THE SOUTHEASTERN ANATOLIAN PROJECT (GAP) AND REGIONAL ECONOMIC GROWTH OF SOUTHEASTERN TURKEY

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1. INTRODUCTION

Turkey is a developing country with a sharp standard of living differences across the regions. Especially up to early 1980s the country had various serious economic problems such as unstable growth, large balance of payments deficit and high unemployment rate. Beginning in the mid 1980s, the economy has undergone some drastic structural and policy changes which deepened regional economic inequalities between the east and the west of the country. Compared with the west, many provinces in the eastern parts of the country have some basic problems. In the eastern parts, agricultural and industrial potentials are low, and natural and human resources are also quite limited. Furthermore, the region has a history of being neglected in terms of both public and private investments due to the lack of resources and other reasons. Therefore, considering both social and economic consequences, Turkish government involved in making a difficult decision between more market-oriented economy and less regional disparities.

Considering high socio-economic potentials, the government has undertaken a very costly project ($32 billion) called Southeastern Anatolia Project (GAP) in the least developed region of the country. The GAP, the biggest hydro-project ever undertaken by Turkish government, is on the Euphrates and Tigris rivers. It targets not only to irrigate over 1.7 million hectare of land, which is about 20% of the irrigable area in Turkey, but also to triple the electricity production of the entire country.

Related research shows that when fully utilized in about 2010, a substantial economic growth and social improvement are expected in the region. Cakmak specifies a strategy about agricultural sector in the short run: increase export and decrease agricultural input and price support policies. He examines various fundamental issues related to the trade off

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Ş. GÜNĘŞ
THE SOUTHEASTERN ANATOLIAN PROJECT (GAP) …

between the agriculture-oriented expansion of exports and self-sufficiency in foodstuffs? Tekinel and Balaban state that when the resources and environmental characteristics of the project are taken into account, the project will redistribute income both in the region and in the country. Yeldan suggests that success for Turkey depends on reestablishment of capital, development of an intermediate industry, and improvements in technology-oriented domestic production. He argues that the new domestic market model is more useful for the country’s long-term economic growth in agriculture. Arslan and Wijnbargen note that aggressive export policies promote growth. They found that the booming export growth in Turkey during the 1980s was related to export subsidies with the real exchange rate depreciation. Metz argues that despite an optimism toward liberal agricultural policies, government intervention in agricultural sector is still in power. Many institutions founded up to 1980s continue playing important roles in agricultural sector. Sirtiogu and Robertson study the effects of the GAP mainly on irrigation, international trade, textile industry, and on cotton production.

The main purpose of this study is to investigate major economic impacts and potentials of the GAP on Turkey’s southeastern regional growth. A particular emphasis will be given to the behavior of demographic movements.

II. THE SOUTHEASTERN ANATOLIAN PROJECT (GAP)

A. A Brief History of the Project

Energy has been one of the most urgent necessities in Turkey especially as a result of rapid social and economic transformation. Relative to supply, demand for energy has been always overwhelming. The need for more productive agricultural land was also becoming vital as the population grew rapidly. Thus, the Electric Works Studies Agency (EWSA) was established in 1936 in order to produce electricity from water and other resources. The agency has initiated intensive works under the “Kebar Scheme.” Observation stations were built in order to examine all aspects of the Euphrates River. Feasibility analyses were undertaken in Kebar strait in 1938. Between 1950-1960, drilling works were carried out by the EWSA on both the Euphrates and Tigris. The State Hydraulic Works (SHW) was established in 1954. SHW divided the country into 26 basins and engaged in various studies and planning activities. As a result of the studies performed by the Euphrates Planning Administration, established in 1961, a survey on the Euphrates basin was originated in 1966. SHW’s Diyarbakır, a large city in the region, regional directorate did similar studies for Tigris basin. In

38
THE SOUTHEASTERN ANATOLIAN PROJECT (GAP)...

1977, the government decided to unite Euphrates basin and Tigris basin projects under the name of “Southeastern Anatolia Project.”

B. The Potentials of the GAP

Southeastern Anatolia Project is one of the major regional development projects in the world, and the largest and the most comprehensive enterprise ever undertaken in Turkey. The following table gives some of the major indicators about the project revealing the importance of its dimensions.

