

Investigating impact of weaknesses and strengtheners local and national factors in border cities' development: Case of study Javanrood city, Iran

Mohsen Janparvar

Ferdowsi University of Mashhad

Kamran Jafarpour Ghalehtimouri (✉ space.kamran@gmail.com)

University of Technology Malaysia

Darya Mazandrani

Ferdowsi University of Mashhad

Mirajaf Mousavi

Urmia University

Research Article

Keywords: Transnational interaction, border city, city development, Javanrood, air pollution

Posted Date: December 7th, 2022

DOI: <https://doi.org/10.21203/rs.3.rs-2344069/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Border cities face numerous development challenges, including geographical, cultural, economic, and national and regional policies. Javanrood city, located in the northwest of Kermanshah province, is one of the border cities with significant natural and human capacities and potentials to connect and shape Iran's western network with neighbouring countries. To accomplish this, an attempt has been made in this article to study the effective areas in promoting the development of the border city of Javanrood. The study of the feasibility of the scenarios, on the other hand, revealed that the assumption of "increasing the level of economic interaction" is the most effective assumption and has the greatest effect on compatibility in the scenarios, and that the assumption of "complete consideration and improvement of ways," despite being the most effective, has the least effect on compatibility in the scenarios. "The level and extent of communication channels along borders, as well as the connection of borders with interior spaces," is the key factor assumption. Therefore, the natural and human potential of Javanrood's border city is such that, if the strategy of promoting economic interactions with Iraq and the Iraqi Kurdistan region is adopted, this city can become a node city in the west of the country, develop to a large extent, and become an engine of development for other cities around it. The results show that 13 key factors are effective in promoting Javanrood development, and for these 13 factors, 51 possible and different situations were drawn, ranging from favourable to unfavourable conditions.

Introduction

According to the Population Division of the United Nations Department of Economic and Social Affairs' most recent world urbanisation prospects report, 55 percent of the world's population lived in cities in 2018, with that figure expected to rise to 68 percent by 2050. (UNDESA, 2018). The pace of urban life has become increasingly fast in parallel with accelerating urbanisation and the expansion of urban development as a result of increased industrialisation) Liu et al., 2018; Wu et al., 2019; Zhang et al., 2018., Wu et al., 2020) Faced with the effects of urbanisation and industrialisation, an increasing number of cities are developing in unfavourable ways, degrading the environment and causing a variety of social problems (Shi et al., 2019: 1. Caragliu et al., 2011, Radford, 2010). In other words, globalisation and economic, political, social, climatic, and cultural changes affect countries not only on a national but also on a local level (Goryakin et al.,2015). Today, many cities in developed countries are recognised as global players and play an important role in the country's economic development (Gyourko et al., 2013;Yang and Pan,2020). Meanwhile, paying attention to urban development strategy has become critical (Colic, 2015; Mobaraki et al.,2012). In fact, city development strategy is defined as the process of preparing the city's long-term vision by developing short-term and medium-term practical plans for sustainable urban development that emphasise inclusive citizen participation, equitable growth, environmental balance, and competition. The city's economy is emphasised. (Nori and et al., 2020., Du et al., 2020). Experts define urban strategy as the process of developing executive plans based on the city's long-term vision in order to achieve balanced growth, sustainability, and improved quality of life in cities (Wang, 2020., Roy and Ong, 2011., Wiechmann, 2008; Ghalehtemouri et al., 2021).

A city development strategy is a process that is developed with the goal of comprehensive city development based on societal realities (existing strengths and weaknesses) and attracting the attention of individuals (Abd Elrahman and Asaad, 2021; Bibri et al., 2020). With the introduction of the concept of urban development strategy, many countries have begun to manage cities in order to anticipate and address the challenges that cities face (Ghalehtimouri and Ros, 2020; Musa and et al., 2018). This process causes the city to be adaptable in the face of global changes and social, economic, cultural, and other issues, allowing it to grow in a positive direction and achieve economic growth (Mäntysalo et al., 2013; Khalil, 2013). This is regarded as an important consideration for border cities (Canka et al., 2014). Because borders are frequently recognised as physical barriers, this affects two-way flows, interactions, and individual behaviour (Haselsberger, 2014). In response to the challenges in border cities, local governments have a responsibility to address the unavoidable social problems that enter the economy, such as urban poverty, unemployment, and rapid population growth (Schultz, 2018; Hekmatnia et al., 2022).

Since border cities can effectively serve as the economic driving force of nation-states in the national arena (Walther, 2014). As a result, the development and management of cities, particularly border cities, through strategic plans is recognised as one of the tasks of governments, and this is an important matter of participation that necessitates local people's cooperation (Colldahl et al., 2013). Paying attention to trade between border cities is one of the most important strategies for their development (Janparvar et al., 2021). Borders between nations present both opportunities and threats. Borders vary in terms of the components that make up the boundaries themselves (Guo 2015). The legal, economic, cultural, and social issues that exist on both sides of the border have the potential to generate a plethora of profitable and innovative businesses (Shahriar, 2020). Borders shape relationships between neighbouring countries, as well as security outcomes, trade, and population mobility (Ullah and Kumpoh 2018). Border opening provides new opportunities for border cities and urban border regions to strengthen their positions at the heart of global economic networks and to assert their independence as cross-border regional entities.

Border trade has a significant positive impact on its neighbours' relationships as well as the people who live on both sides of the borderlands (Das, 2014). It is also beneficial to the well-being of border dwellers. As a result, a border is considered a resource (Sohn 2014). Due to geographical proximity, strong ethnic and historical ties, common border concerns, including counterterrorism, and so on, border relations between Iran and the Autonomous Region of Iraqi Kurdistan can be beneficial for the development of border trade between the two regions. Provided (Janparvar et al., 2020). Javanrood city, which shares a border with the independent region of Iraqi Kurdistan while being far from Iran's political centre (Tehran), has a number of underdeveloped issues, including a lack of a coherent management and monitoring strategy facing border areas. On the other hand, this border city's unique geographical location and natural face (being located in the plain) has paved the way for the growth of cross-border trade and the establishment of sales centres for a variety of products such as TV "clothes" and "food" refrigerators. As a result, the future of this city's border trade and its impact on its development have been investigated in this study. In fact, the purpose of this research is to look into the role of border factors and indicators in the future development of cross-border trade in Javanrood.

Literature Review

Cities are dense, complicated systems. They are distinguished by intense and consistent structured interactions in specific areas of activity or in the management of critical resources or transfer subsystems (Gallopín, 2020; Havko et al., 2017). The concept of a sustainable city is divided into several components, including health, environment, social/cultural, infrastructure, education, crises, and economy (Tori and Murtagh, 2020; Monfaridzadeh and Beradi, 2015). Lenin believed that cities were the focal point of people's economic, political, and spiritual lives, as well as the primary engine of progress (Pu, 2019). Today, cities house more than half of the world's population (O'Brien, 2017), and cities are regarded as important centres of social, economic, and environmental development. Cities' high concentration of activities and population has resulted in a slew of social and environmental issues (Bibri et al., 2020). The main aspects of development, as well as the negative and positive achievements, take place primarily in cities. As a result, policies based on sustainable development in cities can be effective in reducing the aforementioned issues (Schraven et al., 2021).

