Dynamism of Metropolitan Areas: The Case of Metropolitan Dammam, Saudi arabia

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ARTICLES

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Abstract:

The paper assesses to what extent the development of the oil industry in Dammam urban region has contributed to the stimulation of further development in its surrounding areas. By analyzing data on industrial mix and location, it appears that development of industries related to oil became highly polarized in the region. Facilitating the process of its trickling down toward smaller settlements in the form of affiliated industries would require further government intervention to upgrade their infrastructure so as to become more advantageous for private sector initiatives. In the absence of such intervention, people will continue to be pulled toward Dammam urban region and intraregional disparities in levels of development will be further aggravated.

1. Introduction:

In Regional Economics literature, there have been a wide range of arguments on the role that growth or key industries such as oil and oil related industries can play in developing surrounding areas, by inducing other affiliated industries either in the forward or backward direction. On the forward direction, related industries can be in the form of new industries that use the products of the growth industry as intermediate inputs to produce final products. In the backward direction, related industries include those that produce machinery or raw material which are needed by the growth industry. The strength of

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growth industries in further developing related industries within its surrounding area, either in the forward or the backward direction depends greatly on its nature and technical linkages.

In his argument about North-South relation in the process of development, Hirschman who is in favor of growth industries argues that once growth and advancement take a firm hold in one part of the national territory, it sets into motion certain factors that act on the remaining parts. The results are usually dircet economic repercussions, some favorable and some adverse. The favorable ones are the trickling down which take place when the growth industry in an area requires increase in purchases from surrounding stagnant areas to support higher demand in terms of new purchases. this in turn stimulates a rise in the level of investment in the surrounding stagnant areas. The trickling down effects of a growth industry can also take the form of offering and creating jobs to those who are either under-employed or unemployed in the stagnant areas, thus reducing their unemployment problem, which allows an increase in the productivity of labour remaining in stagnant areas. In other circumstances, growth in one area may have adverse effects on other surrounding areas, which Hirschman refers to as "polarization effects". These adverse effects happen when growth and advancement in a given area attracts the most talented skills and investment from stagnant areas, thus reducing their potential to grow and develop (7, pp. 183-201).

Based on these premises, Hirschman and to great extent, Gunnar Myrdal concluded that, for an economy to lift itself to higher income levels, it must and will first develop within itself one or several regional centers of economic strength. This means the emergence of growth points or growth poles. Thus, in the course of economic development process, spatial polarization and interregional inequality of growth is an inevitable concomitant and condition of growth itself. In the geographical sense, growth in the initial stages must be polarized or concentrated in large cities. However, certain trickling-down effects

come into prominence at a later stage, in this view, growth is necessarily biased toward large urban centers in the early stage, but there will be a tendency towards equalization as economy reaches maturity. Based on this, Hirschman asserts that the effect of growth and advancement in one area may express themselves on other areas through the trickling down and polarization effects. Although polarization effects may have a temporary victory in the early stages of development, in the end, trickling down effects would gain the upper hand. This will take place over the long run when expansion of industries in the growing areas becomes hampered by congestion and higher cost. To accelerate the process of trickling down, deliberate economic policies by governments need to come into play through allocations of public investment to promote development in surrounding areas. The most obvious and the least risky course of deliberate government intervention is to endow the surrounding less developed areas with a good system of transportation, electric power and other social overhead capital facilities (12, ch. 3).

This argument may also lead us to the role of cities, especially large cities on regional economic growth. Reviewing available literature also reveals similar inconclusive and opposing views. On one side, Friedman and Hirschman view growth centers as the ones from where growth is initiated and from which the benefits of growth trickle down to slow-growing areas. On the other side scholars such as Frank, Harvey and Castell, view cities where growth takes firm hold, especially in developing countries, as parasitic institutions that siphon resources from surrounding areas and thus, their role in generating growth for a wider geographical area of which they form a part becomes doubtful (14).

The experience of many countries attests to the fact that evidence of the impact of a growth industry on its surrounding region is inconclusive. In France for example, the development of a capital intensive steel industry in the Lorraine region was not accompanied by

the development of industries consuming steel in the region despite the existence of energy sources, transportation facilities and reasonable market size. The steel complex relied heavily on outside sources for machinery and other equipment and only a very small fraction of its output was used in the region to stimulate downstream industries. As a result, the steel industry became an isolated industrial implantation. Similarly, in South-western France in the Lacq region, the discovery of a new energy source represented by large natural gas deposits became a local phenomenon and did little to influence the economic growth of the South West. Also, the establishment of oil refinery in the Cassa di Mezzogiano in a rural region of southern Italy employed few people with little regional multiplier effect and remained isolated in the countryside. On the contrary, the development of a textile industry in the Lyon region in France resulted in stimulating related industries in the manufacturing of machines, chemical products needed by the textile industry. The latter stimulated the chemical sector in general (6, pp 121-135).

It appears from the previous analysis that although growth industries and growing urban centers have proved to be successful in some parts of the world, it had failed in others.

2. Objective and Methodology

The objective of this paper is to assess to what extent the development of Dammam urban region, which is based on its comparative advantage, as represented by existence of the oil industry as a key industry, has contributed to the stimulation of further development in its surrounding areas. The term *key industry* was first introduced by Francis Perroux in 1948 and it refers to an industry that has the quality, when it increases its output it will lead to an increase in the outputs and inputs of other industries which are affected by the key industry (5, pp 93-103). The methodology of the study is based on the analysis of most recent data on industrial location and its mix with Dammam Urban region as compared to the rest of the Eastern

Province. The analysis verifies to what extent the existence of oil and oil related industries as growth industries have either contributed to the polarization of industries in Dammam Urban region or to its dispersal within other urban settlements in the Eastern Province.

In the next sections of this paper, analyses are made to determine to what extent the growth of oil and oil related industries has influenced development outside Dammam Urban region. In doing so, the national setting of the region, its main settlements, their integrated functions and managing their physical growth are briefly noted. This is followed by analysis of location and mix of oil affiliated industries to determine to what extent these industries have been polarized in Dammam Urban region or diffused to other settlements in the Eastern Province. Efforts to orient the region toward its future growth prospects and the functional reorganization of the urban structures for a better diffusion of this development on a larger geographic scale are also presented.