Table 1. The significance of the GAP

<table>
<thead>
<tr>
<th></th>
<th>Turkey</th>
<th>GAP</th>
<th>Ratio %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrigated Land (M hectares)</td>
<td>3.7</td>
<td>1.7</td>
<td>46</td>
</tr>
<tr>
<td>Electricity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---Installed Capacity (MkW)</td>
<td>10.1</td>
<td>7.6</td>
<td>75</td>
</tr>
<tr>
<td>---Production (GkWh)</td>
<td>39.7</td>
<td>22.0</td>
<td>55</td>
</tr>
</tbody>
</table>


Rapid development of the GAP region through irrigation networks, and services related to education, health, planning, infrastructure, licensing, housing, industry, agriculture, mining, energy, transportation, etc is a primary objective of the project that is expected to bring a ‘band-wagon’ effect to the region.

The GAP is a combination of 13 major sub-projects primarily considered for irrigation and hydropower generation. The project includes the construction of 22 dams and 19 hydroelectric power plants on the Euphrates and the Tigris rivers and their tributaries. According to 1997 census, the population of the GAP region was around 6 million, corresponding to 9.7% of the national population of Turkey. The ratio was even higher in the previous years. However, manufacturing share of the GAP region was only 1.9 in 1992 implying that the region has been an import base, rather than an export base. The region itself is out-migrating with a 2.5% average annual population growth. This growth rate is about 1 point higher than national population growth rate.

The project, originally planned as a number of water and land resources development project, is now a multi-dimensional integrated regional development project covering all aspects of development.

Table 2 gives some comparable information about socioeconomic indices for the GAP region and rest of the country. From Table 2, it can be seen that the GAP region lowers its differences with the rest of the country. Especially the share of manufacturing, with a 5 percent growth, in the region

Ş. GÜNEŞ
THE SOUTHEASTERN ANATOLIAN PROJECT (GAP) ...

has increased in recent years. Services sector also shows improvement in the region. In the period 1987-1997, on average the GAP region and the rest of the country grew 4.4% and 4.2%, respectively. These indicators imply that the gap between the GAP and the rest of the country has been diminishing.

<table>
<thead>
<tr>
<th>Table 2. The GAP region versus Turkey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land area (km2)</td>
</tr>
<tr>
<td>Population density</td>
</tr>
<tr>
<td>(1997, person/km2)</td>
</tr>
<tr>
<td>1987-97 % growth rates:</td>
</tr>
<tr>
<td>---Agriculture</td>
</tr>
<tr>
<td>---Manufacturing</td>
</tr>
<tr>
<td>---Services</td>
</tr>
</tbody>
</table>

Source: Prime Ministry GAP Regional Development Administration and DPT report.

C. Socio-Economic Framework of the GAP Region

Turkey has a great agricultural potential. Potential brings responsibility and requires good management. Given this, production management in the country becomes an issue that the government face with a limited success. Price support programs bring many questions and concerns about the policies. With the government provision and guidance into the development of social services and compatible investment in the infrastructure and agricultural extension and research, a market-oriented approach to the agricultural sector and rural development areas seems to have great importance.\(^{10}\)

Compared to many other countries, agriculture still accounts for a relatively larger share of total output (13.5% in 1997) and employment (42%) in Turkey. However, this share tends to fall overtime. Nevertheless, nearly half of the country’s population still lives in rural areas. Low productivity levels and under-modernized agricultural practices still remain as primary issues. The country’s agricultural workforce exhibits a diverse range of farm types. Turkish farms are usually operated by a family and sometimes employ hired workers. Commercial farms (mainly in western Turkey) exhibit human capital composition similar to those of developed world, having high levels of sector-specific skills. In general, agricultural output has increased rapidly within the past several decades. Many of this growth have been due to yield increases. Yields in some crops are currently comparable to the levels achieved in some other developed countries. Relatively abundant land endowment, improved farming techniques, and
THE SOUTHEASTERN ANATOLIAN PROJECT (GAP) ...

agro-climatic conditions in Turkey’s various regions have contributed to this outcome. The country is also one of the major producers of tobacco in the world. Among the main industrial crops produced in Turkey, cotton and tobacco have been principal agricultural export-items. In vegetal production, perishables are the engine of the sector. The country produces about eighty types of fresh fruits and vegetables out of 140 agricultural products grown in the world. Out of 80 types of items, 50 are exported.11