The concept of urban development arose in response to climate change, rapid population growth, urban poverty, and social change, particularly in developing countries (Pan et al., 2021). Economic development, social development, and environmental protection are the three main pillars of sustainable urban development in response to these challenges (Raspotnik et al., 2020). A city development strategy is a tool that assists a city in maximising the benefits of urbanisation through strategic planning (Zho et al., 2021;). It is a participatory action-oriented process that promotes equitable growth in cities and surrounding areas in order to improve the quality of life for all citizens (Pennink, 2016). Diverse perspectives on urban strategy development reflect the complexities of developing and managing urban strategies (Boom et al., 2021). The city's urban development strategy is known as a driver of economic growth (Pernice, 2021). Economic, social, political, institutional, and cultural approaches to development are becoming increasingly important. This approach demonstrates that democracy is not a byproduct of development but is recognised as a necessary component of development (Noori et al., 2021; Shi et al., 2021).

Border cities are important and strategic areas for reducing border problems, and if organised scientifically and logically, they can be very effective in controlling border areas and minimising their problems (Janparvar and et al., 2020). Recognizing the potentials and weaknesses of border areas may be the most effective approach to border city development (Sadeghi and et al., 2014). Development as a result of limits and capabilities If this development is appropriate to the geographical, cultural, and economic conditions, it will lead to economic prosperity, and the physical manifestation of this prosperity will be reflected on the faces of border areas, as well as the state of unplanned urban activities and the separation of urban activities from programmes.

The government will obstruct development, and it will emerge gradually and in accordance with the bottom-up development approach, the country's current laws, and development documents (Talkhabi et al., 2022). Cities in border areas usually face many problems in terms of infrastructure and amenities

because they are far from the development process, so creating basic infrastructure to produce and increase employment, proper and efficient communication channels, and appropriate energy. Continuous training in new methods appears to be required, and in order to generate traction and motivation for border populations on both sides of the border, the government should be required to build necessary infrastructure such as roads, communications, and health facilities (Janparvar et al., 2021., Anabestani and Kohnehpushi, 2011).

Study Area

Javanrood is a city in Kermanshah province, located in the northwest between a minimum of 34 degrees and 40 minutes and a maximum of 35 degrees and 7 minutes north latitude and a minimum of 45 degrees and 5 minutes and a maximum of 46 degrees and 34 minutes east longitude. This city is situated between the Shahu and Bani Gaz mountains, in the continuation of the important Zagros mountain range. According to the Iranian Statistics Center's census, approximately 70% of the city's inhabitants live in urban areas, while 30% live in rural areas (Statistics Center of Iran, 2016). In 1996, 48.8% of the population of this city was urban, 50.8% was rural, and the rest were non-residents (Statistics Center of Iran, 1996). The city centre of Javanrood is located on a slope at an elevation of 300 metres and 82 kilometres northwest of Kermanshah (the centre of the province). The Layla River runs through town. The highest summer temperature in Javanrood is 30, the lowest winter temperature is 727, and the average annual rainfall is 600mm. This city had a population of over 54,000 people in 2016. This city also has one of the largest markets in the country's west (Iran), with high-quality products at reasonable prices. The Javanrood border market has over 300 stalls selling everything from audio and video equipment to cosmetics, health, home, textiles, food, jewellery, and mobile phones. (Janparvar et al., 2021).

Material & Methods

The methodology used was analytical in nature and practical in terms of results. Furthermore, descriptive-analytical studies, document and questionnaire in the Delphi framework, and Cross-Impact Matrix Analysis were carried out using the Micmac and Scenario Wizard software tools. After collecting data and identifying basic variables in the Delphi model, 40 questionnaires were distributed to 25 municipal executives and 15 academic elites with expertise and experience in border city development). Data were analysed using a 6666 matrix, which included data into the cross-impact matrix before closing the CIM. Following this classification, the experts were asked to rate the influencing variables (direct, indirect, or potential) using a scale of 0 to 3 and P values (0 = null, 1 = weak, 2 = average, 3 = strong, P = potential effect).

Finally, a list of variables was compiled as the primary driving forces, which were then incorporated into the midst cross impact method in the form of scenario planning software. At this point, the expert can only describe the probability of hypothesis realisation on a scale of 1 to 5 (weak to high probability), avoiding any lack of precision on the expert's part. It is more useful to think of everything as conditional

probabilities, or the realisation of one hypothesis in relation to others. A score of 6 indicates that the hypothesis is independent. Measuring the direct and indirect influence of variables was not only in the Delphi model framework, but it has also been used for strategically related software to measure the various dimensions of the impact-dependence of each variable (obvious and hidden layers).

Results And Discussion

The $n \times n$ matrix was used to classify the effective development indicators of the border city Javanrood. After holding meetings with the selected academics and executives, the 9 main categories of variables (Table 2), as well as the 66 subcommittee variables, were identified as the primary variables. The variables were then incorporated into the Micmac software in an attempt to define each variable based on its subsidiary and identity. The experts were then asked to score the variables based on their influence and effectiveness rate on each other. The variables were scored from 0 to 3 with P values (0 = null, 1 = weak, 2 = average, 3 = strong, P = potential effect), resulting in a cross impact matrix (Fig. 3). It should be noted that due to the large size of the matrix, only a portion of it is expressed here.

Based on the findings above, it is possible to conclude that the obtained fill rate is 94.1% with two data iterations, indicating a high level of variables influencing each other. This situation demonstrates the effectiveness of the research tool as well as a highly desirable verification of data collection by distributing questionnaires.

Table 2
The features of primary matrix

Matrix Size	Iteration	0 (N)	1(N)	2(N)	3(N)	P (N)	Total	Fill rate
66×66	2	257	994	1797	1129	179	4099	94.1000%

Source: Research findings, 2021.

Following that, CIM was calculated using Table 2. Since the elites calculated a total of 4099 values in the framework of the cross-impact matrix, the 1797 cases with the highest statistical volume had a moderate impact (2) on other variables: In addition, 1129 numbers had the greatest impact, while 994,257 and 179 cases had the least, null, and potential impacts on the other variables.

Table 3
Variables of development indicators of border city Javanrood.

	Categories	Abbreviation	Variables	The highest row rates	The highest column rates
1	Territorial variables	T	T1 & T3	T3: 119	T3:154
2	Sociocultural variables	SC	SC1 to SC6	SC6: 166	SC2: 148
3	Economic variables	E	E1 & E12	E1: 148	E2: 166
4	Political - governance variables	Po	PO1 to PO15	PO5: 136	PO10: 142
5	Geopolitical variables	GP	GP1 to GP5	GP1: 134	GP5: 145
6	Defense - Security variables	DS	DS1 to DS12	DS15: 129	DS11: 150
7	Historical variables	H	H1 to H7	H3: 135	H4: 90
8	Legal - structural variables	LS	LS1 to LS4	LS2: 127	LS1: 149
9	Technological variables	TE	TE1 to TE2	TE2: 119	TE2: 129
Source: Authors finding, 2021					

according to calculated column rates the Sociocultural (SC), Economic (E) and Geopolitical (GP) had the most direct dependency to other research variables. Therefore, Demographic structure (age, gender, literacy) (SC6) with 166 scores, The level of economic interaction on both sides of the border (E2) with 166 scores and Geostrategic position of the border area (GP5) had the most direct impacts on the other variables. (Table 3).