3. National Setting

Dammam urban region is located in the Eastern Province of the Kingdom of Saudi Arabia along the coast of the Arabian Gulf. By excluding the uninhabited area of the Empty Quarter, the Eastern Province covers an area of 194,000 km^2, which represents 8.6% of the total area of the Kingdom of Saudi Arabia. There are 19 urban settlements in the Eastern Province. Eight urban settlements make up Dammam urban region Dammam, Dhahran, Al Khobar, Jubail, Al Qatief, Safwa, Sihat and Ras Tanoura, These settlements fall within the sphere of geographic and functional influence of the tri-polar Dammam conurbation, which is made up of the three overlapping urban settlements of Dammam, Dhahran and Al-Khobar. Classifying Dammam region as an urban region is based on the fact that there exists an integration of the location of the residences, jobs and services among all its settlements. This classification is consistent with Peter Self definition of an urban region, as he states that City boundaries

cannot be used in defining an urban region, it is where there is a daily commuting into a labor market zone where there is an integration of the location of residences, the location of employment and major services and the transportation network. (13, pp 2-3)

Other urban settlements in the Eastern Province include Abqiq; Al Khafji; Al Nairiyah; Al Uliya; Hafr Al Batin; Al Hofouf; Al Ehsa; Al Qaysumah; Haradh; Khorais.

4. The Settlement Pattern

The Eight settlements that make up Dammam urban region vary in size and are a short distance apart. They form a linear region that has evolved around the discovery of oil, its commercial production and its use to support capital intensive industries.

In the early stages of oil production, after the Second World War, production of oil did not exceed half a million bpd. From that time on, it continued to increase gradually to reach 3-5 million bpd in 1970 and it trippled to 9.6 bpd in 1985. According to the National Seventh Development Plan for the period 2001-2005, production of oil amounted to 8.28 million bpd in 1998 and Saudi Arabia s share of OPEC total production reached 40.8% (11, p. 216). Government revenue from oil amounted to 98 Billion Saudi Riyals in 1999, representing 66.7% of total government revenue (10, p. 78).

The population growth of these settlements was exceptionally high during the last twenty years. Since the early 1980 s, total population of these settlements has been growing at an annual rate of 8.5%, which far exceeds the growth rate of all other cities, except the capital city of Riyadh. According to the latest National Census of 1992, Dammam Urban region s total population reached 1.2 million in 1992, and it is estimated at 1.9 million as shown in 2000 (Table 1). Population density is relatively high in the region compared to the Eastern Province as a whole. As an indication, Dammam urban region s geographic area is approximately 57 thousand square kilometers, which represents 29.4 percent of the total inhabited area

of the Eastern Province Yet, it accounts for 50.6 percent of the Eastern Province s total population.

Table 1
Population of Main Settlements of Dammam Urban Region
(in thousands)

Settlements	Population 1992	Estimates for 2000
Dammam	482.3	768.7
Al-Khobar	267.3	426.0
Al-Qatif	125.7	185.0
Al-Jubail	141.0	224.0
Dhahran	73.7	97.0
Sihat	58.1	76.0
Safwa	37.3	48.0
Ras Tanoura	45.5	59.0
Total	**1,230.9**	**1,883.7**
Total population of the Eastern province	2,567	2,886

Sources: 1992 Figures, 1992 National Census.
2000 Estimates.

5. The Integrated Functions of Dammam Urban Conurbation

In general, an urban conurbation is defined as a pattern of urban strip which comprises physically distinct different size cities drawn together over time by advanced transportation network and combines a relatively high degree of access to a variety of jobs and goods (16, p. 530). This definition is highly applicable to the three cities of Dammam Al Khobar and Dhahran. Each of these cities has its own identity and specialization, the city of Dammam serves as the administrative and trade center for the entire Eastern Province. The city of Al Khobar is the dominant urban center with high concentration of specialized

services especially the medical and financial services, and upscale shopping facilities. With respect to the city of Dhahran, it is the central location of the Arabian Oil Company (ARAMCO) which is responsible for the management of all activities related to the exploration. It is also the center of research which is led by the King Fahd University for Petroleum and Minerals production and processing and exportation of oil. A brief note about each of these three urban settlements follows:

5.1 Dammam

Dammam is the oldest administrative entity in the Eastern Province. During the early 1940s, Dammam was a small fishing community and pearl harvesting village. With the development of oil production, a new and large port was established in 1948 at Dammam and the city became the seat of local government for the Eastern Province. Due to its location, Dammam also serves as the port of entry for the Eastern Region and most water borne commerce destined for the Central and Northern Regions. The Seaport has quays to handle a variety of types of ships. Its facilities include 56 multi-purpose cranes; 8 container lifts; 524 fork lifts; 168 mobile cranes; 28 container carriers; a 1,600 meter (1-mile) long quay for small ships; a quay for fishing boats, an elevator for 1,500-ton ships; pollution disposal facilities; a water desalination plant with a daily capacity of 900 cubic meters (31,500 cubic feet), and a training center. The port administration organizes a host of training programs including equipment operation, equipment and systems technology; safety naval training, management and senior management training, English language and basic shipping documentation. The ship repair dock, built at a cost of SR 797 million (US$ 212.5 million), was opened on 13th March 1984. This also coincided with the building of a 2 miles long jetty that extends from the port into the sea. This jetty can handle two ships at a time and is the starting point of the Dammam-Riyadh railway line. To speed up the

importation process via Dammam port, a Dry Port in the capital city of Riyadh has been established and the two ports are connected via a railroad track that extends for 480 km (4).

5.2 Dhahran

Dhahran was the first oil-related community. It was built as a camp center for housing the pioneers of the Arabian American Oil Company (ARAMCO) in 1938 when oil was first discovered. Over time, Dhahran has developed into a modern community hosting all the facilities of the Petroleum Company. Due to the worldwide increasing importance of the oil-based industries in the region, an International Airport was built to facilitate accessibility to the oil-based region from other countries.

To provide the oil industries with required professionals and needed skills, a scientific university was established in Dhahran in the late sixties (King Fahd University for Petroleum and Minerals). This university is one of the most reputable technological centers in the Kingdom. It is very well known for its advanced research in the areas of petroleum engineering, environmental studies and industrial management.