Even though migration to other countries has slowed down considerably, internal migration (mainly from rural areas to industrial centers) continues at a rapid pace, driven largely by income differentials between regions. The experience of many developed countries has shown that rural urban migration is largely an inevitable consequence of industrialization. Before 1990s, in Turkey average annual population growth rate was well over 2%. In the period 1990-1997, it is 1.5% for the country and 2.5% for the GAP region. In 1923 the country’s population was about 13 million and by 2000 it surpassed 65 million, about half being under the age of 20. The population growth rate is almost three times faster than the average population growth rate of the OECD countries. In 1999, urban population share was about 72 in the country. In the GAP region, urban-rural distribution of population was 64 and 36, respectively. High population growth results in high migration from rural to urban regions. Western Turkey and Mediterranean region have been the most attractive to rural out-migrants. Given the conditions, eastern Anatolia has lost more than 16% of its population within the past two decades.12

Economic structure in the GAP region obviously is based on agriculture through its main production, cereals lentil, pistachio, cotton, grapes, and tobacco. Although there is an accelerated industrial improvement throughout the region, the industrial sector required for processing agricultural products has not been developed yet. The expected increase in agricultural output is in cotton, oil seeds, pistachio, and sugar beet. The Gross Regional Product (GRP) is expected to grow at an average of 7.7% per annum. This means a 3% increase in Gross National Product. The share of agriculture will drop from 40% to 23%, industry will rise from 15% to 24%, and services will also rise from 44% to 53%.

The regional population growth rate is higher in the GAP area than national average growth rate of population resulting out-migration to the other parts of the country generally for seasonal agricultural jobs. In the country as whole, the active population is relatively small (50.8% in 1997). This is mainly because of the low female participation rate (43% in rural areas, 16% in towns). In the GAP region, these figures are even more drastic. One of the major problems in the region is high unemployment rate

Ş. GÜNEŞ
THE SOUTHEASTERN ANATOLIAN PROJECT (GAP) ...

especially among the unskilled people. Some surveys show that the unemployment rate in the GAP provinces is around 20%. Even in many extended families, only a member of the family works and the rest depend on his earning. Despite these discouraging current conditions in the region, it is expected that the GAP creates job opportunities for both seasonal immigrants and about 1.4 million others. Therefore, the high potential of the GAP is projected to increase the income level of the region by fivefold and create employment for about 5 million people.¹³

In various categories, agricultural production in the GAP region has increased considerably. For example, between 1990 and 1996, barley, cotton and sugar beet production -in thousand ton- increased from 1304, 356, 33 to 1343, 692, 86, respectively. The increase in agriculture will result in promoting industrial development and services that in turn will create more jobs. The extra demand for labor will cause labor scarcity and therefore the region possibly will receive labor from other regions. Thus, it can be argued that upon the completion of the project, the region in particular, the country in general, will solve much of their unemployment problems.¹⁴

It is clear that the investment for the GAP project has, and will have, a stimulating effect in both private and public spending in the region. In ongoing and planned investment there has been a 47% real increase for the year 1998. This increase is 50% above the average of the country for the same year. Even though the growth rate has been 4.2% for the country on average for the years between 1987-1997, the growth rate in the region was 4.4% on average for the same years. As of 1997, the region’s share in the country’s economy increased from 3.9 to 5.2. In addition, there has been a great improvement in the transportation infrastructure in the region. With ongoing projects, it is expected that there will be a 21% increase in highways in the region, catching-up the country average. In the near future, the region expects to be connected to almost all Mediterranean harbors. This implies that the region will also be connected to the global markets. Nine new airports will also be constructed in the region.¹⁵

The GAP is an integrated development project and therefore, it will have some sort of effect on about every social and economic activity. Thus, the region is destined for a socio-economic boom. New markets, new products, and desire to trade are hallmarks of this surging economy. Both Turkish and foreign firms are drawing up plans to take advantage of the GAP. The increase in crop production will have multiplier effect in the economy and new sectors will emerge rapidly to assimilate the new surplus and wealth of the region. Agro-industries, chemicals, textiles, machinery, transportation, telecommunications, financial services and training are
already in demand. These provinces are currently exporting to nearly 100 countries, and thus, the region will become an important trade center, reaching out markets in the Middle East, Western and Central Europe, Russia, the Mediterranean basin, and the Central Asian republics. The expected changes in the economic structure of the GAP region are given in the following table (all money values are in 1990 prices and growth rates are per annum for the 1985-2005 period).

