

Investigating Position of Qaen City in Regional Development Based on Future Study Approach: Scenario Planning

Položaj mesta Qaen v regionalnem razvoju na podlagi študije prihodnosti: načrtovanje scenarijev



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Abstract

The modern world is defined by abrupt and rapid changes. Due to the importance of the potential future development awareness, future studies approaches are now an academic subject offered by several of the world's most prestigious institutions. Undoubtedly, this knowledge is a principal instrument of the information era. This research looked at Qaen's position in regional development using a futures studies method and presenting strategic future thinking in city planning. It is based on the goal of applied research and data-gathering techniques used in descriptive-analytical studies. Environmental monitoring methods (i.e., observations, interviews, and questionnaires) were employed to evaluate the present state of Qaen City. The acquired data were analysed using Spss and MicMac software. To improve Qaen's position in the regional development process, a structural equations questionnaire was designed with a Likert scale based on current needs and problems, emphasising the most crucial variables and indicators of Qaen's urban development. The final scenario aims at improving Qaen's position in the regional development process. According to the findings, only one scenario shows potential circumstances for enhancing the city's position in regional growth in the future; two are static state scenarios, and the other six are crisis mode scenarios. The scenario proposed by the first group includes favourable conditions based on relative economic growth, GDP, production and industrial prosperity, provincial investment, favourable policies, university development, investment security, favourable production technology, favourable employment, and improving the network of main roads that will have the greatest impact on Qaen City's regional development process.

Keywords: future study, regional development, scenario planning, MicMac, Qaen City, South Khorasan Province

Izvleček

Sodobni svet zaznamuje velike in hitre spremembe. Zavedati se moramo, kaj nam prinaša prihodnost, zato so prihodnje študije akademski predmet, ki ga danes nudijo najbolj prestižne svetovne ustanove. Tovrstno znanje je nedvomno eden od ključnih instrumentov informacijske dobe. Namen pričujoče raziskave je bil s pomočjo metode prihodnjih študij ugotoviti položaj mesta Qaen v regionalnem razvoju in predstaviti strateško razmišljanje o prihodnosti pri načrtovanju mesta. Študija izhaja iz ciljev

uporabnega raziskovanja in tehnik zbiranja podatkov, ki se uporabljajo v deskriptivno-analitičnih študijah. Za oceno trenutnega stanja mesta Qaen smo uporabili metode spremljanja okolja, na primer opazovanje, intervju in vprašalnik. Pridobljene podatke smo analizirali s programsko opremo Spss in MicMac. Za izboljšanje položaja mesta Qaen v procesu regionalnega razvoja smo oblikovali vprašalnik s strukturnimi enačbami z Likertovo lestvico, ki temelji na trenutnih potrebah in problemih, s poudarkom na najpomembnejših spremenljivkah in ključnih kazalnikih razvoja mesta Qaen. V zaključku je bil oblikovan scenarij za izboljšanje vloge mesta Qaen med procesom regionalnega razvoja. Mesto se spogleduje z devetimi možnimi scenariji, od katerih eden nakazuje potencialne okoliščine za izboljšanje vloge mesta v regionalnem razvoju v prihodnosti, dva ohranjata statično stanje, šest pa je kriznih scenarijev. Scenarij prve skupine vključuje ugodne pogoje, ki temeljijo na relativni gospodarski rasti, BDP, proizvodni in industrijski blaginji, naložbah province, ugodnih politikah, razvoju univerz, varnosti naložb, ugodni proizvodni tehnologiji, ugodnem zaposlovanju in izboljšanju omrežja glavnih cest, kar bo imelo največji vpliv na regionalni razvoj mesta Qaen.

Ključne besede: prihodnje študije, regionalni razvoj, načrtovanje scenarijev, MicMac, mesto Qaen, provinca Južni Horasan

Introduction

The industrial era has been pushed upon humanity by advances in science and technology. We are now observing the rise of the trans-industrial age, the information age, and the virtual era. The transition from the industrial to the information waves has had unique consequences, and those who want to avoid being dismayed and seize the golden opportunity must equip themselves with the essential mechanisms of this era and rely on the Information Age and virtual age's special planning tools to stay ahead of the competition (Pourazat & Firouzfard, 2012).¹

Futures studies were characterised as "great science" in the United States Air Force in the mid-20th century, referring to a consciously ordered science that is the cornerstone of progress (Pourmohammadi et al., 2016). On the other hand, individuals, companies, cities, and regions keep facing a complicated and unpredictable future. The only method and policy likely to be more effective in this climate of change, instability, and uncertainty is the hunt for future architecture (Daim et al., 2009). Due to fast environmental changes and the ensuing unpredictability, the necessity for strategic planning and futures studies to cope with potential changes has been increasingly evident in recent years (Forani & Hosseinloo, 2012).

Iran, a developing nation, has a great deal of cultural, social, and economic variety, and planning thought in Iran has been through

numerous ups and downs over the course of history. Be it short-term budget allocations or developing one-, five-, and twenty-year plans, land planning is imperative. Meanwhile, planning thought has evolved from a conventional approach to strategic planning and, ultimately, strategic thinking. According to experts, the future may vary significantly from the past and the present in that it will not necessarily follow historical patterns (Zali, 2009, p. 10). Qaen City has a wonderful opportunity to form a special economic zone owing to its strategic (geographical, political, and economic) location and abundant resources (i.e., agriculture-friendly climate conditions; rich and diverse (non-)metallic mineral resources; natural areas, landscapes, and tourist attractions, especially nature tourism; efficient and young workforce, etc.).

