9.20	5.46	2.63		4.57	2.93	2.93
1991	3.37	2.48	7.06	5.59	2.90		3.55	2.69	2.65
1992	3.13	2.87	6.10	5.72	2.92		4.44	2.88	3.26
1993	4.01	2.20	5.61	6.32	2.65		3.88	2.97	2.00
1994	4.39	2.58	6.29	6.45	2.93		5.32	2.87	5.27
1995	4.33	3.09	7.16	5.93	3.34	4.58	4.37	3.30	2.24
1996	3.83	3.08	6.41	5.79	3.17	4.71	3.91	3.30	2.08
1997	4.37	3.38	6.72	6.13	3.65	7.01	3.76	3.74	2.43
1998	4.20	3.17	6.57	6.46	3.40	6.95	3.81	3.79	2.84
1999	4.75	4.08	7.33	7.32	4.26	8.94	4.93	4.31	3.91
2000	4.98	3.86	7.07	7.58	3.56	9.88	4.49	4.33	3.51
2001	5.13	3.68	7.68	7.84	3.52	10.97	4.54	4.55	3.00
2002	5.40	3.95	8.05	8.68	3.78	12.57	5.04	4.83	3.28

Table 2.54 Number of Doctors per 10,000 people in the provinces of GAP, (SIS, 2005)

	Adıyaman	Batman	Diyarbakır	Gaziantep	Mardin	Kilis	Siiirt	Şanlıurfa	Şırnak
1970	0.76		3.22	2.05	0.82		0.76	0.88	
1971	0.71		3.63	2.13	0.67		0.88	0.81	
1972	1.01		3.86	2.18	0.91		1.38	1.06	
1973	1.17		4.45	2.46	1.56		2.13	1.49	
1974	1.40		3.42	2.42	1.78		1.98	2.19	
1975	1.31		4.24	2.61	1.86		1.40	2.22	
1976	1.54		3.79	3.02	2.09		1.82	2.27	
1977	1.98		3.98	3.54	2.34		2.04	2.30	
1978	2.49		4.02	3.73	2.50		1.83	2.33	
1979	2.85		4.32	3.95	2.93		2.32	2.68	
1980	2.62		5.19	3.90	2.83		2.97	3.02	
1981	2.71		6.25	3.59	3.36		3.84	3.94	
1982	2.68		8.04	4.48	3.77		3.20	3.39	
1983	3.54		7.48	4.23	3.83		3.51	3.24	
1984	3.63		5.00	3.86	3.31		3.76	2.53	
1985	3.14		5.75	3.79	2.54		3.14	2.40	
1986	3.35		6.81	4.32	4.17		5.20	2.30	
1987	5.56		5.71	3.94	3.55		5.14	3.33	
1988	4.39		7.51	4.31	3.81		5.33	2.84	
1989	4.41		7.55	4.12	4.40		6.81	2.60	
1990	4.61	2.52	7.54	4.21	3.79		3.58	2.63	1.89
1000	5.28	2.90	7.92	4.30	3.77		3.30	2.15	1.75
1992	5.19	2.79	8.32	4.27	3.49		4.00	2.11	1.52
1002	5.75	2.79	8.08	4.60	3.57		4.65	2.44	1.89
1994	5.84	2.76	7.99	4.71	3.54		4.49	2.52	2.28
1995	5.88	3.06	9.10	5.01	4.41	5.06	5.28	3.16	2.54
1996	5.73	3.45	8.33	5.16	4.48	7.40	5.78	3.38	2.98
1997	6.74	4.02	10.07	6.20	5.62	8.65	7.83	4.66	4.79
1998	6.83	4.71	9.77	6.46	5.82	8.20	7.43	4.55	4.93
1999	6.80	5.24	9.79	6.62	5.36	7.15	6.73	4.06	4.20
2000	6.94	4.81	9.86	5.23	4.93	9.45	6.27	4.27	3.80
2001	6.67	4.39	9.09	6.20	4.43	7.52	5.97	3.73	3.34
2002	6.83	4.36	8.99	7.61	4.40	6.24	5.91	3.40	3.22

Table 2.55 Number of Nurses per 10,000 people in the provinces of GAP, (SIS, 2005)

The two other important employees in health sector are dentists and midwives. The society in Turkey rarely visit dentist unless there is a major problem. In relatively less developed parts of Turkey, like GAP, the development of dental services is below the average of Turkey. Dental services are even weaker in rural areas, as it is not a habitual event for the local people in rural settlement areas to see dentists. So, the increase in number of dentists is an indication in development of urbanization.

The number of dentists has increased from 75 in 1970 to 481 in 2002. For the period after the GAP Project, rise in number of dentists is 274, which is more than 100 %. But, the ratio of dentists of the Region in Turkey is almost not changed until 1970, only increased and decreased from time to time. According to the data of 2000, this ratio is 2.8 %, which is 0.4 more than the percentage in 1985 (Table 2.56).

The change in number of midwives is quite important, as the midwives are the only representatives of health services in rural areas (especially in villages). In the areas where the urbanization is low, midwifes usually act as nurses, so their existence is vital for rural places. In 1970 the number of midwives is 766 in the Region, which was more than the doctors, nurses and dentists. This situation continued until 1985. After 1985 the number of doctors and nurses has become more than the number of midwives. So, the development in numerical size of midwives is not as high as the doctors and nurses, but higher than the dentists.

As the number of dentists is directly proportional to urbanization, Gaziantep has the highest number of the dentists among the provinces of GAP, 158 in 2002 that is 32 % of the Region (Table 2.57). The share of Diyarbakır is in the second place with 26 %, and followed by Şanlıurfa (14 %), Mardin (8 %), Batman (6 %), Adıyaman (5%), Siirt (4 %), Şırnak (3 %) and Kilis (2%).

	DENTIST		MIDWIFE	
	Turkey	GAP	Turkey	GAP
1970	3 245	75	11 321	766
1971	3 517	78	12 176	857
1972	3 789	83	13 056	877
1973	4 279	97	13 567	909
1974	4 269	99	12 228	1026
1975	5 046	118	12 975	979
1976	5 379	128	13 873	963
1977	5 954	142	16 785	1009
1978	6 826	153	16 219	1033
1979	7 021	163	15 904	978
1980	7 077	157	15 872	885
1981	6 790	150	13 890	712
1982	6 802	180	13 454	644
1983	7 763	52	14 570	699
1984	8 133	41	15 506	804
1985	8 305	207	17 987	952
1986	8 410	213	19 127	1317
1987	8 589	324	21 982	1660
1988	9 639	310	25 665	1718
1989	10 132	270	27 805	1785
1990	10 514	294	30 415	1885
1991	10 623	248	33 724	2109
1992	10 703	247	35 096	2305
1993	11 069	284	36 263	2172
1994	11 457	317	35 604	1780
1995	11 717	292	39 551	2118
1996	12 406	350	38 945	2016
1997	12 737	401	40 230	2083
1998	13 421	423	41 059	2221
1999	14 226	450	41 271	2464
2000	16 002	420	41 590	2428
2001	15 866	378	41 158	2322
2002	17 108	481	41 513	2307

Table 2.56 Number of Dentists and Midwives in GAP and Turkey, (SIS, 2005)

	Adıyaman	Batman	Diyarbakır	Gaziantep	Mardin	Kilis	Siiirt	Şanlıurfa	Şırnak
1970	1		32	25	7		2	8	
1971	1		34	26	7		2	8	
1972	1		35	27	7		4	9	
1973	1		42	30	7		6	11	
1974	2		36	27	10		11	13	
1975	5		36	44	9		9	15	
1976	5		36	46	12		9	20	
1977	6		41	47	13		11	24	
1978	6		47	49	11		11	29	
1979	8		43	55	13		14	30	
1980	7		45	52	11		14	28	
1981	7		45	50	8		15	25	
1982	7		79	45	6		21	22	
1983	8		13	11	6		4	10	
1984	4		8	10	3		4	12	
1985	18		33	101	14		13	28	
1986	14		34	112	8		15	30	
1987	18		102	131	18		18	37	
1988	17		84	140	18		20	31	
1989	17		84	98	8		29	34	
1990	17	13	92	109	15		11	36	1
1991	15	13	51	109	15		10	34	1
1001	16	16	54	108	9		9	34	1
1993	23	10	68	120	11		10	40	2
1994	20	19	44	143	18		15	41	17
1995	19	16	84	102	15	5	8	41	2
1996	16	15	133	116	8	4	7	46	5
1007	21	17	137	148	10	6	9	48	5
1008	27	20	140	150	12	8	10	49	7
1000	18	21	164	151	23	5	10	52	6
2000	22	28	106	146	34	9	9	51	15
2000	20	27	44	154	34	7	13	67	12
2007	25	27	128	158	40	9	18	65	11

Table 2.57 Number of Dentists in the provinces of GAP, (SIS, 2005)

	Adıyaman	Batman	Diyarbakır	Gaziantep	Mardin	Kilis	Siiirt	Şanlıurfa	Şırnak
1970	100		210	115	121		73	147	
1971	108		217	132	140		90	170	
1972	110		214	144	139		88	182	
1973	112		219	162	139		87	190	
1974	117		252	147	184		124	202	
1975	115		233	148	166		123	194	
1976	107		230	162	163		109	192	
1977	120		230	192	166		113	188	
1978	134		229	203	162		106	199	
1979	124		217	201	153		99	184	
1980	116		198	201	128		97	145	
1981	100		149	179	88		74	122	
1982	88		146	156	80		62	112	
1983	99		138	166	95		77	124	
1984	100		159	176	128		106	135	
1985	158		147	163	136		157	191	
1986	163		270	294	201		177	212	
1987	208		329	378	243		204	298	
1988	224		426	387	200		208	273	
1989	239		438	347	249		196	316	
1990	270	106	463	359	218		112	297	60
1991	318	135	546	378	243		126	273	90
1992	301	192	517	432	255		165	337	106
1993	350	168	491	440	235		135	264	89
1994	278	113	469	376	173		84	229	58
1995	311	134	526	405	191	64	116	288	83
1996	283	125	523	414	174	70	91	266	70
1997	280	141	528	419	183	88	86	277	81
1998	295	158	550	431	194	100	108	284	101
1999	321	166	598	499	231	87	127	330	105
2000	314	151	598	425	267	81	115	387	90
2001	298	152	589	449	231	64	99	361	79
2002	310	141	592	464	214	64	98	353	71

Table 2.58 Number of Midwives in the provinces of GAP, (SIS, 2005)

The distribution of number of midwifes to the provinces of GAP is shown in Table 2.58. According to the data of 2002, Diyarbakır has the highest number of midwifes in the Region. Different to the number of other health personnel, Gaziantep is not the leader in midwives as the urbanization ratio in Gaziantep is higher than the other provinces. The distribution of midwives to the provices is as follows: Diyarbakır 26 %, Gaziantep 20 %, Şanlıurfa 15 %, Adıyaman 13 %, Mardin 9 %, Batman 6 %, Siirt 4 %, Şırnak 4 %, and Kilis 3.

The number of dentists per 10,000 people in the Region is very low (Figure 2.17). Only a small increase is observed, but never reached to one dentist to 10,000 people. On the contrary, the low value of Turkey (one dentist in 1970) has almost tripled between 1970 and 2002.



Figure 2.17 Number of Dentists per 10,000 People in GAP and Turkey

On the midwife side, no constant trend is seen, changing time to time. However, the total change between 1970 and 2000 is very small. For the period after the GAP Project, the number of midwives per 10,000 has increased from two to three between 1984 and 1986 and remained almost constant afterwards (Figure 2.18).



Figure 2.18 Number of Midwives per 10,000 People in GAP and Turkey

Only in Gaziantep, the number of dentists per 10,000 is one. Again, it is important to stress that this relatively high ratio has no direct relation with GAP Project and change after 1985 is negligible. For the other provinces, this ratio is very small compared to the average of Turkey, 0.91 in Diyarbakır, 0.81 in Kilis, 0.68 in Siirt, 0.57 in Batman, 0.55 in Mardin, 0.43 in Şanlıurfa, 0.39 in Adıyaman and 0.30 in Şırnak (Table 2.59). Despite of high population in Şanlıurfa, its dentist ratio is not developed since the urbanization ratio is small in the province.

The midwife ratio (number of midwives per 10,000 people) is close to average of Turkey in Kilis and Adıyaman provinces. Between 1997 and 1999 it was higher than average of Turkey in Kilis, 8 midwifes per 10,000 people. The lowest ratio is observed in Şırnak with one midwife. The average values for the other provinces are: 5 in Adıyaman, 4 in Batman, Diyarbakır and Gaziantep, 3 in Şırnak and Şanlıurfa (Table 2.60).

	Adıyaman	Batman	Diyarbakır	Gaziantep	Mardin	Kilis	Siiirt	Şanlıurfa	Şırnak
1970	0.03		0.56	0.42	0.16		0.06	0.15	
1971	0.03		0.58	0.42	0.15		0.06	0.15	
1972	0.03		0.58	0.42	0.15		0.12	0.16	
1973	0.03		0.68	0.45	0.14		0.17	0.19	
1974	0.06		0.57	0.39	0.20		0.30	0.22	
1975	0.15		0.56	0.62	0.17		0.24	0.25	
1976	0.14		0.54	0.63	0.23		0.23	0.33	
1977	0.17		0.59	0.63	0.24		0.27	0.40	
1978	0.17		0.66	0.64	0.20		0.27	0.48	
1979	0.22		0.58	0.70	0.24		0.33	0.50	
1980	0.19		0.59	0.65	0.20		0.32	0.46	
1981	0.19		0.56	0.60	0.14		0.33	0.40	
1982	0.18		0.95	0.52	0.10		0.45	0.33	
1983	0.20		0.15	0.12	0.10		0.08	0.14	
1984	0.10		0.09	0.11	0.05		0.08	0.16	
1985	0.42		0.36	1.06	0.22		0.25	0.36	
1986	0.32		0.36	1.13	0.16		0.65	0.37	
1987	0.39		1.03	1.28	0.35		0.77	0.43	
1988	0.36		0.83	1.32	0.34		0.85	0.34	
1989	0.35		0.80	0.90	0.15		1.21	0.36	
1990	0.33	0.38	0.84	1.09	0.27		0.45	0.36	0.04
1991	0.29	0.37	0.46	1.06	0.26		0.41	0.33	0.04
1992	0.30	0.44	0.47	1.02	0.15		0.36	0.32	0.04
1993	0.43	0.27	0.58	1.11	0.18		0.40	0.36	0.07
1994	0.36	0.50	0.37	1.29	0.29		0.60	0.36	0.58
1995	0.34	0.41	0.69	0.90	0.24	0.40	0.32	0.34	0.07
1996	0.28	0.37	1.07	1.00	0.13	0.33	0.27	0.37	0.16
1997	0.36	0.41	1.08	1.24	0.15	0.49	0.35	0.37	0.16
1998	0.45	0.47	1.08	1.23	0.18	0.67	0.38	0.37	0.21
1999	0.30	0.48	1.24	1.21	0.34	0.43	0.38	0.38	0.18
2000	0.35	0.62	0.78	1.14	0.49	0.78	0.34	0.36	0.43
2001	0.32	0.58	0.32	1.18	0.48	0.62	0.49	0.45	0.33
2002	0.39	0.57	0.91	1.19	0.55	0.81	0.68	0.43	0.30

Table 2.59 Number of Dentists per 10,000 people in the provinces of GAP, (SIS, 2005)

	Adıyaman	Batman	Diyarbakır	Gaziantep	Mardin	Kilis	Siiirt	Şanlıurfa	Şırnak
1970	3.32		3.66	1.92	2.69		2.30	2.76	
1971	3.49		3.68	2.13	3.03		2.74	3.11	
1972	3.47		3.54	2.25	2.93		2.59	3.27	
1973	3.44		3.55	2.44	2.85		2.47	3.34	
1974	3.49		3.99	2.15	3.67		3.40	3.48	
1975	3.34		3.60	2.09	3.22		3.26	3.27	
1976	3.06		3.45	2.23	3.10		2.80	3.21	
1977	3.39		3.33	2.57	3.11		2.81	3.14	
1978	3.75		3.20	2.66	2.98		2.56	3.32	
1979	3.43		2.92	2.57	2.77		2.32	3.06	
1980	3.17		2.57	2.50	2.28		2.20	2.41	
1981	2.66		1.87	2.16	1.53		1.62	1.95	
1982	2.27		1.76	1.81	1.35		1.32	1.69	
1983	2.47		1.61	1.86	1.56		1.58	1.77	
1984	2.42		1.78	1.91	2.04		2.11	1.82	
1985	3.70		1.59	1.70	2.10		3.02	2.44	
1986	3.69		2.83	2.97	4.03		7.67	2.58	
1987	4.55		3.34	3.70	4.75		8.73	3.47	
1988	4.73		4.19	3.66	3.81		8.79	3.03	
1989	4.88		4.17	3.18	4.62		8.18	3.35	
1990	5.32	3.11	4.25	3.58	3.93		4.61	3.00	2.31
1991	6.13	3.84	4.90	3.67	4.28		5.14	2.65	3.36
1992	5.68	5.30	4.53	4.09	4.38		6.67	3.15	3.83
1993	6.47	4.51	4.21	4.07	3.94		5.41	2.37	3.12
1994	5.04	2.94	3.93	3.39	2.83		3.34	1.98	1.97
1995	5.52	3.39	4.32	3.57	3.05	5.14	4.57	2.40	2.74
1996	4.93	3.08	4.20	3.56	2.72	5.69	3.56	2.14	2.24
1997	4.78	3.38	4.15	3.52	2.79	7.25	3.33	2.15	2.52
1998	4.94	3.68	4.23	3.54	2.90	8.37	4.16	2.13	3.05
1999	5.27	3.76	4.51	4.00	3.37	7.40	4.86	2.39	3.08
2000	5.06	3.33	4.42	3.33	3.81	7.02	4.37	2.71	2.57
2001	4.72	3.27	4.27	3.44	3.23	5.66	3.74	2.45	2.20
2002	4.83	2.96	4.21	3.48	2.93	5.79	3.69	2.32	1.92

Table 2.60 Number of Midwives per 10,000 people in the provinces of GAP, (SIS, 2005)

2.3.4 Medical Facilities

The development in number of pharmacies, which are the direct medical services facilities, is in positive way in the Region. The number of pharmacies in the Region was only 99 in 1970, which was the 3.9 % of the Turkey. It increased to 475 in 1985 (4.9 % of Turkey); and reached to 1237 in 2000 that is the 6 % of total pharmacies of Turkey (Table 2.61). Although the pharmacy percentage of the Region in Turkey is lower than its population percentage, it displayed a 3 % growth after GAP.

	Turkey	GAP	GAP / Turkey
1970	2524	99	3.9
1971	3280	138	4.2
1972	3700	164	4.4
1973	4295	191	4.4
1974	4331	188	4.3
1975	4742	203	4.3
1976	5296	231	4.4
1977	5878	267	4.5
1978	6193	281	4.5
1979	6174	281	4.6
1980	6335	305	4.8
1981	6914	349	5.0
1982	7802	394	5.0
1983	8599	404	4.7
1984	9192	432	4.7
1985	9755	475	4.9
1986	10266	503	4.9
1987	10994	538	4.9
1988	11754	603	5.1
1989	12397	654	5.3
1990	13005	715	5.5
1991	13148	741	5.6
1992	13605	771	5.7
1993	14269	820	5.7
1994	14831	873	5.9
1995	15573	926	5.9
1996	16681	1026	6.2
1997	17746	1103	6.2
1998	18385	1137	6.2
1999	19157	1162	6.1
2000	20748	1237	6.0

Table 2.61 Number of Pharmacies in GAP and Turkey, (SIS, 2005)



Figure 2.19 Number of Pharmacies per 10,000 People in GAP and Turkey

The growth in number of pharmacies is also seen from Figure 2.19. Before 1985 only one pharmacy was available for 10,000 in the Region. Until 2000, it increased to two pharmacies per 10,000. However, this ratio is lower than the average of Turkey (two in 1985 and three in 2000).

For the provinces of GAP, highest numbers of pharmacies are in Gaziantep for the whole years between 1970 (44) and 2000 (378). This number is also high for the two other densely populated provinces, Diyarbakır (19 in 1970 and 258 in 2000) and Şanlıurfa (14 in 1970 and 247 in 2000). In Kilis the number of pharmacies increased from one to 28 between 1999 and 2000 (Table 2.62). The change in Adıyaman is also higher, almost tripled fro the period 1985 and 2000.

According to the 2000 values, the highest pharmacy ratio (number of pharmacies per 10,000 people) was in Gaziantep (3). Diyarbakır and Kilis follow Gaziantep with 1.91 and 2.43. The values for the other provinces are: 1.50 in Mardin, 1.42 in Adıyaman, 1.63 in Siirt, 1.73 in Şanlıurfa, 1.17 in Batman, and 1.06 in Şırnak

	Adıyaman	Batman	Diyarbakır	Gaziantep	Mardin	Kilis	Siiirt	Şanlıurfa	Şırnak
1970	4		19	44	10		8	14	
1971	6		25	59	13		16	19	
1972	9		30	65	15		19	26	
1973	11		35	77	16		21	31	
1974	7		33	78	20		15	35	
1975	7		35	84	21		16	40	
1976	10		38	97	28		16	42	
1977	13		46	111	30		19	48	
1978	11		48	118	32		18	54	
1979	17		48	118	27		18	53	
1980	15		51	130	35		24	50	
1981	18		68	138	38		28	59	
1982	23		75	157	40		30	69	
1983	23		74	167	41		27	72	
1984	24		78	183	40		30	77	
1985	25		91	193	46		31	89	
1986	25		99	204	46		34	95	
1987	27		115	213	44		38	101	
1988	29		142	229	51		45	107	
1989	32		152	244	59		49	118	
1990	34	1	178	260	63		51	126	2
1991	41	1	189	268	63		51	126	2
1992	43	2	190	275	70		52	134	5
1993	48	6	201	286	75		54	141	9
1994	51	9	209	295	78		59	161	11
1995	58	13	214	301	78		62	183	17
1996	65	14	235	326	91		69	204	22
1997	72	17	248	344	99	1	74	220	28
1998	74	15	258	352	98	1	75	232	32
1999	79	16	252	357	100	1	76	243	38
2000	88	53	258	378	105	28	43	247	37

Table 2.62 Number of Pharmacies in the provinces of GAP, (SIS, 2005)

	Adıyaman	Batman	Diyarbakır	Gaziantep	Mardin	Kilis	Siiirt	Şanlıurfa	Şırnak
1970	0.13		0.33	0.73	0.22		0.25	0.26	
1971	0.19		0.42	0.95	0.28		0.49	0.35	
1972	0.28		0.50	1.01	0.32		0.56	0.47	
1973	0.34		0.57	1.16	0.33		0.60	0.54	
1974	0.21		0.52	1.14	0.40		0.41	0.60	
1975	0.20		0.54	1.19	0.41		0.42	0.67	
1976	0.29		0.57	1.33	0.53		0.41	0.70	
1977	0.37		0.67	1.49	0.56		0.47	0.80	
1978	0.31		0.67	1.54	0.59		0.43	0.90	
1979	0.47		0.65	1.51	0.49		0.42	0.88	
1980	0.41		0.66	1.62	0.62		0.54	0.83	
1981	0.48		0.85	1.66	0.66		0.61	0.94	
1982	0.59		0.91	1.83	0.67		0.64	1.04	
1983	0.57		0.86	1.87	0.67		0.55	1.03	
1984	0.58		0.87	1.98	0.64		0.60	1.04	
1985	0.59		0.98	2.02	0.71		0.60	1.14	
1986	0.57		1.04	2.06	0.92		1.47	1.16	
1987	0.59		1.17	2.08	0.86		1.63	1.17	
1988	0.61		1.40	2.17	0.97		1.90	1.19	
1989	0.65		1.45	2.23	1.09		2.05	1.25	
1990	0.67	0.03	1.63	2.59	1.14		2.10	1.27	0.08
1991	0.79	0.03	1.70	2.61	1.11		2.08	1.22	0.07
1992	0.81	0.06	1.67	2.61	1.20		2.10	1.25	0.18
1993	0.89	0.16	1.72	2.64	1.26		2.16	1.27	0.32
1994	0.92	0.23	1.75	2.66	1.28		2.34	1.39	0.37
1995	1.03	0.33	1.76	2.65	1.25		2.44	1.53	0.56
1996	1.13	0.34	1.89	2.80	1.42		2.70	1.64	0.70
1997	1.23	0.41	1.95	2.89	1.51	0.08	2.87	1.71	0.87
1998	1.24	0.35	1.99	2.89	1.46	0.08	2.89	1.74	0.97
1999	1.30	0.36	1.90	2.86	1.46	0.09	2.91	1.76	1.12
2000	1.42	1.17	1.91	2.96	1.50	2.43	1.63	1.73	1.06

Table 2.63 Number of Pharmacies per 10,000 people in the provinces of GAP, (SIS, 2005)

2.3.5 Infant and Child Mortality

Both infant and child mortality rates are directly proportional to the development of health services, increase in educational background, and growth in economic activities. As a summary infant and child mortality rates decrease with socio-economic development.