Table 4. Socioeconomic projections for the GAP region

<table>
<thead>
<tr>
<th></th>
<th>1985</th>
<th>2005 (expected)</th>
<th>Growth Rate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRP (billion TL)</td>
<td>8,442</td>
<td>37,562</td>
<td>7.7</td>
</tr>
<tr>
<td>Agriculture</td>
<td>3,339</td>
<td>8,672</td>
<td>4.9</td>
</tr>
<tr>
<td>Industry</td>
<td>1,324</td>
<td>8,928</td>
<td>10.0</td>
</tr>
<tr>
<td>Construction</td>
<td>628</td>
<td>2,246</td>
<td>6.6</td>
</tr>
<tr>
<td>Services</td>
<td>3,150</td>
<td>17,716</td>
<td>9.0</td>
</tr>
<tr>
<td>Population (1000 pers.)</td>
<td>4,304</td>
<td>9,284</td>
<td>3.9</td>
</tr>
<tr>
<td>Employment (1000 pers.)</td>
<td>1,508</td>
<td>3,324</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Source: Prime Ministry GAP Regional Development Administration

Table 4 shows that the expected growth rate in the industry and services are around 50% higher than the expected growth rate in agriculture. In part, this is because these sectors are currently less developed than agriculture in the region. Also, latest population indicators in the country reveal that population grows slower than expected. Unlike the past estimates, population growth rate in the future is expected to be less than 3.9 percent. In the following section, the population issue will be discussed.

D. Long-Run Regional Agricultural Expectations

By a group of economists, a model (TURGAP) was developed with a nonlinear quadratic function in Turkey. The model intends to guide producers and consumers. It covers the GAP region and the rest of Turkey in order to analyze expected agricultural development. The TURGAP model has approximately 4500 variables and 1250 equations.

The model finds that expected consumer and producer surpluses in the region will be tripled by the year 2010. The producer surplus is about 25% more than the consumer surplus. The agricultural value product increases from $16.4 to 75 billion, half of it resulting from an increase in quantity and the rest coming from an increase in product price. The model estimates the livestock and crop products to be increased by $36 and $40.3 billion, respectively. The value of crop will go up at the rate 18% of the total value crop production of the country compared with 11% in 1988. Though
THE SOUTHEASTERN ANATOLIAN PROJECT (GAP)...
the net value of export is expected to increase for the country, due to overwhelming increase in domestic demand, the export is expected to fall by 4% by the year 2010. The extra domestic demand comes from income and population increases. The model also predicts that the region itself will be abundantly self-sufficient in terms of most agricultural products at least for the next several decades.17

The TURGAP model further predicts that demand for agricultural labor and capital will go up by 75% and 34% for the country, respectively. For the GAP region these figures are 160% and 200%, respectively. However, these increases are not enough to eliminate the unemployment in agricultural sector. The use of fertilizers is also expected to go up from 1.1 million to 1.3 million tons for nitrogen. The wages, land rents and demand for farming equipment are also expected to increase. Especially the wage rates for the agricultural sector will rise up to 50% by the year 2010.

The model suggests that in the early stage of the project it is better to stick with the small-scale marketing investment. In the latter stages, however, larger-scale adjustments are advised. In general, the model states that by the year 2010 Turkey will be self-sufficient in agriculture and could even be an exporter of some agricultural products.18

III. URBANIZATION AND THE GAP REGION

In terms of agricultural products, industry and services, it is obvious that there will be a significant increase in the GAP region in the future. However, a sound evaluation of the region’s future also requires a careful analysis of the population movements in the area. Currently, rural population rate is quite high (36%) in the region, but it seems there is a strong tendency towards urbanization.