Given the city's potential, this part of the study aims to discover the variables and reasons impacting the province's sluggish growth. Relevant planning is needed to reach the desired outcome. In light of the overall regional conditions, Qaen City is far from the objectives and prospects of upstream programs in various city areas. Therefore, to achieve the province's development goals and opportunities, the main problems and obstacles in the city's development must be identified and resolved through accurate and effective planning methods. Adopting a strategic approach to determine the priorities is essential. The role of the city of Qaen in the regional development of South Khorasan Province is one of the most significant concerns

addressed in this research. What are the city's growth possibilities and the intended scenario for enhancing Qaen's position in the South Khorasan regional development process?

Theoretical Framework

Future Study

A precise definition of futures studies is equivocal since individual philosophers offer diverse formulations based on their skills and interests. Furthermore, the notion of futurism is constantly evolving due to the short lifespan of such information and experience. Nonetheless, several definitions of future investigations have been proposed thus far (Khazaei and Elahi, 2012, p. 11).

„A process through which one may get a thorough grasp of the dynamics that create a long-term future and can be considered in establishing policies, planning, and decision-making,“ maintains Joseph Kotz.

Future discussions include a variety of “possible”, “probable,” and “desirable” to transform from the present to the future (Moghimi, 2014, p. 4). In their view, future terms fall into at least three categories:

- A: FUTURES, FUTUROLOGY, FUTURES STUDIES
- B: FORECASTING
- C: FORESIGHT

Most Group A concepts have the same meaning as futures studies and futurism, which is why anything dealing with the future falls under this category. FORECASTING employs a more scientific approach to making future predictions, relying on quantitative methods and precise scientific models. As a result, it is often translated as “future prediction,” whereas FORESIGHT means foresight, implying a human activity to shape the future. Consequently, we may describe these three groups using the terms “futurism,” “future watching,” and “foresight” (Tadbir, 2006, p. 6).

Future Observations

According to Ben Martin, “/f/oresight is a methodical approach to assessing the long-term future of science, technology, economics, and society in order to suggest areas for strategic study. Common technology with the greatest potential for economic and societal benefit” (Mozaffari, 2010, p. 23).

As stated by Luke Georgiou, futures studies are a methodical technique for analysing scientific and

technical advancements that have a significant influence on industrial capability, income production, and quality of life (Saheqinejad, 2006).

Futures studies are outlined in one of the most relevant ways: Invest money into it, and “/t/hey are likely to be financially and socially beneficial. In truth, future studies imply planning for the future and making the greatest use of available resources in accordance with values” (Tehran Development Foundation, 2005).

- This is a process, not a method that can be predicted.
- It is an interdisciplinary endeavour.
- It takes a long-term approach.
- It integrates various perspectives on technological advancement, the economy, politics, and society.
- It is a supportive instrument for decision-making and policymaking.
- It aims to promote social and technological innovations in the private and public sectors.

Regional Development

With regard to planning, regional development does not refer to national development at the national level, which includes five-year or multi-year development plans for an entire territory, nor does it refer to sectoral and local planning, which only addresses the issues and potentials of a village. The region, city, or province is planned separately from other regions. However, it refers to the methods of planning an area that may include multiple significant cities in a region or numerous provinces or states, regionally and globally, in order to attain relative supremacy and to obtain the opinions of authorities and legislators in that area while benefiting from the region's balanced development and progress consistently (Mehdizadeh, 2006).

Regional development is the concept for individuals living within the region's physical limits. The growth process must coincide with an increase in the capacity of the region's residents to broaden their options for human development in the social and political arenas (Exchange, 1998, p. 41). To fundamentally modify the current understanding of planning, regional development necessitates the organic linkage of two levels of local and national activities at their interface, i.e., the region (p. 14). The three aims of regional development are productive, social, and biological. The goal is to create optimal conditions and facilities for long-term growth, reduce and eliminate the disparity in regional and intra-regional quality of life and make the most extensive possible use of a region's natural

resources and people's abilities to accomplish these two objectives (Khazaei, 2007).

Regional development aims to increase overall wealth while distributing it more evenly across various areas and ethnic groups. If we merely consider growth in terms of landscaping, we can see that regional development still has a long way to go in terms of creating a diverse and equal society. According to Ziari, the well-being of people and places is frequently at odds in regional development. It takes precedence over employment creation in other areas as it establishes an area where psychological and economic costs of migration are avoided, and natural resources, capital equipment, and social infrastructure are utilised. Indeed, when there is a waste of space, such as the expenses of capital growth and migration to specific locations for competitive activities or scarcity of natural resources, the priority of producing employment in the place of residence is dropped. However, this priority is generally quite evident and, conversely, unobservable, which is why regional development initiatives that emphasise location are sometimes implemented with enthusiastic