The average infant mortality rate in the Region is close to the average of Turkey for all the years between 1980 and 2000. In 1985, the infant fertility rate was 123 ‰ where 126 ‰ in Turkey. Afterwards, it displayed a constant decrease trend and reached to 110 ‰ in 1985, 65 ‰ in 1990 and 48 ‰ in 2000 (Table 2.64). This trend is an evidence of socio economic development of the Region.

Among the provinces of GAP, Şanlıurfa has the lowest infant mortality rate according to the results of 2000 (37 ‰). Şanlıurfa and Adıyaman are the only provinces that have the infant mortality ratios below the average of Turkey. Although the ratio in other provinces is higher than average of the country, the change is also very significant. Infant mortality rate has decreased by 79 ‰ in Adıyaman, 76 ‰ in Diyarbakır, 78 ‰ in Gaziantep, 79 ‰ in Mardin, and 75 ‰ in Siirt.

	1980	1985	1990	2000
Adıyaman	121	105	67	42
Batman	-	-	58	50
Diyarbakır	133	123	75	57
Gaziantep	122	109	66	44
Mardin	122	103	63	43
Kilis	-	-	-	48
Siirt	138	125	80	63
Şanlıurfa	103	96	51	37
Şırnak	-	-	60	51
GAP	123	110	65	48
Turkey	126	109	67	43

Table 2.64 Infant Mortality Rate in GAP (‰),(SIS, 2005)

As similar to infant mortality rate, child mortality rate also decreased by a significant amount in the Region which was closer to the average of Turkey. The average child mortality rate of GAP was 45 ‰ in 1980, 38 ‰ in 1985, 15 ‰ in 1990 and ‰ 9 in 2000. Decrease in child mortality is an indication of development of health services, education system and economy of GAP.

Şanlıurfa has the lowest child mortality rate among the provinces of GAP with 6 ‰ in 2000, which is lower than the average of Turkey. In other provinces this amount is 7 ‰ in Adıyaman, 9 ‰ in Batman and Kilis, 12 ‰ in Diyarbakır, 8 ‰ in Gaziantep and Mardin, and 10 ‰ in Şırnak. Only in Siirt, child mortality rate is very high compared to other provinces and Turkey, which was 53 ‰ in 1980 and 15 ‰ in 2000 (Table 2.65).

	1980	1985	1990	2000
Adıyaman	43	35	16	7
Batman			12	9
Diyarbakır	50	45	20	12
Gaziantep	45	38	15	8
Mardin	45	34	14	8
Kilis				9
Siirt	53	46	23	15
Şanlıurfa	34	31	10	6
Şırnak			13	10
GAP	45	38	15	9
Turkey	47	37	16	7

Table 2.65 Child Mortality Rate in GAP (‰),(SIS, 2005)

CHAPTER 3

ECONOMIC DEVELOPMENT

All the investments in the framework of GAP Project are basically aimed to improve the less developed economic situation of the Region. Financial improvement on macro and micro basis is the baseline of development in other sectors.

The economic development, change in financial figures, are the main outcomes of the GAP investments. It is easier to observe the impacts of GAP Projects in economy, so the evaluation of economic structure of GAP can be a rough projection of the profits of today's and future investments.

While evaluating economic changes in the Region, the situation of Turkish economy shall be taken into consideration, economic crises and high inflation in Turkey in the years of 1994, 1999, 2001 and political structure during 90's and security problems in the region between 1990 and 2000. These factors affected the macro economic structure of the Region negatively and some fluctuations were observed during those periods.

3.1 Economic Activities

The economic activities in the Region can be divided into three sub activities, namely; agriculture, industry and services. Agricultural activities include agriculture and livestock breeding, forestry and fishing. Industry covers manufacturing industry, mining, and industries related to electricity, gas and water. Services consist of construction, trade, hotel and restaurant services, transportation and communication, financial institutions, business, ownership of dwelling, and government services. Among the three major economic activities, agriculture, industry and services, biggest share belongs to the services. The share of the services in terms of percentage in total gross national product was 52.4% in 1987 and it expands to 57.5% in 2000 (Table 3.1). When it is compared to the average of Turkey, it is seen that it is lower by 4 %.

Agriculture as a whole held 26.6 % as an economic activity in 1987 which decreased to 24.6 % in 2000. The share of the industry is the lowest one, with 21.1 % in 1987 and 17.9% in 2000.

For the sub-categories of economic activities, the main economic activity is agriculture and livestock breeding. Although the ratio of agricultural activity has decreased from 25.9 % in 1987 to 24.4% in 2000, it still holds the dominancy in the economy of the Region. The percentage of agriculture is higher than the average of Turkey. The dominancy of agriculture is also an indication incomplete transformation to the industrialization.

The negative change in industry is also observed in its sub-categories except electricity, gas and water industries, mining decreased 4.3 %, manufacturing industry decreased 0.4% between 1987 and 2000. Electricity, gas and water industries are the only industry type that has increased in the same period, which is 1.6 %.

Despite of regression of 2.2 % in trade, it is still one of the major types of economic activities with 13.9 % in 2000. The major increase is observed in governmental services from 6.8 % in 1987 to 16.8 % in 2000. The important reason for this increase is the growth in governmental institutes and facilities.

Similar to governmental services, a big change in transportation and communication sector is observed. The share of this sector has risen from 8.8 % in 1987 to 13.5 % in 2000. The development of communication sector is Turkey is the major factor for this change. The infrastructure change in the Region also effected the development of this sector.

	GAP		TURKEY		Change, %		
	1987	2000	1987	2000	GAP	TURKEY	
Agriculture	26.6	24.6	18.1	14.1	-2.0	-4.0	
Agriculture and							
Livestock Production	25.9	24.4	16.7	13.3	-1.5	-3.4	
Forestry	0.6	0.1	1.1	0.3	-0.5	-0.8	
Fishing	0.0	0.0	0.4	0.4	0.0	0.0	
Industry	21.1	17.9	26.2	24.1	-3.2	-2.1	
Mining and Quarrying	8.7	4.4	2.0	1.1	-4.3	-0.9	
Manufacturing	9.5	9.1	22.3	19.9	-0.4	-2.4	
Electricity, Gas and							
Water	2.8	4.4	2.0	3.0	1.6	1.0	
Services	52.4	57.5	55.7	61.8	5.1	6.1	
Construction	7.7	5.2	7.4	5.2	-2.5	-2.2	
Trade, Wholesale							
and Retail Trade	16.1	13.9	17.5	16.5	-2.2	-1.0	
Hotels, Restaurants							
Services	1.1	1.2	2.7	3.5	0.1	0.8	
Transportation and							
Communication	8.8	13.5	11.7	14.2	4.7	2.5	
Financial Institutions	1.3	1.5	3.1	3.8	0.2	0.7	
Business and							
Personal Services	1.3	1.7	2.4	3.9	0.4	1.5	
Government Services	6.9	16.8	5.1	10.1	9.9	5.0	
Ownership of							
Dwelling	9.2	3.9	5.9	4.6	-5.3	-1.3	
GDP	100.0	100.0	100.0	100.0			

Table 3.1 Economic Structures and Change in GAP and Turkey, (SIS, 2005)

The gross national product (GDP) generated from economic activities is proportional to their percentage presented in Table 3.1. The GDP value generated from services was 2 billion T.L at 1987 prices. The GPD value of agriculture was 1733 billion TL and industry was 1189 billion T.L at 1987 prices.

If each economic activity is considered, with its dominancy in percentage, agriculture and livestock production generates the highest gross domestic product, 1014 billion TL in 1987 and 1725 billion TL at 1987 prices (Table 3.2).

	GAP		TURKEY	
	1987	2000	1987	2000
Agriculture	1,038	1,733	13,537	16,642
Agriculture and				
Livestock Production	1,014	1,725	12,443	15,568
Forestry	23	6	817	714
Fishing	1	2	277	360
Industry	824	1,189	19,596	34,988
Mining and Quarrying	341	211	1,475	1,643
Manufacturing	373	654	16,639	29,528
Electricity, Gas and				
Water	110	324	1,482	3,817
Services	2,046	3,147	41,589	67,159
Construction	301	270	5,502	5,991
Trade, Wholesale				
and Retail Trade	630	1,082	13,098	24,286
Hotels, Restaurants				
Services	43	68	1,982	3,922
Transportation and				
Communication	343	751	8,720	16,290
Financial Institutions	52	64	2,338	2,958
Business and				
Personal Services	50	106	1,776	3,098
Government Services	269	410	3,789	4,965
Ownership of				
Dwelling	358	396	4,384	5,649
GDP	3,908	6,069	74,722	118,789

Table 3.2 GDP	of Economic	Activities	n GAP	and Turkey	(SIS)	2005)
		Activities		and runcey,	(000,	2000)

The percentage of agricultural activity of the Region was the 7.7 % of the Turkey in 1987. By the effects of investments of GAP, this ratio has increased to 8.8 %. This sector generates more economic benefits to Turkey.

Although ratio of Region's industry sector in Turkey is not very high (4.2% in 1987 and fall down to 3.8 % in 2000), a sub-sector of industry, mining, holds 19.5 % of total mining activities in Turkey. Another main economical activity that has an important share in Turkey is governmental services, which has increased 1.3 % in overall government activities in the country (Table 3.3).

	GAP / Tur	key	Marmara / Turkey		
	1987	2000	1987	2000	
Agriculture	7.7	8.8	15.4	15.8	
Agriculture and Livestock Production	8.1	9.3	14.7	15.0	
Forestry	2.8	1.4	18.1	24.5	
Fishing	0.4	0.4	36.5	33.6	
Industry	4.2	3.8	47.9	47.9	
Mining and Quarrying	23.1	19.5	12.3	9.4	
Manufacturing	2.2	0.2	53.5	51.5	
Electricity, Gas and Water	7.4	7.4	20.2	38.9	
Services	4.9	4.7	35.8	37.6	
Construction	5.5	5.0	28.9	29.6	
Trade, Wholesale and Retail Trade	4.8	4.3	38.0	45.1	
Hotels, Restaurants Services	2.2	1.7	41.6	36.1	
Transportation and Communication	3.9	4.8	33.5	34.5	
Financial Institutions	2.2	2.0	52.8	53.0	
Business and Personal Services	2.8	2.1	47.9	49.3	
Government Services	7.1	8.4	24.5	22.6	
Ownership of Dwelling	8.2	4.3	35.7	41.1	
GDP	5.2	5.1	35.3	37.0	

Table 3.3 Shares of GAP Economies in Turkey, (SIS, 2005)

The growth rates of economical activities between 1987 and 2000 in terms of % are shown in Table 3.4. The growth rate of agriculture sector is 3.9 % that is higher than Marmara Region (1.1 %) and Turkey (1.6). This is resulted from the investments of GAP that are mainly focused on development of agriculture. The change in industry is lower than both Turkey and Marmara, only 2.8 %. This result is not a positive result for the impacts of GAP as the main target of the investments are to transform the regional activities into industrial ones (please refer to chapter 5).

The 4.1 % change in hotel and restaurant services is mainly resulted from the development of tourism activities, which is a direct impact of GAP Project. The same situation is valid for the fishing sector. After the GAP, especially in the reservoir of Atatürk Dam, fishing activities has become an important agricultural activity in the Region. The growth of this sector by a 5.3 % is an evidence of these impacts. It is interesting to observe the regression in construction sector by 0.8% after the Project. The major reason for this is the overall regression of construction sector in Turkey due to the economic crises.

	GAP	Marmara	Turkey
Agriculture	3.9	11	16
Agriculture and	0.0		1.0
Livestock Production	4.1	1.1	1.7
Forestry	-10.3	1.0	-1.0
Fishing	5.3	0.5	2.0
Industry	2.8	5.1	4.5
Mining and Quarrying	-3.7	-0.8	0.8
Manufacturing	4.3	4.8	4.4
Electricity, Gas and			
Water	8.3	11.8	7.3
Services	3.3	3.8	3.7
Construction	-0.8	1.4	0.7
Trade, Wholesale			
and Retail Trade	4.3	4.7	4.7
Hotels, Restaurants			
Services	4.1	3.7	5.2
Transportation and			
Communication	6.1	4.9	4.8
Financial Institutions	1.6	3.3	1.8
Business and			
Personal Services	3.3	3.6	4.3
Government Services	3.2	2.7	2.1
Ownership of			
Dwelling	0.8	1.4	2.0
GDP	3.4	4.1	3.6

Table 3.4 Growth Rates of Economic Activities in GAP, 1987-2000, %, (SIS, 2005)

3.2 Gross National Product

Gross national product (GDP) is the total value of goods, and services generated from the economical activities in a region. It is the major variable used in the comparison of economic development.

The comparison of gross national product in this study is based on the prices of 1987 in terms of T.L., and on current prices in terms of USD. The gross domestic product of GAP has increased from 4,513,963 million TL in 1990 to 6,076,451 million TL in 2001. The change in GDP of the Region between 1990 and 2000 is around 35 %. For the same period, the GDP value of Turkey increased by 27 % and GDP of Marmara Region increased by 37 %. The growth in GAP is the second highest one in the Turkey after Marmara (Table 3.5).

However, for different periods, the GDP change of Region is lower than the average of Turkey. Between 1990 and 1995 the GDP change is 12.1 %, and between n1995 and 2000 the change is 19.8 %. For the same periods the change in GDP of Turkey is 17.1 % and 19.8 % (Table 3.6).

	GAP	Marmara	Turkey
1990	4,513,963	29,968,840	17,679,750
1991	4,827,953	30,478,035	18,071,143
1992	5,001,911	32,500,111	18,940,367
1993	5,353,236	35,682,706	19,634,686
1994	4,934,308	32,534,143	19,024,033
1995	5,123,286	35,966,673	19,536,133
1996	5,443,406	39,154,509	21,139,436
1997	5,992,076	42,962,071	22,746,534
1998	6,161,055	43,873,080	23,494,980
1999	5,750,224	41,732,529	22,676,878
2000	6,068,009	45,117,496	23,377,746
2001	6,076,451	40,914,675	22,573,987

Table 3.5 Gross Domestic Product in GAP, at 1987 prices million TL (Ministry of Finance)

Table 3.6 Rate of change of Gross Domestic Products, %, (SIS, 2005)

	1990-1995	1995-2000
Turkey	17.1	21.3
GAP	12.1	19.8

Among the provinces of GAP, Gaziantep has the highest GAP values between 1990 and 2001, which is the 29 % of total GDP value of the Region. The gross domestic product of Gaziantep was 1505 billion TL in 1990 and increased to 1686 billion TL (at 1987 prices) in 2001. Divarbakir generates the second highest GDP value in the Region, having 21 %. The change in GDP of Gaziantep is 171 billion TL for the period 1990- 2001.

Although the GDP of Şanlıurfa is not the highest one, it has increased six times between 1990 and 2001, which higher than all regions of Turkey (Table 3.7). This main change in Şanlıurfa is due to the economic impacts of GAP Project.

Table 3.7 Gross Domestic Product in the Provinces of GAP, at	1987	prices
billion TL, (Ministry of Finance)		

	Adıyaman	Batman	Diyarbakır	Gaziantep	Mardin	Kilis	Siirt	Şanlıurfa	Şırnak
1990	527	-	1,119	1,505	410	-	357	597	-
1991	607	357	1,156	1,479	374	-	190	597	66
1992	610	390	1,210	1,449	403	-	200	674	66
1993	595	360	1,273	1,639	415	-	183	794	94
1994	457	314	1,133	1,447	401	-	173	912	98
1995	465	330	1,155	1,602	429	-	166	869	107
1996	465	355	1,178	1,567	462	200	165	931	118
1997	536	429	1,220	1,665	495	182	175	1,138	152
1998	561	442	1,295	1,646	541	185	176	1,167	147
1999	552	379	1,178	1,559	485	174	192	1,110	121
2000	492	366	1,196	1,742	500	200	202	1,250	119
2001	473	356	1,223	1,686	566	189	217	1,236	131

On the contrary of Şanlıurfa, the change of GDP in Adıyaman is negative. It decreased from 527 billion TL in 1990 to 473 billion TL in 2000. The share of the provinces in GAP in term of GDP values are; Gaziantep 29 %, Diyarbakır 21%, Şanlıurfa 17%, Adıyaman 4 %, Mardin 8 %, Batman 7 %, Siirt 4 %, Kilis 3 % and Şırnak 2% (Figure 3.1).



Figure 3.1 Distribution of GDP in the provinces of GAP

The gross national product per capita is the indicator of economic change in individual basis. The gross national product per capita (GNDP) value in the Region only increased a small amount between 1990 and 2001. The GDPC value of 1029 USD (current prices) in 1990 has increased to 1045 USD in 2001. The reason for not observing the change of GDP in per capita values is the fast population growth of the Region.

Among the regions of Turkey, the GDPC value of GAP is in the 6th place. Only Eastern Anatolia Region has a lower value than GAP (Table 3.8).

		Eastern			Middle			
	Mediterranean	Anatolia	Aegean	GAP	Anatolia	Blacksea	Marmara	Turkey
1990	1,711	711	2,105	1,029	1,576	1,157	2,626	1,717
1991	1,618	695	2,046	1,056	1,604	1,160	2,583	1,700
1992	1,679	724	2,144	1,061	1,645	1,244	2,666	1,767
1993	1,795	749	2,295	1,101	1,739	1,267	2,835	1,875
1994	1,677	743	2,215	986	1,648	1,228	2,505	1,741
1995	1,754	729	2,317	994	1,722	1,282	2,686	1,833
1996	1,794	748	2,429	1,026	1,789	1,401	2,837	1,929
1997	1,971	762	2,594	1,139	1,893	1,495	3,099	2,082
1998	1,978	777	2,633	1,143	1,973	1,578	3,079	2,113
1999	1,868	758	2,445	1,043	1,875	1,531	2,855	1,985
2000	1,856	734	2,580	1,069	1,905	1,477	3,027	2,033
2001	1,730	716	2,344	1,045	1,709	1,378	2,677	1,849

Table 3.8 Gross National Domestic Products per Capita in Turkey, USD, (Ministry of Finance)

The change of GDPC in GAP is presented in Figure 3.2. The low level of GDPC is easily observed. It is almost half of the Marmara Region, which is the most developed region in Turkey.



Figure 3.2 Change in Gross National Product per Capita in Turkey, at 1987 prices in TL

A decrease trend in GDPC value is observed in all provinces of GAP (Table 3.9). As the most developed province is Gaziantep in the Region, the GNPC is the highest one, 2035 USD in 1990, 2085 USD in 1995 and 1593 USD in 2001. Despite the decrease, GDPC value in the province is higher than the average of Turkey. Şırnak has the lowest GDPC value with 877 USD in 1995 and 638 in 2001. A positive change in GDPC is seen in Batman, 59 USD between 1995 and 2001. In Adıyaman (from 1217 to 918 USD), Diyarbakır (from 1908 to 1313 USD), Mardin (from 1021 to 983 USD), Siirt (from 1138 to 1111 USD), and Şanlıurfa (from 1010 to 1008 USD) a negative change in GDPC is observed between 1990 and 2001.

		1990	1995	2001
Adıyaman		1217	1222	918
Batman	1		1157	1216
Diyarbakır		1908	1696	1313
Gaziantep		2035	2085	1593
Mardin		1021	1229	983
Kilis	1		-	1817
Siirt		1138	1326	1111
Şanlıurfa		1010	1238	1008
Şırnak	-		877	638

Table 3.9 Gross Domestic Product per Capita in the provinces of GAP (USD), (SIS, 2004)

3.3 Income level

The impacts of economic changes on the people are the rise of income levels of individuals and households. The direct contribution of financial benefits arisen by Southeastern Anatolia Project to the local people is the change in their income levels.

The income per capita in GAP has increased from 981 USD in 1987 to 1532 USD in 2000. The amount of change is 56 %. The major change is observed between 1989 and 2000 by an amount of 483 USD. However, the income per capita in the Region is much less than the average of Turkey,

which was 1629 USD in 1987 and 2941 USD in 2000. When its is compared to Turkey, the percentage of income per capita is around 60 % in 1987, and decreased to 52.1 % in 2000. The results of comparison of GAP with Marmara region give more negative values. The ratio of income per capita of GAP over Marmara was 38.3 % in 1987 and changed to 35.9 % in 2000 (Table 3.10).

				GAP/Turkey,	GAP / Marmara,
	GAP	Marmara	Turkey	%	%
1987	981	2559	1629	60.2	38.3
1988	988	2691	1685	58.6	36.7
1989	1086	3090	1933	56.2	35.1
1990	1569	4133	2655	59.1	38.0
1991	1580	4013	2603	60.7	39.4
1992	1597	4026	2682	59.5	39.7
1993	1707	4395	2981	57.3	38.8
1994	1281	3129	2173	59.0	40.9
1995	1498	4005	2747	54.5	37.4
1996	1580	4163	2894	54.6	38.0
1997	1619	4475	2979	54.3	36.2
1998	1686	4612	3176	53.1	36.6
1999	1493	4010	2910	51.3	37.2
2000	1532	4270	2941	52.1	35.9

Table 3.10 Income per capita, USD (Ministry of Finance)

If the growth rates of income per capita in the Region are compared with Marmara Region and Turkey for different periods, it is seen that growth in GAP is the lowest one. For the period 1987-2000, the change in income per capita was 3.4 % in GAP, 3.9 % in Marmara Region and, 4.5 % in Turkey. If the time interval is shortened to 10 years period, between 1987 and 1997, the growth rate of GAP was 5 %, where it was 5.6 % in Marmara and 6 % in Turkey. It is interesting that negative values occurred for the period 1990-2000 in the Region. The growth rate of income per capita between 1990 and 2000 was -0.2 % in GAP, 0.3 % in Marmara, and 1 % in Turkey (Table 3.11).

	GAP	Marmara	Turkey
1987-2000	3.4	3.9	4.5
1987-1997	5.0	5.6	6.0
1990-2000	-0.2	0.3	1.0

Table 3.11 Growth ra	ate of income per	capita in USD, %,	(Ministry of Finance)
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3.4 Banking

The accumulated bank deposits and widespread usage of bank credits are the signs of economic growth. The trade credits given by banks are also related to the transformation of savings to investments.

The banking sector with its 1.3 % of total economic activities in GAP is a newly developed sector in the Region. The bank deposit per capita is quite low, when it is compared with the average of Turkey. In 1990 the amount of deposits per capita in GAP was 72 USD. This number increased to 85 USD in 1995, and reached to 155 USD in 2000. The rise has continued till 2002 and become 165 USD (Table 3.12).

The amounts of deposits per capita in Turkey were 571 USD, 720 USD, 1503 USD and 1247 USD in 1990, 1995, 2000 and 2002 respectively. The values of the average of Turkey are approximately nine times greater than the Region. This is explained by two major reasons; the weakness in individual (per capita) economic structure and traditional money saving habits of the local people. The traditional money saving habit of the local people in GAP usually invest their savings to gold instead of investing in bank accounts.