Source: Authors finding, 2021

The research variables are distributed in the diagram according to the variable status in the analyses and the planar identity of some other variables. Paying attention to the findings presented in Fig. 2, Fig. 3 can be illustrated as below.

Source: Authors finding, 2021

As a result, the high level of stability of the Javanrood border city development system was confirmed by data obtained from the analysis of indirect influences of the variables on each other, indicating that the variables are more distributed around diagonal lines in the northeast and southeast parts of the diagram. As a result, most variables in this section have a planar identity while also being very influential and impressionable as a result of the exacerbating or dampening effects of variations due to their instable

nature. Accordingly, the variables with the highest indirect impacts on the other variables include SC6 (Demographic structure (age, gender, literacy)), SC2 (Stability of living in a border city), E1 (Dependence of border residents on economic interaction across borders), SC4 (Spatial structure of ethnic and religious groups), SC1 (Existence of social capital) with row points of 2408026, 2208276, 2163726, 2054905 and 2038895, respectively. Meanwhile, the indexes of E2 (The level of economic interaction on both sides of the border), E4 (Level and extent of existence of communication channels along borders and connection of borders with interior spaces), E9 (The level of development of the two border regions relative to the center and relative to the border region of the border country), E3 (Existence of diversity in the income sources of border residents) and the T3 (Environmental hazard status) with column points of 2383905, 2349318, 2340051, 2273408 and 2241451 presented the highest indirect dependencies among the other variants.

Source: Authors finding, 2021.

Final Results Scores Of Indicators Affecting The Development Of The Border City Of Javanrood

Based on the results presented in the above, the most important effective indicators in the development of the border city of Javanrood, based on the score that each of these indicators achieved in direct and indirect effects, finally 8 key indicators were selected (Table 4)

Table 4
The key affecting variables in development of the border city of Javanrood

Key direct influencing factors	Abbreviation	Key indirect influencing factors	Abbreviation
Demographic structure (age, gender, literacy)	SC	Demographic structure (age, gender, literacy)	SC
Stability of living in a border city	SC	Stability of living in a border city	SC
Spatial structure of ethnic and religious groups	SC	Dependence of border residents on economic interaction across borders	E
Dependence of border residents on economic interaction across borders	E	Spatial structure of ethnic and religious groups	SC
Existence of social capital	SC	Existence of social capital	SC
Employment in the border area on both sides of the border	E	The level of economic interaction on both sides of the border	E
Type of economy of the border area (agriculture, industry, services)	E	Level and extent of existence of communication channels along borders and connection of borders with interior spaces	E
How borders are formed	H	The level of development of the two border regions relative to the center and relative to the border region of the border country	E
Existence of diversity in the income sources of border residents	SC	Existence of diversity in the income sources of border residents	E
Geoeconomic position of the border area	GP	Environmental hazard status	T
Source: Authors finding, 2021			

Identification Of Compatible Development Scenarios Of Javanrood Border City

The scenario writing method is examined in this section, which employs scenario software to create scenarios for the factors influencing the development of border cities. The first step is to compile a list of the most important key factors influencing border city development. Using Mick Mac software, 13 key factors in the development of border cities were identified in the previous section of the research. The possible status of key factors is identified in detail in this section; for these factors, possible and different scenarios can be imagined, which are very important and can serve as strategies to guide planners and

policymakers. A total of 51 different scenarios were created for 13 different key factors ranging from favourable to unfavourable (Fig. 5). The number of possible situations for each factor ranged from 3 to 7 depending on the degree of impact and importance. Given the number of possible scenarios, there are over 34 million possible scenarios for border development in the future. The software's results show that there are 5 scenarios with strong or probable compatibility, the number of scenarios with poor compatibility was not calculated due to the large number, and there are 38 incompatible scenarios. Figure 5 shows a table of scenarios that are strongly compatible with the desirability or criticality of possible situations. The bold green colour represents perfect condition, the light green colour represents relatively good condition, the yellow colour represents indifferent condition, the orange colour represents relatively critical condition, and the red colour represents the critical condition of possible conditions.

The robust scenario panel includes 65 different scenarios. The number of favourable situations outnumbers the number of unfavourable situations. 16.92% of these 70 situations are critical, 35.38% are on the verge of a crisis, 15.38% are apathetic, 20% are relatively favourable, and 12.30% are completely favourable. In total, 52.3% were in an unfavourable situation, while 32.30% were in a favourable situation. One of the five possible scenarios is in good condition (scenario number one). Scenarios 2, 2, 3, and 4 are in the middle, while scenario 5 is unfavourable. Figure 7 depicts the sustainability and compatibility values of the scenario hypotheses. The assumption of "increasing the level of economic interaction" is the most effective and has the greatest effect on scenario compatibility, and the assumption of "complete consideration and improvement of ways," despite being the most effective key factor assumption of "the level and extent of communication channels," is the least effective. Along the boundaries and the connection of the boundaries with the interior spaces is chosen with the lowest compatibility value, and support for this descriptive assumption is weak in the border area development scenarios.

Conclusion

Geographical spaces have become more connected and interdependent in various ways as a result of globalisation. Then current research makes an attempt to investigate the most effective fields for promoting the development of the border city of Javanrood. These spaces, in proportion to their potentials and capacities, have been able to play a role in the process of globalisation and progress at different rates in accordance with the strategies that have been placed in front of them. Meanwhile, some geographical spaces, such as border cities, have become prominent and connecting points between the two countries because they were located between the two countries and experienced insecurity and problems in the past, and at one time were in geographical isolation and development due to the weakness of communication and information networks, so these changes and developments resulting from globalisation and increasing the scope of relations between countries. In other words, the interior space has become the international space, with the necessary capacity and potential to become the engine and main artery of countries' development as a result of the acquisition of connecting hinges. Given that Iran, with its distinctive and prominent role in the past, and because of its crossing position, which connects spaces and countries far and near to each other, border cities in Iran can play an important role. Javanrood city, located in the northwest of Kermanshah province, is one of these border

cities with significant natural and human capacities and potentials to connect and shape the arteries of western Iran.

Javanroud absolute and geographical location are shown at the end of this paper, as well as how they can play an important role on a national and transnational scale. In a geographical sense, this is what space and place attract as a result of the globalisation of places without their connection roles. Because both countries' valuable human and natural resources necessitate an intermediate location such as Javanroud, this can be a golden opportunity for city development, improving citizens' quality of life, and supporting sustainable development goals with self-sufficiency. In general, the natural and human capacities and potentials of Javanroud city are such that, if the strategy of promoting economic interactions with Iraq and the Iraqi Kurdistan region is implemented, this city can become a node city (Fig. 10) in the west of the country (Iran) and develop to a great extent, while also serving as an engine of development for other cities around it.