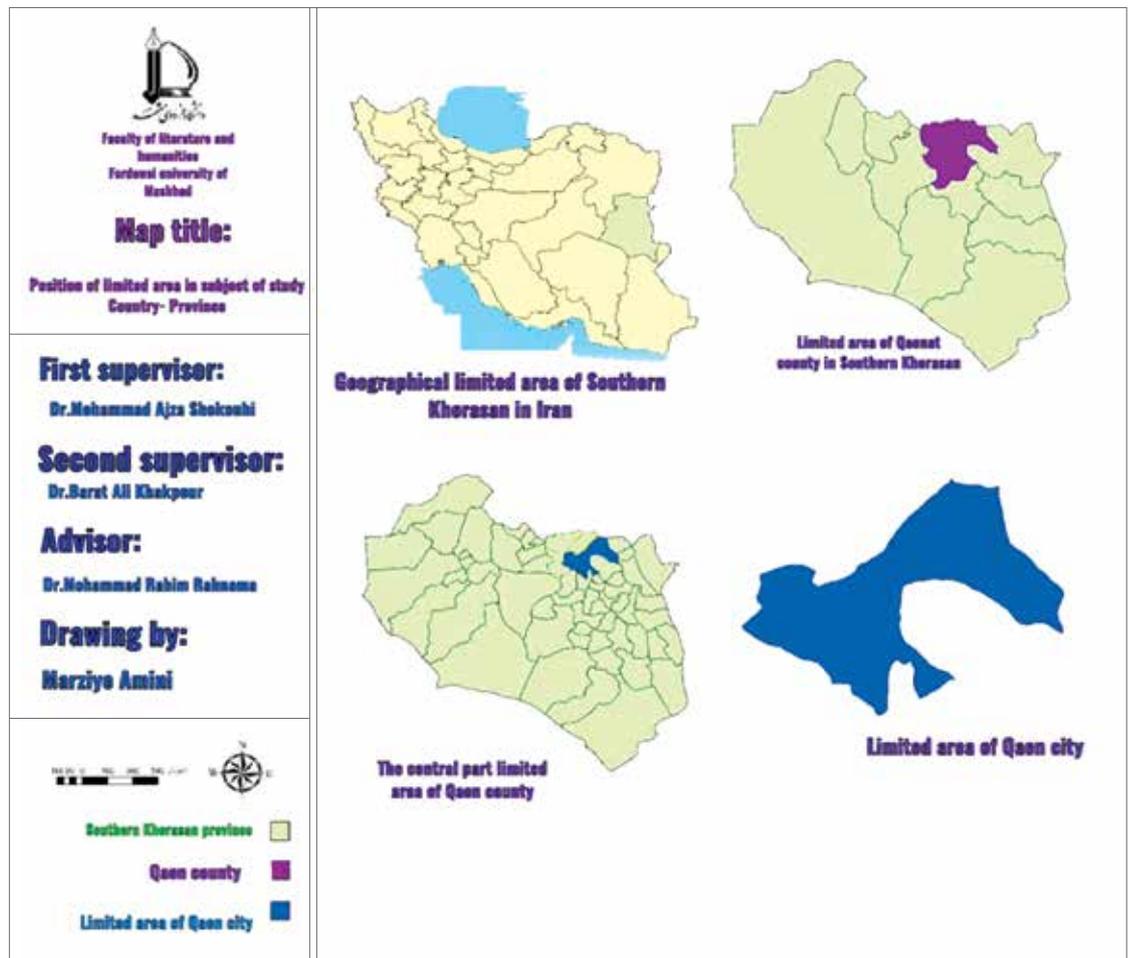
public support even if they lose public favour (Ziari, 2004, p. 14).

Study Area

Sedeh and Nimblak are the two central districts of Qaen County. Mahmu'i, Mohammadabad, Futile, Nimbolok, Karghand, Sedeh, Afriz, and Qanjan are the county's eight villages. Altogether, there are 172 settlements in the county in total. Qaen City is the main site in South Khorasan Province, with significant capacity in mining, agriculture, tourism, and other fields, as well as various potential threats, such as security and the environment. Perhaps the greatest and, at the same time, the most challenging case study we have used in our research.

Methodology

This study employs descriptive-analytical research methodologies, focusing on the goal of applied research. Environmental monitoring methods, such as observations, interviews, and questionnaires, were adopted to assess the present state of Qaen City. The collected data



Map No. 1: Geographical location of Qaen County

were analysed using Spss and Micmac software. Following an assessment of Qaen City's current situation, a structural equations questionnaire was created with a Likert scale based on the current needs and problems, emphasising the most important variables and indicators of Qaen City's urban development. Using the Delphi method, it was distributed to 30 city managers and 382 citizens using the Cochran sampling method. Finally, we created a scenario to improve the city's position and used scenario software for scenario analysis in the regional development process.

The validity of the questionnaire was supported by expert comments. Cronbach's alpha, which was 0.78, indicated that the questionnaire had the desired high reliability. Inferential t-values were used to analyse the questionnaire data.

Research Findings

Analysing Status of Qaen City's Position in Regional Development of South Khorasan Province

In this part, we evaluate the city of Qaen's position in the province of South Khorasan's regional growth. The residents received a questionnaire that covered economic, spatial-physical, social, and environmental issues.