As Mills and Hamilton states, one of the important characteristics of the developing countries is that they are inevitably less urbanized than developed countries. The reason is that urbanization is a concomitant of development. A less developed country is almost necessarily one with a predominantly agricultural economy. Having this fact in hand, it is no great mystery why the urban share of the population correlates so strongly with the level of economic development. In general, the basic pattern on the urbanization of the economy is as follows: In earlier stages, food is the prime requirement for life, and in the poorest countries, most production effort is devoted to agriculture. As economies develop, inputs and outputs shift from agriculture to manufacturing (the secondary or processing, sometimes including construction) and services (the tertiary sector). In 1980, low-income countries had a weighted average of 72% of their labor forces in agriculture, in middle-income countries, the percentage was 43; and in

44
THE SOUTHEASTERN ANATOLIAN PROJECT (GAP)...

industrial market economies the percentage was 7. Over the entire range of development, the percentage of the labor force in agriculture varies from 75 to 93 in the lowest-income countries to 3 to 6 percent in the highest-income countries.19

The crucial question is why does the massive shift from agriculture into industry and services occur during economic development? One important reason is that demand shifts. At low-income levels, most income is spent on food. However, the income elasticity of demand for manufactured products and services are large, and income shares spent on them rise with income. Therefore, 10 or 20 fold increase in income that occurs during development causes a massive shift of demand from food to manufactured products and services. Employers in growing sectors offer relatively high wages and other input prices, and labor and other inputs move in directions of relatively high returns. In addition, product prices of manufactured goods and services may fall relative to those of agricultural products. Technical progress may be faster in industry and services than in agriculture and the accumulation of both physical and human capital may favor industry and services relative to agriculture. Furthermore, same powerful reasons can be shown for industry and services to be located in urban areas: Large markets permit scale and agglomeration economies to be exploited; production can locate where comparative advantage dictates and near water, road, and rail transportation facilities so that inputs and outputs can be shipped cheaply; and proximity to inputs produced in the same urban area permits savings on transportation costs.20

As Amos explains, people are naturally attracted to locations containing abundant concentrations of resources used to increase their well-being. Natural resources attract people. People produce capital. Capital attracts more people. The spatial differentiation of capital and people then becomes cumulatively reinforcing, leading to the emergence of cities. Relative concentration of people and activity that characterizes cities also provides more interaction and socio-economic integration. Within a densely populated city, scores of people can be seen and numerous activities can be undertaken within a single day.21

All these clearly indicate that there is a strong relationship between the level of urbanization and the level of economic development. As less urbanized country or region becomes more urbanized, this can be considered as an indication of more economic development. Therefore, in order to see urbanization patterns of the GAP region, I forecasted urban and rural population growth of both the region and the country. I used SHAZAM program, ARIMA model, and data from 1940 to 1997 for both the GAP

Ş. GÜNEŞ
THE SOUTHEASTERN ANATOLIAN PROJECT (GAP) ... region and for the rest of the country. The data comes from the State Institute of Statistics.

The current data and forecasting results up to year 2010 indicate that country-wise rural population started to decrease in the early 1980s. Even though the decrease is not significant, it continues to do so. Also beginning in the 1980s, there is a significant increase (yearly about 3%) in urban population for non-GAP regions.

In the GAP region population started to decrease in 1986 and keeps decreasing thereafter in rural areas. Urbanization in the GAP region starts accelerating about 10 years later than it does in the rest of the country. Forecasting results show that from 1997 to 2010 urban population growth will be 28.6% in the GAP region and 38.8% in the rest of the country. Rural population will decrease by 4.7% and 2.4% in the GAP and non-GAP regions, respectively, for the same years. These results show that a high rate of urbanization will take place both in the GAP region and in rest of the country. However, for the next decade urbanization rate in the GAP region still will be lower than it is in the non-GAP regions. This may be so because the pulling and multiplier effects of the integrated GAP projects, including industry and services, needs more time than just ten or fifteen years to fully accelerate. Thus, it means that until the GAP project is fully utilized affecting all other sectors, the region will be still out-migrating to the other parts of the country while continuing its high rate of urbanization. Compared with the non-GAP regions, higher decrease in population growth in rural areas in the GAP region also supports this result.

A further analysis of the data and forecasted values also show that population growth rate is decreasing in general. This also is considered as a prerequisite for faster growth rate in developing countries. With around estimated 2.3% annual population growth, the GAP region will be experiencing somewhat more than the current non-GAP region's population growth rate for the next decade. Though not very appealing, this -lower population growth rate- is still another good indication on behalf of the region's development expectations.