	1990	1995	2000	2002
Adıyaman	70	89	136	158
Batman	55	48	99	110
Diyarbakır	97	94	156	179
Gaziantep	163	267	399	453
Mardin	63	48	85	129
Kilis	-	-	253	180
Siirt	49	39	83	96
Şanlıurfa	51	45	96	105
Şırnak	27	50	88	76
GAP	72	85	155	165
Turkey	571	720	1503	1247

Table 3.12 Bank Deposits per Capita in GAP, USD, (SIS, 2004)

As similar to bank deposits, the amount of bank credits per capita is very low in the Region when it is compared to average of Turkey. It was 55 USD in 1990, which was the 11 % of average personal bank credit amount of Turkey. It decreased to 42 USD in 1990, and rose to 97 USD in 2000 and again fall down to 36 USD in 2002. The same trend is valid for Turkey, 471 USD in 1995, increased to 751 USD in 2000, and decreased to 461 USD in 2002. The reason for the drop between 2000 and 2002 is the devaluation of Turkish Lira in 2001.

	1990	1995	2000	2002
Adıyaman	51	48	90	28
Batman	32	20	55	14
Diyarbakır	40	26	84	24
Gaziantep	198	167	320	156
Mardin	38	19	68	14
Kilis	-	-	105	33
Siirt	33	16	46	16
Şanlıurfa	46	38	76	25
Şırnak	4	3	31	13
GAP	55	42	97	36
Turkey	479	471	751	461

Table 3.13 Bank Credits per Capita at current prices USD in GAP, (SIS, 2004)

The bank credits per capita in Gaziantep are the highest one, as the investments and economic activities are denser. The amount of credits per person was 198 USD in 1990, 167 USD in 1995, 320 USD in 2000 and 156 USD in 2002. The lowest credit amount is observed in Şırnmak, where industrial and financial activities are not developed. The values of Şırnak were 4 USD in 1990, 3 USD in 1995, 31 USD in 2000, and 13 USD in 2002.

The change of bank credits in other provinces in GAP is not constant, varies time to time, which is shown in Table 3.13.

3.5 Investments and Budgets

The municipal and governmental budgets and expenditures are defining factors of the direction of economic activities. Public investments are very important for the continuation of GAP Project. The future of the Region mainly depends on the public and private investments, which will determine the development of the Region.

Today, the most important problem of GAP Project is lack of required amount of both public and private investments. As seen from the tables 3.14 and 3.15, instead of the necessity in increase of investments, public investments decreased from 1990 to 2001. This period was extremely important for the development of GAP, since it was just after the completion of major physical components of the Project. Unfortunately, wrong governmental policies and economic imbalanced structure of Turkey did not allow directing the sufficient amount of invest to the Region.

In 1990, the share of public investments of GAP is the 6 % of total investment value in Turkey. It decreased constantly as the time elapsed and in 2001, the share of GAP investments has become 2 % of total investment of the country.

As most of the physical investments were implemented in Şanlıurfa, its share in total public investment is the highest one, 50%. Diyarbakır follows it with 26 %. The distributions of public investments in other provinces are:

Gaziantep 12 %, Adıyaman 4 %, Batman 3 %, Şırnak 2%, Siirt 1%, and Kilis 0.4 % (Figure 3.3).

Provinces	1990	1991	1992	1993	1994	1995
ADIYAMAN	11,625	7,317	13,138	10,142	5,936	7,211
DİYARBAKIR	94,673	45,617	42,059	47,156	29,808	74,943
GAZİANTEP	47,645	25,936	27,587	19,827	11,813	12,241
MARDİN	15,108	8,592	6,495	5,373	4,765	2,386
SIIRT	13,508	5,429	3,702	3,669	1,549	1,570
ŞANLIURFA	253,602	188,115	152,725	99,006	61,492	64,802
BATMAN	11,496	11,942	9,326	7,365	6,381	11,576
ŞIRNAK	11,714	1,838	3,216	3,144	2,185	2,293
KİLİS	-	-	-	-	-	-
GAP	459,372	294,786	258,249	195,683	123,929	177,023
Turkey	8,801,288	8,748,426	8,848,814	9,094,798	5,849,122	4,826,098

Table 3.14 Public Investments, 1990-1995, at 2001 prices billion TL (SPO)

Table 3.15 Public Investments, 1996-2001, at 2001 prices billion TL (SPO)

Provinces	1996	1997	1998	1999	2000	2001
ADIYAMAN	8,111	10,357	10,720	9,782	11,633	7,378
DİYARBAKIR	77,846	86,433	83,548	61,596	69,523	44,739
GAZİANTEP	17,675	38,876	45,341	40,703	49,320	26,666
MARDİN	1,835	2,156	1,743	2,413	1,361	956
SIIRT	771	857	1,304	2,743	1,959	1,084
ŞANLIURFA	115,298	111,302	89,905	81,344	145,256	119,621
BATMAN	3,974	4,315	4,198	2,399	3,026	10,676
ŞIRNAK	3,457	5,582	5,729	1,842	3,459	2,650
KİLİS	1,064	1,717	817	1,848	3,130	3,539
GAP	230,031	261,595	243,305	204,670	288,667	217,309
Turkey	6,074,441	7,960,827	7,727,112	7,037,162	8,610,563	6,569,160



Figure 3.3 Distribution of total public investments in GAP

If the amount of public investments per capita is considered, the share of GAP is below the average of Turkey. The difference between Turkey and GAP was 28 USD in 2000, 33 USD in 2002, and 21 USD in 2004 (Table 3.16). Among the provinces, Şanlıurfa , Kilis have the highest ratios in 2004, 123 USD and 139 USD. Due to the decrease in total public investment in Gaziantep, the amount per capita has displayed a decrease trend from 136 USD in 200 to 35 USD in 2004. Again, Siirt has the lowest public investment per capita ratio, 13 USD in 2000, 28 USD in 2002, and 14 USD in 2004.

	2000	2002	2004
Adıyaman	27.67	10.28	33.71
Batman	16.38	8.64	53.25
Diyarbakır	98.60	55.24	51.41
Gaziantep	136.45	74.75	34.79
Mardin	15.59	8.50	18.85
Kilis	39.12	65.39	139.15
Siirt	12.56	27.95	13.56
Şanlıurfa	72.20	49.51	123.13
Şırnak	29.74	15.69	31.57
GAP	49.81	35.11	55.49
Turkey	77.29	68.75	76.24

Table 3.16 Public Investment per Capita in GAP, USD, (SIS, 2004)

The values of municipal expenditures per capita are the indication of service level to the pubic by municipalities. When this ratio is high, the sanitation conditions are better and infrastructure development is higher.

The municipal expenditures per capita in the Region are approximately half of the average of Turkey (Table 3.17). In 1985, it was 9.88 USD per capita. This value increased to 17.32 USD in 1990 and to 28.23 USD in 1995. A decrease was observed between 2000 and 2002, from 59.56 USD to 32 USD.

On the provincial basis, Gaziantep has the highest ratio of municipal expenditures per capita among the Region. Batman and Şırnak has the lowest ratios, as they are the two underdeveloped provinces in the Region. As a result of high population in Şanlıurfa and Diyarbakır, the municipal expenditures per capita are not high.

	1985	1990	1995	2000	2002
Adıyaman	5.74	19.74	22.06	53.94	27.38
Batman	-	22.77	17.35	43.34	25.05
Diyarbakır	7.65	5.69	29.94	113.46	39.55
Gaziantep	22.95	32.26	52.47	72.56	53.17
Mardin	5.74	18.98	24.25	72.22	25.62
Kilis	-	-	-	55.79	37.51
Siirt	9.56	18.22	26.80	32.70	29.19
Şanlıurfa	7.65	10.63	25.37	59.40	26.32
Şırnak	-	10.25	27.60	32.66	24.26
GAP	9.88	17.32	28.23	59.56	32.01
Turkey	19.12	46.69	66.13	130.40	74.29

Table 3.17 Municipality Expenditures per Capita in GAP, USD, (SIS, 2004)

In terms of budget revenues per capita, as similar to other financial figures, the Region has lower values than the average of Turkey, 62 USD in 1990, 52 USD in 1995, 82 USD in 2000, and 92 USD in 2003 (Table 3.18). These values are almost 10 times lower than Turkey.

Gaziantep has the highest budget revenue ratio, which was 114 USD in 1990, 112 USD in 1995, 150 USD in 2000, and 213 USD in 2003. Siirt and Şanlıurfa has the lowest values among the Region, 60 and 70 USD in 2003.

	1990	1995	2000	2003
Adıyaman	37.96	66.58	48.50	71.86
Batman	75.92	51.55	59.80	71.12
Diyarbakır	75.92	53.70	66.00	86.16
Gaziantep	113.87	111.69	149.49	213.29
Mardin	75.92	38.66	50.73	55.81
Kilis	-	-	62.34	98.25
Siirt	37.96	36.51	45.64	60.44
Şanlıurfa	37.96	32.22	50.89	69.51
Şırnak	37.96	27.92	202.77	98.72
GAP	61.68	52.35	81.80	91.69
Turkey	379.58	483.26	774.97	935.45

Table 3.18 Budget Revenues per Capita in GAP, USD, (SIS, 2004)

3.6 Incentives

Governments to attract the private investments to a region use incentives. These investments are crucial as the success of development is based on the contribution of private sources in addition to public ones.

The change in number of incentive certificates, amount of investments and employment generated from these incentives is summarized in Table 3.19. In 1991, number of incentive certificates was 258 with a total investment amount of 1.1 billion USD. The number of employment arisen from the incentives given in 1991 was 19,167. The number of incentives reached its peak value in 1997, 415 certificates. The investment amount of these incentives was 1.7 billion USD, which generated 19,481 employments. The number of incentive certificates decreased to 152 in 2001, which was equal to 597 million USD. The employment generated from these incentives in 2001 was 7717.
YEARS	GAP			TURKEY		
	Number of	Amount of	Number of	Number of	Amount of	Number of
	Certificates	Investment	Employment	Certificates	Investment	Employment
		, million			, million	
		USD			USD	
1991	258	1,113	19,167	1743	8,298	140,176
1992	32	165	1,545	1527	7,152	113,189
1993	95	1,095	5,014	2994	21,076	192,687
1994	54	421	4,230	1368	6,508	88,004
1995	274	7,962	29,217	4926	86,318	371,156
1996	316	2,556	17,840	4990	36,829	266,892
1997	415	1,726	19,481	5074	28,102	328,237
1998	322	1,187	22,173	4241	16,619	280,360
1999	157	490	7,945	2895	13,036	185,293
2000	208	488	9,321	3447	12,467	180,052
2001	152	597	7,717	2110	8,110	100,735

Table 3.19 Incentives in GAP and Turkey (SPO)

3.7 Import and Export

Importing and exporting are indicators of the growth of economical activities, mainly industry. Increase in export is resulted from development of industrial activities and has a direct impact on the financial status of a region.

Both importing and exporting values in terms of USD has increased in the Region after GAP Project. Exporting value has risen by one billion USD between 1989 and 2005. Importing value has also grown from 100 million USD in 1989 to 600 million USD in 2004 (Figure 3.4). The significant change after 2000 in export values is an evidence of how industrial activities and trade have been developed after GAP Project.

Although the export per capita ratio has increased 10 times between 1990 and 2003, from 15 to 155 USD, it is lower than the average of Turkey. As Gaziantep is the industry and trade center of the Region, export values are the highest one in this province. In Gaizantep the export per capita value has increased from 46 USD to 426 USD between 1990 and 2003 (Table 3.20). Other major exporting center in the last decade is Siirt. The export ratio in this province has risen from one USD in 1990 to 437 USD in 2003.



Figure 3.4 Import and Export values of GAP

	1990	1995	2000	2001	2003
Adıyaman					
Batman		2			
Diyarbakır		3	2	2	2
Gaziantep	46	97	270	362	426
Mardin	9	103	24	79	32
Kilis					
Siirt					36
Şanlıurfa	4	7		4	2
Şırnak	1	9	97	285	437
GAP	15.0	36.8	98.3	146.4	155.8
Turkey	207	329	388	454	666

Table 3.20 Export per capita in GAF, USD, (SIS, 2004)	Table 3.20	Export per	capita in GA	P, USD,	(SIS, 200)4)
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Like export rate, the import value per capita has displayed an increase trend in the Region, from 37 to 81 USD between 1990 and 2003. Again, Gaziantep and Siirt are has the highest import ratios with 310 USD and 49 USD in 2003 (Table 3.21).

	1990	1995	2000	2001	2003
Adıyaman					
Batman	94	7	1		28
Diyarbakır	6	8		2	
Gaziantep	98	107	127	117	310
Mardin	3	10	11	8	10
Kilis					
Siirt					
Şanlıurfa	8	14	18	6	8
Şırnak	12		304	117	49
GAP	36.8	29.2	92.2	50.0	81.0
Turkey	294	474	652	592	973

Table 3.21 Imports per capita in GAP, USD, (SIS, 2004)

3.8 Employment Generation

Employment is a main factor defining the economic income structure. Beside its economic contribution, the social life of individuals, and related household life quality depends on the employment types and opportunities.

The most important variable that has to be asses in order to understand the economic side of employment generation after GAP is unemployment rate, which is defined as the number of unemployed persons per 100 persons in labor force (SIS, 2004).

Despite of new economic activities and new opportunities in employment after GAP Project, the unemployment rate in the Region has increased in recent years. The rate of unemployment was 4.32 % in 1980, which was closer to the average of Turkey. This ratio increased to 6.07 % in 1985 and reached to 7.79 % in 1990. This trend has continued and become 12.13 % in 2000, which was 4 % more than the average of Turkey.

The increase in unemployment rate has two major reasons; high population growth rate and regression in Turkish economy in recent years. This shows that without solving the population growth problems, the economic growth will not be effective in GAP.

	1980	1985	1990	2000
Adıyaman	3.70	5.30	7.50	11.10
Batman	-	-	8.60	17.40
Diyarbakır	7.10	6.70	11.50	14.20
Gaziantep	3.60	6.80	7.70	11.40
Mardin	3.20	4.80	9.00	13.00
Kilis	-	-	-	6.20
Siirt	4.30	6.90	6.60	10.70
Şanlıurfa	4.00	5.90	7.70	14.50
Şırnak	-	-	3.70	10.70
GAP	4.32	6.07	7.79	12.13
Turkey	3.60	4.70	5.40	8.90

Table 3.23 Unemployment Rate (12 years old population and over - %), (SIS, 2004)

The change in unemployment rate is not positive in the provinces of GAP between 1980 and 2000. According to the results of 1980, unemployment rate in was 3.7 % in Adıyaman, 7.1 % in Diyarbakır, 3.6 % in Gaziantep, 3.2 % in Mardin, 4.3 % in Siirt, and 4% in Şanlıurfa. These rates became one times greater in 1985. No major change was observed between 1980 and 1985. Afterwards, the unemployment rate increased again and reached to 11.1 % in Adıyaman, 17.4 % in Batman, 14.2 % in Diyarbakır, 11.4 % in Gaziantep, 13 % in Mardin, 6.2 % in Kilis, 10.7 % in Siirt, 14.5 % in Şanlıurfa and 10.7 % in Şırnak.

Only in Kilis the unemployment rate was below the average of Turkey. Despite of improved economic activities in Gaziantep, the rate of unemployment is not the lowest on in the Region.

Labor force participation rate is defined as the number of person in labor force per 100 people who is 12 years of age and over (SIS, 2004). It is important to analyze the changes in labor force participation rate, as it indicates the power and strength of productivity of the Region.

In Southeastern Anatolia Region, labor force participation rate is higher than the average of Turkey. It was 65.97 % in 1980, which was 3.07 % than Turkey. Although it decreased after 1980, it was again higher than the

average of Turkey in 1985 and 1990 (65.17 % in 1985 and 64.65 % in 1990). In 2000, it decreased to 52.7 %, which was lower than the average of Turkey by 2.5 %.

Among the provinces of GAP, Mardin and Adıyaman has the highest labor force participation rates; 55.2 % and 58 % in 2000. The rates of all provinces except Gaziantep was higher than the average of Turkey in 1980 (Adıyaman 71.2%, Diyarbakır 64.4 %, Gaziantep 56.9 %, Mardin 70.3 %, Siirt 69.2 %, Şanlıurfa 63.8 %), however the situation changed completely in 2000, and the ratios of all provinces except Adıyaman and Mardin dropped below the average of Turkey (Table 3.24).

	1980	1985	1990	2000
Adıyaman	71.20	71.60	69.00	55.20
Batman	-	-	62.10	47.90
Diyarbakır	64.40	63.40	62.10	52.80
Gaziantep	56.90	55.30	54.80	47.30
Mardin	70.30	70.30	66.90	55.10
Kilis	-	-	-	49.30
Siirt	69.20	65.40	67.70	54.00
Şanlıurfa	63.80	65.00	62.80	54.70
Şırnak	-	-	71.80	58.00
GAP	65.97	65.17	64.65	52.70
Turkey	62.90	61.10	60.60	55.20

Table 3.24 Labor Force Participation Rate, %, (SIS, 2004)

The structure of employment by activity in the Region has significantly changed between 1990 and 2000. The share of each activity in employment was; 54 % in agriculture, 13 % in construction, 11.9 % in manufacturing industry, 11 % in trade and commerce, 6 % in mining, 2.1 % in telecommunication and transportation, and 2 % in industry related to electricity, water and gas (Figure 3.5).

The dominancy of agriculture in employment distribution has continued with a small amount of decrease by 4 % in 2000. The change in share of other activities in total employment is 1 % increase in construction, 1.9 %

increase in manufacturing industry, 3.5 % increase in trade and commerce, 1.2 % increase in telecommunication and transportation, and 3.5 % increase in industry related to electricity, water and gas (Figure 3.6).



Figure 3.5 Employments by Activity in GAP, 1990



Figure 3.6 Employments by Activity in GAP, 2000

The change in share of industrial employees in total employed population in GAP is given in Table 3.26. According to the table, the share of industrial employees increased between 1990 and 2000 from 5.21 % to 1.8 %; which were less than the average of Turkey, 12.80 % in 1990 and 13.30 % in 2000. Among the provinces of GAP, the share of industrial employees is the highest in Gaziantep, in which industrial activity is the main economic activity. In the provinces where the industrial activities are low, the share of employees working in this sector is less. This situation is valid for Adıyaman, Diyarbakır, Mardin, Siirt, Şanlıurfa and Şırnak.

	1980	1985	1990	2000
Adıyaman	3.80	3.60	4.80	4.80
Batman	-	-	6.70	6.00
Diyarbakır	3.40	2.80	3.50	3.80
Gaziantep	13.40	13.90	16.20	21.30
Mardin	2.50	2.20	2.30	2.40
Kilis	-	-	-	7.20
Siirt	4.10	3.60	2.50	2.60
Şanlıurfa	3.60	3.20	3.70	3.50
Şırnak	-	-	2.00	1.80
GAP	5.13	4.88	5.21	6.68
Turkey	11.60	11.40	12.80	13.30

Table 3.25 Share of Industrial Employees in Total Employed Population, %, (SIS, 2004)

When the share of annual average industry employees of GAP in Turkey is considered, the positive change is observed between 1980 and 2000. This percentage was 1.96 in 1980 and increased to 2.65 in 2000. The share of Gaziantep in Turkey is also high, 0.94 % in 1980 and 2.11 % in 2000 (Table 3.27).

	1980	1985	1990	1995	2002
Adıyaman	0.15	0.18	0.18	0.38	0.08
Batman	-	-	0.06	0.06	0.06
Diyarbakır	0.23	0.30	0.28	0.21	0.15
Gaziantep	0.94	1.13	1.26	1.58	2.11
Mardin	0.07	0.08	0.06	0.06	0.07
Kilis	-	-	-		0.04
Siirt	0.46	0.10	0.03	0.03	0.05
Şanlıurfa	0.11	0.10	0.13	0.08	0.07
Şırnak	-	-	0.00	0.01	0.02
GAP	1.96	1.89	2.00	2.41	2.65

Table 3.26 Share of Annual Average of Manufacturing Industry Employees of GAP in Turkey, %, (SIS, 2004)

As the main economic activity in the Region is agriculture, its share in total employment is the highest one. Although the share of agricultural employees has displayed a decrease trend between 1980 and 2000, it is still 20 % higher than the average of Turkey. This ratio was 72.18 % in 1980, 72.40 % in 1985, 69.20 % in 1990 and 60.11 % in 2000.

In Adıyaman and Şanlıurfa the share of agricultural employees are the highest ones, 73.60 % and 72.80 % in 2000. In Gaziantep, where the industrial activity is dominant, this ratio is very small compared to the other provinces of GAP and Turkey, 39, 10 % in 2000. The agricultural employee shares of the other provinces are above the average of Turkey in 2000, 63.50 % in Batman, 63.9 % in Diyarbakır, 69.9 % in Mardin, 54.7 % in Kilis, 56.9 % in Siirt, and 46.6 % in Şırnak.

	1980	1985	1990	2000
Adıyaman	82.80	83.20	79.20	73.60
Batman	-	-	70.00	63.50
Diyarbakır	71.90	71.40	69.00	63.90
Gaziantep	53.10	53.00	50.20	39.10
Mardin	77.70	78.00	74.40	69.90
Kilis	-	-	-	54.70
Siirt	76.90	75.50	71.60	56.90
Şanlıurfa	70.70	73.30	71.20	72.80
Şırnak	-	-	68.00	46.60
GAP	72.18	72.40	69.20	60.11
Turkey	60.00	59.00	53.70	48.40

Table 3.27 Share of Agricultural Employees in Total Employed Population, %, (SIS, 2004)

3.9 Tourism

The impacts of development in tourism sector to the economy are very effective. It is the easiest way to accumulate the foreign exchange which resulted in growth of economy and employment generation. When compared to other sectors, the efficiency of tourism is more than other sectors in terms of time, labor force and income.

The development of tourism in Southeastern Anatolia Region is mainly observed GAP Project. First of all, after the Project, the Region has become more popular and well-known place all around the World. The historical and cultural richness of the Region become apparent and focus of the media in Turkey. This popularity makes the Region a new tourism center. In addition to this, GAP Project, itself with reservoirs and huge hydraulic structures, like Atatürk Dam, increased the attraction to the Region.

The positive change in tourism is seen from Table 3.7 and 3.8. The number of foreigners arrived to the Region for tourism has significantly changed after 1994. It increased more than five times, from 70,000 foreigners in 1993 to 420,000 in 2004. The situation for local visitors is better, increased from 40,000 in 1993 to one million in 2004.



Figure 3.7 Number of Foreign Tourist Arrivals to GAP



Figure 3.8 Number of Local Tourist Arrivals to GAP

CHAPTER 4

AGRICULTURAL DEVELOPMENT

The economy of GAP is an agricultural based economy. The efficient utilization of the natural sources of the region focuses on raising levels of income in the rural sector; providing inputs for industrial enterprises in the region; creating employment opportunities so as to minimize out-migration and encouraging export oriented production in the region.

Turkey has an area of 77,945,200 hectares; whereas, Southeastern Anatolia Region has an area of 7,538,500 hectares and cover about 9.7% of Turkey. In the Region, there are 3.2 million arable land where 1.7 million hectares of this area is suitable for irrigation, which is the 20 % of that Turkey (www.gap.gov.tr). The other portion (1.2 million ha) is suitable for dry-plant production.

In Southeastern Anatolia, 32.91% of the land consists of I, II and III grade soil that is suitable for agriculture; 9.23% of the land is IV grade which is limited suitable and the remaining 54.03% of the land is unsuitable for cultivation (V-VIII class)⁴. About the 3.83% of the land cannot be used for agriculture anyway. The types of soil in the Region are shown in Table 4.1.