Table 1: Economic variable of regional development

Descriptive Statistics	Std. Deviation	Mean	N
Qaen City development has reduced the level of poverty in the region.	1.41121	2.5354	381
Qaen City development has increased the level of employment in the region	1.42278	2.5066	381
The development of Qaen City increases the currency exchange inside the country.	1.33157	3.1864	381
Qaen City development has increased investment opportunities in the region.	1.39706	2.5643	381
Qaen City development has increased the level of competition in the quality of goods in the region.	1.30707	2.7900	381
Qaen City development has increased the level of production in the region	1.17461	2.6352	381
Qaen City development has reduced the level of trafficking in the region	2.40927	3.0262	381
Qaen City development has increased the level of tourism industry in the region	1.39413	2.6509	381
Qaen City development has increased the level of attracting foreign investment in the region	1.38530	2.4961	381
Qaen City development has increased the level of financial and monetary market (influence of banks and financial and credit institutions) in the region in the region.	1.14111	2.4199	381
Valid N (listwise)			381

Economic Variable of Regional Development

Poverty indicators, employment rate, exchange rate, investment opportunities, competition level, production level, smuggling rate, tourist sector, foreign investment attraction level, and financial and monetary market level are all economic variables that affect regional development (influence of banks and financial and credit institutions). The findings of the questionnaire analysis revealed that all indicators, with the exception of the exchange rate index, were below average (average 3).

Physical-Space Variable of Regional Development

Physical-space variables of regional development include infrastructure indicators, ease of access to transportation, strategisation level, tourist attractions, accommodation, and welfare facilities, government support for the private sector, crime level, and technology. The results of the questionnaire analysis revealed that all indicators were below average, except for the crime level decrease index (average 3).

Social Variable of Regional Development

Social variables of regional development include quality of life indicators, cultural and ethnic ties, increased social involvement, growth of

Table 2: Physical-space variable of regional development

Descriptive Statistics	Std. Deviation	Mean	N
Qaen City development has increased the infrastructure in the region	1.30420	2.5486	381
Qaen City development has increased the ease of access to transportation in the region	1.19948	2.9423	381
Development of Qaen City increases the level of strategisation in the region	1.21371	2.7874	381
Qaen City development has increased the level of tourist attractions in the region	1.32303	2.7297	381
The development of Qaen City has led to the development of accommodation and welfare facilities in the region	1.25871	2.0499	381
Qaen City development has increased the level of government support for the private sector in the region	1.27700	2.5643	381
Qaen City development has reduced the crime rate in the region	1.13395	3.2073	381
Qaen City development has led to the promotion of technology in the region	1.28146	2.6378	381
Valid N (listwise)			381

Table 3: Social variable of regional development

Descriptive Statistics	Std. Deviation	Mean	N
Qaen City development has improved the quality of life in the region	1.21883	2.2782	381
Qaen City development has led to cultural and ethnic ties in the region	1.24424	2.6352	381
Qaen City development has increased social participation	1.07609	2.7816	381
Qaen City development has led to the development of cultural and religious centers in the region	1.32767	3.0210	381
Qaen City development has increased the skilled manpower in the region	1.39523	2.6404	381
Qaen City development has led to social justice in the region	1.12173	2.5538	381
Qaen City development has led to the development of social relations in the region	1.33185	2.6168	381
Qaen City development has increased social capital in the region	1.28475	2.4908	381
Qaen City development has made livability in the region	1.32164	2.7375	381
Valid N (listwise)			380

cultural and religious centres, increased skilled labour, social justice, development of social interactions, increased social capital, and livability. The questionnaire analysis revealed that all indicators, with the exception of the development index of cultural and religious centres, were below average (average 3).

Regional Development Environmental Variable

Indicators of the physical-space variable in regional development include green space development, improved energy supplies, reduced

polluting industries, environmental health promotion, and agricultural land conservation. The analysis of the findings revealed that all the variables were below average (mean 3).

Analysis of Key Factors and Drivers Affecting Position of Qaen City in Regional Development

The primary variables affecting the position of Qaen City in regional development were identified using the Delphi method. A team of experts and executors in the study area were asked to provide their thoughts on

Table 4: Regional development environmental variable

Descriptive Statistics	Std. Deviation	Mean	N
Qaen City development has led to the development of green spaces in the region	1.22275	2.5538	381
Qaen City development has improved energy resources in the region	1.71748	2.5302	381
Qaen City development has reduced polluting industries in the region	1.18193	2.5328	381
Qaen City development has led to the promotion of environmental health in the region	1.33002	2.3150	381
Qaen City development has led to the preservation of agricultural lands in the region	1.35310	2.6404	381
Valid N (listwise)			381

Qaen's regional development. Following the observations, 37 variables were identified as predominant. One of the most commonly used techniques in futures research is reciprocal or cross-effect analysis. We predict the impact (or

likelihood of effect) of one variable on the other and calculate the total of these interactions in the process of interaction analysis. To accomplish this, Michel Godet, a Frenchman, developed structural analysis using Micmac software as