5.3 Al-Khobar

Prior to the discovery of oil, Al-Khobar was a small fishing community. Due to the increase in oil production and importation of goods, a new port facility was needed to handle the shipment of oil and incoming goods. As a result, a new pier was built in 1938. Since then, traditional fishing activities of Al-Khobar started to decline and oil related activities began to expand. At present, Al-Khobar is the urban center with the most amenities within Dammam urban conurbation (3). Its total population is estimated in 2000 at 426 thousand, representing 30.8% of the total population of Dammam urban conurbation, (see Table 1).

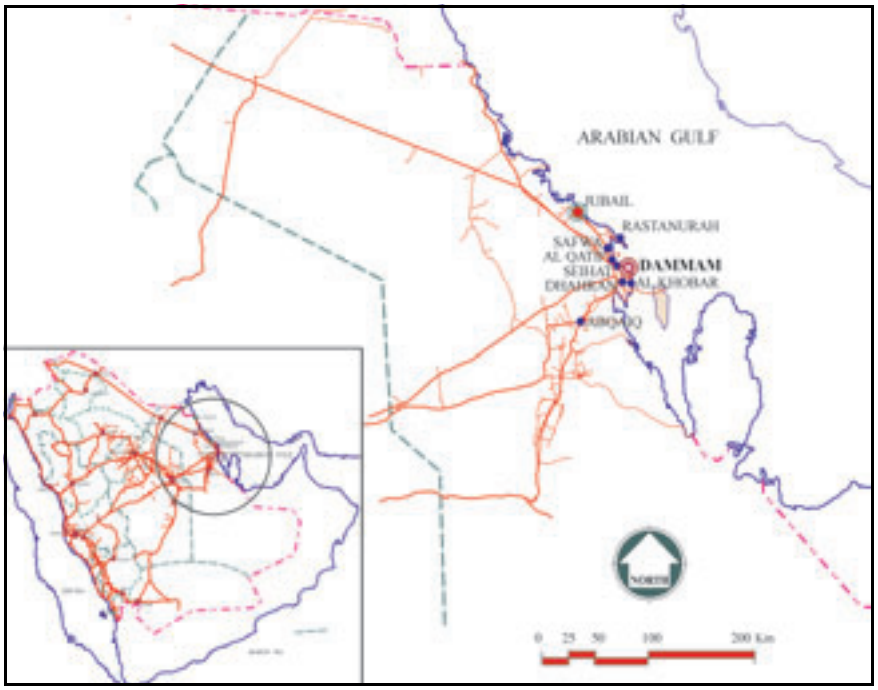


Figure 1: Dammam Urban Region

6. Improving efficiency through long term management of urban growth:

6.1 The Planning Agencies

As Dammam urban conurbation emerged from the successive integration of the three urban centers of Dammam Dhahran AlKhobar which were performing complimentary functions, managing its physical growth on long term basis deemed necessary as to ensure that further integration and expansion would be efficient and will further enhance, rather than hamper, its development prospects.

The Arabian American Oil Company (ARAMCO), played the first active role in long term physical planning. It was responsible for preparing, monitoring, and amending physical plans for areas under its control, namely, Dhahran andAl-Khobar. In 1965, Dammam Municipality became an active agency in physical planning. Its activities

started by implementing urban programs and the institutionalization of physical planning at the local levels. As a result, The Planning and Development Department of the Dammam Municipality became a responsible body for conducting physical surveys and preparing planning reports, including Master Plans, Execution Plans and Action Area Plans. These plans, however, were confined to the immediate areas of the city.

Since 1975, The Royal commission for Jubail and Yanbu became a major player in the planning activities of the region. It became responsible for the planning and construction of the industrial city of Jubail which is located 90 km north of Dammam.

Although adequate coordination between these three planning agencies exists, the prospects for further development of the region need to be based on a comprehensive regional development strategy that enforces linkages between Dammam urban region and the rest of the Eastern Province. Formulation of such regional development strategy requires further cooperation and coordination among sectoral ministries at the central level and the planning agencies at the local level.

6.2 The Planning Activities

a) The Early Action Master Plan

During the period 1970-1980, the unparalleled physical growth of Dammam conurbation, which was mostly random and haphazard, necessitated the formulation of an Action Master Plan to help ensure logical and systematic patterns of the city s physical growth. Toward this, an Action Master Plan for the urban conurbation of Dammam was formulated and its priorities included: (8)

- Containment of urban sprawl;
- Controlling the location of industrial development so as to avoid detrimental environmental effects;
- Provision of adequate land for warehousing and storage to keep up with the increase in the handling capacity;

- Control of coastal development, mainly excessive filling of coastal water to avoid negative impacts on the environment;
- Improvement of transportation facilities;
- Extension of utilities;
- Construction of neighborhood and community facilities;
- Revitalization of the central business districts;
- Preservation of culturally significant areas;
- Enforcement of planning regulations.

b) Delineation of Urban Growth Limits

By mid 1980 s, discrepancies between the target objectives of the Master Plan and the realities of physical development that took place in Dammam urban conurbation became apparent and alarming. Urban sprawl on the city s peripheries became excessive. As a result, the need for the provision of new urban infrastructure to cover the areas of low densities was pushed beyond limits. Field surveys revealed that although total population of Dammam conurbation increased by 230% between 1970 and 1980, its total area had increased by 400%. To rationalize government expenditures on the provision of new urban infrastructure and to ensure efficiency in the use of an already existing one, extensive surveys were carried out to define and delineate future urban growth limits. The growth limits defined the directions and pace of physical development for 20 years period divided to four consecutive phases of five-years each that correspond to the National Five-Year Development Plans. Based on these growth limits, government policies confined the provision of new infrastructure and the approval of new land subdivisions to the designated areas defined by the earmarked growth limits. In addition, it curtailed land grants and new subdivisions in areas outside the growth limits. At present, the growth limits are mandatory planning instruments and municipalities are empowered to enforce them through a wide range of control instruments. One of the most interesting findings of this exercise was the identification of

serviced vacant land within the built-up areas and the existence of excess capacities in infrastructure. These parameters were extremely important in defining the future directions of physical growth within the urban conurbation. (2, pp 31-62)

c) Structural Plans

As planning is a continuous process and of long term nature, it was necessary to look beyond the delineated growth limits of the twenty years period. Lessons learned from past experience had shown that to avoid future problems of under utilization of urban infra-structure and to improve the urban fabric, structure plans for cities must be formulated and enforced. These plans were prepared to provide a long-term vision of future growth of Dammam urban conurbation and to serve as a development control mechanism for guiding for the physical development in areas beyond the defined growth limits. The plans outline land use; future road network and infrastructure requirements, Implementation of these plans is expected to improve the internal efficiency of cities and to ensure their orderly growth.