⁴ Köy Hizmetleri Genel Müdürlüğü (General Directorate of Rural Services) - 1995

	GRADE OF	AREA (Ha)	RATIO (%)
	SOIL		
	1	946,061	12.57
LAND SUITABLE FOR	11	817,703	10.87
AGRICULTURE			
	III	712,769	9.47
	Sub Total	2,476,533	32.91
	IV	694,263	9.23
	V	1,291	0.02
	VI	880,631	11.7
	VII	3,184,472	42.32
	Sub Total	4,066,394	54.03
LAND NOT SUITABLE	VIII	288,410	3.83
FOR AGRICULTURE			
	Total	7,525,600	100

Table 4.1 Soil grades in GAP Region (<u>www.gap.gov.tr</u>)

The GAP region extends over an area of 75,000 km² and a wide range of crops each requiring different climatic conditions are raised in this area including olive, pistachio, hazelnut and persimmon. The region has 3.2 million hectares of land fit for crop culture. Forested areas make up 1.3 million hectares while 2.3 million hectares of land consists of pastures and ranges.

With the completion of irrigation projects of GAP, it is estimated that 1.7 million hectares of land will be open to irrigation. At the end of year 2005, the total area of irrigated land was 236,019 hectares.

4.1 Harran Plain

Water accumulated in the reservoir of Atatürk Dam is utilized for irrigation of Harran Plain by the two parallel tunnels, each 26.4 km long (DSI, 2004). By the end of 2002, 116,000 ha land is open to irrigation. Upon the

completion of all irrigation projects related to Atatürk Dam, the area brought under irrigation will be equal to 190,000 ha. This will naturally bring along significant changes in agricultural output and crop design. Such irrigation-led crops like soybean, groundnut, corn, sunflower and fodder crops will be the basis of flourishing agro-industries.

After the start of irrigation in Harran Plain in 1995, the area brought under irrigation reached to 116 000 ha until the end of 2001. The change in gross domestic product per capita and value added as a result of irrigation in Harran Plain is given in Table 4.2.

Table	4.2	GDP	and	Value	Added	in	Harran	Plain	before	and	after	irrigation
(GAP	Adm	ninistra	ation))								

		Gross Domestic Product						
	Area	Million USD						
Year	(ha)	/year	USD/ha	USD/person				
Before								
Irrigation	30000	31,5	1050	1044				
1995	30000	65,4	2180	2168				
1996	40000	87,5	2187	2229				
1997	60000	125,8	2097	1896				
1998	90000	178,8	1987	2388				
1999	103000	199	1932	2185				
2000	111600	261,9	2347	2574				
2001	116000	181,3	1563	1689				

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Figure 4.1 Change in area of irrigated lands (ha) in Harran Plain



Figure 4.2 Change in GDPC before and after irrigation in Harran Plain

From 1995 to 2001, the area opened to irrigation become twice of its original value reaching to 120,000 ha. As shown in Figure 4.2, there was a regular increase in GPD until 2000, but in 2001, it decreased below 200 million USD as a result of -8.5 % regressions in Turkish economy.

4.2 Change in Agricultural Output and Crop Pattern

4.2.1 Total Agricultural Production

The main change in crop design has occurred in irrigated lands. Cotton has become the major crop by 85 % in the areas opened to irrigation due to high value added content and possession of organized purchasing market rather than other crops. Especially in Harran Plain, significant changes had observed in agricultural output especially in corn and cotton. The output increase index based on the values of 1985 has become 152 in cotton, 161 in corn, 114 in wheat and 106 in barley.

	1995 Crop Design		2003 Crop Design		
Crops	Ratio (%)	30 000 (ha)	Ratio (%)	116 000 (ha)	
Wheat	49	14700	21.03	25530	
Barley	20	6000	1.2	1457	
Cotton	21	6300	76.49	92859	
Corn II	0	0	3.81	4625	
Fruits	0	0	0.15	182	
Sesame II	0	0	0.08	97	
Vegetable	2	600	1.05	1275	
Vegetable					
garden	0	0	0.08	97	
Lentil	8	2400	0	0	
Total	100	30000	103.89	126122	

Table 4.3 Change in crop pattern between 1995 and 2003 (SIS)

Some new types of crops are also sown by the farmers after irrigation; olive, pistachio, hazelnut and persimmon. This significant change in crop design and production lead the local people to earn more money from agricultural activities. Especially in Şanlıurfa the major economic activity has become agriculture. The output of this economic activity also affected the industrial sector of the whole Region. The growth in agricultural production in the Region has changed the direction of industrial activities, mainly to manufacturing type (textile).

Table 4.4 Total Crop Productions and its Marketing Value in GAP Region (SIS, 2005)

	GAP						
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)				
1994	7,119,798	55,171,580	1,823				
1995	6,852,979	110,397,072	2,371				
1996	7,534,003	210,251,272	2,610				
1997	6,975,734	391,053,013	2,698				
1998	8,176,590	714,223,535	2,704				
1999	6,441,956	833,332,924	1,953				
2000	6,451,838	1,372,713,348	2,183				
2001	9,654,900	2,308,428,330	1,853				
2002	9,156,280	3,314,652,679	2,185				
2003	9,152,131	4,623,779,751	3,105				

		TURKEY					
YEARS		PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)			
	1994	80,994,124	533,145,216	17,617			
	1995	82,702,297	1,084,215,147	23,287			
	1996	89,164,192	2,060,733,722	25,585			
	1997	91,260,126	3,553,871,383	24,524			
	1998	103,369,284	7,265,715,276	27,503			
	1999	94,495,937	9,652,440,413	22,625			
	2000	99,969,782	14,920,079,928	23,728			
	2001	89,202,197	20,017,457,178	16,070			
	2002	97,867,166	32,264,199,599	21,268			
	2003	93,717,999	40,569,390,283	27,246			

Table 4.5 Total Crop Productions and its Marketing Value in Turkey, (SIS, 2005)

Before irrigation (1994) the total crop production in Southeastern Anatolia Region is 7.12 million tons. In 2003 this number increased to 9.15 million tons. Although only the 20% (DSI, 2005) of the irrigation project has been completed until 2003, the crop production increased approximately 2 million tons. This change in production also affected the value of the agricultural activity. The marketing value of crop production in 1994 was 1.8 billion USD and increased to 3.1 billion USD in 2003 (Table 4.4). For the years 1999 and 2001, the values of the agricultural production both in Turkey and GAP decreased in USD currency significantly. Between 1998 and 1999 the decrease was around 0.8 billion USD and 4.9 billion USD in GAP and Turkey respectively. Between 2000 and 2001, the amount of decrease was 0.3 billion USD in GAP and 7.7 billion USD in Turkey. The reason of this situation was not due to the decrease of yield, only depend on the economic regression of Turkish economy (between 1998-1999 and 2000-2001 the exchange rate of TL vs. USD was doubled). The Turkish economy also affected the production values of crops in GAP for the years 1998 and 1999 (the total crop production decreased from 8 million tons to 6 million tons). The economic crises occurred in Turkish economic life in these years caused the

industrial activities in negative way (especially in manufacturing industry, please refer to Chapter 3). Decrease in industrial activities directly affected the demand of agricultural products; less production needs fewer raw materials.

	ADIYAMAN						
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)				
1994	586,821	5,013,821	166				
1995	634,856	12,657,428	272				
1996	651,618	21,477,524	267				
1997	543,977	38,770,183	268				
1998	727,171	72,125,559	273				
1999	572,103	89,236,091	209				
2000	579,396	115,904,267	184				
2001	823,308	176,064,169	141				
2002	732,694	242,372,964	160				
2003	614,350	298,750,140	201				

Table 4.6 Total Crop Productions and its Marketing Value in Adıyaman, (SIS, 2005)

Adıyaman Province is the one of the most affected provinces in the Region by Atatürk Dam in means of loosing the agricultural lands. The one of the claims about the Dam is reduction of agricultural lands due to Atatürk Dam Reservoir. This claim is not wrong about the land situation. However, despite of reduction in agricultural lands, amount of agricultural products has increased after irrigation. In 1994, the production and value generated from crop production was 586,821 tons and 166 million USD. In 2003, production and its value increased to 614,350 tons and 201 million USD. The agricultural production reached its peak value in 2001 as 823,308 tons.

	ŞANLIURFA							
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)					
1994	2,055,462	13,891,995	459					
1995	1,866,732	29,150,827	626					
1996	2,283,179	62,244,392	773					
1997	2,114,322	115,711,142	798					
1998	2,678,552	228,324,770	864					
1999	2,378,182	280,767,498	658					
2000	2,031,590	424,957,535	676					
2001	3,344,200	751,972,862	604					
2002	3,077,137	1,046,780,148	690					
2003	3,095,985	1,488,355,571	1,000					

Table 4.7 Total Crop Production and its Marketing Value in Şanlıurfa, (SIS, 2005)

Şanlıurfa is the province that has the most agricultural production among the Region. Atatürk Dam and related irrigation projects are mainly focused on the increase in agricultural yield in Şanlıurfa (Harran Plain). The production in these provinces has increased from 2 million tons in 1994 to 3 million tons in 2003. One million production increases is an evidence of how Şanlıurfa has developed in agricultural sector. The development is not only in the numeric value of agricultural production, but also by means of its marketing value; from 459 million USD in 1994 to 1 billion USD in 2003. The significant change in agricultural marketing value also shows beside the physical size of production increase, the crop design (especially cotton) has changed in order to get more profit from agricultural activities.

The two other important provinces in agricultural activity are Diyarbakır and Gaziantep that produce more than one million of crops in a year. The production and its value in Diyarbakır have increased from 1.73 million tons and 418 million USD in 1994 to 2.15 million tons and 645 million USD in 2003. For Gaziantep the increase is from 888,800 tons and 280 million USD in 1995 to 1.16 million tons and 534 million USD in 2003 (Table 4.7 and 5.8).

	GAZIANTEP							
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)					
1994	1,229,173	12,409,708	410					
1995	888,800	13,051,359	280					
1996	833,391	23,149,060	287					
1997	821,423	42,175,710	291					
1998	896,535	64,805,942	245					
1999	745,440	106,371,676	249					
2000	831,510	219,699,896	349					
2001	1,052,274	274,943,305	221					
2002	1,017,758	440,625,320	290					
2003	1,166,977	795,585,125	534					

Table 4.8 Total Crop Productions and its Marketing Value in Gaziantep, (SIS, 2005)

Table 4.9 Total Crop Productions and its Marketing Value in Diyarbakır, (SIS, 2005)

	DİYARBAKIR							
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)					
1994	1,739,945	12,657,075		418				
1995	1,644,916	24,069,246		517				
1996	1,913,952	47,719,513		592				
1997	1,929,838	95,055,587		656				
1998	2,017,678	173,238,773		656				
1999	1,518,691	181,348,439		425				
2000	1,522,963	287,397,032		457				
2001	2,198,293	492,191,147		395				
2002	2,131,842	685,726,901		452				
2003	2,156,995	960,198,938		645				

For the other provinces (Batman, Kilis, Mardin, Siirt, and Şırnak) the development in crop production is similar to Region's increase trend except Siirt (Table 4.10, 5.11, 5.12, 5.13, 5.14).

Table 4.10) Total	Crop	Production	and	its	Marketing	Value i	n Batman,	(SIS,
2005)		-				-			

	BATMAN							
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)					
1994	232,685	2,132,989	70					
1995	223,989	6,599,577	142					
1996	230,958	11,680,949	145					
1997	328,452	30,705,204	212					
1998	355,055	41,468,533	157					
1999	296,544	49,083,737	115					
2000	299,617	68,142,248	108					
2001	378,050	103,419,806	83					
2002	366,880	152,767,567	101					
2003	369,771	199,940,283	134					

Table 4.11 Total Crop Production and its Marketing Value in Kilis, (SIS, 2005)

	KILIS							
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)					
1994	-	-	-					
1995	318,963	3,659,126	79					
1996	349,912	6,286,734	78					
1997	211,348	8,986,662	62					
1998	198,902	14,553,663	55					
1999	148,674	17,830,375	42					
2000	346,526	67,887,088	108					
2001	350,630	101,609,179	82					
2002	397,067	179,222,471	118					
2003	392,406	231,804,467	156					

Table	4.12	Total	Crop	Production	and	its	Marketing	Value	in	Mardin,	(SIS,	
2005)												

	MARDİN							
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)					
1994	905,697	5,744,895	190					
1995	930,723	13,790,819	296					
1996	920,517	25,022,199	311					
1997	687,715	39,038,860	269					
1998	971,275	84,656,720	320					
1999	533,639	71,775,751	168					
2000	534,796	119,286,618	190					
2001	1,120,233	290,872,567	234					
2002	1,022,939	401,728,687	265					
2003	983,535	461,058,551	310					

Table 4.13 Total Crop Production and its Marketing Value in Siirt, (SIS, 2005)

	SIIRT			
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)	
1994	151,651	1,519,075		50
1995	117,612	2,288,443		49
1996	135,332	4,711,355		58
1997	129,099	8,986,619		62
1998	131,907	15,338,015		58
1999	121,648	19,411,510		46
2000	145,586	41,466,932		66
2001	125,745	48,743,954		39
2002	131,194	69,693,147		46
2003	109,961	73,053,698		49

	ŞIRNAK			
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)	
1994	218,364	1,802,022		60
1995	226,388	5,130,247	1	10
1996	215,144	7,959,546		99
1997	209,560	11,623,046		80
1998	199,515	19,711,560		75
1999	127,035	17,507,847		41
2000	159,854	27,971,732		44
2001	262,167	68,611,341		55
2002	278,769	95,735,474		63
2003	262,151	115,032,978		77

Table 4.14 Total Crop Production and its Marketing Value in Şırnak , (SIS, 2005)

4.2.2 Field Crops

In the Region main agricultural crop type is a field crop. The field crops consist of cereals, pulses, industrial crops, oil seeded crops and tuber crops. The field crop production is around 70 % of the total crop production in the Region (Figure 4.3). However, share of marketing value of field crops is slightly smaller than its production percentage, around 60 % between 1994 and 2003 (Figure 4.4). With high production and marketing percentage field crops are key elements of economic activity in the Region.



Figure 4.3 Percentage of Field Crop Production in Total Crop Production in GAP



Figure 4.4 Percentage of Field Crop Marketing Value in Total Crop Value in GAP

The total field crop production in GAP has an increase trend after the start of irrigation in the Region (1994). The amount of field crops produced was 4,873,069 tons with a market value of 987.99 million USD in 1994; these

numbers have changed to 6,425,114 tones and 1,8 billion USD in 2003 (Table 4.15).

Table 4.15 Total Field Crop Production and its Marketing Value in GAP, (SIS, 2005)

	GAP		
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)
1994	4,873,069	29,899,228	987.99
1995	4,751,319	75,653,060	1,624.90
1996	5,073,171	138,958,295	1,725.24
1997	4,414,770	244,627,760	1,688.06
1998	5,724,815	483,496,449	1,830.16
1999	4,081,683	495,881,036	1,162.35
2000	4,045,783	744,406,602	1,183.85
2001	6,947,463	1,464,372,281	1,175.63
2002	6,502,472	2,122,366,949	1,399.04
2003	6,425,114	2,756,976,036	1,852

Table 4.16 Total Field Crop Production and its Marketing Value in Turkey, (SIS, 2005)

		TURKEY		
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)	
199	50,613,852	230,882,102	7,629.26	
199	5 52,411,665	581,106,790	12,481.22	
199	55,872,322	993,134,797	12,330.30	
199	60,582,374	1,924,856,745	13,282.51	
199	68,284,658	3,544,345,173	13,416.25	
199	59,343,348	4,593,517,900	10,767.27	
200	63,433,032	6,600,892,750	10,497.57	
200	54,192,949	8,903,224,755	7,147.68	
200	60,103,449	14,566,410,608	9,602.00	
200	50,613,852	230,882,102	7,629.26	

The field crop production of the Region is around 10 % of Turkey. In marketing values Region's share increases to 14% (Figure 4.5). The higher marketing value percentage is resulted from the sown of crops with higher marketing values in the Region (the majority of field crops are industrial crops with higher marketing values).



Figure 4.5 Percentage of Field Crop Production and Marketing Value of GAP in Turkey

Among the Region, 69 % of the field crop production is cereals. Pulses and oil seed crops follow cereals wit 10 % production share. The amount industrial crops produced are 8% of the total production in the Region, where tuber crops are 3%. The high amount of cereal production mainly depend on two reasons; namely possibility of sowing easily as a secondary crop type in farms after industrial crops; and high yield (kg/ha) rates (Figure 4.6).



Figure 4.6 Distribution of Field Crop Production by crop types in GAP



Figure 4.7 Distribution of Field Crop Value by crop types in GAP

The marketing value of cereals has also biggest portion in GAP, however far behind its production percentage with 42%. The industrial crops have the second highest share in total marketing value of field crops with 37%. The reason for this is very obvious; industrial crops are raw materials for industry thus having high market demand and value. The pulses have 17%, tuber crops have 3% and oil seed crops have 1% in total marketing values (Figure 4.7).

Şanliurfa Province is the leader in field crop production with a total amount of over 2 million tons. It is the around 75 % of all crop production. The value of produced field crops was 297 million USD in 1994 and increased to 718 million USD in 2003 (Table 4.17). The field crop production was also increased form 1.5 million tons (1994) to 2.3 million tons (2003).

Table 4.17 Total Field Crop Production (SIS, 2005)	and its Marketing Value in Şanlı	urfa,
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	ŞANLIURFA		
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)
1994	1,567,230	8,988,032	297.00
1995	1,408,364	20,476,023	439.79
1996	1,784,466	44,168,330	548.37
1997	1,499,043	75,375,438	520.13
1998	2,013,863	166,639,424	630.77
1999	1,539,306	173,696,167	407.15
2000	1,401,102	270,900,084	430.82
2001	2,592,230	556,186,530	446.52
2002	2,375,643	779,032,705	513.53
2003	2,372,634	1,070,301,480	718.79



Figure 4.8 Percentage of Field Types in Şanlıurfa (by production)

Cereals is the major field crop type in Şanlıurfa (67%) and followed by oil seed crops (15%), industrial crops (10%), pulses (8%), and tuber crops with 0.2%. On the contrary, industrial crops have the highest market value share in Şanlıurfa by 45%. Cereals have only a market value share of 42% despite of its high production percentage (67%). The value percentages of other crops are; 12% pulses, 1% oil seed crops and 0.47% tuber crops (Figure 4.7).



Figure 4.9 Percentage of Field Types in Şanlıurfa⁵ (by market value)

Diyarbakır is another province that has high field crop production (over one million tons). In 1994 1.1 million tons of field crop was produced, afterwards the production amount decreased below 1 million in 1999 and 2000. After 2000, again it raised and reached to 1.5 million tons in 2003. Its market value has also increased in terms of USD, from 228 million to 454 million (Table 4.18). The field crop type distribution in Diyarbakır is similar to Şanlıurfa, 70% of cereals, 13% pulses, 8% oil seed crops, 6% industrial crops and 3% tuber crops. However, market value distribution is different

⁵ Average of years between 1994 and 2003

than Şanlıurfa; 43% cereals, 29% industrial crops, 23% pulses, 3% tuber crops, and 2% oil seed crops.

	DİYARBAKIR		
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)
1994	1,179,976	6,925,526	228.85
1995	1,097,580	15,887,202	341.23
1996	1,123,992	29,794,782	369.92
1997	1,167,650	54,492,266	376.02
1998	1,336,124	108,331,849	410.06
1999	970,509	110,839,205	259.81
2000	928,553	164,643,326	261.84
2001	1,516,261	309,389,999	248.38
2002	1,484,661	463,892,852	305.79
2003	1,553,685	676,483,513	454.31

Table 4.18 Total Field Crop Production and its Marketing Value in Diyarbakır, (SIS, 2005)

For the other provinces, both amount of production and market values has been increased after irrigation. The total field crop production in Adıyaman province was 403,921 tons with a market value of 98 million USD in 1994 and increased to 586,630 tons with a market value of 126 million USD in 2002. In Adıyaman the dominant field crop is again cereal with 74 %, and followed by pulses 10%, industrial crops 8 %, oil seeded crops 5% and tuber crops 3%. As similar to Şanlıurfa share of industrial crops in market values is the highest with 43 % in Adıyaman despite of its low production percentage. The difference between two provinces is the type of industrial crops that has been playing an important role; cotton in Şanlıurfa and tobacco in Adıyaman.

Table 4.19 Total Field Crop Production and its Marketing Value in Adıyaman, (SIS, 2005)

	ADIYAMAN		
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)
1994	403,921	2,977,341	98.38
1995	451,083	9,851,869	211.60
1996	468,227	15,897,544	197.38
1997	328,787	29,401,889	202.89
1998	522,633	56,243,123	212.89
1999	414,083	70,396,746	165.01
2000	414,760	82,419,198	131.07
2001	673,099	136,904,094	109.91
2002	586,630	191,232,615	126.06
2003	463,693	201,426,076	135.27

Table 4.20 Total Field Crop Production and its Marketing Value in Batman, (SIS, 2005)

	BATMAN		
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)
1994	180,112	1,407,707	46.52
1995	173,020	5,635,081	121.03
1996	176,616	10,099,451	125.39
1997	198,789	24,205,303	167.03
1998	235,411	31,612,627	119.66
1999	175,325	35,371,747	82.91
2000	172,096	43,883,797	69.79
2001	238,175	61,767,278	49.59
2002	226,678	93,527,367	61.65
2003	230,951	120,473,035	80.91

Table 4.21 Total Field Crop Production and its Marketing Value in Gazianatep , (SIS, 2005)

	GAZIANTEP		
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)
1994	692,275	4,429,915	146.38
1995	623,962	7,552,628	162.22
1996	531,673	10,725,712	133.17
1997	533,057	20,708,495	142.90
1998	616,382	36,140,985	136.80
1999	465,728	40,567,819	95.09
2000	508,119	66,414,282	105.62
2001	661,918	112,146,657	90.03
2002	597,120	174,416,736	114.97
2003	666,256	251,192,746	168.70

Table 4.22 Total Field Crop Production and its Marketing Value in Kilis, (SIS, 2005)

	KILIS		
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)
1994	0	0	0.00
1995	122,469	1,974,467	42.41
1996	120,662	2,699,292	33.51
1997	62,540	2,151,294	14.85
1998	65,330	3,886,032	14.71
1999	29,072	3,201,727	7.50
2000	84,695	13,067,039	20.78
2001	81,974	19,270,289	15.47
2002	103,090	33,150,671	21.85
2003	104,027	38,118,175	25.60

Table 4.23 Total Field Crop Production and its Marketing Value in Mardin, (SIS, 2005)

	MARDİN		
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)
1994	588,672	3,269,783	108.05
1995	620,686	9,131,009	196.12
1996	603,833	16,557,460	205.57
1997	366,224	23,479,373	162.02
1998	678,658	55,163,017	208.81
1999	302,849	38,240,714	89.64
2000	300,248	59,977,914	95.38
2001	872,750	191,890,582	154.05
2002	798,177	273,391,714	180.22
2003	744,217	287,464,536	193.06

Table 4.24 Total Field Crop Production and its Marketing Value in Siirt, (SIS, 2005)

	SIIRT			
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)	
1994	85,854	559,142	18.48	
1995	69,427	1,252,869	26.91	
1996	80,856	2,310,093	28.68	
1997	71,932	4,593,527	31.70	
1998	76,526	7,654,789	28.98	
1999	69,012	8,244,749	19.33	
2000	89,040	18,701,250	29.74	
2001	69,899	18,056,019	14.50	
2002	78,697	32,093,732	21.16	
2003	61,134	27,071,973	18.18	

Table 4.25 Total Field Crop Production and its Marketing Value in Şırnak, (SIS, 2005)

	ŞIRNAK			
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)	
1994	175,029	1,341,782	44.34	
1995	184,728	3,891,912	83.59	
1996	182,846	6,705,631	83.25	
1997	186,748	10,220,175	70.52	
1998	179,888	17,824,603	67.47	
1999	115,799	15,322,162	35.92	
2000	147,170	24,399,712	38.80	
2001	241,157	58,760,833	47.17	
2002	251,776	81,628,557	53.81	
2003	228,517	84,444,502	56.71	

4.2.2.1 Cereals

In Southeastern Anatolia Region, cereals are most produced crops despite of their low marketing value. Cereals are sown mainly as a secondary product in farms after cotton. The cereal crops produced in the region include wheat, barley, maize, millet, and rice.