Table 5. Population movements in the GAP and non-GAP regions: 1997-2010 period ex ante (out of sample) forecast results.

<table>
<thead>
<tr>
<th>Period-over-period percent growth rate:</th>
<th>GAP region</th>
<th>Non-GAP regions</th>
</tr>
</thead>
<tbody>
<tr>
<td>---Urban</td>
<td>28.6</td>
<td>38.8</td>
</tr>
<tr>
<td>---Rural</td>
<td>-4.7</td>
<td>-2.4</td>
</tr>
<tr>
<td>Compound annual growth rate:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---Urban</td>
<td>2.3</td>
<td>2.8</td>
</tr>
<tr>
<td>---Rural</td>
<td>-0.36</td>
<td>-0.18</td>
</tr>
</tbody>
</table>
THE SOUTHEASTERN ANATOLIAN PROJECT (GAP) ...

If we evaluate all information in hand, we can say that the GAP region will experience a higher urbanization rate for the next decade and may be even higher thereafter. Because urbanization has begun later in the GAP region than rest of the country and the project is just affecting population movements in the region, it is possible that forecasted values for the GAP region are underestimated (analysis of the forecast errors also imply such a possibility). Various exogenous regional factors may also cause some, or even severe, deviations from the forecasted values. Such factors may disturb the normal pattern of population movements, particularly in the region. Whether this is the case or not, it seems that the urbanization gap between the GAP region and the rest of the country is subject to diminish, but not significantly until the project is fully utilized in every aspect as an integrated project.

We can also support this conclusion by looking at almost 100% higher negative rural population growth rate in the GAP region compared with the non-GAP regions. This indicates that at least for the next decade cities in the GAP region will not be completely able to absorb the migration from rural areas. However, as the positive side-effects, such as infrastructure, industry, services of the project come into existence, a higher, growth-related (originating from pulling-effects rather than pushing-effects) sound urbanization in the region should be in process by about a decade later from now. Obviously, it is a long time, but unfortunately this is the hard face of the reality awaiting the region. Nevertheless, one thing is clear that in the absence of the project, the region could have never dreamed of progress and prosperity.

IV. CONCLUSION

At the beginning, the GAP was planned as a means of narrowing regional socioeconomic disparities in the country’s more remote and less developed southeastern region. Currently, even though nearly 10% of the country’s population lives in the GAP region, it contributes less than 5%of the country’s GDP from its traditional semi-arid agricultural economy. The GAP region, having a sunny climate and good soil conditions, lacked wide-scale irrigation facilities to distribute the region’s abundant river water. The need for utilizing these resources has been the primary incentive to build this massive $32 billion project. Therefore, expectations from the project are also very high. People, not only in the GAP region but also in the whole country, enthusiastically want to see and collect fruits of the project for which almost every individual has made sacrifices for years in one way or another.

Ş. GÜNEŞ
THE SOUTHEASTERN ANATOLIAN PROJECT (GAP)...

With the implementation of the GAP, by the year 2005, the amount of cultivable land will rise to nearly 4 million acres, an increase of about 400%. This increase in arable land will bring an associated rise in agricultural output in the region corresponding to a 50% increase in the whole country’s agricultural production. Electricity production of hydroelectric power plants in the GAP will be 27 billion-kilowatt-hour, annually. This corresponds 25% of the country’s estimated needs as of the year project is completed. As it is already happening, the project will have multiplier effects on the infrastructure, industry, services, education, and briefly, on the whole socio-economic structure.

The GAP region will also experience an accelerated urbanization primarily due to the implementation of the project and related industries. It is expected that by the year 2010, 76.8% of the people will live in urban areas in the region. Compared with the current situation, this indicates about 12.8% increase in urbanization in the region.

By looking at all these predictions and expectations, however, it would be wrong to say that the road to the GAP was paved with gold. After all, nothing comes easily especially to such a region that has been suffering from the socioeconomic problems of decades. Nevertheless, the region is now closer than ever before to a new life, growth, and prosperity.

NOTES
9. Prime Ministry GAP Regional Development Adm., Status Report, Executive

48 Ş. Güneş
17. Annexes D, E, F, TURGAP Computer Program, Database and Model Results (Year 2010-Basic).
18. Annexes D, E, F, TURGAP Computer Program,