7. Industrial Economic Base

The industrial economic base of Dammam urban region is a true reflection of its comparative advantages as represented by the existence of oil and oil related industries. As stated earlier, the region is at the center of an area that has 20% of the world s proven oil reserves which amount to 257 billion barrels. Proven natural gas reserves are estimated at 126.1 trillion feet. Undoubtedly, the region became a major beneficiary of these favourable conditions.

Over the last thirty years, the industrial sector in Dammam urban region has been expanding steadily. Total number of industrial establishments had increased from 39 in 1970 to a total of 482 in 1987 and it reached 626 in the year 2000. Table 2 and Chart 1 indicates

that in the year 2000, Dammam urban region s share in the total industrial establishments in the entire Eastern Province amounts to 85.5%. Similarly, Table 3 and Chart 2 indicate that the share of the region in total industrial employment of the Eastern Province amounts to 91.5%. It appears from this industrial location pattern that industries are highly polarized in Dammam urban region.

Table 2
Distribution of Industrial Establishments by Industry Type. Eastern Province, 2000

Industry Type	Dammam Urban Region	Other settlements in the Eastern Province	Total Eastern Province
Food Products	48	40	88
Textiles	26	07	33
Wood Products	24	03	27
Paper and Printing	20	06	26
Chemicals	282	26	308
Construction Material	32	05	37
Metallic/Machinery	184	15	199
Other	10	02	12
Total	626	104	730
Percentage Shares	85.8%	14.2%	100%

Source: Ministry of Industry and Electricity
Deputy Ministry of Industrial Affairs, Industrial Licenses, 1421

With respect to industrial mix, Chart 2 indicates that two types of industries dominate the industrial mix in Dammam urban region, namely, chemicals and metallic/machinery industries. These two industrial sub-sectors which account for 74.6% of the region s total industries. These two sub-sector industries are highly associated with

oil. The chemical industries, such as fertilizers and plastic products are down stream industries of the oil industry. With respect to machineries and metallic industries, while the machinery industries are supportive of the oil industry, the basic metallic industries such as steel and steel products are energy intensive where natural gas and oil are among their main inputs.

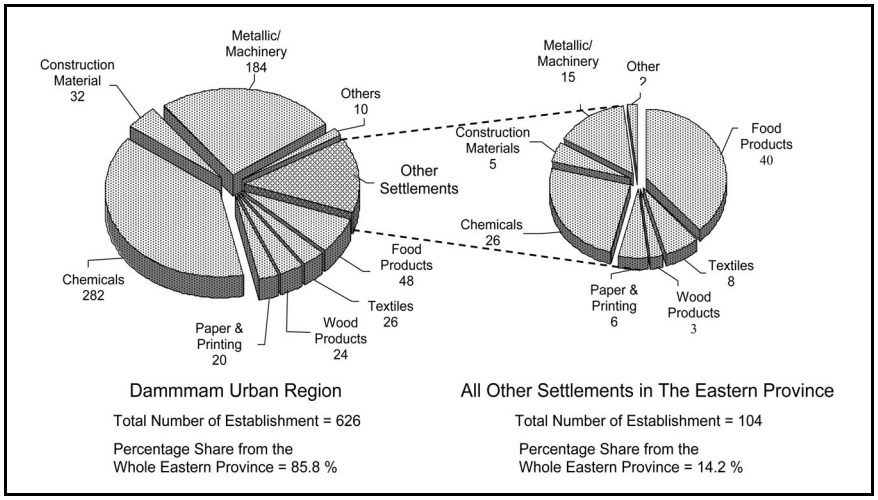


Chart 1: Distribution of Industrial Establishments by Industry Type. Eastern Province, 2000

Table 2 also shows that if Dammam urban region is excluded, then total number of chemical and metallic/machinery industrial establishments in all other settlements of the Eastern Province, would only amount to 41 establishments, representing only 8 % of the total of 507 chemical and metallic/machinery industrial establishments in the entire Eastern Province. Similarly, Table 3 and Chart 3 reveal similar findings with respect to the polarization of industrial employment in Dammam urban region as compared to the entire Eastern Province.

Table 3: Distribution of Industrial Employment by Industry Type. Eastern Province, 2000

Industry Type	Dammam Urban Region	Other settlements in the Eastern Province	Total Eastern Province
Food Products	2009	1320	3329
Textiles	1394	403	1797
Wood Products	1261	126	1387
Paper and Printing	1030	156	1186
Chemicals	19025	924	19949
Construction Material	1462	275	1737
Metallic/Machinery	11962	372	12334
Other	359	22	381
Total	38502	3598	42100
Percentage	91.5%	8.5%	100%

Source: Ministry of Industry and Electricity
Deputy Ministry of Industrial Affairs, Industrial Licenses, 1421

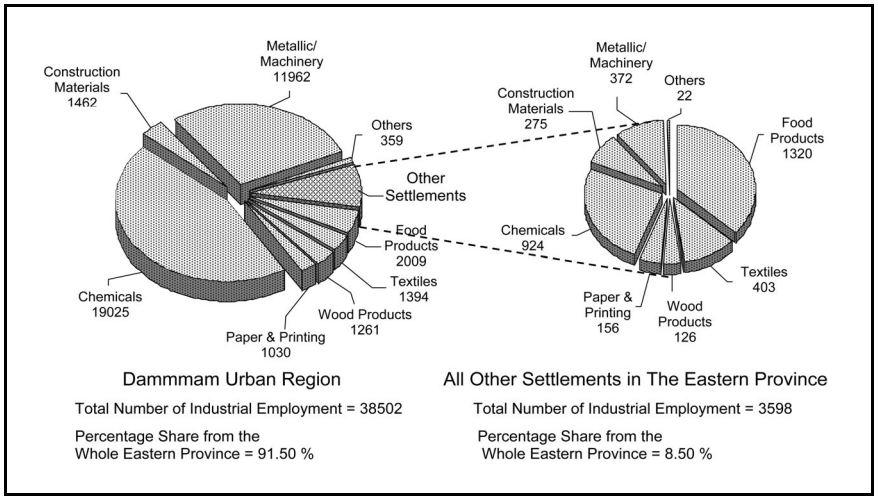


Chart 2: Distribution of Industrial Employment by Industry Type. Eastern Province, 2000

This analysis reveals that the trickling down and dispersion of industries related to oil toward other settlements within the Eastern Province away from the Dammam urban region has been minimal.