As the cereals are important crop type in the Region, the data about the agricultural development of such crops are analyzed in a detailed way in this section including; area sown, amount of production, yield, and marketing values.

Total cereal production in GAP increased about one million ton between 1994 and 2003, from 3.5 million tons to 4.5 million tons. The marketing value of cereals also took off from 404 million USD before irrigation (1994) to 902 million USD in 2003. When the production of cereals and its marketing value is compared with Turkey, the percentage of GAP increased from 13% to 15% between 1994 and 2003 both in production and marketing values (Figure 4.10). The 2% change in cereal production is very small if the amount of investments and time elapsed since the commencement of GAP is considered. There are several reasons for this small change; the low market value of the cereals, insufficient education of farmers about the crop production and ineffective utilization of water resources.

	GAP			
YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)	
1994	3,529,282	12,542,329		414
1995	3,237,301	27,320,413		587
1996	3,556,582	64,130,863		796
1997	2,836,440	87,022,889		601
1998	3,962,877	201,693,936		763
1999	2,657,698	179,758,065		421
2000	2,388,508	238,098,065		379
2001	5,188,386	726,591,467		583
2002	4,540,506	991,265,808		653
2003	4,539,677	1,342,710,772		902

Table 4.26 Total Cereal Production and its Marketing Value in GAP, (SIS, 2005)

Table 4.27 Total Cereal Production and its Marketing Value in and Turkey, (SIS, 2005)

		TURKEY		
YEARS		PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)
	1994	26,934,400	101,189,300	3,344
	1995	28,083,560	227,945,129	4,896
	1996	29,231,100	509,288,112	6,323
	1997	29,650,575	861,812,547	5,947
	1998	33,060,972	1,572,084,532	5,951
	1999	28,749,720	1,938,377,707	4,544
	2000	32,108,694	3,092,935,584	4,919
	2001	29,426,560	4,386,360,787	3,521
	2002	30,686,650	7,153,926,608	4,716
	2003	30,658,000	9,463,460,227	6,355



Figure 4.10 Percentage of Cereal Production of GAP in Turkey

The most cereal production in GAP is in Şanlıurfa with 35 %, and followed by Diyarbakır 24%, Gaziantep 11%, Mardin 11%, Adıyaman 10%, Batman 4%, Şırnak 3%, Siirt 1% and Kilis 1%. The marketing value distribution is similar to production distribution between provinces.



Figure 4.11 Cereal Productions by Provinces


Figure 4.12 Percentages of Cereal Types in 1990 (by production)



Figure 4.13 Percentages of Cereal Types in 2003 (by production)

The two crops wheat and barley are the dominant cereals in the Region. In 1990 the production percentage of wheat is 57% and of barley is 43%. The other cereals, maize, millet and rice have percentages lower than 1 in 1990. This distribution is not changed significantly in 2003. The percentage of wheat increased to 62%, barley decreased to 36% and maize increased to

3%. The remaining crops millet and rice has percentages lower than 1% again (Figure 4.12 and 4.13).



Figure 4.14 Percentages of Cereal Types in 2003 (by production)



Figure 4.15 Percentages of Cereal Types in 2003 (by marketing value)

If the marketing values of the cereal crop types are considered, the dominancy of wheat is observed. Wheat's share in total cereal marketing values has almost 10% more than its production percentage. This situation is also valid for millet, maize and especially for rice. As the wheat and barley has high percentages of production and market values in the Region, the development of these crops are discussed in the following parts:

<u>Wheat</u>

Wheat is the major type of cereal in GAP with 63% of production. Although the wheat-sown area has not changed before and after GAP, the yield thus the production increased significantly from 1.75 million tons in 1980 to 2.8 million tons in 2003. The important impact of GAP in wheat production is the improvement of yield from 1452 kg/ha to 2388 kg/ha between 1980 and 2003 (Table 4.28). The change in yield indicates that the agricultural efficiency has improved after the projects implemented in the framework of GAP with modern equipment, effective utilization of water, fertilizers and more consciousness farmers.

The market value of the wheat changed with production increase, 241.55 million USD in 1980, 389.19 million USD in 1995 (just after the start of irrigation) and reached to 621.97 million USD in 2003. The marketing values in terms of USD for the periods 1998-1999 and 2001 were contradicted as a result of the imbalance structure of Turkish Economy.

	WHEAT					
Years	Area Sown (ha)	Production (ton)	Yield Kg/Ha	Value (million TL)	Value (million USD)	
1980	1,294,178	1,754,850	1,452	19,030	241.55	
1985	1,080,941	1,748,777	1,618	119,330	228.20	
1990	1,040,440	1,720,360	1,653	885,223	336.02	
1995	1,042,330	1,873,804	1,798	18,120,049	389.19	
1996	1,094,998	2,189,935	2,000	42,343,947	525.72	
1997	1,166,718	1,788,438	1,533	60,465,453	417.24	
1998	1,175,179	2,620,438	2,230	145,667,962	551.39	
1999	1,196,445	1,723,885	1,441	125,156,423	293.37	
2000	1,039,378	1,547,614	1,489	158,387,599	251.89	
2001	1,154,713	3,101,001	2,686	462,346,052	371.18	
2002	1,159,381	2,863,013	2,469	699,507,115	461.11	
2003	1,175,842	2,807,663	2,388	926,128,825	621.97	

Table 4.28 Wheat Production in GAP, (SIS, 2005)



Figure 4.16 Percentages of Wheat Production of GAP in Turkey

The total wheat production in the Region is the 10% of the wheat production of Turkey in 1980. This proportion has increased 5 % and become 15 % of the Turkey's production in 2003. While the share of GAP in

production increases, the percentage of wheat-sown area in Turkey remains almost same (Figure 4.16). This is an evidence of the increase in yield in Region, which indicates the development in agricultural sector.

Among the provinces of Southeastern Anatolia Region, Şanlıurfa produces the most wheat. The annual wheat production in the province was 314,210 tons with a market value of 43 million USD in 1980. In 2003, the amount of production is 925,412 tons with a market value of 212 million USD (Table 4.29). Although the size of the wheat-sown area has decreased in these years from 445,850 ha to 364,483 ha, the yield of wheat production has increased from 705 kg/ha to 2539 kg/ha between 1980 and 2003. The yield reached to its peak value in 2001, 2914 kg/ha and accordingly in the same year wheat production had its peak value over one million tons.

	Area	Production	Yield	Value	Value (million
Years	Sown (ha)	(ton)	Kg/Ha	(million TL)	USD)
1980	445,850	314,210	705	3,456	43.87
1985	336,991	438,249	1,300	29,363	56.15
1990	349,172	535,150	1,533	271,856	103.19
1995	360,316	524,529	1,456	5,508,604	118.32
1996	405,948	787,277	1,939	15,279,472	189.70
1997	429,678	617,547	1,437	20,950,900	144.57
1998	426,063	879,995	2,065	48,828,283	184.83
1999	411,739	632,471	1,536	46,565,045	109.15
2000	269,499	441,731	1,639	47,459,579	75.48
2001	370,765	1,080,378	2,914	162,624,979	130.56
2002	355,134	917,491	2,584	227,697,411	150.10
2003	364,483	925,412	2,539	316,877,726	212.81

Table 4.29 Wheat Production in Şanlıurfa, (SIS, 2005)

The second wheat production center in the Region is Diyarbakır with 697,577 tons in 2003 having a marketing value of 151.8 million USD. The wheat production yield of Diyarbakır is less than Şanlıurfa , so the production in Diyarbakır is less than Şanlıurfa although the sown area of wheat is close

in these provinces. Similar to Şanlırfa, the yield of wheat production in Diyarbakır has increased between 1980 and 2003, from 1431 kg/ha to 2301 kg /ha (Table 4.30).

	_				Value
	Area	Production	Yield	Value	(million
Years	Sown (ha)	(ton)	Kg/Ha	(million TL)	USD)
1980	278,328	398,270	1,431	3,983	50.56
1985	276,361	462,825	1,675	33,786	64.61
1990	254,214	446,336	1,756	225,846	85.73
1995	228,228	424,736	1,861	4,130,982	88.73
1996	230,942	436,962	1,892	8,620,823	107.03
1997	253,978	442,179	1,741	14,197,926	97.97
1998	257,157	589,807	2,294	32,008,236	121.16
1999	276,863	379,153	1,369	24,980,875	58.56
2000	271,142	356,776	1,316	33,922,619	53.95
2001	279,247	673,015	2,410	94,806,950	76.11
2002	287,690	691,630	2,404	155,514,389	102.51
2003	303,183	697,577	2,301	226,030,992	151.80

Table 4.30 Wheat Production in Diyarbakır, (SIS, 2005)

The share of wheat production in other provinces, Adıyaman, Batman, Siirt, Şırnak, Mardin, Kilis and Gaziantep have same development trend like Şanlıurfa and Diyarbakır after GAP; increase in yield and production. Following Şanlıurfa (31%) and Diyarbakır (23%), Gaziantep has a share of 12% in wheat production, Mardin 12%, Adıyaman 10%, Batman 5%, Şırnak 4%, Siirt 2% and Siirt 1% (Figure 4.17).



Figure 4.17 Wheat Production Distributions by Province in GAP



Figure 4.18 Average Yields in Wheat Production

The ranking of provinces according to average yield in wheat production is different than production. The yield of Gaziantep is above 2500 kg/ha, where in the other provinces average yield is below 2000 kg/ha. This value is below 1500 in Kilis and Siirt (Figure 4.18).

Barley

Barley is the second major cereal type in terms of production in GAP. Although the percentage of barley production in total cereals has decreased since 1990 (43%), it covers still a big portion of production and a major crop in the Region with 36% in 2003. If the barley production since 1980 is considered, a high jump in production values is clearly seen, despite of reduction in its percentage in total cereal production. This 7% decrease in production percentage is due to its relatively low marketing value. Farmers always have tendency to earn more money, which force them to sown more valuable crops like wheat in cereal type crops.

The major change in area sown of barley was between 1980 and 1985 from 339,425 ha to 587,894 ha. After GAP Project (1995) the level of barleysown area has not shown a significant change, only some small fluctuations. However both in yield and production the impacts of GAP can be clearly seen. The level of yield of barley production has changed 31% in positive way and reached to 2659 kg/ha. Accordingly the production values showed an increase trend from 481,000 tons in 1980 to 1.6 million tons in 2003 (Table 4.31).

Despite of the positive trend in production and yield, the change in marketing value of barley is relatively smaller. It increased only 20% in terms of USD.

Years	Area Sown (ha)	Production (ton)	Yield Kg/Ha	Value (million TL)	Value (million USD)
1980	339,425	481,856	1,420	4,044	41.67
1985	587,894	1,103,786	1,878	56,622	92.62
1990	605,108	1,304,213	2,155	531,860	201.88
1995	675,684	1,349,063	1,997	8,955,529	192.35
1996	650,275	1,343,375	2,066	20,974,504	260.41
1997	631,589	1,014,056	1,606	24,995,843	172.48
1998	585,863	1,300,365	2,220	52,530,377	198.84
1999	564,146	895,998	1,588	51,672,744	121.12
2000	544,371	788,086	1,448	70,892,320	112.74
2001	702,183	2,034,904	2,898	251,309,047	201.76
2002	674,736	1,634,407	2,422	277,872,174	183.17
2003	605,320	1,609,526	2,659	367,215,186	246.61

Table 4.31 Barley Production in GAP, (SIS, 2005)

The order of provinces in barley production is same as wheat. Şanlıurfa (36%) is the leader and followed by Diyarbakır (25%), Mardin (12%), Gaziantep (9%), Adıyaman (9%), Barman (3%), Şırnak (2%), Kilis (2%), and Siirt (2%).



Figure 4.19 Barley Production Distributions by Province in GAP

The barley production in Şanlıurfa has increased from 355,697 tons with a market value of 35.37 million USD in 1985 to 614,149 tons with a market value of 93 million USD in 2003. The change in yield is again affected by same conditions with general of GAP (from 1526 in 1985 to 2479 in 2003). The situation in Diyarbakır is same with Şanlıurfa, but the yield in Diyarbakır is more than Şanlıurfa.

Years	Area	Production	Yield	Value (million	Value (million
	Sown (ha)	(ton)	Kg/Ha	TL)	USD)
1980	121,550	78,068	642	703	8.92
1985	233,080	355,697	1,526	18,496	35.37
1990	237,590	480,041	2,020	188,656	71.61
1995	265,949	445,756	1,676	2,622,828	56.33
1996	250,171	491,315	1,964	6,979,621	86.66
1997	244,162	344,452	1,411	8,088,422	55.81
1998	221,086	485,335	2,195	18,105,908	68.54
1999	222,204	346,657	1,560	20,329,006	47.65
2000	171,563	232,610	1,356	22,568,520	35.89
2001	279,949	790,094	2,822	97,177,612	78.02
2002	279,434	660,535	2,364	107,352,790	70.77
2003	247,763	614,149	2,479	139,432,704	93.64

Table 4.32 Barley Production in Şanlıurfa, (SIS, 2005)

Table 4.33 Barley Production in Diyarbakır, (SIS, 2005)

Years	Area Sown (ha)	Production (ton)	Yield Kg/Ha	Value (million TL)	Value (million USD)
1980	72,350	140,495	1,942	1,264	16.04
1985	137,730	280,715	2,038	14,036	26.84
1990	153,131	348,307	2,275	137,581	52.22
1995	179,122	372,299	2,078	2,689,116	57.76
1996	168,402	343,007	2,037	6,129,071	76.10
1997	162,959	340,984	2,092	8,633,033	59.57
1998	150,073	330,877	2,205	13,379,011	50.64
1999	137,429	252,759	1,839	13,426,558	31.47
2000	140,500	212,754	1,514	18,352,586	29.19
2001	164,755	468,171	2,842	60,765,787	48.78
2002	152,420	351,312	2,305	58,003,016	38.23
2003	142,952	381,811	2,671	87,377,447	58.68

If the yield in barley production is compared among the provinces in GAP, it is seen that the Adıyaman has the highest yield (Figure 4.19). The yield in Şanlıurfa, which produce most of barley in the Region, is relatively small than the other provinces.



Figure 4.20 Average Yields in Barley Production

Other Cereals

Millet, rice and maize are the minor cereal types in terms of production and marketing value in the Region. The production percentage in total cereals of these three crops is only 1%. Their percentage in marketing values is much more than their production share, almost 4%.

Although the amount of millet is small with respect to other cereals, its percentage in millet production in Turkey is high. In 1985 35% of millet production in Turkey was from Southeastern Anatolia Region. However, after 1985 it decreased constantly and become 20% in 2003. The reduction in millet production by percentage is caused from replacement of millet by other relatively valuable crops. Maize and rice production in GAP covers small percentage in Turkey, 1% and 3% respectively.



Figure 4.21 Percentages of other cereals in Turkey's total production

The maize production in GAP has significantly increased in 2003 from 40,000 tons in 2002 and 110,000 tons in 2003. Before 2002 the average production value of maize in the Region is around 30,000 tons per year. The marketing value of maize in the Region has similar growth trend with its production (Figure 4.22).



Figure 4.22 Maize Productions in GAP



Figure 4.23 Millet Production in GAP

Contrary to maize production, millet production has decreased after 1995 from 60,000 tons to 10,000 tons (Figure 4.23). Rice production in the Region has changed time to time. The average value of rice production is 50,000 tons (Figure 4.24).



Figure 4.24 Rice Productions in GAP

4.2.2.2 Industrial Crops

Cotton, sugar beets and tobacco are the main industrial crops produced in Southeastern Anatolia Project. Industrial crops are important as their marketing values are high and they are the raw materials for industry. For this reason, after irrigation the production of industrial crops has taken off. However, the lack of consciousness in the local people (farmers) about effective agriculture caused several problems like salination and erosion. The yield of industrial crop production has become less especially due to successive planting of cotton. After realization of such problems, several projects are planned and implemented in the Region to put immediate measures.

Before irrigation (1994), industrial crop production was 270,132 tons. Immediately after irrigation in 1995 it increased 46,000 tons. In 2003 the industrial crop production has reached to 528,798 tons. The most important change before and after irrigation is the change in marketing values of industrial crops. The difference between 1995 and 1994 values is 338 million USD (Table 4.34). This enormous difference occurred only in one year is not resulted from only from increase in production. The change in crop design with beginning of cotton production immediately after irrigation is the main result of the acceleration in marketing value. Since 1995 the market value in terms of USD has only changed in small amounts.

The percentage of GAP in Turkey with respect to industrial crop production has an average of 5%. Before and after irrigation in production ratio is slightly increased from 2% to 4%. However, the share of GAP in Turley in terms of marketing value of industrial crops is much higher than production percentage. Before irrigation it was 16.7%, and increased to 26.1% in 2003. The effect of change in crop design to the ones having higher marketing values is seen here obviously (Figure 4.25).

YEARS	PRODUCTION (tons)	VALUE (in million TL)	VALUE (in million USD)
1994	86,953.00	4,357.43	55.31
1995	182,964.00	30,966.29	59.22
1996	436,931.00	1,004,918.69	381.45
1997	687,809.00	29,053,865.42	624.03
1998	743,038.00	47,554,844.24	590.42
1999	918,190.00	112,918,127.52	779.19
2000	1,087,561.00	187,324,728.83	709.07
2001	941,835.00	216,462,825.50	507.39
2002	1,203,094.00	357,510,130.69	568.56
2003	1,177,062.00	442,650,521.90	355.37

Table 4.34 Industrial Crop Production in GAP, (SIS, 2005)



Figure 4.25 Industrial Crop Production Share of GAP in Turkey

The sown area of industrial crops has significantly changed after GAP Project. The sown area of industrial crops was only 50,000 ha in 1980; afterwards it increased constantly and reached 250,000 ha in 1995. The

increase trend has continued since 2003 and become 350,000 ha, which is the 25% of the total industrial crop planting area in Turkey (Figure 4.26).



Figure 4.26 Industrial Crops in GAP – Area Sown

Şanlıurfa is the center of industrial plant production. The major development in industrial plant production is observed only in Şanlıurfa among the Region after GAP. The direct impacts of the agricultural projects under GAP have become clearer in Şanlıurfa and its vicinity. The industrial crop planting area has increased from 64,000 ha in 1980 to 332,000 ha in 2003. The production value of industrial crops in Şanlıurfa has same trend until 2001, expand from 87,000 tons/year in 1980 to 1.19 million tons/year in 2000. The development in production values is quite significant, almost increased 32 times in 20 years. However, a major drop in production was seen between 2000 and 2001, from 1.2 million tons to 1 million tons (Figure 4.27). The reason for this major change is the decrease in yield of industrial crop production. The salination problems due to overuse of water, erosion due to uncontrolled drainage through the years of irrigation are the main factors for the change in yield.



Figure 4.27 Industrial Crops in Şanlıurfa

The dominancy of Sanliurfa after GAP Project is more obvious from the Figures 5.28 and 5.29. Before GAP started, in 1980, the percentage of Sanliurfa in industrial crop production was 22%. In 2003, this percentage is raised to 71. The incredible increase 49% is resulted from the irrigation projects completed until 2003. Sanliurfa is the only province that has a developing agricultural activity, although agriculture component of GAP covers all of the nine provinces. The explanation for the situation is behind the investment rate that has completed until today. One of the handicaps of GAP is the decrease in investment rate for the completion of the Project. At the planning stage of GAP, it was estimated that the project components would be completed until 2005. However, this was far behind the reality. Only a small portion (20%) of the required investment has been realized until today. In addition to insufficient investments, the direction of investment could not be enlarged, most of them only focused on development of Harran plain and its vicinity without considering agricultural potential of the other provinces.



Figure 4.28 Industrial Crop Production Percentages by Province in 1980



Figure 4.29 Industrial Crop Production Percentages by Province in 2003

The major industrial crop type that sown in the Region is cotton, with an average of 91% (average of production values between 1980 and 2003). The other two crops sugar beets and tobacco has small ratio by means of production, 5% and 4% respectively (Figure 4.30).



Figure 4.30 Production percentages of Industrial Crop Types in GAP

<u>Cotton</u>

Cotton is one of the most important industrial crops due to its market value and place in manufacturing industry. It is the raw material of textile industry that is the major manufacturing industrial sector in Turkey. Turkish textile sector has not only a big marketing value inside the Country but also a significant effect on exporting and foreign market value.

The economic revenues stemming from textile industry has transformed the cotton as the most favorite industrial crop in Turkey. From the farmer's side, this crop is also one of the most profitable agricultural crop. The effects of cotton production and related industrial developments are so obvious that it can be easily seen from the social economic development of Çukurova region, which was the regional leader in cotton production in Turkey before GAP Project. So, cotton production is not only an agricultural activity but also an industrial and economic activity that has socio-economic regional effects. The change in employment opportunities can be a basic example to this situation. Before irrigation in GAP, the local people in Southeastern Anatolia migrate to Çukurova every year in cotton season in order to earn their life. However, after GAP the direction of this migration has

changed. Today, without the need of migration, people can easily find an opportunity to work in cotton fields.

In Southeastern Anatolia irrigated area and cotton production has been increasing as a result of Atatürk Dam and irrigation projects, or shortly GAP Project. Before the start of irrigation (1994) cotton-sown area was only 160,000 hectares, and has increased significantly after irrigation to 300,358 hectares in 2003 (Table 4.35). The major effect in this increase is after the opening of first Şanlıurfa irrigation tunnel at the end of 1994.

Increase in the size of irrigated lands also affected the cotton production. Before irrigation the cotton production was only around 160,000 tons, and after irrigation it has reached to 1,135,886 tons in 2003. GAP water and irrigation investments have transformed Southeastern Anatolia into a leader in cotton production of Turkey, in 1994 GAP's share is only 25 %, but according to the values of 2003, it expanded to 48.42 %. Today, as a result of GAP project, the Region has become the main cotton supplier in Turkey (Figure 4.31). After the start of irrigation in the Region, Turkey's cotton production is also increased in World's market significantly.

Years	Area Sown (ha)	Production (ton)	Yield Kg/Ha	Value (million TL)	Value (million USD)
1980	42,044	61,049	1,452	2,532	32.14
1985	84,950	160,602	1,891	30,884	59.06
1990	134,016	356,981	2,664	604,165	229.33
1995	204,232	599,685	2,936	19,618,857	421.38
1996	226,205	670,352	2,963	33,014,526	409.89
1997	265,228	791,875	2,986	70,580,257	487.04
1998	307,164	946,912	3,083	132,231,714	500.53
1999	331,895	843,514	2,542	151,890,377	356.03
2000	316,819	1,116,273	3,523	302,465,485	481.02
2001	310,071	1,120,547	3,614	446,773,192	358.68
2002	360,020	1,297,967	3,605	684,292,082	451.08
2003	300,358	1,135,936	3,782	867,505,426	582.60

Table 4.35: Total production, area sown and yield in cotton, (SIS, 2005)



Figure 4.31: Change in Share of GAP in Cotton Production of Turkey



Figure 4.32: Turkey's Cotton Area by Region

The cotton-sown area in the Region has changed so fast that it became the largest cotton area in Turkey after 1998 (Figure 4.32). This result is very important evidence of how the agricultural development is progressing and how an arid land has become a useful plain.

In terms of yield in cotton production, the values for Region have changed in positive way immediately after irrigation. In 1980 the value of yield was 1452 kg/ha, and increased to 3782 kg/ha in 2003. A decrease trend is observed in 1998-1999 by an amount of 500 kg/ha. By the increase in production, value added resulted from cotton has significantly changed. The change in gross sale resulted from cotton production is 550 million USD between 1980 and 2003 (Table 4.35).

Especially Şanlıurfa, Harran Plain, has become major cotton sown area in the Region after GAP with marketing value of 319 million USD in 2003. The change in production, total market values and in yield of cotton is remarkable. Production increased from 19,000 tons in 1980 to 639,475 tons in 2003; yield has changed from 1539 kg/ha to 3855 kg/ha between those years, and total marked has increased by an amount of 300 million USD (Table 4.36).