Table 5: Factors affecting regional development of Qaen City

Short label	Long label	N°	Short label	Long label	N°
Agriculture	Method and capacity of agricultural products	20	Road	Improving the main road network	1
Foundation	Improving information technology infrastructure	21	Employment	Employment structure	2
Coordinator	Coordination of organisations	22	produce	Production technology	3
Prosperity	Prosperity of the production and industrial sector	23	Health	Improving the health network	4
Hoarding	Hoarding and stock exchange	24	participation	Social participation	5
Market	Internationalisation of Yazdan Bazaar	25	Justice	Lack of social justice in the distribution of urban services	6
Investment	Increase investment in the province	26	Ethnicity	Ethnicity	7
Networks	Development of social networks	27	Biological	Biodiversity	8
Energy	Energy sources	28	Force	Skilled manpower	9
Options	The rate of delegation of powers to provincial and local levels	29	Activity	Focus on activities	10
Relative growth	Relative economic growth	30	green space	Urban green space	11
GDP	National gross product	31	industries	Polluting industries	12
Security	Investment security	32	Water	Water resources	13
Geopolitics	Geopolitical position of the province	33	University	Development of universities	14
Interaction	Model of interaction and cooperation with Afghanistan	34	Science	Production of science	15
Transnational	Transnational role of the province	35	Relations	Development of social relations in the region	16
Enterprise	Reduction of government ownership	36	Basics	Entry and exit points of the city	17
Policies	Macro policies of the government	37	Riley	Construction of the railway network of the province	18
			Risks	Drought and natural hazards	19

Source: Research findings, MicMac software output

part of strategic foresight (Gorane et al., 2012). During the research, 37 significant parameters influencing the regional growth of the city of Qaen were input into the software.

General Analysis of System Environment

Using the aforementioned Delphi method, 37 variables were identified as factors influencing the regional development of the city of Qaen. They were then analysed using interaction or structural effects analysis with the MicMac software to extract the primary factors influencing the future status of the study environment. Based on the number of variables, the matrix dimensions are 37 by 37. The influence of each component on the others was calculated (from 0 to 3) by arranging and weighting the elements in the matrix. All aspects of regional development, such as an interconnected system of segments, are considered a structure. Their interrelationships are assessed to determine the most influential factors.

The degree of matrix fill is 97.15 percent, indicating the distribution of the factors influencing the future of Qaen City. This matrix contained 1330 evaluable associations, with 39 being zero, 502 being one, 744 being two, and 84 being three. In addition, the matrix's 97 percent desirability and optimisation based on statistical indicators with two data rotations show the questionnaire and its respondents have high validity. The discussion that follows is an overview of the system environment and the identification of the most influential components.

Table 6: Initial analysis of cross effects matrix data

Indicator	Amount
Matrix dimensions	37
The number of repetitions	2
No effect (zero)	39
Slight impact (one)	502
Medium Impact (Two)	744
High impact (three)	84
Total	1330
Filling rate	97.15%

Table 7: Degree of desirability and optimisation of matrix

Influence	Impact	Rotation
97%	97%	1
100%	100%	2

Scenario Making for Improving Status of Qaen City in Regional Development Process

In this study section, the driving variables retrieved in the previous stage are the key axes impacting optimum management and scenario formulation to enhance Qaen City's position in the regional development process. These are the fundamental elements for developing plausible circumstances and scenarios.

Development of Probable Conditions of Key Propellants

To construct a scenario based on the prominent variables, it was necessary to identify the anticipated future positions of Qaen City in the regional development process. As a primary prerequisite, developing scenarios necessitates an accurate study of future events and the identification of probability situations. The Delphi method was used to poll experts to determine plausible scenarios for each propulsion element.

Future Portfolio Preparation and Analysis of Possible Scenarios

During this stage of the study, ten drivers were presented with 30 alternative scenarios. The complexity of the three situation criteria determines the number of potential circumstances for each element. After developing the situations and creating a 30-30 crossover matrix, as in the previous stage for identifying the crucial components, a questionnaire was designed and sent to 15 experts, including city affairs authorities (i.e., the municipality and city councils) and a group of specialists in this sector. The experts examined the effect of one of the thirty events on the (non-)occurrence of other situations. They completed a questionnaire (with weights between -3 and -3) and estimated the systemic impact of each incident.

The following scenarios were extracted after analysing the questionnaire: two (2) very strong scenarios, nine (9) high-compatibility (believable) scenarios, and six hundred and three (693) weak scenarios.

Table 8: Probable conditions of propulsion factors to improve the position of Qaen City in regional development process

Probable situations	Key Factors	Abbreviation Name
A1 Favourability of relative economic growth	Relative economic growth	A
A2 Lack of relative economic growth		
A3 Unfavourable relative economic growth		
B1 Increase in GDP	GDP	B
B2 Continuing the current situation		
B3 GDP decline		
C1 Rapid production and industrial prosperity	Manufacturing and industrial prosperity	C
C2 Continuing the current trend		
C3 Slow boom in production and industry		
D1 Increasing investment in the province	Investment in the province	D
D2 Lack of investment in the province		
D3 Reduction of investment in the province		
E1 Improving the macro policies of the government	The government's macro policies.	E
E2 Continuing the current situation		
E3 Lack of improvement in macro government policies		
F1 Optimal development of universities	University Development	F
F2 Continuing the current situation		
F3 Adverse development of universities		
G1 Increasing investment security	Investment Security	G
G2 Continuing the current situation		
G3 Weakening investment security		
H1 Optimal production technology	Production Technology	H
H2 Continuing the current situation		
H3 Unfavourable production technology		
I1 Optimal job creation	Employment Structure	I
I2 Continuing the current situation		
I3 Unfavourable job creation		
J1 Improving the main road network	Main Roads Network	J
J2 Lack of improvement of the main road network		
J3 Weakening of the main road network		

Strong Scenarios Analysis

The two strong scenarios, one with promising or favourable circumstances and the other with critical conditions for Qaen City, both had very high scores and increased feasibility of occurring.