This weak trickling down of oil related industries to other settlements away from Dammam urban region may be attributed to many factors, such as small population size of these urban settlements; the requirements for large amounts of fixed investments - as these industries are capital intensive - which can be difficult to raise by the private sector alone. In addition, these industries also require high levels of technology and know-how which is easier to become accessible when such industries agglomerate and become supportive of one another in a large urban setting.

Based on this finding, the development of other small urban settlements in the Eastern Province away from Dammam urban region cannot be assumed to be a matter of time, rather the pattern of development has to be changed and guided through intentional government intervention to orient these settlements to become more attractive for private sector investment.

8. Orienting Dammam urban region toward further growth

The government investment allocation policy has been a strong factor in shaping the current level of development in Dammam urban region and in orienting it toward further growth. In doing so, the government had committed massive amounts of investments for the provision of infrastructure; improving accessibility with neighboring countries and the processing of the region s main natural resources so as to diversify its industrial economic base and reduce national reliance on exportation of crude oil .

a) Provision of advanced infrastructure

At present, Dammam urban region's infrastructure represents one of its main assets. Four modes of transportation integrate well in the region; these include road, air, rail and water. The region has the largest international airport in the kingdom, with direct daily services to other Middle East locations, Europe and Asia. The airport, which started operation in 1999 is located half way between the cities of Dammam and Jubail. The economic development and urban expansion of the last ten years have heightened the need for a high standard airport similar to that of Riyadh and Jeddah. The Airport designed capacity far exceeds the requirements of the whole Eastern Province for both domestic and

international air travel. It is the Kingdom's largest Airport in terms of area and facilities as it covers an area of 760 square kilometers.

In addition to the new airport, the railway that connects Dammam to the capital city of Riyadh has been upgraded. Dammam urban region is also highly accessible from the capital city of Riyadh via a 6 lane super express highway. Moreover, the region possesses highly advanced communications; power generation and adequate water desalination facilities, which are adequate in meeting future requirements. At present, desalinated water from the region is pumped through pipelines to the capital city and other parts of the country. Industrial zones have also been established to provide fully serviced sites for industrial activities. The government had also invested heavily in establishing highly specialized medical services; scientific; educational and research institutions within Dammam urban region.

b) The newly built Causeway

The newly built Causeway connecting Dammam urban region with the State of Bahrain has also eased accessibilities to other Gulf Cooperation Council countries (GCC). This Causeway extends over water for twenty-five kilometers and puts the state of Bahrain within 30 minutes from Dammam Conurbation. Other Gulf countries can also be reached by driving from Dammam.

Since its inauguration in 1986, passenger and freight traffic across the Causeway have been growing steadily. Table 4 and Chart 3 show that passenger traffic across the Causeway had increased from a daily average of 11.2 thousand in 1987 to almost 20 thousand per day in 1999. Total numbers of passenger vehicles and buses doubled during the same period.

Table 4: Passenger traffic across the Causeway. (Selected years)

Year	Passenger Cars	Buses	Total	Total Passengers	Average Daily Passengers
1987	1,399,368	11,645	1,411,031	4,124,012	11,299
1993	1,659,105	8,073	1,667,142	4,321,143	11,839
1997	2,093,800	11,257	2,105,057	5,647,348	15,472
1999	2,654,982	22,373	2,677,355	7,233,031	19,817

Source: King Fahd Causeway Authority, memo dated July 26, 2000.
Recent Statistics

With respect to freight and commodities movements, data on volume and nature of these commodities are not available. However, a strong proxy for the growth of freight movements is measured by traffic of high volume trucks, as they are used mainly for transportation of goods.

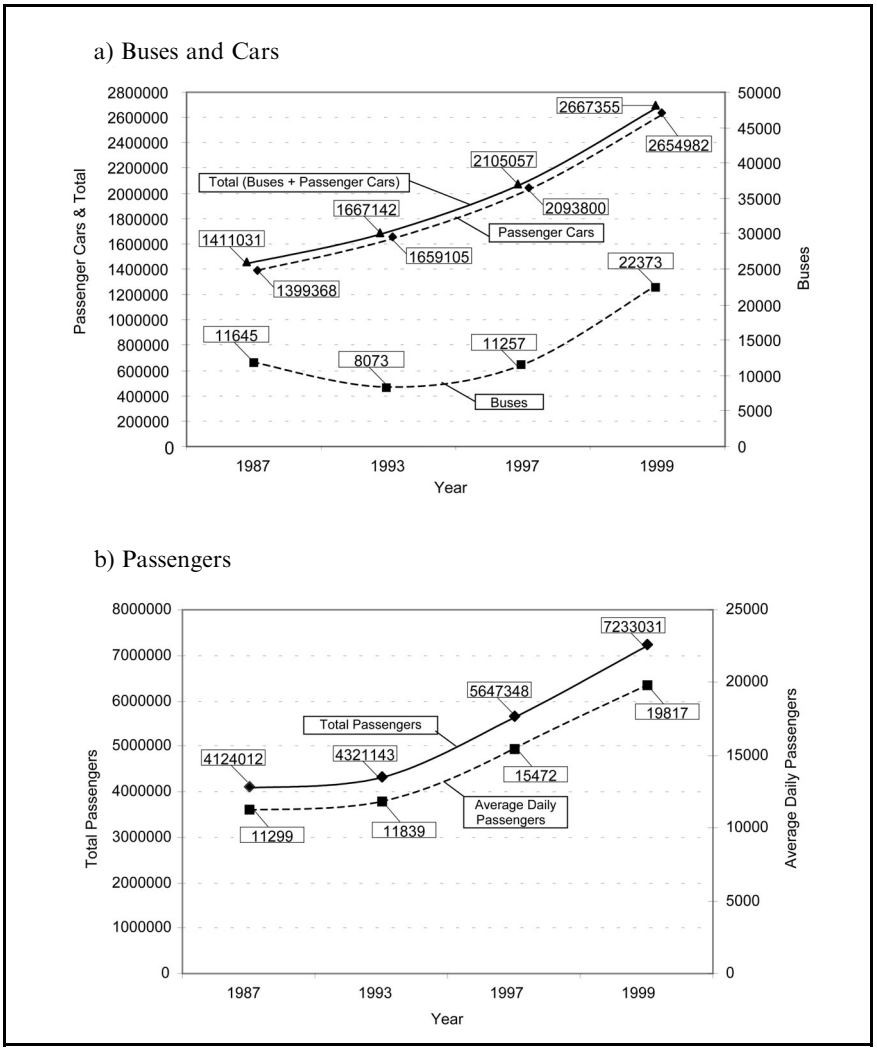


Chart 3: Passenger Traffic across the Causeway. (Selected years)