References

1. Abd Elrahman, A and Asaad, M (2021), "Urban Design & urban planning: A critical analysis to the theoretical relationship gap", *Ain Shams Engineering Journal*, Vol 12, PP 1163-1173. <https://doi.org/10.1016/j.asej.2020.04.020>.
2. Abduljabbar, R L and Liyanage, S and Dia, H (2021) "The role of micro-mobility in shaping sustainable cities: A systematic literature review", *Volume 92*. <https://doi.org/10.1016/j.trd.2021.102734>.
3. Anabestani, A and Tayebnama, H and Shayan, H and Rezvani, MR (2014): Analysis of barriers to diversification of economic activities in border villages of Marivan city, *Quarterly Journal of Space Economics and Rural Development*, Year 3, Issue 4, Winter, Consecutive 10. pp. 87-111.
4. Bansard, J S and Pattberg, H P and Widerberg, O (2017) "Cities to the rescue? Assessing the performance of transnational municipal networks in global climate governance", *Int Environ Agreements*, Volume 17, PP 229–246. DOI 10.1007/s10784-016-9318-9.
5. Bibri, S E and Krogstie, J and Karrholm, M (2020), "Compact city planning and development: Emerging practices and strategies for achieving the goals of sustainability", *Developments in the Built Environment*, Vol 4. <https://doi.org/10.1016/j.dibe.2020.100021>.
6. Bibri, S E and Krogstie, J and K arrholm, M (2020), "Compact city planning and development: Emerging practices and strategies for achieving the goals of sustainability", *Developments in the Built Environment*, Vol 4, <https://doi.org/10.1016/j.dibe.2020.100021>.
7. Boom, S and Weijsschede, J and Melissen, F and Kones, K and Mayer, I (2021), "Identifying stakeholder perspectives and worldviews on sustainable urban tourism development using a Q-sort methodology", *Current Issues in Tourism*, Vol 24, Issue 4, pp 520-535. <https://doi.org/10.1080/13683500.2020.1722076>.

8. Caragliu, A., C. Del Bo, and P. Nijkamp. 2011. "Smart Cities in Europe." *Journal of Urban Technology* 18 (2): 65–82.
9. Colldahl, C and Frey, S and Kelemen, J e (2013), "Smart Cities: Strategic Sustainable Development for an Urban World", Master's Degree Thesis, School of Engineering Blekinge Institute of Technology Karlskrona, Sweden.
10. Das, P. 2014. Status of India's Border Trade: Strategic and Economic Significance (IDSA Occasional Paper No. 37). New Delhi: Institute for Defense Studies and Analyses.
https://idsa.in/occasionalpapers/OP_StatusofIndiasBorderTrade_pdas_101214.
11. Du, M and Zhang, X and Mora, L, (2020) "Strategic Planning for Smart City Development: Assessing Spatial Inequalities in the Basic Service Provision of Metropolitan Cities", *Journal of Urban Technology*, Volume 28, 2021 - Issue 1-2, PP 115-134.
<https://doi.org/10.1080/10630732.2020.1803715>.
12. Gallopin, G C (2020), "Cities, Sustainability, and Complex Dissipative Systems. A Perspective" CONCEPTUAL ANALYSIS, <https://doi.org/10.3389/frsc.2020.523491>.
13. Ghalehtemouri, K. J., & Ros, F. B. C. (2020). The spatial turn in the National Physical Plan (NPP) Malaysia in compare to Germany for better criteria identification on climate change and environmental hazards issues. *Climate Change*, 6(21), 141-155.
14. Ghalehtemouri, K. J., Shamaei, A., & Ros, F. B. C. (2021). Effectiveness of spatial justice in sustainable development and classification of sustainability in Tehran province. *Regional Statistics*, 11(2), 52-80.
15. Goryakin, Y and Lobstein, T and and James, W and Suhrcke, M., (2015) "The impact of economic, political and social globalization on overweight and obesity in the 56 low and middle income countries" *Social Science & Medicine*, Volume 133, PP 67-76.
<https://doi.org/10.1016/j.socscimed.2015.03.030>.
16. Guo, R. (2015) "Cross-Border Management: Theory, Method and Application". Berlin: Springer.
17. Hekmatnia, H., Mousavi, M. N., Ghalehtemouri, K. J., Shamsoddini, A., Kashkouli, A. B., & Jamshidi, A. (2022). Population Aging Tendencies in Islamic Countries Between 1950-2020: A Geographical Assessment. *Journal of Population and Social Studies [JPSS]*, 30, 36-53.
<http://doi.org/10.25133/JPSSv302022.003>
18. Janparvar M., Bahrami Jaf S, Salehabadi R. Analysis and leveling of border parameters affecting the security and development of border cities. (Case study: Javanrood city). *IQBQ*. 2021; 3 (2) :70-80.
URL: <http://psp.modares.ac.ir/article-42-55556-fa.html>
19. Janparvar, M., Bahrami Jaf, S., Shahbazi, M. et al. Control and maintenance of borders due to the expansion of the Kurdish ethnic group on both sides of the Iranian-Iraqi border. *GeoJournal* (2021).
<https://doi.org/10.1007/s10708-021-10492-5>.
20. Janparvar, M., Heydari, A., Bahrami Jaf, S. et al. Analysis of kulbari's economic position in the northwest border villages of Iran (a study of paveh border villages). *GeoJournal* (2021).

<https://doi.org/10.1007/s10708-021-10428-z>.

21. Ji, C. Liu, L. Huang, and G. Huang, "The Evolution of Resources Conservation and Recycling over the Past 30 Years: A Bibliometric Overview," *Resources, Conservation and Recycling* 134 (2018) 34–43.
22. Khalil, H A E E (2012), "Enhancing quality of life through strategic urban planning", *Sustainable Cities and Society*, Vol 5, pp 77-86. <https://doi.org/10.1016/j.scs.2012.06.002>.
23. Lamour, C (2021), "Right-wing populist media events in Schengen Europe The negotiated border discourse in-between nation states" *Journal of Language and Politics*, <https://doi.org/10.1075/jlp.20066.lam>.
24. Mäntysalo, R and Jarenko, K and Nilsson, K L, Saglie, I L (2015), "Legitimacy of Informal Strategic Urban Planning—Observations from Finland, Sweden and Norway" *European Planning Studies*, Vol 23, Issue 2, pp 349-366. <https://doi.org/10.1080/09654313.2013.861808>.
25. Masic, G and Sagan, I and Scott, J W (2020) "Smart City strategies and new urban development policies in the Polish context", *Cities*, Volume 108. <https://doi.org/10.1016/j.cities.2020.102970>.
26. Medeiros, E and Ramirez, M G and Dillagiacoma, C and Brustia, G (2021), "Will reducing border barriers via the EU's b-solutions lead towards greater European territorial integration?", *Regional Studies*, Vol 55, Issue 12, <https://doi.org/10.1080/00343404.2021.1912724>.
27. Monfaredzadeh, T and Berardi, U (2015), "Beneath the smart city: dichotomy between sustainability and competitiveness", *International Journal of Sustainable Building Technology and Urban Development*, Volume 6, Issue 3, PP 140-156. <https://doi.org/10.1080/2093761X.2015.1057875>
28. Noori, N and De Jong and Janssen, M and Schraven, D and Hoppe, T, (2020) "Input-Output Modeling for Smart City Development", *Journal of Urban Technology*, Volume 28, No 1-2, PP 71-92. <https://doi.org/10.1080/10630732.2020.1794728>.
29. O'Brien, G (2017), "Cities – good for the environment?", *International Journal of Environmental Studies*, Vol 78, Issue 1, PP 16-28. <https://doi.org/10.1080/00207233.2017.1392767>.
30. Pan, S and Zhou, W and Pirmauthu, S and Giannikas, V and Chen, C (2021), "Smart city for sustainable urban freight logistics", *International Journal of Production Research*, Vol 59, Issue 7, PP 2079-2089. <https://doi.org/10.1080/00207543.2021.1893970>.
31. Pennink, C (2016), "CDS Toolkit "version 2.0", Institute for Housing and Urban Development Studies (IHS) and FLMH (Labor für Politik und Kommunikation).
32. Pernice, R (2021), "Verticality and Conflicting Identities in the Contemporary Chinese City: The Urban Development of Suzhou Industrial Park", *Journal of Chinese Architecture and Urbanism - Special Issue: Influential theories and works for contemporary Chinese urban planning and design (1920-2020)*, Vol 3, No 1. <https://doi.org/10.36922/jcau.v3i1.1026>.
33. Pu, X (2019), "An Overview of Research on the Definition and Formation of Cities", *Research Center of Sichuan Old Revolutionary Areas Development*, Sichuan University of Arts and Science, Dazhou, China. 7, 252-256.