In the first scenario, every possible situation was desirable; in the second one, every possible circumstance was undesirable. In practice, both are highly improbable, if not impossible. As a result, trusting these scenarios was irrational, so they were excluded from the analysis process.

Compared to the other alternatives, these two scenarios had the heaviest weight. Given the weight of strong possibilities, the second scenario had a higher chance of occurring and implied a crucial degree of regional development.

Preliminary analyses of the nine possibilities show that the number of adverse events outnumbers the positive ones. Except for a few restricted scenarios with desired and developing characteristics, the other scenarios do not conjure up an image of a desirable and dignified city with vital missions toward the future vision. Importantly, for Qaen to reach its vision objectives and perform its future endeavours, it will face significant challenges. It is crucial to acknowledge the likelihood of their occurrence and plan for it. This outlook reduces the possibility of deviating from the correct path. Each potential scenario was examined to assess Qaen's situation.

This section is divided into three scenarios based on the state of the crucial components, to aid comprehension of the circumstances and the (un)favourable conditions' relative

importance. The numbers were replaced for this purpose and based on the scores of -3 and 3 assigned to each circumstance. A qualitative understanding of the scenarios page was also provided by substituting the circumstances with titles ranging from desirable to crisis, which may aptly illustrate the status and position of Qaen through the scenarios and each essential aspect. In other words, we replaced the three markers with colours, numbers, and terms describing the incident on the scenario page to indicate the basic circumstances. Unfortunately, critical or near-crisis situations cover a considerable portion of the scenario page, whereas good scenarios comprise but a tiny fragment.

Out of 90 states (numbers) regulating the scenario page, 58 crucial states account for 64.44 percent, 17 static states account for 18.88 percent, and 15 ideal states account for 16.66 percent. This state indicates that most modes on the scenario screen are in critical mode, followed by static and optimum modes.

Due to the commonality of the scenarios, they can fall into three categories, each including

Table 9: Colorful spectrum and desirability of strong scenarios

Relative economic growth A	Relative economic growth A
Favourable economic growth A1	Lack of A2 economic growth
GDP B	GDP B
Increase in GDP B1	Decrease in GDP B3
Production and industrial prosperity C	Production and industrial prosperity C
Rapid boom in production and industry C1	Slow and quiet boom in manufacturing and industrial C3
Investment in D province	Investment in D province
Increase investment in D1 province	Decreased investment in D3 province
Macro policies of the government E	Macro policies of the government E
Improving macro government policies E1	Lack of improvement of E3 government macro policies
University Development F	University Development F
Optimal development of universities F1	Adverse University Development F3
Investment Security G	Investment Security G
Increase G1 investment security	Undermining G3 investment security
Production technology H	Production technology H
Optimal production technology H1	Adverse production technology H3
Employment structure I	Employment structure I
Optimal job creation I1	Undesirable employment I3
Main Road Network J	Main Road Network J
Improve the main road network J1	Undermining the main road network J3

Table 10: The status of each factor according to the scenarios and the desired triple spectrum up to the crisis

Main road network	Employment structure	Production technology	Investment security	Development of universities	Macro policies of the government	Investment in the province	Prosperity of the production and industrial sector	National gross product	Relative economic growth	Scenario / Propulsion
Optimal	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal	Scenario 1
Optimal	Static	Static	Critical	Critical	Static	Static	Static	Static	Optimal	Scenario 2
Optimal	Static	Static	Critical	Critical	Static	Static	Critical	Optimal	Optimal	Scenario 3
Static	Critical	Critical	Critical	Critical	Critical	Critical	Critical	Critical	Static	Scenario 4
Static	Critical	Critical	Critical	Critical	Critical	Critical	Critical	Critical	Critical	Scenario 5
Critical	Critical	Critical	Critical	Critical	Critical	Static	Critical	Critical	Static	Scenario 6
Critical	Critical	Critical	Critical	Critical	Critical	Static	Critical	Critical	Critical	Scenario 7
Critical	Critical	Critical	Critical	Critical	Critical	Critical	Critical	Critical	Static	Scenario 8
Critical	Critical	Critical	Critical	Critical	Critical	Critical	Critical	Critical	Critical	Scenario 9

several cases with nearly identical characteristics among the ten primary criteria.

The categories are:

- optimal scenarios (including scenario 1),
- static scenarios (including scenarios 2 and 3),
- crisis scenarios (including scenarios 4, 5, 6, 7, 8, and 9).

Among the nine plausible future scenarios for the city of Qaen, one implies a positive situation, i.e., favourable circumstances for the future regional growth of Qaen. There are also two static state scenarios and six crisis situations for the future. The situations are categorised as follows.

Scenario 1: Favourable conditions based on relative economic growth, GDP, productive and industrial prosperity, provincial investment, beneficial policies, government macro, university development, investment security, favourable production technology, and favourable employment, improvements to the main road network.