	Area Sown	Production	Yield	Value	Value
Years	(ha)	(ton)	Kg/Ha	(million TL)	(million USD)
1980	12,310	18,946	1,539	815	10.34
1985	30,688	64,948	2,116	12,340	23.60
1990	63,233	180,154	2,849	316,711	120.22
1995	91,920	277,696	3,021	8,732,151	187.55
1996	109,893	334,084	3,040	15,878,678	197.14
1997	123,393	401,603	3,255	35,314,960	243.69
1998	152,659	488,038	3,197	67,686,478	256.21
1999	174,934	462,655	2,645	81,975,989	192.15
2000	179,300	661,950	3,692	169,732,585	269.93
2001	157,200	566,775	3,605	222,192,803	178.38
2002	177,500	639,475	3,603	339,235,732	223.62
2003	168,600	649,960	3,855	475,844,815	319.57

Table 4.36: Cotton Production in Şanlıurfa, (SIS, 2005)

The other important cotton center in GAP is Diyarbakır with 249,873 tons of production in 2003. Similar to Şanlıurfa, after GAP the cotton production, yield and total marked values in Diyarbakır have increased significantly. The change in cotton production in Diyarbakır between 1980 and 2003 is as follows: area sown from 6970 ha to 70,175 ha; production from 11,734 tons to 249,873 tons, yield from 1684 kg/ha to 3561 kg/ha, and total annual marketing value from 5.66 million USD to 137.73 million USD (Table 4.37).

Years	Area Sown (ha)	Production (ton)	Yield Kg/Ha	Value (million TL)	Value (million USD)
1980	6,970	11,734	1,684	446	5.66
1985	20,315	35,152	1,730	7,241	13.85
1990	33,633	90,667	2,696	140,081	53.17
1995	43,652	113,944	2,610	3,553,913	76.33
1996	43,652	115,678	2,650	5,265,778	65.38
1997	65,000	162,500	2,500	13,369,525	92.26
1998	66,070	184,996	2,800	25,597,157	96.89
1999	65,000	150,700	2,318	28,723,420	67.33
2000	64,040	198,092	3,093	52,508,048	83.50
2001	53,811	186,983	3,475	69,429,219	55.74
2002	61,770	221,574	3,587	115,301,349	76.01
2003	70,175	249,873	3,561	205,083,265	137.73

Table 4.37: Cotton Production in Diyarbakır, (SIS, 2005)

The share of other provinces is small compared to Şanlıurfa and Diyarbakır. The average share of the provinces between 1980 and 2003 are in order of Şanlıurfa (51.1%), Diyarbakır (18.6 %), Mardin (8.4 %), Şırnak (6.1 %), Gaziantep (5.1 %), Adıyaman (3.9 %), Batman (3.2 %), and Kilis (0.2 %).



Figure 4.33: Distribution of Cotton Production by Provinces in GAP

Different from other crops, the percentage of Şırnak in cotton production is very high (Figure 4.33). Important development in cotton production in Şırnak has observed after GAP. The production values increased more than 20 times between 1990 and 1995, from 1510 kg to 62,250 tons. However, in 1999 the production values decreased to the half of the production of 1998 to 36,680 tons. Afterwards it again catches the increase trend and reached to 42,319 tons in 2003 (Figure 4.38).

Years	Area Sown (ha)	Production (ton)	Yield Kg/Ha	Value (million TL)	Value (million USD)
1990	1,510	3,406	2,256	6,189	2.35
1995	17,900	62,250	3,478	2,241,000	48.13
1996	19,900	68,257	3,430	4,266,882	52.98
1997	21,150	66,890	3,163	5,536,151	38.20
1998	22,150	66,450	3,000	9,435,900	35.72
1999	14,829	36,680	2,474	6,645,169	15.58
2000	9,516	29,238	3,073	8,917,590	14.18
2001	13,179	41,966	3,184	18,055,242	14.50
2002	15,472	53,787	3,476	27,459,393	18.10
2003	12,091	42,319	3,500	29,961,852	20.12

Table 4.38: Cotton Production in Şırnak, (SIS, 2005)

<u>Tobacco</u>

Before GAP Project, the main industrial crop was tobacco in the Region. The lead of tobacco was replaced with cotton after GAP Project. The annual production level of tobacco has decreased from 46,000 tons in 1990 to 14,355 tons in 2003. Accordingly the total annual market values have decreased from 150 million USD to 28 million USD (Table 4.38).

Years	Area Sown (ha)	Production (ton)	Yield Kg/Ha	Value (million TL)	Value (million USD)
1980	15,864.00	24,220.00	1,526.73	1,821.98	23.13
1985	12,496.00	16,247.00	1,300.18	0.00	0.00
1990	41,089.00	46,091.00	1,121.74	396,797.49	150.62
1995	27,519.00	37,231.00	1,352.92	9,307,750.00	199.92
1996	31,091.00	41,543.00	1,336.17	14,471,545.65	179.67
1997	49,445.00	61,568.00	1,245.18	41,607,654.40	287.11
1998	47,490.00	50,201.00	1,057.09	47,776,190.93	180.85
1999	36,896.00	42,940.00	1,163.81	63,136,141.87	147.99
2000	30,097.00	29,708.00	987.08	51,514,384.63	81.92
2001	15,272.00	15,663.00	1,025.60	31,933,834.28	25.64
2002	12,294.00	13,274.00	1,079.71	47,454,536.65	31.28
2003	17,373.00	14,355.00	826.28	41,198,323.17	27.67

Table 4.39: Tobacco Production in GAP, (SIS, 2005)

Adıyaman produces 41.1 % of the total cotton production in the Region, followed by Batman (35.1%), Diyarbakır (11%), Siirt (9.5%), Mardin (2.9%), and Gaziantep (0.4%).



Figure 4.34: Distribution of Tobacco Production by Provinces in GAP

Sugar Beet

Sugar beet is another major industrial crop in the Region with 5 % production ratio. Production of sugar beet in GAP showed varying change between 1980 and 2003. It was 1684 ton in 1980 and increased to 50,893 tons in 1995. It reached to a peak value in 1998 to 90,448 tons. Afterwards it showed a decreased trend and dropped to 37,968 tons in 2003. The change in market value of the sugar beet is similar to production change. First it increased from 0.04 million USD in 1980 to 5.74 million USD in 1998, and decreased to 2.19 million USD in 2003 (Table 4.39). Despite of fluctuations in production and values, the yield of sugar beet production has increased in the Region from 17,542 kg / ha in 1980 to 41,046 kg/ha in 2003.

Gaziantep is the center of sugar beet production among the Region with 72.2 %. Adıyaman is the second province with 19.5 %, followed by Diyarbakır 4.2%, and Kilis 3.1% (Figure 4.35). Contrary to other industrial crops, the share of Şanlıurfa in sugar beet is very low, 1.1 %. In other provinces the sugar beet production is negligible, smaller than 1%.

Years	Area Sown (ha)	Production (ton)	Yield Kg/Ha	Value (million TL)	Value (million USD)
1980	96	1,684	17,542	3	0.04
1985	341	6,115	17,933	83	0.16
1990	993	33,859	34,098	3,956	1.50
1995	1,338	50,893	38,037	127,233	2.73
1996	1,846	31,143	16,871	137,029	1.70
1997	2,019	64,747	32,069	730,216	5.04
1998	2,779	90,448	32,547	1,515,094	5.74
1999	1,436	55,381	38,566	1,436,306	3.37
2000	1,484	57,113	38,486	2,091,022	3.33
2001	1,197	40,852	34,129	1,838,340	1.48
2002	980	35,635	36,362	2,775,289	1.83
2003	925	37,968	41,046	3,263,008	2.19

Table 4.40: Sugar Beet Production in GAP, (SIS, 2005)



Figure 4.35: Distribution of Sugar Beet Production by Provinces in GAP

CHAPTER 5

INDUSTRIAL DEVELOPMENT

Industrialization is a defining factor in socio-economic development. Employment generation, growth in gross national domestic product, and income per capita is directly related to the development in industrial sector in a region. The realization of transformation from an agricultural based economy to industrial based one is a fundamental requirement of the growth in income levels and sustainable development in economic and social sectors.

The aim of industrial development component of the GAP project is to transform the region to an "agriculture based export center" (GAP, Administration 2003). However, the change in industrial sector in the Region remains only with improvement resulted from public investments. The attraction of private capital and investment could not reach to the sufficient amount to change the economic face of GAP.

The construction of seven Organized Industrial Zones (OIZ) has been completed in the Region. The provincial distribution of these organized industrial zones are as follows; three of them in Gaziantep (260 ha, 500 ha, and 540 ha), one in Şanlıurfa (286 ha), one in Adıyaman (150 ha), one in Mardin (300 ha), and one in Kilis (90 ha). The percentage of OIZ in terms of coverage area in Turkey is around 12.4 %. Until the end of 2002, there were 680 active establishments with 62,000-employment capacity exist in these organized industrial zones (GAP Administration, 2004). The construction of five industrial zones in the Region has not completed yet which are located in Diyarbakır (523 ha), Siirt (100 ha), Batman (100 ha), Şırnak and Kilis.

The infrastructure of 22 small-medium industrial areas is completed with 83% of usage ratio. The eight of them are located in Gazinatep, six of them in Diyarbakır, one in Adıyaman, four in Şanlıurfa, one in Siirt, one in Batman, and one in Kilis. The existing 7044 establishments in these industrial areas generate employment to approximately 35,000 employees.

In GAP Region, there two free trade zones, one in Gaziantep and one in Mardin. In Gaziantep free trade zone there are 18 establishments with 54.3 million USD trade capacities in 2001. Mardin free trade zone, which consists of 34 establishments, has an average annual trade capacity of 5.5 million USD (Table 5.1).

Table 5.1: Free Trade Zones in GAP

	FREE TRADE ZONES				
	Mardin	Gaziantep			
Number of Establishments	34	18			
Trade Capacity (million USD)					
1998	13.7	16			
1999	5.3	15.7			
2000	5.5	35.7			
2001	5.3	54.3			

After the start of irrigation in the Region, there are major changes in industry sector is observed. Between 1995 and 2000, the number of establishments in industry was almost doubled. The ratio of Region's industry in the total industrial value added of Turkey has increased from 2% to 4%.

Region's industry is mainly composed of food and textile industry. These establishments are mostly small and medium size establishments. The relatively big sizes ones are mostly located in Gaziantep. The total number of establishments with an average employee of more than 100 is 82 in 2001, where 59 of them are located in Gaziantep. The changes in industry can be observed from the Development Ranking of Provinces Study prepared by State Planning Organization in 1996 and 2003. According to the study, there is no significant change in industry sector of the Region. The ranking of GAP has not changed between 1996 and 2003 among the regions of Turkey (Table 5.2). In terms of number of parcels in OIZ, the ranking of GAP is 4th with 667 parcels in 1996 and 1733 parcels in 2003. Although the ranking is the higher than Region's overall ranking, the percentage of number of parcels in Turkey has decreased from 11% to 6%. Considering the number of establishments in manufacturing industry, the situation of the Region shows better results. The change in the numbers of establishments between 1996 and 2003 is around 45%. Its percentage in Turkey has also risen from 2.35% to 3.23%.

The annual average number of employees in manufacturing industry has increased 35.65% from 23,279 to 31,576. However, if the total population growth between these years is considered, the increase in number of employees not becomes an achievement.

In the comparison of economic side of manufacturing industry, annual value added per capita, Region has stepped forward from 7th place to 6th place. The percentage of Region in Turkey has risen up from 12% to 21%.

	GAP		TURKEY	,	Ranking of GAP (among 7 regions)		
Variables\ Year	1996	2003	1996	2003	1996	2003	
Number of parcels in OIZ	667	1,733	5,893	28,756	4	4	
Number of Establishments in Manufacturing Industry	248	359	10,541	11,118	6	6	
Average Number of Employees in Manufacturing Industry in a Year	23,279	31,576	978,983	1,130,488	6	6	
Value Added of Manufacturing Industry per Capita (million TL)	0.93	73.00	7.60	350.00	7	6	

Table 5.2: Change in Industry Indicators of GAP

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However, these small changes in the selected variables of industry do not indicate a major development in industry. On the contrary, by examining these figures, it can be concluded that the impacts of GAP Project in industry is very small and the industrial development target of GAP did not come into reality.

When the types of industrial activities are considered, despite of decrease between 1987 and 2000, mining still has an important role in the Region. The percentage of mining industry of the Region in Turkey has decreased from 23.1 % to 19.5 %. The change in manufacturing industry, which is very important by means of economic income generation, is very small, from 2.2% to 2.3 %. There is almost no change in electricity gas and water industry in the Region, 7.4% for 1987 and 2000 (Table 5.3).

Table 5.3: Types of industrial activities in GAP (%)

	GAP / Turkey			
Types of Industrial Activity	1987	2000		
Mining	23,1	19,5		
Manufacturing Industry	2,2	2,3		
Electricity, Gas And Water	7,4	7,4		

5.1 Manufacturing Industry

Manufacturing Industry is the main defining factor and locomotive of economic structure. The strength of economic structure depends on the development level of manufacturing industry.

The GAP Project did not bring a strong manufacturing industry to the Region. The development in manufacturing industry is very low compared to Turkey. Only in Gaziantep, this industrial activity is well developed. However, it will not be correct to relate the industrial development of Gaziantep to the impacts of GAP Project. Gaziantep was also a trade and industry center in Region before GAP. The only impact of the Project helped Gaziantep to strengthen its dominancy in industry among the Region.

In terms of share of manufacturing industry in total gross national product generation in GAP, no major change is observed. It increased only a small amount from 9 % in 1990 to 10.6 % in 2000, which are below the average of Turkey. As seen from Figure 5.1, the rate of change of manufacturing industry sector in GAP is slower than Turkey.



Figure 5.1: Share of Manufacturing Industry in GDP (%)

For the value added generation of manufacturing industry of GAP in Turkey, the situation is not very positive although it increased two times between 1980 and 2000, from 1.10 % to 2.44 %. Gaziantep generates more than half of the value added in manufacturing industry in the Region. In 1980, its share in Turkey was 0.41 %, and increased to 1.98 % in 2002. The share of Siirt was also high in 1980 (0.42 %) and in 1985 (0.53 %), but decreased to 1 ‰ in 2002. The value added generations in manufacturing industry of other provinces are very small, almost negligible (Table 5.4).

	1980	1985	1990	1995	2002
Adıyaman	0.04	0.08	0.09	0.15	0.09
Batman	-	-	0.40	0.25	0.12
Diyarbakır	0.13	0.25	0.20	0.09	0.08
Gaziantep	0.41	0.57	0.64	0.65	1.98
Mardin	0.07	0.06	0.08	0.13	0.10
Kilis	-	-	-	-	0.01
Siirt	0.42	0.53	0.01	0.01	0.01
Şanlıurfa	0.03	0.03	0.09	0.05	0.05
Şırnak	-	-	-	0.00	0.00
GAP	1.10	1.52	1.51	1.33	2.44

Table 5.4: Share of Value Added in Manufacturing Industry of GAP in Turkey, %

The number of establishments in manufacturing industry displayed an increase trend between 1990 and 1999 (Figure 5.2). The same situation is also valid for the change in number of employees. The proportion of manufacturing industry establishments in GAP to the total amount in Turkey increased from 1.9 % in 1990 to 3 % in 1999. The same proportion for number of employees increased from 2 % in 1990 to 2.6 % in 1999.



Figure 5.2 Share of Manufacturing Industry of GAP in Turkey, %

	GAP Administration (1996)				Trade and Industry Provincial Directorate (2001)				
Name of the	Establish	ment	Employment		Establish	ment	Employment		
sector	Number	%	Number	%	Number	%	Number	%	
Paper and									
paper									
products	8	2	260	1	36	3	682	1	
Wood									
Products	32	6	2662	8	71	7	2576	4	
Metal and									
Metal									
Products	44	8	1154	4	56	5	1432	3	
Chemical,									
Oil and									
Plastic	77	15	2955	9	158	15	7182	13	
Foods and									
Beverages	154	30	4850	15	299	28	7266	13	
Textile	20	39	19754	63	439	42	36531	64	
Total	516	100	31595	100	1075	100	57125	100	

Table 5.5 Sectoral Distribution of Manufacturing Industry in GAP

The sub-sectors of manufacturing industry in GAP are, paper and paper products, wood, metal, chemical, food and textile. As the cotton production has increased significantly in the Region, textile industry has grown accordingly. Between 1996 and 2001, the number of establishments in textile increased 20 times from 20 to 439. The number of employees in the textile has also increased from 19,754 to 36,532. The other important manufacturing industry type in the Region is food industry. The number of establishments in food sector rose from 39 in 1996 to 299 in 2001; also the change in employment of food industry is from 4850 to 7266.

As number of establishments is considered, the biggest share in GAP belongs to textile with 42 % in 2001. Food industry is in the second place with 28%. The shares of other industries are: chemical, oil and plastic industry 15 %, metal industry 5 %, wood products 7 %, and paper industry 3 %.

When the proportions of the manufacturing industry types in employment structure are examined, again textile has the biggest share, 64 %. The ratio of food industry is 13 %, chemical and oil industry is 13 %, metal industry is 3%, wood production is 4 % and paper industry is 1 %.



Figure 5.3: Change in number of establishments in sub-sectors of manufacturing industry

The distribution of manufacturing industry establishments in the provinces of GAP in 2001 is shown in Table 5.6. In each sector, the highest numbers of establishments are in Gaziantep. The distribution of textile industry is 41.5 % in Gaziantep, 26.4 % in Şanlıurfa, 13 % in Diyarbakır, 10.9 % in Adıyaman, 2.7 % in Mardin and Batman, 0.9 % in Kilis, 0.4 % in Şırnak, and 0.2 % in Siirt. The ratios of the provinces in food sector are in order of Gaziantep 31.1 %, Şanlıurfa 19.7 %, Diyarbakır 13.4 %, Kilis 8.7 %, Adıyaman 10.7 %, Mardin 7.4%, Batman 4.7%, Siirt 3 %, and Şırnak 0.7 %

Sector (%)	Gaziantep	Şanlıurfa	Diyarbakır	Adıyaman	Mardin	Batman	Kilis	Siirt	Şırnak
Textile	41.5	26.4	13	10.9	2.7	2.7	0.9	0.2	0.4
Food	31.1	19.7	13.4	10.7	7.4	4.7	8.7	3	0.7
Plastic	46.1	14.6	19.1	5.6	4.5	6.7	2.2	1.1	
Chemical	33.3	31.9	14.5	8.7	4.3		5.8	1.5	
Machinery	48	21.1	15.4	9.6	1.9			3.8	
Wood	36.1		33.3	11.1	5.6	5.6	2.8	5.6	
Metal	26.5	11.8	29.4	8.8	29.4	8.8	2.9		2.9
Mining			81.8		3	12.1			
Other	30	18.1	19.4		12.5	5.6	2.8		
Total	39.8	23.9	19.9	10.4	6.1	4.4	4.1	2	0.6

Table 5.6 Provincial distribution of industrial establishment in 2001, %
CHAPTER 6

ENERGY

Nowadays, energy is an important necessity for human life. The increase in the energy consumption by industrial and domestic activities makes the renewable energy sources very vital.

The energy consumption in Turkey has increased significantly for the last decades, from 1183 kWh/person to 1415 kWh/person between 1996 and 2001. It is estimated that the energy needs will become two times higher than today's value in 2010, and four times higher in 2020.

Energy investments, one of the major components of GAP, target to ensure a sustainable infrastructure development in the region. The potential of Euphrates and Tigris basins, which is the 27 % of the total water potential of Turkey, is utilized for a tow-fold purpose; namely (i) for realization of an efficient energy production (ii) for development in agricultural sector.

The potential of these basins are utilized for energy production most of which are generated from Atatürk, Birecik and Karkmış Dams, which are in an interconnected water system.

In the following table, the amount of electric energy generated from these three dams until 2002 is given with their market value in USD. Until 2002, from Atatürk, Birecik and Karkamış Dams totally 83.70 billion kWh energy was produced. Its economical equivalence was 5.022 billion USD. This amount of energy production and its economic contribution is very important in a energy crises environment.

		Set-up	Energy	Total energy	
	Year of	power	Production	production	Equivalent
Name of the Dam	operation	(MW)	(GWh)	(billion kWh)	millionUSD
Atatürk Dam and HPP	1993	2,400	8,900	79.50	4,770
Birecik Dam and HPP	2000	672	2,516	3.30	198
Karkamış Dam and HPP	1999	189	652	0.90	54

Table 6.1 Power Generations and its Monetary Equivalence (USD), until 2002 (DSI)

Source: DSI

Table 6.2 Power Generations and its Monetary Equivalence (USD) in 2002 (DSI)

Name of the Dam	Energy production in 2002 (billion kWb)	Equivalent
Atatürk Dam and HPP	5,05	303
Birecik Dam and HPP	1,72	103,2
Karkamış Dam and HPP	0,29	17,4

In the year 2002, totally 7.06 billion kWh electric energy was generated from these three dams. This value is the 5.05 % of the total energy production of Turkey (33.7 billion kWh).

		Set-up	Energy	Total energy	
	Year of	power	Production	production	Equivalent
Name of the Dam	operation	(MW)	(GWh)	(billion kWh)	millionUSD
Atatürk Dam and HPP	1993	2.400	8900	79.5	4770
Birecik Dam and HPP	2000	672	2516	3.3	198
Karkamış Dam and HPP	1999	189	652	0.9	54
Karakaya Dam and HPP	1987	1800	7354	111.8	6708
Kralkızı Dam and HPP	1998	94	146	0.4	24
Dicle Dam and HPP	1999	110	298	0.3	18

Table 6.3 Cumulative Energy Production in GAP region (DSİ)

Table 6.4 Energy Productions in Turkey and GAP (TEAŞ)

		GAP	GAP/TURK	EY		
	Thermal		Total	Hydraulic	Hydraulic	
Year	(GWh)	Hydraulic (GWh)	(GWh)	(GWh)	(%)	Total (%)
1995	52,548	31,973	84,521	16,114	50.40	19.07
1996	54,448	40,423	94,871	19,314	47.78	20.36
1997	63,299	39,764	103,063	19,385	48.75	18.81
1998	68,677	42,224	110,901	20,053	47.49	18.08
1999	81,800	34,629	116,429	14,781	42.68	12.70
2000	94,185	30,930	125,115	12,114	39.17	9.68
2001	99,004	23,998	123,002	11,490	47.88	9.34
2002	95,380	33,716	129,096	12,404	36.79	9.61

From Table 6.4, the decrease in the ratio of GAP in energy generation can be clearly seen (from % 19 to % 9.61). The reason for this is the purchase guarantee of the government to private natural gas power plants besides the cheap energy from hydroelectric power plants, which can be explained as a wrong energy policy in Turkey. It is wrong, as the hydropower energy is cleaner and cheaper than natural gas and Turkey has enough water resources to utilize for energy production. It would be more economic and efficient to use Turkish own water potential rather than importing natural gas from other countries for energy, which makes Turkey more dependable to foreign natural resources.

It is important to analyze the impacts of Atatürk Dam; the major investment in the framework of GAP, in energy sector as its contributions both to Turkey and to the Region is an evidence of the impacts of GAP Project. The impacts of Atatürk Dam in energy sector are analyzed in terms of following items:

- Energy generation and contribution to economy
- Energy consumption
- Effects on energy export
- Effects on environment and public health

6.1 Comparison of Atatürk Dam with other energy technologies

The total amount of electricity production from Atatürk Dam was 79.5 billion kWh. If it is assumed that the price of hydroelectric energy in Turkey is 6 cents/kWh, then the total amount of energy, which was generated from Atatürk Dam equals to 4.7 billion USD. It is over the total energy investments in the framework of GAP by the 2002, which is 4.17 billion USD. The total monetary equivalence becomes over 5 billion if the values from Birecik and Karkamış Dams are included.