34. Pysz, J K and Castanho, R A and Loures, L (2018), "Sustainable Planning of Cross-Border Cooperation: A Strategy for Alliances in Border Cities" *Sustainability*, Vol 10, No 5. <https://doi.org/10.3390/su10051416>.
35. Radford, A. 2010. "Urban Design, Ethics and Responsive Cohesion." *Building Research and Information* 38 (4): 379–389.
36. Raspotnik, A and Grønning, R and Herrmann, V (2020), "A tale of three cities: the concept of smart sustainable cities for the Arctic", *Polar Geography*, Vol 43, Issue 1, pp 64-87. <https://doi.org/10.1080/1088937X.2020.1713546>.
37. Robinson, J and Attuyer, K (2020), "Extracting Value, London Style: Revisiting the Role of the State in Urban Development" *International Journal of Urban and Regional Research*, Volume 45, Issue 2 pp 303-331. <https://doi.org/10.1111/1468-2427.12962>.
38. Sadeghi, H and Falsoliman, M and Hashemi, S and Fadaei, M (2014): Restrictions and capacities for sustainable development in the border villages of eastern Iran (In Persian).
39. Sassen, S and Kourtit, K (2021), "A Post-Corona Perspective for Smart Cities: 'Should I Stay or Should I Go'" *Sustainability*, Vol 13, No 17, <https://doi.org/10.3390/su13179988>.
40. Schraven, D and Jossb, S and Jongcd, M (2020), "Past, present, future: Engagement with sustainable urban development through 35 city labels in the scientific literature 1990–2019", *Journal of Cleaner Production*, Vol 292, <https://doi.org/10.1016/j.jclepro.2021.125924>.
41. Schultz, K A (2014), "Borders, Conflict, and Trade", *Annual Review of Political Science* Vol 18, Issue 1 . <https://doi.org/10.1146/annurev-polisci-020614-095002>.
42. Shearer, A W and Kilcullen, D J and Pendleton, G (2021) "Conceptualizing a Model of Antifragility for Dense Urban Areas" *Journal of Digital Landscape Architecture*, Vol 6, doi:10.14627/537705004.
43. Shi, Y and Zhai, G and Zho, S and Chen, W and He, Z., (2019) "Slow City development in China: process, approaches and acceptability" *Third World Quarterly*, Volume 40, Issue 7, PP 1265-1282. <https://doi.org/10.1080/01436597.2019.1594181>.
44. Talkhabi, H., Ghalehtemouri, K. J., Mehranjani, M. S., Zanganeh, A., & Karami, T. (2022). Spatial and temporal population change in the Tehran Metropolitan Region and its consequences on urban decline and sprawl. *Ecological Informatics*, 70, 101731. <https://doi.org/10.1016/j.ecoinf.2022.101731>
45. Teerawichitchainan, "B and Ying, T Q (2021) The situation and well-being of custodial grandparents in Myanmar: Impacts of adult children's cross-border and internal migration", *Social Science & Medicine*, Vol 277. <https://doi.org/10.1016/j.socscimed.2021.113914>.
46. Toli, A M and Murtagh, N (2020), "The Concept of Sustainability in Smart City Definitions", *Journal of Digital Landscape Architecture*, Vol 6, PP 75-84. doi:10.14627/537705004.
47. Ullah, A.K.M.A., and A.A.-Z.A. Kumpoh. (2018) "Are Borders the Reflection of International Relations" *Southeast Asian Borders in Perspective. Journal of Asian Security and International Affairs* 5, no. 3: 295–318. doi:10.1177/2347797018798253.

48. UNDESA (United Nations Department of Economic and Social Affairs), 2018 Revision of World Urbanization Prospects (New York: UN, 2018) <<https://www.un.org/development/desa/publications/2018-revision-of-world-urbanization-prospects.html>> Accessed May 16, 2018
49. Walther, O (2014), "Border Markets: An Introduction", *Journal of urban Research*, Vol 10. <https://doi.org/10.4000/articulo.2532>.
50. Wang, M (2020), "Polycentric urban development and urban amenities: Evidence from Chinese cities" *Journal Indexing & Metrics*, Vol 48, Issue 3, <https://doi.org/10.1177/2399808320951205>.
51. Wei, J. Gu, H. Wang, T. Yao, and Z. Wu, "Uncovering the Culprits of Air Pollution: Evidence from China's Economic Sectors and Regional Heterogeneities," *Journal of Cleaner Production* 171: Supplement C (2018) 1481–1493.
52. Wiechmann, T (2008), "Errors Expected – Aligning Urban Strategy with Demographic Uncertainty in Shrinking Cities" *International Planning Studies*, Vol 13, Issue 4, PP 431-446. <https://doi.org/10.1080/13563470802519097>.
53. Wu, Z and Jiang, M and Li, H and Zhang, X., (2020) "Mapping the Knowledge Domain of Smart City Development to Urban Sustainability: A Scientometric Study" *Journal of Urban Technology*, Volume 28, Issue 1-2, PP 29-53 <https://doi.org/10.1080/10630732.2020.1777045>
54. Zhang, A and H. Li, "Urban Resilience and Urban Sustainability: What We Know and What Do Not Know?" *Cities* 72 (2018) 141–148.
55. Zho, Y and Li, J and Pu, L (2021), "Quantifying ecosystem service mismatches for land use planning: spatial-temporal characteristics and novel approach—a case study in Jiangsu Province, China" *Environmental Science and Pollution Research*, <https://doi.org/10.1007/s11356-021-17764-0>.