As shown in Table 5 and Chart 4, total number of heavy weight trucks had increased by 70 percent over a period of 12 years. Due to proximity to other Gulf Cooperation Council Countries, increase in trade between the Kingdom and these countries will continue resulting in further expansion of road transport.

Table 5
Traffic of heavy weight trucks across the Causeway (Selected years)

Year	Total	Daily Average
1987	93,290	256
1993	133,224	364
1997	131,478	360
1999	161,653	443

Source: King Fahd Causeway Authority, memo dated July 26, 2000.
Recent Statistics

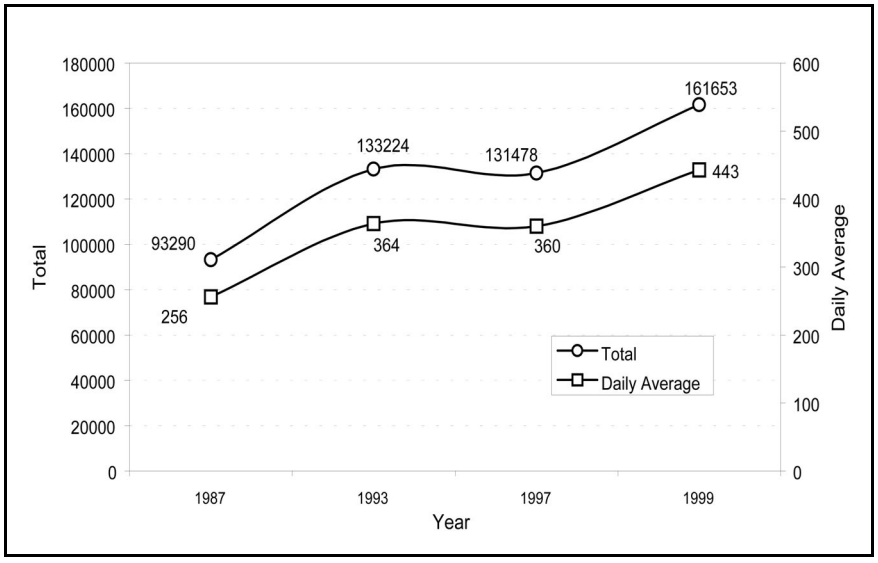


Chart 4: Traffic of Heavyweight Trucks across the Causeway. (Selected years)

c) The Building of a New Industrial City

Many of the New Town's policies addresses population redistribution, either to relieve population pressure on major urban areas or to intercept incoming rural population. The purpose of building the new industrial city of Jubail is to capitalize on the comparative advantage of the region's natural resource endowments as represented by the existence of oil and natural gas. The region's proven reserves of Crude oil are enough to pump 5 million barrels a day for 140 years.

Building the new industrial city in Al-Jubail stems from the national objectives of diversifying the country's economic base and increasing the value added of crude oil through the introduction of capital and energy intensive broad based chemical industries. This will undoubtedly lessen the country's vulnerability to fluctuations in the price of crude oil in international markets thus avoiding their negative impacts on government revenues and development programs.

The jobs to be created by these industries are expected to facilitate the absorption of Saudi nationals in technologically advanced high paying jobs. Jubail industrial city is also reducing the Kingdom's vulnerability to hostile elements by decentralizing oil refineries, shipment and port facilities. The Industrial City is located 90 km north of Dammam and can be reached within one hour driving. The choice of its location was based on extensive studies that took into consideration topographical, environmental, economic and strategic factors. It is built in the heart of the Kingdom's oil producing region to be easily supplied with fuel and feed stocks. It is also adjacent to deep water, thus permitting port development, which is very essential for heavy industries. The coastal location is also necessary for obtaining the seawater used in industrial cooling.

The infrastructure of Al-Jubail Industrial City is by all standards among the best of newly built industrial towns. More than 537 kilometers of road network have been constructed, power is provided through tie-ins to the Eastern Province grid, and a water desalination

plant with a capacity of 90,000 cubic meters of distilled water per day has been built. An industrial port complex has also been set up in the city for the export and import of goods. It comprises four terminals. 20 berths, two storage areas, service platforms and a two miles tanker terminal for the loading of oil refinery products. One berth has been set aside for chemical products, and a separate terminal is designated for iron ore, fertilizer and sulfur exports. The annual handling capacity of the port is over 50 million tons of bulk liquids, plus 10 million tons of other materials. In addition, a modern airport, which covers an area of 250 square kilometers was built in the industrial city so as to meet all the city's requirements, including air cargo and passenger services. The airport's main runway is 4 km long, allowing it to be used by all existing wide-bodied aircrafts as well as possible future super wide-body planes. In addition to its normal facilities, the airport also houses a civil defense center and a training center for all types of airport activities. As for communications, cable and satellite relays to carry telephone and telex traffic around the world with direct dial systems have been installed. In addition, quality housing and recreational facilities extend along the Arabian Gulf shorelines.

In Summary, through planning and government funds, availability of infrastructure is no longer a constraint to support future development within the industrial city. Its infrastructure is capable of supporting further development and strengthening linkages with the rest of the Kingdom and the outside world. (1)

After the completion of infrastructure in 1976, the government established the Saudi Basic Industries Corporation (SABIC) to promote the primary industries in the industrial city and to provide support to the private sector to invest in secondary and ancillary industries.