Based on the first scenario in the first category, the anticipated future of the city of Qaen is promising. It incorporates the best and most desired circumstances for regional growth. In comparison to the other categories, this group enjoys the highest frequency of positive occurrences. Weighing the frequency of favourable situations and crises in this group

against those of other groups reveals that the city of Qaen is in a suitable position in this group. These scenarios indicate favourable economic growth, an increase in the GDP, a rapid expansion of production and industry, an increase in investment in the province, an improvement in government policies, the favourable development of universities, an increase in investment security, favourable production technology, and favourable employment. Network enhancement is of paramount concern. In general, the suitable conditions confronting the city of Qaen are determined by the scenarios in this category.

Scenarios of the second group: the process of slow and steady changes that maintain the status quo.

This group has two scenarios, the second and the third. In terms of frequency, this category has the highest number of static states compared to others. When comparing the percentages of good conditions and crisis frequency in this group to those of other groups, it is clear the situation facing the city of Qaen in this group is essentially stable. The magnitude of this group's impact differs significantly from that of the first and third groups. This category comprises provincial investment characteristics, macro government policies, production technology, and employment structure.

Table 11: Coefficients, number and percentage of each situation separately for each scenario based on the triple spectrum

Total points	Coefficients of situations			Number of situations separately			Scenario / Status
	-3	1	3	Critical	Static	Optimal	
30	0	0	30	0	0	10	Scenario 1
6	-6	6	6	2	6	2	Scenario 2
4	-9	4	9	3	4	3	Scenario 3
-22	-24	2	0	8	2	0	Scenario 4
-26	-27	1	0	9	1	0	Scenario 5
-22	-24	2	0	8	2	0	Scenario 6
-26	-27	1	0	9	1	0	Scenario 7
-26	-27	1	0	9	1	0	Scenario 8
-30	-30	0	0	10	0	0	Scenario 9

Scenarios of the third group: critical and unfavourable conditions, impossibility of regional development.

The fourth, fifth, sixth, eighth, and ninth scenarios cover the crisis situations. The disparity between the number of desired and stagnant states and crises distinguishes this category. This group has the highest frequency of crisis circumstances compared to the others. When comparing the frequency of favourable situations and concerns with that of other groups, the city of Qaen faces a crisis in this group. Among the characteristics of possible futures are unfavourable relative economic growth, a decline in the gross domestic product, slow and prosperous production and industry, a decrease in provincial investment, a failure to improve macro government policies, and the unfavourable development of universities, the deterioration of investment security, unfavourable production technology, unfavourable job creation, and the deterioration of the major road network.

Conclusion

What is the role of Qaen City in the regional development of South Khorasan Province?

To answer the first study question, indicators for assessing the city's position in regional development were gathered from the research background and an opinion survey of experts and city managers. The employees and administrators of Qaen Municipality then completed a questionnaire. We compared the mean of a quantitative variable to a constant

value (T-test) and used the mean equality test on a sample to analyse the indicators. The data on each criterion were gathered for the examination. Based on the questionnaire's five-level scale, each option was assigned a number from 1 to 5: very low, low, somewhat, moderate, and very high. The lengths between Likert scale alternatives are also assumed to be the constant in this study.

The results of the test of equality of means indicate that there is no significant difference in all economic, spatial-physical, social, and environmental factors with a significance level greater than 0.05, and these findings can be extrapolated to the entire group. As a result, it is 95 percent certain that the rate of these indicators is lower than the average.

As a result of the findings, Qaen City appears to be at the bottom of South Khorasan Province's regional development process.

What are the most important critical factors and agents promoting Qaen City in regional development?

What are the most important critical factors and drivers influencing the city's position in regional development?

After researching Qaen's position in the regional development of South Khorasan Province, the next phase involved identifying the most significant key variables and pioneers influencing the city's position in regional growth. Following the discovery and assessment of 37 variables based on the preceding themes, we identified ten elements as major drivers impacting the

Table 12: Results of one-sample t-test to assess the indicators of the position of Qaen City in regional development

One-Sample Statistics						
	N	Mean	Std. Deviation	Std. Error Mean		
Economic	381	2.6811	.47640	.02441		
Space- Physical	381	2.6929	.45107	.02311		
Social	380	2.6374	.49016	.02514		
environmental	381	2.5144	.66691	.03417		

One-Sample Test						
Test Value = 3						
	T	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Economic	-13.066	380	.000	-.31890	-.3669	-.2709
Space- Physical	-13.288	380	.000	-.30709	-.3525	-.2616
Social	-14.419	379	.000	-.36257	-.4120	-.3131
Environmental	-14.212	380	.000	-.48556	-.5527	-.4184

promotion of Qaen City's position in regional development, all of which reoccurred directly or indirectly.

The following is a prioritised list of the most relevant factors:

As shown in the table above, the primary variables and drivers influencing the advancement of Qaen City's position in regional development are relative growth, GDP, prosperity, investment, and policies, respectively. In light of these essential characteristics, regional growth in the city of Qaen is possible.

What are the development scenarios of Qaen City and the desired scenario to improve its position in the regional development process of South Khorasan?