Figures

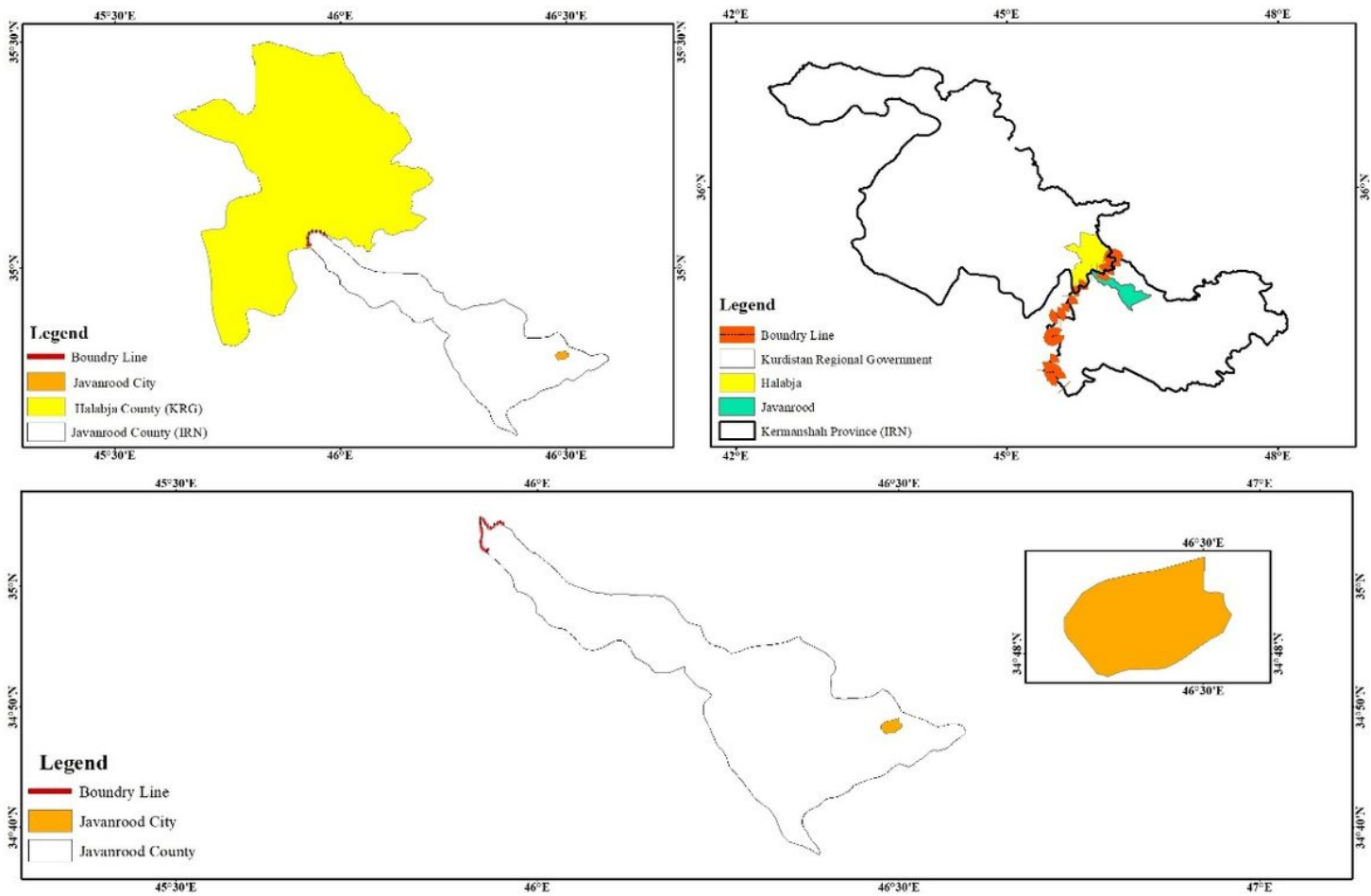


Figure 1

Regional area of Javanrood city

Source: Authors finding, 2021

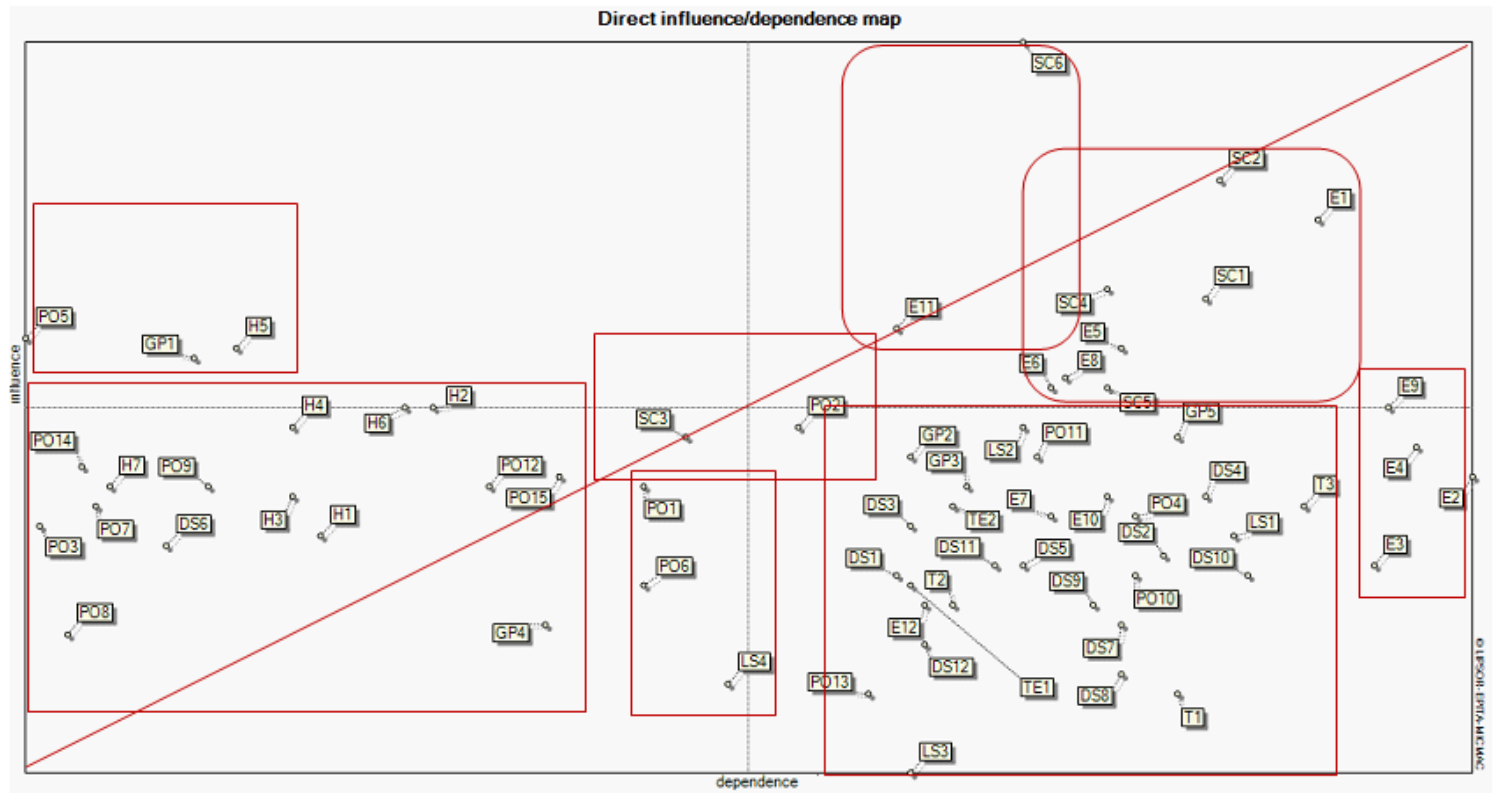


Figure 4

Distribution of variables according to direct influence-dependency & their planar identity.