The net unit price (purchasing price-operating costs) gives us incomes from the Atatürk dam. For operation and maintenance cost for a HPP like Atatürk is 0.203 cents/kWh. And the cost of water is so small that it can be assumed as zero. Then, the net unit price of hydroelectric energy becomes 5.797 cent, and totally until 2002 the economic revenue from these three dams become 4.85 billion USD, which is again over the total energy investment cost in the framework of GAP project.

Electric energy is a secondary energy source, which is generated from other energy sources. Thus, the technology for electric energy generation shall be carefully selected. The selection criteria for the technology are based on:

- safety
- economy
- effects on environment and public health
- efficiency of energy source

The comparison of Atatürk Dam in terms of the items identified above is discussed in the following parts:

			Total	Average		
		Cost of	operation	purchasing		Investment
Energy source	O&M cost	source	cost	price	Net price	cost
of the plant	(cent/kWh)	(cent/kWh)	(cent/kWh)	(cent/kWh)	(cent/kWh)	(\$/kW)
Natural Gas	0.415	3.609	4.024	8	3.976	795
Lignite	1.495	1.839	3.334	8	4.666	1500
Import coal	1.413	1.965	3.378	8	4.622	1325
Nuclear	0.780	1.000	1.780	No info	No info	2000
				6	5.797	1200 -
Hydroelectric	0.203	-	0.203			5000

Table 6.5 Costs for Energy Technologies (TEAŞ)

6.1.1 Comparison of operation and maintenance cost

The total amount of electric energy generated from Atatürk dam until the end of the year 2002 is 79.50 billion kWh. The operation and maintenance costs (unit prices are given in Table 6.5) of this amount of electric energy from different technologies are given below:

- Hydroelectric Power Plant : 161.385 million USD
- Natural gas PP: 2869.155 million USD
- Lignite Thermal Power Plant : 1462 million USD
- Export Coal Thermal Power Plant: 1562.175 million USD
- Nuclear Power Plant: 795 million USD

If this amount of energy was generated from:

- natural gas cycling plant, Turkey would have spent 2.7 billion USD more for operation and maintenance.
- lignite thermoelectric power plant, Turkey would have spent 1,3
 billion USD more for operation and maintenance.
- export coal thermoelectric power plant, Turkey would have spent
 1,4 billion USD more for operation and maintenance.
- nuclear power plant, Turkey would have spent 633 million USD more for operation and maintenance.

As shown in Table 6.5, the operation and maintenance cost for a hydroelectric power plant is 1/20 of a natural gas power plant. This ratio is around 1/17 for power plants with coal and lignite. This indicates that operation and maintenance costs of hydroelectric power plant are negligible for when compared with other technologies.

6.1.2 Comparison according to cost of energy source

In Turkey, the net thermal value for an imported coal is 6000 kcal/kg (humidity ratio of %8) whose cost is 50\$/ton. For 1 kWh energy production 0.393 kg coal is used. According to this, for 79.5 billion kWh electric energy (total production of Atatürk dam) 31.24 Mt coal should be used, which costs extra 1.562 billion USD for this amount of energy.

Lignite has net thermal value of 100 kcal/kg whose cost is 9\$/ton, and for 1 kWh energy 2.043 kg lignite is used. For 79.5 billion kWh energy, 162 Mt lignite should be used, which costs extra 1.46 billion USD to Turkish economy.

In natural gas power plants, for 1 kWh energy an average value of 0.193 m³ gas is used, where 1000 m³ of gas costs 187 USD. If 79.5 billion kWh energy was generated from natural gas power plant, Turkish economy should have spent extra 2.87 billion USD.

For a hydroelectric power plant, there is no cost for the source, which gives it a unique advantage among the other technologies.

6.1.3 Comparison of investment costs

If it is compared with other technologies, especially with natural gas power plants, the investment cost of hydroelectric power plant is doubled, which is a major economic claim for hydroelectric power plants.

However, these investment costs shall not be considered directly. One shall keep in mind that the economic life of a hydroelectric power plant is around 70 years whereas it is around 30 years for a natural gas power plant. Only by small investments for electro mechanic equipments (200-500 USD/kW), the economic life of a hydroelectric power plant can be extended. Thus, for a real comparison of investment values, one shall consider the investment value as USD/kW-year, not use USD/kW (Ünsal.İ, 2003).

Also, the foreign exchange needs for a hydroelectric power plant is very small and not continuous. The import ratio in energy investments in Turkey is given as below:

- for hydroelectric power plant, it is around %30; 450 USD/kW
- for natural gas power plants, it is around % 75; 596 USD/kW

This last comparison obviously support that hydroelectric power plant is more economic than other technologies in Turkey for electric energy production.

6.1.4 Comparison According to Foreign Exchange Rates

Today, the % 70 of the imported natural gas is used for energy generation, 22 % of which is lost during transportation. On the other side, Turkey uses 35 % of its hydropower potential (Ünsal.İ, 2003).

Atatürk Dam saves 2.87 billion USD exchange rates until 2002 if compared to natural gas, or 1.62 billion USD exchange rate if compared with imported coal.

6.1.5 Comparison According to CO₂ Emission

Today global warming is a serious environmental problem arises from CO₂ emission resulted from combustion of hydrocarbon energy sources, like coal, lignite, and natural gas.

As given in the previous chapters, the Atatürk Dam generates approximately 5 billion kWh electric per annum, which has not got any green house effect due to CO_2 emission. However, thermo power plants like Yatağan, Elbistan produce huge amounts of CO_2 . In the following table CO_2 emission amounts of major energy sources are given:

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Energy Source	Petroleum	Coal	Natural Gas
Average CO2 emission (kg/GJ)	85.50	69.40	52.00
Total gases which causes green house effect equivalent to CO2	1.33	0.96	1.23

Natural gas is considered as clean energy source today and is shown as an alternative energy source to hydroelectric energy regarding to effects on global warming. However, the CO₂ emission ratio of natural gas/coal is around 60 % and it is around 90 % considering total green house effect gases. So, it is convenient to emphasize that natural gas can not be an alternate of hydropower regarding to green house effects. Table 6.7 CO₂ emission values for different energy sources in kg/mtep⁶ (Ünal, 2003)

	CO2 emission
Energy Source	(kg/tep)
Petroleum	3.077
Lignite	4.617
Coal	4.106
Natural gas	2.051

Table 6.8 \mbox{CO}_2 emission values equivalent to energy produced from Atatürk Dam

	Amount of source for		Total		Total
	energy generation		generated	CO2	CO2
Energy	equivalent to Atatürk		energy in	emission	emission
Source	Dam	tep equivalent	Mtep	(kg/tep)	in Mkg
Lignite	162 Mt	0.2 for 1 ton	32.40	4.617	149.59
Coal	31.24 Mt	0.61 for 1 ton	19.06	4.106	78.25
		0.91 for 1000			
Natural gas	15.35 billion m3	m3	13.97	2.051	28.65

As shown in Table 6.8, the 79.5 billion kWh electric energy generated from Atatürk Dam prevented 28.65 Mkg CO₂ emission when its is compared with natural gas power plant, 78.25 Mkg CO₂ emission when compared with coal thermo power plant, and 149.59 Mkg CO₂ when compared with lignite thermo power plant.

If the following power plants were used instead of Ataturk dam, the given amounts of harmful gases would have been generated (Table 6.9) If we multiply these ratios by the amount of energy generated from Atatürk

⁶ tep=petroleum equivalent tones

Dam, the avoidance of harmful effect as a result of Atatürk Dam construction will become more obvious.

Thermo power plant	Harmful emission ratio							
	(kg/MW.h)							
	Particular	SO ₂	NO _x	CO	Uçucu			
					HC			
Afşin Elbistan	1,116	49,41	14,12	0,71	0,094			
Çayırhan	0,313	5,92	5,09	0,25	0,034			
Kangal	2,520	55,40	11,08	0,55	0,074			
Orhaneli	0,143	27,14	5,71	0,29	0,038			
Seyitömer (1-4)	3,270	43,30	8,66	0,43	0,058			
Soma A	1,523	21,30	12,00	0,59	0,080			
Soma B (1-6)	1,648	24,86	7,33	0.37	0,049			
Tunçbilek A	1,558	25,58	5,12	0,26	0,034			
Tunçbilek B	3,067	20,48	7,00	0,35	0,047			
Yatağan	0,418	44,36	6,57	0,33	0,044			
Yeniköy	0,719	80,00	8,00	0,40	0,053			

Table 6.9 Emission ratios of harmful gases from major thermo power plants of Turkey (TEAŞ)

6.1.6 Impacts on Public Health

All energy production processes can be dangerous to the employees working in power plants and public as a result of accidents. In addition to this, they can endanger the public health by means of several diseases.

In Table 6.10 and 6.11, the accidental diseases risk factors for different kind of power plants are given. As clearly seen at the construction stages, accidental risk value of the hydropower plant is less than other technologies. This situation is also valid for the risk values for diseases.

Table 6.10 Risk values for accident (Ünal, 2003)

				Accidents	
	Worker	s		Public	
	F		NF	F	NF
Coal		1,4	60	1	18
Petroleum		0,35	30		
Natural Gas		0,2	15	0,009	0,005
Nuclear		0,2	15	0,012	0,12
Hydropower		0,01		0,001	

Table 6.11 Risk values for diseases (Ünal, 2003)

		Diseases					
	Wo	rkers		Public			
	F		NF	F	NF		
Coal		1	3	10	2000		
Petroleum	-		-	10	2000		
Natural Gas		0	0	0	0		
Nuclear		0,1	1	0,1	0,1		
Hydropower	-		-	0,001	-		

F: fatal NF: non-fatal

6.2 Energy Consumption Potential in the Region

The sector distribution of energy usage is investigated for determination of potential energy consumption of the GAP region, which is the % 12 percent of energy consumption of Turkey. When the energy consumption in the provinces of GAP is investigated, it is observed that the ratio of industrial consumption is not significant as in other regions, except Gaziantep province.

The total energy production potential of the region is the double of the consumed amount that is 11.625 GWh.

The provincial consumption distribution in the year 2001 is given in Table 6.12 and 6.13

From Table 6.12, it is observed that the major sector for energy consumption, which is generated from region, is industry with % 36.37. Gaziantep is the leading province for industrial energy consumption as a result of its developed structure (% 61). The major sector in Urfa is agricultural irrigation due to high agricultural activities as a result of Atatürk Dam, Harran Plain irrigation program (% 39.66). As industry in Urfa has just begun to develop in recent days, it does not reflect to the ratios given in Table 6.13.

	20							10
Province	Residence	Trade (%)	Government Offices (%)	Industry (%)	Agricultural irrigation (%)	Illumination (%)	Others (%)	Share in GAP (%)
Adiyaman	22,97	3,03	2,51	41,10	7,41	5,29	17,68	9,04
Diyarbakır	21,12	5,21	15,73	12,41	7,83	30,92	6,77	15,01
Gaziantep	16,53	5,21	1,88	66'09	2,90	7,08	5,40	35,15
Mardin	14,29	2,34	3,03	18,08	15,08	36,22	10,97	10,21
Silirt	16,51	2,33	10,00	50,52	26'0	10,26	9,41	3,66
Şanlıurfa	17,48	4,28	3,02	16,31	39,66	11,80	7,45	14,63
Batman	22,27	4,32	89,8	28,80	4,68	14,59	16,66	5,74
Şırnak	25,62	1,59	15,48	27,24	3,96	24,45	1,66	5,56
Kilis	44,66	9'92	13,53	11,16	4,63	6,12	10,25	1,00
Share in GAP	18,83	4,27	5,86	36,37	10,78	15,67	8,22	100,00

Table 6.12 Energy consumption ratios in GAP provinces

			Government		Agricultural			
Province	Residence	Trade	Offices	Industry	irigation	Illimunation	Others	Total
Adiyaman	120397	15888	13174	215382	38838	27699	92672	524050
Diyarbakır	183816	45372	136905	108011	68133	269048	58869	870154
Gaziantep	336745	106144	38293	1242372	59176	144319	110041	2037090
Mardin	84550	13829	17913	106987	89225	214321	64890	591715
Silut	35009	4934	21194	107127	2062	21753	19962	212041
Şanlıurfa	148233	36259	25578	138292	336336	100088	63206	847992
Batman	74085	14368	28866	95797	15574	48541	55402	332633
Şırnak	82563	5131	49906	87795	12771	78791	5341	322298
Kilis	25893	5598	7844	6469	2683	3550	5944	57981
Total	1091291	247523	339673	2108232	624798	908110	476327	5795954
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CHAPTER 7

RESULTS & DISCUSSIONS

The Southeastern Anatolia Project (GAP) is a multi-sector, integrated regional development project implemented in one of the less developed regions of Turkey including nine provinces. By the definition as an integrated project, the project aims not only economic progress in the Region but also the cultural and social development. For achieving its target, the investments and activities are directed to several diverse subjects including agriculture, industry, education, health, infrastructure, culture, tourism, and other social and cultural activities. The main target of the project is to eliminate regional disparities.

The aim of this study is to assess the impacts of the GAP Project to the development of the Southeastern Anatolia Region. In the previous chapters social and economic development of the Region is presented. The summary of the results is summarized and discussed in this chapter.

7.1 Results

The results of changes of the Southeastern Anatolia Region after GAP Project are summarized below under the headings of social, economic, agriculture, industry and energy development:

7.1.1 Social Development

The planned changes in social sector of the Southeastern Anatolia Region after GAP Project have been partially achieved so far. The main changes in the Region are summarized as follows:

Population

• Total population of the Region increased from 4.35 million in 1985 to 6.6 million in 2000.

• The proportion of Region's population to Country's population has displayed a constant increase trend from the level of 8.58 % in 1985 to the level of 9.73 % in 2000.

• The annual population growth rate of GAP was 34.12 ‰ between 1985 and 1990, 28.69 ‰ for the next five-year period (1990-1995), and 20.77 ‰ for 1995-2000.

• The urban (city) population of Southeastern Anatolia Region increased from 2,873,801 in 1990 to 4,154,558 in 2000.

• In the Southeastern Anatolia Region, urban population ratio was 55.72 % in 1990 and increased to % 62.91 in 2000 which were close to the average of Turkey (59.60 % and 65.01% in 1990 and 2000).

• Age dependency ratios in GAP were more than 50 % (reference percentage) and average of Turkey.

• Gaziantep has the lowest age dependency ratio for all years between 1980 and 2000. The decrease in age dependency ratio is the highest one in Adıyaman, from 118 % to 78 %.

• The population density increased very rapidly in the Region, from 54 to 89 in 1980 and 2000 respectively.

In Southeastern Anatolia average household size increased from
6.7% to 7% in 1980 and 2000 respectively.

• The total fertility rate in the Region was 4.8% in 1980. It increased to 5.0% in 2000. In the same period, average fertility rate in Turkey decreased.

• The net migration rate in the Region became more negative between 1980 and 2000, changed from -22 ‰ to -33 ‰.

• After the construction of Atatürk Dam 12 villages and 46 districts with a total population of 58,645 (1990 census), was completely covered with water.

Education

• The literacy ratio of GAP was 42.4% in 1980, 55.39% in 1985, 57.53 % in 1990 and 72.20 % in 2000.

• In 1985 only 29 % of women population was literate in the Region. This ratio increased to 38 % in 1990 and became 52% in 2000.

• Before 2000, average school number in pre-school education was around 300. It has become over 1000 in recent years.

• The number of schools in primary education increased from 4893 in 1986/1987 education year to 5822 in 1994/1995. After this period it has decreased to 5000 schools.

• The number of students in primary education in the Region has increased from 662,927 in 1986/1987 educational year to 1,393,540 in 2004/2005 educational year.

• The number of teachers in primary education increased from 15,115 in 1986/1987 education year to 39,657 in 2004/2005 education year.

• The number of students per teacher in primary education has become less throughout the years in the Region. After 2000, the number of students per teacher has decreased from 40 to 35.

• The average enrolment ratio of female students in primary education is 40 % for all education years.

• In Adıyaman Province, the number of students per teacher in primary education is the lowest one in 2005. The number of students per

teacher in Adıyaman has decreased from 51 (1986/1987) to 26 (2004/2005).

• The total number of schools in secondary education was 160 in 1986/1987 education year. It has displayed a constant increase trend and reached to 431 in 2004/2005 educational year.

• Among the provinces of GAP, number of secondary education schools is the highest in Gaziantep (38 in 1986/87 and 98 in 2004/05).

• The number of vocational schools increased from 72 in 1866/87 education year to 217 in 2004/05 education year. In the distribution of secondary schools according to their categories, 52 % is general high schools, 48 % is vocational and technical schools, where the proportion of general high schools to vocational is 57/43 in Turkey.

• The number of enrolments in secondary education increased from 49,485 in 1986/87 to 209,705 in 2004/05.

• The proportion of numbers of vocational and technical school enrolment of Region to the total number of Turkey increased from 4.45 % to 7.7 %.

• Gaziantep has the highest number of enrolment in secondary education. Diyarbakır, Şanlıurfa, Adıyaman, Mardin, Batman, Şırnak and Siirt follow Gaziantep.

 Average female enrolment ratio in secondary education is highest in Gaziantep and Adıyaman (39 %), and followed byDiyarbakır 30 %, Batman 34 %, Mardin 30%, Siirt and Şanlıurfa 27%, and Şırnak 25 %.

• The number of teachers in secondary education in the Region increased from 3,987 in 1986/87 to 9,525 in 2004/05.

• In 1986/87 education year, number of students per teacher in secondary education in the Region was equal to the average of Turkey, 12 students per teacher. After 1986, this number has become more than the average of Turkey. Only in Gaziantep (19) and Adiyaman (20) this ratio is

close to the average of Turkey. In the other provinces, especially in Batman (27) and Şırnak (25), it is much higher then the average.

• In 1980 the rate of university graduates in 25 years old and over population was only 1.28 %, where the average of Turkey was 3.60 %. This rate increased was 1.84 % in 1985, 2.44 % in 1990 and reached to 4.52 % in 2000.

• In 1970, there were only 20 libraries in the Region. Until 1985 there was no significant change in the number of libraries, however after 1985 it increased constantly and reached to 80 in 2005. Similar to growth of the number of libraries; the number of books and readers has increased. In 1985 the average number of readers in libraries was around 944,000 (21% of the total population). The percentage of number of readers in total population increased to 26 % in 1990 and 34% in 2000.

<u>Health</u>

In 1980, 6.7 % of total hospitals in Turkey were in the Region. In 1985, the ratio of the population of GAP to the population of Turkey was 8.58%, while the ratio of number of hospitals in the Region to the total number of hospitals in Turkey was 5.8. In 1990, these ratios became 9.13 % (population) and 6.2 % (hospitals). For the year and in 2000, the difference between population and hospital ratios was 3.8 (9.73% for population, 5.9 % for hospitals).

• Until 1982, the number of people per hospital was close to the average of Turkey, around 60,000 people per hospital. Afterwards it increased and in 2004 it became over 100,000 people per hospital.

• In the Region the average number of people per hospital bed is around 800, where 500 in Turkey. Despite of high number of people in hospital beds, the decrease trend is observed after 1990.

• In 1985 number of doctors per 10,000 people was 3 doctors. Afterwards, it displayed an increase trend and reached to 6 doctors per 10,000 people. However, it is always lower than the average of Turkey (4 in 1970, 7 in 1985, and 14 in 2002).

• The number of dentists per 10,000 people in the Region is very low. Only a small increase is observed, but never reached to one dentist to 10,000 people.

• Although the pharmacy percentage of the Region in Turkey is lower than its population percentage, it displayed a 3 % growth after GAP.

• The average infant mortality rate in the Region is close to the average of Turkey for all the years between 1980 and 2000. In 1985, the infant fertility rate was 123 ‰, where 126 ‰ in Turkey. Afterwards, it displayed a constant decrease trend and reached to 110 ‰ in 1985, 65 ‰ in 1990 and 48 ‰ in 2000.

7.1.2 Change in Economy

The main changes in economy of the Region are summarized as follows:

• Among the three major economic activities, agriculture, industry and services, biggest share belongs to the services. The share of the services in terms of percentage in total gross national product was 52.4% in 1987 and it expands to 57.5% in 2000

• Agriculture as a whole held 26.6 % as an economic activity in 1987 that decreased to 24.6 % in 2000. The share of the industry has been the lowest one, with 21.1 % in 1987 and 17.9% in 2000.

• For the sub-categories of economic activities, the main economic activity is agriculture and livestock breeding. Although the ratio of agricultural activity has decreased from 25.9 % in 1987 to 24.4% in 2000, it still holds the dominancy in the economy of the Region.

• The negative change in industry is observed in its sub-categories except electricity, gas and water industries. Mining decreased by 4.3 %, and manufacturing industry decreased by 0.4% between 1987 and 2000.

Electricity, gas and water industries are the only industry type that has increased in the same period, which is by 1.6 %.

• Despite of 2.2 % regression in trade, it is still one of the major economic activities with 13.9 % in 2000. The major increase is observed in governmental services from 6.8 % in 1987 to 16.8 % in 2000.

• The change in GDP of the Region between 1990 and 2000 is 35 %.

• The gross national product per capita (GNDP) value in the Region only increased a small amount between 1990 and 2001. The GDPC value of 1029 USD (current prices) in 1990 increased to 1045 USD in 2001.

• The income per capita in GAP has increased from 981 USD in 1987 to 1532 USD in 2000. The amount of change is 56 %. The major change is observed between 1989 and 2000 by an amount of 483 USD. However, the income per capita in the Region is much less than the average of Turkey, which was 1629 USD in 1987 and 2941 USD in 2000.

• In 1990 the amount of deposits per capita in GAP was 72 USD. This number increased to 85 USD in 1995, and reached to 155 USD in 2000. The rise has continued till 2002 and become 165 USD.

• The amount of bank credits per capita was 55 USD in 1990, which was the 11 % of average personal bank credit amount of Turkey. It decreased to 42 USD in 1990, and rose to 97 USD in 2000 and again fall down to 36 USD in 2002.

• In 1990, the share of public investments of GAP is the 6 % of total investment value in Turkey. It decreased constantly as the time elapsed and in 2001, the share of GAP investments has become 2 % of total investment of the country.

• If the amount of public investments per capita is considered, the share of GAP is below the average of Turkey. The difference between Turkey and GAP was 28 USD in 2000, 33 USD in 2002, and 21 USD in 2004

• The municipal expenditures per capita in the Region are approximately half of the average of Turkey In 1985, it was 9.88 USD per capita. This value increased to 17.32 USD in 1990 and to 28.23 USD in 1995. A decrease was observed between 2000 and 2002, from 59.56 USD to 32 USD.

• In terms of budget revenues per capita, the Region has lower values than the average of Turkey, 62 USD in 1990, 52 USD in 1995, 82 USD in 2000, and 92 USD in 2003.

• In 1991, number of incentive certificates was 258 with a total investment amount of 1.1 billion USD. The number of employment arisen from the incentives given in 1991 was 19,167. The number of incentives reached its peak value in 1997, 415 certificates. The investment amount of these incentives was 1.7 billion USD, which generated 19,481 employments. The number of incentive certificates decreased to 152 in 2001 that was equal to 597 million USD. The employment generated from these incentives in 2001 was 7717.

• . Exporting value has risen by one billion USD between 1989 and 2005. Importing value has also grown from 100 million USD in 1989 to 600 million USD in 2004.

• The unemployment rate in the Region has increased in recent years. The rate of unemployment was 4.32 % in 1980, which was closer to the average of Turkey. This ratio increased to 6.07 % in 1985 and reached to 7.79 % in 1990. This trend has continued and become 12.13 % in 2000, which was 4 % more than the average of Turkey.

In Southeastern Anatolia Region, labor force participation rate was 65.97 % in 1980, which was 3.07 % than Turkey. Although it decreased after 1980, it was again higher than the average of Turkey in 1985 and 1990 (65.17 % in 1985 and 64.65 % in 1990). In 2000, it decreased to 52.7 %, which was lower than the average of Turkey by 2.5 %.