New industries to be located within the industrial city are carefully selected to ensure the use of Saudi Arabia's petroleum and other mineral resources to generate domestic and export products. These

industries range from heavy to light, and from capital intensive to labor intensive. They fall into three major categories: primary, secondary and support and light manufacturing.

The primary industries are mainly export-oriented, built as joint ventures between SABIC and large international corporations. These industries include refineries, petrochemical plants, methanol plants and steelwork. The Secondary industries are mainly those engaged in the processing of intermediate petrochemical products to either final or other intermediate products. These industries include plastic, copper, aluminum, fertilizer, pesticides and other industries. The support and light industries include those engaged in the production of pre-cast and metallic products, air-conditioning and a wide range of other products needed either for industrial or household use.

During the last 6 years, investment in Al-Jubail Industrial City increased significantly. Based on recent information provided by the Royal Commission for Jubail and Yanbu, total industrial investment in Al-Jubail Industrial City in the year 2000 reached 112.3 billion Saudi Riyals (30 billion US Dollars).

Table 6
Industrial Investment, Al-Jubail Industrial City 1994, 2000
(in billions of SR)

Category	Total Investment in 1994	Total Investment in 2000	% Change
Basic Industries	53.0	100.3	89.2%
Secondary Industries	6.4	9.5	48.4%
Light Industries	1.6	2.5	56.3%
Total	**61.0**	**112.3**	**83.9%**

Source: Royal Commission for Jubail and Yanbu, 2000, Recent Statistics, memo July 2000.

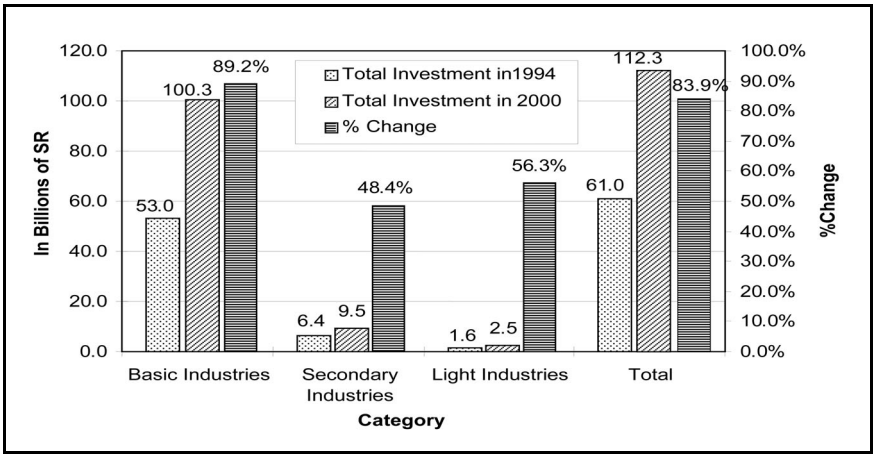


Chart 5: Industrial Investment, Al-Jubail Industrial City 1994, 2000 (in billions of SR)

Table 6 and Chart 5 show that over the period 1994-2000, total industrial investment in Jubail industrial city had increased by 83.9 percent and most of this increase occurred in the basic industries as investment in this sub-sector had increased by 89.2%.

Table 7 and Chart 6 also show that due to large investments, total number of industrial establishments in operational status had increased from 104 in 1994 to 136 in 2000. This is in addition to 32 industrial establishments under construction and 66 industries in the design stage in the year 2000.

Table 7: Change in number of industrial establishments. Al-Jubail Industrial City 1994-2000

Category	In Operation		Under Construction		In the Design Stage	
	1994	2000	1994	2000	1994	2000
Basic Industries	16	17	-	-	2	7
Secondary Industries	8	16	4	3	12	18
Light Industries	80	103	28	29	31	41
Total	**104**	**136**	**32**	**32**	**45**	**66**

Source: Royal Commission for Jubail and Yanbu, 2000
Recent Statistics, memo, July 2000

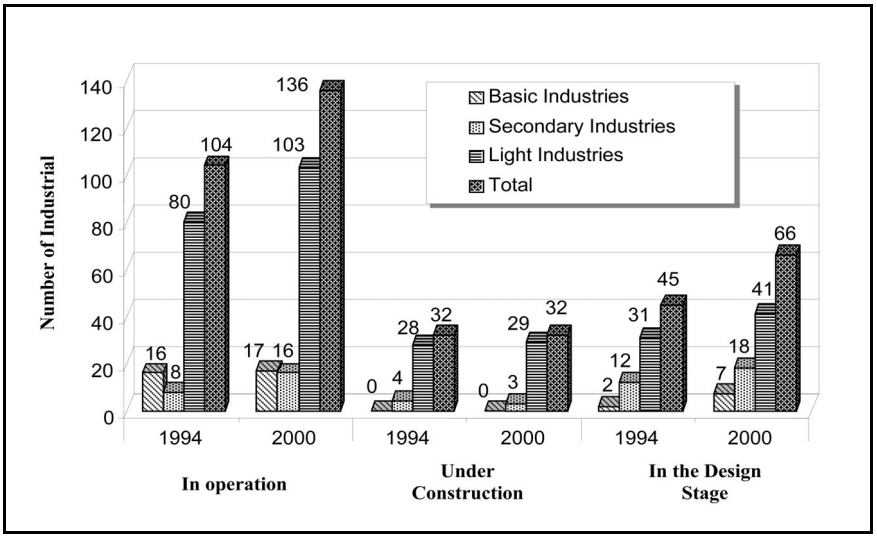


Chart 6: Change in number of industrial establishments. Al-Jubail Industrial City 1994-2000

With respect to the role of these industries in generating employment opportunities, basic and secondary industries in the industrial city have already generated 57,300 high paid jobs and it is projected to reach 83,900 jobs by the year 2013. The Royal Commission has also established an industrial college in Al-Jubail to ensure the provision of skilled national manpower to match future needs of industries. During 1999, a total of 527 students were admitted and 142 students graduated. The Commission also offers a wide range of on-the-job training programs and 540 trainees attended these programs during 1999. [15]

To further diversify the economic base of the region, greater role has been given to the private sector to invest in non-traditional activities. Emphasis has been placed on tourist and recreational facilities, where new concepts to the Kingdom such as integrated resort villages and hotels along the seashore have been supported by the government through the provision of land sites with long-term

nominal rent. Investors in these activities are also provided with easy term loans.