The study generated 30 plausible scenarios for ten propulsion variables. Given the intricacy of the circumstances, there are three possible outcomes for each element. After creating the instances and the 3030 cross matrix, a questionnaire was developed and distributed to experts (as in the previous stage) to identify the main components. Fifteen experts addressed the question of what impact the existence of one of the thirty events would have on the occurrence or absence of other situations. To complete the questionnaire, 58 crucial situations out of 90 controlling the scenario page corresponded to the number 58 critical situations, based on a weighting between -3 and -3, the rate of influence of each event on the system, after calculating the software. 64.44 percent were static, 18.88 percent were favourable, and 16.66

Table 13: Key influential propellants (direct and indirect)

Indirect impact	Variable	Direct impact	Variable	ranking
347	Relative growth	347	Relative growth	1
336	GDP	334	GDP	2
331	Prosperity	330	Prosperity	3
330	Investment	330	Investment	4
320	Policies	321	Policies	5
317	University	316	University	6
314	Security	316	security	7
308	Produce	307	produce	8
305	Employment	303	Employment	9
300	Road	298	Road	10

percent were negative. This indicates that most states on the scenario page are in the critical condition, followed by the static state, and then the desirable state, which has the lowest value.

In terms of proximity, the scenarios can fall into three categories, each consisting of several scenarios with fairly common characteristics, meaning little difference in one or more situations among the ten main factors. The groups are as follows:

- optimal scenarios (scenario 1),
- static scenarios (scenarios 2 and 3),
- crisis scenarios (scenarios 4, 5, 6, 7, 8, and 9).

Among the nine plausible future possibilities for the city of Qaen, there is one scenario with favourable circumstances for enhancing the city's position in future regional growth, two static state scenarios, and six crisis mode situations. Situations are categorised as follows.

First group scenarios (Scenario 1):

Favourable conditions as a result of relative economic growth, GDP, manufacturing and industrial prosperity, investment in the province, favorable policies, government macros, university development, investment security, favourable production technology, favourable employment, and the enhancement of the main road network.

According to the first scenario in the first group, Qaen City's future looks promising, with the best and most advantageous conditions for regional growth. This scenario has the best conditions of all. By comparing the frequency percent of the desired condition and the crisis in this group with other groups, we demonstrate the suitable scenario confronting the city of Qaen in this group.

These scenarios include favourable relative economic growth, increased GDP, rapid production and industrial prosperity, increased provincial investment, improved government macroeconomic policies, favourable university development, increased investment security, favourable production technology, favourable employment, and an optimised main road network. In general, the situations in this collection show the city of Qaen in a pleasant and suitable light.

Second group scenarios: slow and steady changes, maintaining the status quo.

This category includes two situations, i.e., the second and third scenarios. In terms of frequency, this group has the most static statuses compared to the other groups. When

the frequency percentages of ideal and crisis situations in this group are compared to other groups, it is evident that Qaen City remains essentially unchanged. This group's effects are noticeably different from those of the first and third groups. This category comprises provincial investment characteristics, macro-government policies, manufacturing technologies, and employment structure.

Third group scenarios: critical and undesirable conditions, impossibility of regional development.

This set of six scenarios, i.e., the fourth, fifth, sixth, seventh, eighth, and ninth scenarios, covers crisis situations. The group is distinguished by the number of favourable, static, and crisis situations. It has the most crisis circumstances when compared to the other groups' scenarios.

A comparison of the frequency percent of the desired scenario and the crisis in this group to other groups demonstrates that the city of Qaen is in a state of crisis. Among the characteristics of this group of scenarios are the undesirable economic relative growth, the decrease in GDP, the slow growth of production and industry, the reduction in provincial investment, the failure to improve the government's macroeconomic policies, the undesirable development of universities, the deterioration of investment security, the undesirable production technology, the undesirable employment, and the weakening of the main road network.

According to the findings revealed that Qaen City ranks low in South Khorasan Province's regional development process. The experts rated the variables in the form of an N * N matrix in the second stage of the interview to score the effects of the variables on each other. According to the findings of this study, relative economic growth, GDP, productive and industrial prosperity, provincial investment, favourable policies, government macro, university development, investment security, optimal production technology, optimal employment, and improving the road network are all factors to be considered. The most important ones will have the greatest impact on Qaen's regional development. These variables are the most important in determining whether Qaen City's regional development has been completed (or not); changes in regional development depend on them. As a result, the degree of control over these variables is critical. The scenario writing method generated strong scenarios in the current study, including thirty possible scenarios for ten drivers. Among the

nine (9) plausible scenarios confronting the city of Qaen, one (1) favourable scenario shows promising conditions for improving the city of Qaen's position in regional development in the future, two (2) are static state scenarios, and six (6) are crisis scenarios. The scenarios are organized as follows.

First group scenarios (Scenario 1): adequate economic growth, GDP, productive and industrial prosperity, provincial investment, favourable policies, government macro, university development, investment security, optimal employment, optimum production technology, and improvement of the main road network.

Second group scenarios: slow and steady process of change and maintaining the status quo.

Third group scenarios: critical and unfavourable conditions and impossibility of regional development.

Qaen's future is bright, according to the first scenario in the first group. It contains the most favorable and ideal conditions for regional development. In terms of frequency, this group has the best conditions compared to the other groups' scenarios. By comparing the frequency of favourable situations and crises in this group with other groups, we can identify the appropriate scenario confronting the city of Qaen.

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