Source: Authors finding, 2021

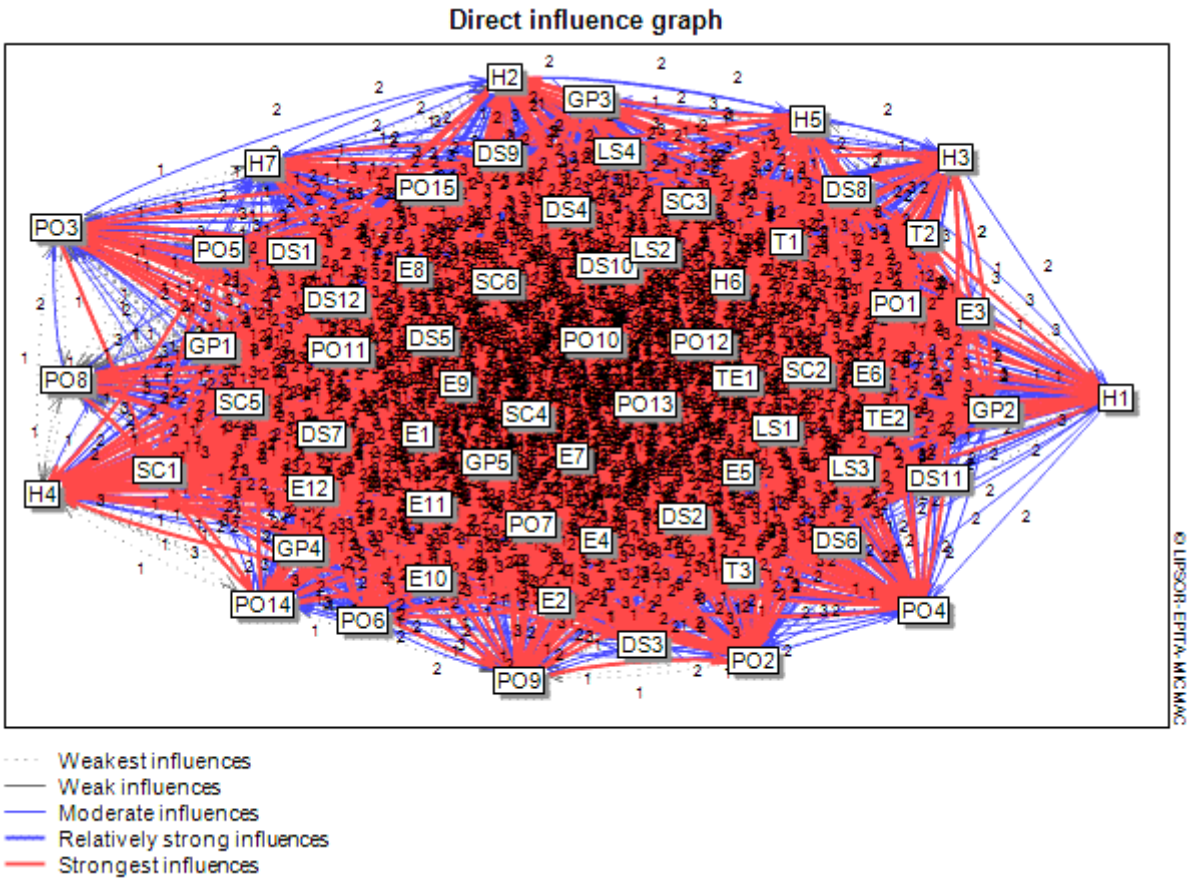


Figure 5

Distribution of variables according to their direct influence-dependency.

Source: Authors finding, 2021

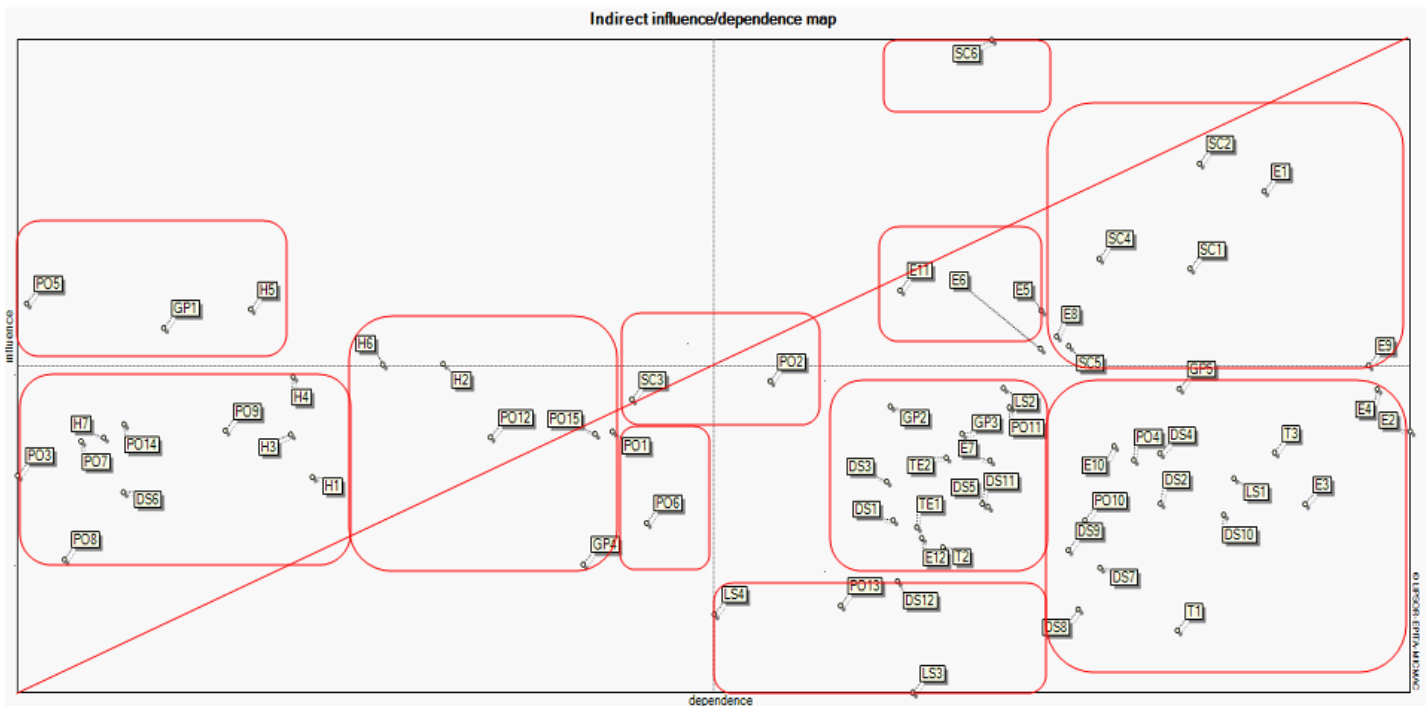


Figure 6

Distribution of variables according to indirect influence-dependency.

Source: Authors finding, 2021.