• The share of each activity in employment was; 54 % in agriculture, 13 % in construction, 11.9 % in manufacturing industry, 11 % in trade and commerce, 6 % in mining, 2.1 % in telecommunication and transportation, and 2 % in industry related to electricity, water and gas.

• The dominancy of agriculture in employment distribution has continued with a small amount of decrease by 4 % in 2000. The change in share of other activities in total employment is 1 % increase in construction, 1.9 % increase in manufacturing industry, 3.5 % increase in trade and commerce, 1.2 % increase in telecommunication and transportation, and 3.5 % increase in industry related to electricity, water and gas

• The share of industrial employees increased between 1990 and 2000 from 5.21 % to 1.8 %; which were less than the average of Turkey, 12.80 % in 1990 and 13.30 % in 2000

• When the share of annual average industry employees of GAP in Turkey is considered, the positive change is observed between 1980 and 2000. This percentage was 1.96 in 1980 and increased to 2.65 in 2000.

• Although the share of agricultural employees has displayed a decrease trend between 1980 and 2000, it is still 20 % higher than the average of Turkey. This ratio was 72.18 % in 1980, 72.40 % in 1985, 69.20 % in 1990 and 60.11 % in 2000.

• The number of foreigners arrived to the Region for tourism has significantly changed after 1994. It increased more than five times, from 70,000 foreigners in 1993 to 420,000 in 2004. The situation for local visitors is better, increased from 40,000 in 1993 to one million in 2004.

7.1.3 Change in Agriculture

The main changes in agriculture sector in the Region are summarized as follows:

• From 1995 to 2001, the area opened to irrigation become twice of its original value reaching to 120,000 ha.

• The main change in crop design has occurred in irrigated lands. Cotton has become the major crop by 85 % in the areas opened to irrigation due to high value added content and possession of organized purchasing market rather than other crops. Especially in Harran Plain, significant changes had observed in agricultural output especially in corn and cotton. The output increase index based on the values of 1985 has become 152 in cotton, 161 in corn, 114 in wheat and 106 in barley.

• Some new types of crops are also sown by the farmers after irrigation; olive, pistachio, hazelnut and persimmon.

• Before irrigation (1994) the total crop production in Southeastern Anatolia Region is 7.12 million tons. In 2003, this number increased to 9.15 million tons.

• The marketing value of crop production in 1994 was 1.8 billion USD and increased to 3.1 billion USD in 2003.

• The field crop production is around 70 % of the total crop production in the Region However, share of marketing value of field crops is slightly smaller than its production percentage, around 60 % between 1994 and 2003

• The total field crop production in GAP has an increase trend after the start of irrigation in the Region (1994). The amount of field crops produced was 4,873,069 tons with a market value of 987.99 million USD in 1994; these numbers have changed to 6,425,114 tones and 1,8 billion USD in 2003

 The field crop production of the Region is around 10 % of Turkey. In marketing values Region's share increases to 14%

• Among the Region, 69 % of the field crop production is cereals. Pulses and oil seed crops follow cereals wit 10 % production share. The amount industrial crops produced are 8% of the total production in the Region, where tuber crops are 3%. • The marketing value of cereals has also biggest portion in GAP, however far behind its production percentage with 42%. The industrial crops have the second highest share in total marketing value of field crops with 37%. The pulses have 17 %, tuber crops have 3 % and oil seed crops have 1% in total marketing values.

• Total cereal production in GAP increased about one million ton between 1994 and 2003, from 3.5 million tons to 4.5 million tons. The marketing value of cereals also took off from 404 million USD before irrigation (1994) to 902 million USD in 2003. When the production of cereals and its marketing value is compared with Turkey, the percentage of GAP increased from 13% to 15% between 1994 and 2003 both in production and marketing values.

• The two crops wheat and barley are the dominant cereals in the Region. In 1990 the production percentage of wheat is 57% and of barley is 43%. The other cereals, maize, millet and rice have percentages lower than 1 in 1990. This distribution is not changed significantly in 2003. The percentage of wheat increased to 62%, barley decreased to 36% and maize increased to 3%. The remaining crops millet and rice has percentages lower than 1% again

• Wheat is the major type of cereal in GAP with 63% of production. Although the wheat-sown area has not changed before and after GAP, the yield thus the production increased significantly from 1.75 million tons in 1980 to 2.8 million tons in 2003. The important impact of GAP in wheat production is the improvement of yield from 1452 kg/ha to 2388 kg/ha between 1980 and 2003.

• The marketing value of the wheat production changed with production increase; 241.55 million USD in 1980, 389.19 million USD in 1995 (just after the start of irrigation) and reached to 621.97 million USD in 2003.

• Barley is the second major cereal type in terms of production in GAP. Although the percentage of barley production in total cereals has decreased since 1990 (43%), it cover still a big portion of production and a major crop in the Region with 36% in 2003.

• Before irrigation (1994), industrial crop production was 270,132 tons. Immediately after irrigation in 1995 it increased 46,000 tons. In 2003 the industrial crop production has reached to 528,798 tons. The most important change before and after irrigation is the change in marketing values of industrial crops. The difference between 1995 and 1994 values is 338 million USD

• The percentage of GAP in Turkey with respect to industrial crop production has an average of 5%. Before and after irrigation in production ratio is slightly increased from 2% to 4%. However, the share of GAP in Turkey in terms of marketing value of industrial crops is much higher than production percentage. Before irrigation it was 16.7%, and increased to 26.1% in 2003.

• The sown area of industrial crops has significantly changed after GAP Project. The sown area of industrial crops was only 50,000 ha in 1980; afterwards it increased constantly and reached 250,000 ha in 1995. The increase trend has continued since 2003 and become 350,000 ha, which is the 25% of the total industrial crop planting area in Turkey

• The major industrial crop type that sown in the Region is cotton with an average of 91% (average of production values between 1980 and 2003). The other two crops sugar beets and tobacco has small ratio by means of production, 5% and 4% respectively.

• In Southeastern Anatolia irrigated area and cotton production has been increasing as a result of Atatürk Dam and irrigation projects, or shortly GAP Project. Before the start of irrigation (1994) cotton sown area was only 160,000 hectares, and has increased significantly after irrigation to 300,358 hectares in 2003 • Increase in the size of irrigated lands also affected the cotton production. Before irrigation the cotton production was only around 160,000 tons, and after irrigation it has reached to 1,135,886 tons in 2003. GAP water and irrigation investments have transformed Southeastern Anatolia into a leader in cotton production of Turkey, in 1994 GAP's share is only 25 %, but according to the values of 2003, it expanded to 48.42 %.

7.1.4 Change in Industry Sector

The main changes in industry sector in the Region are summarized as follows:

• The construction of seven Organized Industrial Zones has been completed in the Region. The provincial distribution of these organized industrial zones are as follows; three of them in Gaziantep (260 ha, 500 ha, and 540 ha), one in Şanlıurfa (286 ha), one in Adıyaman (150 ha), one in Mardin (300 ha), and one in Kilis (90 ha). The percentage of OIZ in terms of coverage area in Turkey is around 12.4 %. Until the end of 2002, there were 680 active establishments with 62,000-employment capacity exist in these organized industrial zones.

• The infrastructure of 22 small-medium industrial areas is completed with 83% of usage ratio. The eight of them are located in Gazinatep, six of them in Diyarbakır, one in Adıyaman, four in Şanlıurfa, one in Siirt, one in Batman, and one in Kilis. The existing 7044 establishments in these industrial areas generate employment to approximately 35,000 employees.

 In GAP Region, there two free trade zones, one in Gaziantep and one in Mardin. In Gaziantep free trade zone there are 18 establishments with 54.3 million USD trade capacities in 2001. Mardin free trade zone which consists of 34 establishments has an average annual trade capacity of 5.5 million USD

• Region's industry is mainly composed of food and textile industry. These establishments are mostly small and medium size establishments. • In terms of share of manufacturing industry in total gross national product generation in GAP, no major change is observed. It increased only a small amount from 9 % in 1990 to 10.6 % in 2000, which are below the average of Turkey.

• For the value added generation of manufacturing industry of GAP in Turkey, the situation is not very positive although it increased two times between 1980 and 2000, from 1.10 % to 2.44 %.

• The number of establishments in manufacturing industry displayed an increase trend between 1990 and 1999. The same situation is also valid for the change in number of employees. The proportion of manufacturing industry establishments in GAP to the total amount in Turkey increased from 1.9 % in 1990 to 3 % in 1999. The same proportion for number of employees increased from 2 % in 1990 to 2.6 % in 1999.

7.1.5 Energy Sector

• Until 2002, from Atatürk, Birecik and Karkamış Dams totally 83.70 billion kWh energy was produced. Its economical equivalence was 5.022 billion USD

• In the year 2002, totally 7.06 billion kWh electric energy was generated from these three dams. This value is the 5.05 % of the total energy production of Turkey (33.7 billion kWh).

• Total amount of energy, which was generated from Atatürk Dam equals to 4.7 billion USD. It is over the total energy investments in the framework of GAP by the 2002, which is 4.17 billion USD

• 79.5 billion kWh electric energy generated from Atatürk Dam prevented 28.65 Mkg CO2 emission when its is compared with natural gas power plant, 78.25 Mkg CO2 emission when compared with coal thermo power plant, and 149.59 Mkg CO2 when compared with lignite thermo power plant.

• Major sector for energy consumption, which is generated from region, is industry with % 36.37

7.2 Discussions of the Results

The discussions of results are important to interpret the results of the statistical analysis and to make conclusions about the success of the Project.

The results obtained from the thesis give important clues about the success of the Project. Despite the changes, improvements of the conditions, and development of the Region; the Southeastern Anatolia Region is still among the one of the least developed regions of Turkey. When the situation is analyzed by province basis, a more negative result is observed. Instead of rising, socio-economic development rank of most of the provinces in GAP has become worse. Even the rank of Şanlıurfa, where most of the investments has been realized, has decreased from 59 to 63. These results indicate that the GAP Project has not achieved desired results yet.

The major discussions are presented below for each sector identified in the thesis:

7.2.1 Social Sector

• The increase trend in Region's population has two major explanations; high fertility rate and economic development. Large household size and high fertility rate are social characteristics of Southeastern Anatolia Region. Despite of the recent changes in household characteristics in the region (smaller household sizes); high fertility rate is still a reality. The development in economic activities and social facilities in the last two decades have also significant effects to the population size expand.

• Diyarbakır and Şanlıurfa have become the two most densely populated areas, as these two provinces are the most affected ones among the others in the Region by the outcomes of GAP. • The infrastructure of the urban centers is still not sufficient although several remediation projects have been implemented. Some major improvements in sanitation conditions of Gaziantep and Şanlıurfa was observed, however in the other parts of the poor sanitation conditions endanger the public health. Especially in Siirt, Batman provinces sanitary infrastructure is insufficient.

• The Atatürk Dam and related water utilization investments increased the population characteristics of Şanlıurfa significantly.

• The high growth rate of population has affected the Region in a negative way and decreased the efficiency of economic development. It is obvious that this high rate is not only due to the sustainable urbanization of the Region. The effect of political situation (migration as a result of terror events) forced the rural population to migrate to larger and safer urban areas.

 Although urban population rate has increased, it is still below the average of Turkey. The sustainable urbanization should be realized to complete the social reforms. Şanlıurfa has the lowest increase in city population ratio as a result of high agricultural activities. However, this does not indicate that Şanlıurfa is underdeveloped. On the contrary both economically and socially Şanlıurfa is the second developed province in the Region after Gaziantep.

• The most developed province in the region Gaziantep has the lowest rural settlement ratio due to industrial activities and high employment ratio. Although the industrial activities in Batman and Siirt are not developed, the ratio of urban settlement for two provinces has increased as a result of political situation.

• Although the age dependency ratios in GAP are more than 50 % which is close to average of Turkey, the regular declines in the ratios for the last two decades have been observed.

• In Southeastern Anatolia average household size has increased. Average household size is indirectly proportional to development. However, a larger household type is a characteristic life style of the Region, and it is a part of Region's culture. Due to this condition, average household size cannot be an indicator of the development of the Region. Also, the Region cannot be defined as underdeveloped only by considering these rates without considering social and cultural characteristics.

• Fertility rate has increased in the last decade. This increase trend can be related to the low literacy ratio of women in the Region. Although one of the major targets of the GAP is the development of the women life, this target did not come to realization completely. The most important reason is the cultural characteristics of the Region. The difficulties in breaking the traditional women image in the Region prevented the development of women life as it had been planned.

• Out migration has increased. GAP investment could not prevent the out migration from the Region. Even in Şanlıurfa net migration rate has increased.

• What is called "security migration" became a major reason for inhabitants to migrate in certain provinces where GAP did not start yet. The terrorist events forced local people in rural area) to migrate to safer places to larger cities or metropolitan settlements. In some rural areas security forces evacuated people for safety measures.

• High urbanization rate of Adıyaman is not due to the development of the province, on the contrary an obligatory population movement to urban settlements of the people affected by the Atatürk Dam reservoir.

• The literacy ratio is increased significantly after GAP.

• The ratio of literate women population has increased, however it is still below the average of Turkey. Although this ratio is far behind the ratio in Turkey in 2000, it is a huge progress for the Region where traditional women role is dominant. • The number of schools in pre-school education in GAP has significantly increased. This may help to improve educational background of the Region in future.

• Enrolment in primary and secondary education is low in the Region.

• Despite of the developing economy of the Region, teachers did not want to settle in the Region because of security problems in 1990's. This situation has improved in recent years.

• In Southeastern Anatolia, the number of female students is an important indicator for the social development in GAP. The cultural characteristics of the Region do not allow the girls to study in primary schools. There have been lots of projects implemented to improve the situation; these projects did not change the general trends in the Region. It is not easy to break some traditions about the social life and role of women.

• The number of students per teacher is a defining factor in education development. In Southeastern Anatolia, this ratio has decreased throughout the years. The effects of GAP on education development have been more evident in recent years.

• The percentage of university graduates in total population is very low in the Region. This is a problem of insufficient number of qualified labor force in the Region.

 No significant changes are observed in gender inequality problem in education.

• The education has not developed as it planned. The target of GAP Project has not been achieved in education sector.

• Number of people per hospital has increased. The fast growth in population in the Region is the major reason for this increase. However, regarding social development, this brings negative impacts to the Region.

• In the Region, no major change is observed in number of doctors per 10,000 people until 1985. Afterwards, it displayed an increase trend.

Despite a positive change in the ratio, it is always lower than the average of Turkey. However, it is not correct to relate the increase in this ratio to the socio-economic impacts of GAP completely. The major factor is the overall development of Turkish health system.

• For the over all consideration, however, health sector is also underdeveloped relative to the other regions of Turkey.

• The average infant mortality rate in the Region is close to the average of Turkey for all the years between 1980 and 2000. It displayed a constant decrease trend throughout the years. This trend is an evidence of socio economic development of the Region.

• Similar to infant mortality rate, child mortality rate decreased by a significant amount in the Region. Decrease in child mortality is an indication of development of health services, education system and economy of the GAP.

7.2.2 Economy

• The percentage of agricultural activities is higher than the average of Turkey. The dominancy of agriculture also indicates that agricultural products are not yet processed by industry as targeted in the Master Plan.

• The growth rate of agriculture sector is higher than Turkey. This is a result of large investment made in GAP to develop agriculture in last two decades.

• The change in industry is lower than both Turkey and Marmara. This is not a positive result for the impacts of GAP as the main objective of the investments was to transform the Region into agro industrial export base.

• After the GAP, fishing activities has become an important economic activity in the Region, especially fishery in Atatürk Dam and reservoir became an important center for this development.

• The gross national product per capita (GNDP) value in the Region increased only a small amount between 1990 and 2001. The reason for not

observing the change of GDP in per capita values is the fast population growth of the Region and regression in Turkish economy in that period.

• The income per capita in the Region is much less than the average of Turkey.

• The amounts of bank deposits per capita in GAP are very small compared to average of Turkey. This is explained by two major reasons; the weakness in individual (per capita) economic structure and traditional money saving habits of the local people. The traditional money saving habit of the local people in GAP usually invest their savings to gold instead of investing in bank accounts. As similar to bank deposits, the amount of bank credits per capita is very low in the Region when it is compared to average of Turkey.

• The future of the Region mainly depends on the public and private investments, which will determine the development of the Region. However, today the most important problem in GAP Project is lack of required amount of both public and private investments. Public investments are very important for the continuation of GAP Project. Instead, public investments have been insufficient during the last decade. This period was extremely important for the development of GAP, since it was just after the completion of Atatürk Dam which is the major physical component of the Project. Although the Turkish government decided to complete the GAP Project in 10 years in 1998, this decision has not been realized due to insufficient allocation of funds.

• Both importing and exporting values has increased in the Region after GAP Project. The change in export values is an evidence of increased industrial activities and trade after GAP Project.

• Despite of new economic activities and new opportunities in employment after GAP Project, the unemployment rate in the Region has increased in recent years. The increase in unemployment rate has two major reasons; high population growth rate and regression in Turkish economy in recent years.

• The development of tourism in Southeastern Anatolia Region is mainly observed after GAP Project. First of all, after the Project, the Region has become more popular and well-known place all around the World. The historical and cultural richness of the Region become apparent and focus of the media in Turkey. This popularity makes the Region a new tourism center. In addition to this, GAP Project, itself with reservoirs and huge hydraulic structures, like Atatürk Dam, increased the attraction to the Region.

7.2.3 Agriculture

• Significant increase in agricultural production leads the local people to earn more money. Especially in Şanlıurfa the major economic activity has become agriculture. The output of this economic activity also affected the industrial sector of the whole Region. The growth in agricultural production in the Region has changed the direction of industrial activities, mainly to manufacturing type.

• The Turkish economy has also been affected by the production values of crops in GAP.

 Adıyaman Province is the one of the most affected provinces in the Region by Atatürk Dam in means of loss of the agricultural lands. The one of the claims about the Dam is reduction of agricultural lands due to Atatürk Dam Reservoir. However, despite of reduction in agricultural lands, amount of agricultural products has increased after irrigation.

• Şanlıurfa is the province that has the most agricultural production among the Region. Atatürk Dam and related irrigation projects are mainly focused on the increase in agricultural yield in Şanlıurfa (Harran Plain). Increase in production is an evidence of how Şanlıurfa has developed in agricultural sector. The development is not only in the numeric value of agricultural production, but also by means of its marketing value. The significant change in agricultural marketing value also shows beside the physical size of production increase, the crop design (especially cotton) has changed in order to get more profit from agricultural activities.

• Şanlıurfa is the only province that has a developing agricultural activity, although agriculture component of GAP covers all of the nine provinces. This is due to insufficient investment rate to complete the project. At the planning stage of GAP, it was estimated that the project components would be completed until 2005. However, this was far behind the reality. Only a small portion (~13%) of the targeted agricultural areas has been completed until today.

• Before irrigation in GAP, the local people in Southeastern Anatolia migrated to Çukurova every year in cotton season in order to earn their life. However, after the GAP the direction of this migration has changed for agricultural workers. Today, without the need of migration, people can easily find an opportunity to work in cotton fields.

• GAP water and irrigation investments have transformed Southeastern Anatolia into a leader in cotton production of Turkey. Today, as a result of GAP project, the Region has become the largest cotton supplier in Turkey.

7.2.4 Industry

• The change in industrial sector in the Region remains only with improvement resulted from public investments. The attraction of private capital and investment could not reach to the sufficient amount to change the economic face of GAP.

• After the start of irrigation in the Region, some changes in industry sector has been observed. The number of establishments in industry was almost doubled between 1995 and 2000.

• However, these changes in the industry do not indicate a major development. On the contrary, by examining the figures, it can be
concluded that the impacts of GAP Project in industry is very small and the industrial development target of GAP did not come into reality.

• The GAP Project did not bring a strong manufacturing industry to the Region. The development in manufacturing industry is very low compared to Turkey. Only in Gaziantep, this industrial activity is well developed. However, Gaziantep was also a trade and industry center in Region before GAP. GAP helped Gaziantep to strengthen its dominancy in industry in the Region.

7.2.5 Energy

• Energy investments of GAP have reached to their target. The electric energy produced is very significant for Turkey. Also, the investments compensate their investing values by their production

• The dam project also contributes positive effects to environment mainly, to green house gas reduction. Dams and hydropower plants are more environment friendly compared to other energy sources used in Turkey.

CHAPTER 8

CONCLUSIONS

The main conclusion of this thesis indicates that Southeastern Anatolia Region has developed both socially and economically after GAP Project. However, the development in the Region is behind the target of the GAP Project.

The conclusions derived from the results of the study are explained as follows:

1) Today, the Southeastern Anatolia Region is one of the less developed regions in Turkey with respect to all socio-economic indicators. The impacts of the GAP Project have been insufficient to increase the overall socio-economic development ranking of the Region among Turkey. Ranked by the level of development in 2003, all of the provinces, except Gaziantep, had low rankings.

2) One of the main problems of the Southeastern Anatolia Region is the high rate of population growth. High population growth rate combined with insufficient employment opportunities led to increase in out-migration rate in the Region in recent years. In addition, high population growth rate decreased the efficiency of economic development. Moreover, it also created adverse effects on the urban infrastructure in the major provinces, where the population increased due to urbanization. The security problems encountered at some parts of the Region have also played a certain role in this type of migration. 3) Low education levels for women, less awareness of birth control methods increased the fertility rate in the Region. The cultural characteristics of the Region do not allow all the girls to study in primary schools. There have been lots of projects implemented to improve the situation; these projects did not change the general trends in the Region.

4) One of the achievements of the GAP Project is the significant change in the literacy ratio of women. Also, increases in number of schools, enrolments and teachers have been observed after the Project. However, the education has not developed as it planned. The target of GAP Project has not been achieved in education sector. In addition, it is seen that the Region is below the average of Turkey in higher education graduate ratio. This leads to insufficiency in qualified human power.

5) There are some problems preventing to give protective and full health services effectively in the Region. The first problem is the insufficient number of health institutions and health personnel. Another factor effecting health level negatively is the low rate of education of the population in the Region. The GAP Project targets have not been achieved in health sector completely.

6) After the Project, agriculture has become the major economic activity in the Region. New economic activities, like fishery and tourism, have been developed by the impacts of GAP Project. The financial figures have not increased significantly due to the fast population growth and regression in Turkish economy in a certain period. Despite of new economic activities and new opportunities in employment after GAP Project, the unemployment rate in the Region has increased in recent years.

7) Today, the most important problem in GAP Project is lack of required amount of both public and private investments. Public investments are very important for the continuation of GAP Project. Insufficient allocation of funds causes delays and incomplete realization of the Project components. 8) The impacts of GAP Project are more effective in agriculture than the other sectors. Significant increases are observed in agricultural lands, production, yield, and marketing values. This leads the local people to earn more money. Today, as a result of GAP project, the Region has become the largest cotton supplier in Turkey. However, insufficient investment rate to complete the project caused the development of agriculture mainly in Şanlıurfa. In addition only a small portion (~13%) of the targeted agricultural areas has been completed until today.

9) The industry sector in the Region is developed but not as much as in agriculture. The share of textile and food industry has increased after the Project. However, the insufficient public and private investments decreased the level of growth. The impacts of GAP Project in industry are very small and the industrial development target of GAP did not come into reality.

10) The increase of energy generation is one of the main impacts of the GAP Project. Total market value of the energy generated from the investments in the framework of GAP is more than the total energy investment value of the Project. This indicates that the economic benefits of energy sector reached its target. The dam projects in the framework of GAP also contribute positive effects to environment mainly, to green house gas reduction.

As a summary, the main factors affecting negatively the achievements of GAP Project is given as follows; high population growth rate, incomplete realization and delay in investments due to insufficient public and private investments, regression of Turkish economy, ethnic and security problems.

It is also important to mention that the results are not as positive as expected, as only a small amount of investment has been realized since the commencement of the Project. For example, only 12 % of the irrigation projects have been completed until today. So, the impacts of the Project is expected to be more promising than presented in this study if the Turkish government will continue to invest to the Region, and complete the projects in the future.

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