9. Addressing Spatial Imbalances

The successive National Five-Year Development Plans call for reducing inter and intra regional disparities in levels of development and promoting a spatially balanced distribution of population and economic activities over the national space. In a free enterprise economy, these objectives may be difficult to realize in the absence of a long-term vision of a spatial development. Toward this objective, The Ministry of Municipal and Rural Affairs (MOMRA) has formulated a National Spatial Strategy to address the following long term concerns that have been postulated by the Five-Year Development Plans. These concerns include: (9, pp.6)

a - The need to correct spatial imbalances in the distribution of population and to avoid the negative impacts of fast growth in the size of large urban centers.

b - The need to promote balanced development within regions and between regions.

c - The need to rationalize government expenditure on the provision and maintenance of urban infrastructure.

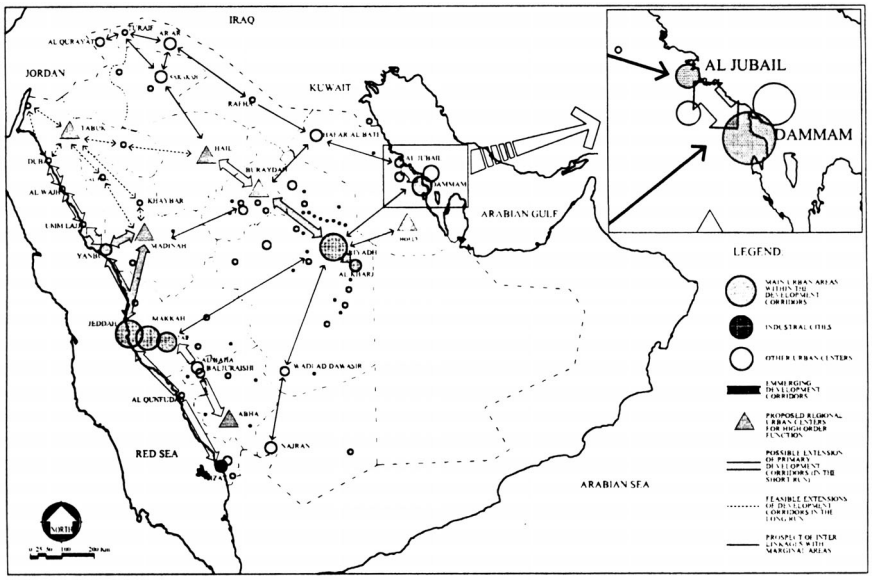
d - The importance of accelerating the process of integration between rural and urban areas and improving the national system of cities due to their dominant role in the transmitting economic impulses and the diffusing innovations.

e - The importance of developing border cities for reasons of national security.

The formulated Strategy identified a set of emerging development corridors that could enhance the prospects of better integration between different parts of the national space (Figure 2). With respect to Dammam urban region, the strategy identified an emerging development corridor which extends from the urban conurbation of Dammam to the industrial city of Al-Jubail. This development

corridor was found to be one of the most viable and promising development corridors that can help in reducing intra-regional disparities. It has a diversified mix of economic activities and is strategically located along a waterway within close proximity to the other Gulf States. It also has an adequate social and economic infrastructure and a diversified economic base which includes industrial; finance; trade and tourism activities.

Facilitating the role of this region's development corridor in promoting a wider dispersion and the trickling down of development of smaller settlement would require:



Source: National Spatial Strategy Main Report, Ministry of Municipal & Rural Affairs Deputy Ministry for Town Planning, 1999

Figure 2: Development Corridors identified by the National Spatial Strategy

a - Enhancing the functions of the regional and the local growth centers which are located within close proximity to Dammam

urban region by upgrading their infrastructure and provision of investment incentives to private sector. By so doing, these local growth centers could become anchor points for facilitating the trickling down of development from Dammam urban region to its surrounding areas. The identified regional and local growth centers include Hofouf to the south, Al Uliya, Qaysumah, Al Nairiyah and Al Khafji to the north.

b - Building on the strength of Dammam urban region by facilitating future development along the northeast international border toward the urban settlement of Hafr Al Batin and Rafha and in South East toward Al Ahsa. Implementing development programs by sectoral ministries along these potential corridors could definitely accelerate the process of spatial integration between the Dammam urban region and other parts of the Eastern Province and beyond.

c - Sponsoring vigorous programs for promoting private sector investments in small scale industries in order to facilitate the diversification of the economic base of surrounding urban centers. Industrial Development Funds and financial institutions can play an active role by providing loans to increase private sector investments in supporting industries.

d - As the availability of skilled manpower is one of the most important incentives for industrial location, hence, provision of adequate vocational and technical training by government training institutions must be expanded. The training institutions and their training programs need to be geared toward the required skills and actual needs of new industries which are to be introduced in local growth centers away from Dammam urban region.

10. Conclusion

Dammam urban region has unquestionably broadened the Kingdom's industrial base and provided the means to recycle more of the Kingdom's wealth within the country. Exportation of produced

products from Dammam Urban Region contributes greatly to foreign trade and the balance of payments through substituting for imports. The region's proximity to other GCC countries offers a great opportunity for further growth. Due to the nature and the focus of the region's economic activities on oil and oil byproducts for which demand is worldwide and by taking into consideration the region's strategic location, it is reasonable to believe that future growth prospects of the region depends greatly on cooperation with the outside world and stability in the region.

As industrial development has been mostly confined to Dammam urban region and the trickling down of this development to other surrounding smaller settlements has been relatively slow, intentional government intervention in the development process of the surrounding smaller urban settlements is highly desirable. Otherwise, further polarization of development in Dammam urban region may continue thus aggravating the existing intra-regional disparities in levels of development.

The real challenge facing policy makers is that continuing high rates of both natural population increase and urbanization will inevitably maintain external pressure on Dammam Urban Region to accommodate high rates of population increase. Unless clear policies are implemented to upgrade the infrastructure of smaller urban settlements in the Eastern Province and to provide adequate incentives for attracting private sector investments to these settlements, population will continue to be pushed from these smaller settlements toward Dammam urban region. At the same time, the prospects of increasing job opportunities in oil related industries - especially after the introduction of liberal policies to attract foreign investment will cause the Dammam urban region to continue to be a place of attraction for potential new residents. People may continue to be pulled to Dammam urban region.

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