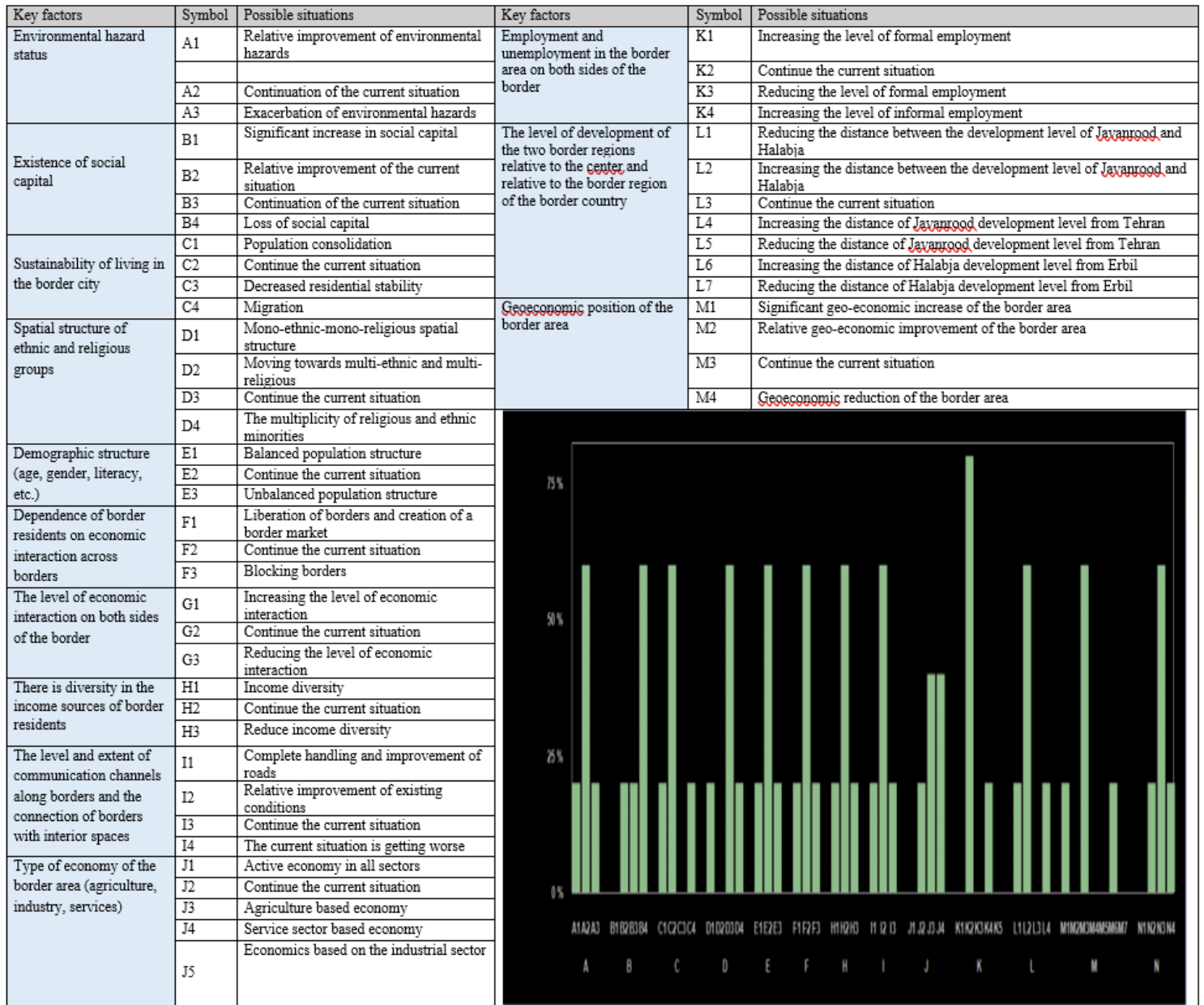


Figure 7

Possible situations facing key factors in the development of the border town of Javanrood

Source: Authors finding, 2021

Scenario No. 1	Scenario No. 2	Scenario No. 3	Scenario No. 4	Scenario No. 5
Environmental hazard status: Relative improvement of environmental hazards	Environmental hazard status: Continuation of the current situation			Environmental hazard status: Exacerbation of environmental hazards
Existence of social capital: Relative improvement of the current situation	Existence of social capital: Continuation of the current situation	Existence of social capital: Loss of social capital		
Sustainability of living in the border city: Population consolidation	Sustainability of living in the border city: Continuation of the current situation	Sustainability of living in the border city: Migration		
Spatial structure of ethnic and religious groups: Mono-ethnic-mono-religious spatial structure	Spatial structure of ethnic and religious groups: Continuation of the current situation	Spatial structure of ethnic and religious groups: The multiplicity of religious and ethnic minorities		
Demographic structure (age, gender, literacy): Balanced population structure	Demographic structure (age, gender, literacy, etc.): Unbalanced population structure	Demographic structure (age, gender, literacy, etc.): Continuation of the current situation		
Dependence of border residents on economic interaction across borders: Liberation of borders and creation of a border market	Dependence of border residents on economic interaction across borders: Continuation of the current situation	Dependence of border residents on economic interaction across borders: Blocking borders		
Level of economic interaction on both sides of the border: Increasing the level of economic interaction	Level of economic interaction on both sides of the border: Continuation of the current situation	Level of economic interaction on both sides of the border: Reducing the level of economic interaction		
Existence of diversity in income sources of border residents: Income diversity	Existence of diversity in income sources of border residents: Continuation of the current situation	Existence of diversity in income sources of border residents: Decreasing income diversity		
Level and extent of communication channels along borders and connection of borders with interior spaces: Relative improvement of existing conditions	Level and extent of communication channels along borders and connection of borders with interior spaces: Continuation of the current situation	Level and extent of communication channels along borders and connection of borders with interior spaces: Worsening of the existing conditions		
Type of economy of the border area (agriculture, industry, services): Economy based on service sector	Type of economy of the border area (agriculture, industry, services): Continuation of the current situation			
Employment and unemployment in border areas on both sides of the border: Increasing the level of formal employment	Employment and unemployment in the border areas on both sides of the border: Continuation of the current situation	Employment and unemployment in border areas on both sides of the border: Increasing the level of informal employment		
Level of development of two border regions in relation to the center and in relation to the border region of the neighboring country: Reducing the distance between the development level of Javanrood and Halabja	Level of development of two border regions in relation to the center and in relation to the border region of the neighboring country: Continuation of the current situation	Level of development of two border regions in relation to the center and in relation to the border region of the neighboring country: Increasing the distance of Halabja development level from Erbil		
Geoeconomic location of the border area: Relative geo-economic improvement of the border area	Geoeconomic location of the border area: Continuation of the current situation	Geoeconomic location of the border area: Geoeconomic reduction of the border area		

Figure 8

Table of compatible scenarios in the development of the border city of Javanrood

Source: Authors finding, 2021

Key factor	Assumption	Compatibility
Environmental hazard status	Relative improvement of environmental hazards	29
Existence of social capital	Significant increase in social capital	-5
Sustainability of living in a border town	Population consolidation	35
Spatial structure of ethnic and religious groups	Mono-ethnic-mono-religious spatial structure	20
Demographic structure (age, gender, literacy, etc.)	Balanced population structure	45
Dependence of border residents on economic interaction across borders	Liberation of borders and creation of a border market	40
The level of economic interaction on both sides of the border	Increasing the level of economic interaction	47
Existence of diversity in the income sources of border residents	Income diversity	44
The level and extent of communication channels along borders and the connection of borders with interior spaces	Complete maintenance and improvement of roads	-9
Type of economy of the border area (agriculture, industry, services)	Active economy in all sectors	-7
Employment and unemployment in the border area on both sides of the border	Increasing the level of formal employment	34
The level of development of the two border regions in relation to the center and in relation to the border region of the neighboring country	Reducing the distance between the development level of Javanrood and Halabja	2
Geoeconomic location of the border area	Significant geo-economic increase in the border area	-6

Figure 9

The most effective assumptions and their compatibility

Source: Authors finding, 2021

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [groupimage1.jpeg](#)