

Transborder Interactions and the Comprehensive Development of Border Cities

Azad Hidayat Hasan¹, Jamshid Moloudi²

¹Assistant professor Dr of Geography and rural Planning, Soran University, Erbil

²PhD of Geography and Urban Planning, Tarbiat Modares University, Tehran, Iran

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Abstract

Border areas are considered as some part of the spatial structure of the countries with an opportunity towards changing the transnational regional economic system. In this regard, the border cities of Iranian Kurdistan have had deep relations with other sides of the border through formal and informal joint border markets in previous years. This study aims to explore the relationship between transborder interactions and the development of Baneh and Marivan cities. This was done by quantitative and survey methods from the perspectives of two sample groups, including border trade activists and family heads. Based on the results, transborder interactions in the region under study have experienced an increase, especially after the fall of the Ba'ath regime in Iraq. The descriptive findings also showed mean values of 3.26 and 3.11 for transborder trade activists and family heads in terms of urban development, respectively. Then, in response to the main research question, a significant correlation was found between transborder interactions and the urban development of border cities. This correlation has been evaluated at the intermediate level. According to the Pearson correlation results also showed that economic interactions among different dimensions of transborder interactions hold the highest correlation with components of urban development.

Keywords: *transborder interactions, urban development, border cities, Baneh, Marivan.*

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Azad Hidayat Hasan

**Assistant professor Dr of Geography and rural Planning, Soran University,
Erbil,**

Gmail : azad.hasan@soran.edu.iq

Jamshid Moloudi¹

**PhD of Geography and Urban Planning, Tarbiat Modares University,
Tehran, Iran**

Email: j.moloudi@gmail.com

1. Introduction

Many urban geographers and historians believe that cities are the product of a long evolutionary process. This means that settlements have gradually evolved since 15,000 BC and have become cities with complex urban structures in the twenty-first century (Hall 2006, 5). Michael Pacione (2005) divided the factors effective in urban transformation and development into two major categories, namely local and global forces. He believes that local forces lead to enormous changes in the structure of cities through tax policies, local planning regulations, trade unions, interest groups and institutions, political organizations, basic economy, social structure, etc. On the other hand, these forces and global processes lead to urban changes. Global forces in urban environments act in different forms, such as social, demographic, economic, political, technological, cultural, and environmental forces (Pacione 2005). In the book entitled, *Cities in Transition*, the most important forces and factors effective in urban development have been mentioned comprehensively; and economic forces globalization, mergers, and global and local partnerships have been introduced as the factors effective in urban development (Schneider-Sliwa 2006, 3). Claude Chaline (1993) has categorized the main factors affecting the dynamics of cities into endogenous and exogenous forces. He believes that these forces are motors of urban dynamics. Chaline, divides the active domain of endogenous and exogenous forces into two spaces, including political-official and socio-economic climates (Chaline 1993, 23-24). Other researchers have also emphasized the effectiveness of internal factors and forces (local or endogenous) and external ones (global or exogenous) in the change process and urban development (Cadwallder 1985; Knox & Pinch 2000; Kaplan, et al. 2004). According to Herzog, a profound transformation occurred in urban studies in

¹ . Corresponding Author

the 1980s when researchers found that many of the urban processes -economics to urban planning- have been tied to economic, social, and political forces (Herzog 1991, 519).

In this regard, border cities have always been subject to the impact of transnational forces due to their specific position near the international borders. Brzosko-Sermak (2007) believes that small and large cities in border regions are the main target of border effects. The severity and impact of these forces will be doubled, especially when the borders lose their legal strictness (Chaline 1993). Therefore, study of the effects and role of such forces in the framework of cross-border/transborder relations, interactions, and cooperation has constituted the main bulk of transborder studies in recent decades (Van Geenhuizen et al. 1996; Perkman 1998; Stryjakiervichz 1998; Kratke 1998; Kratke 1999; Church & Reid 1999; Van Houtum 2000; Kolossov 2005; Brunet-Jailly 2005; Bunnell et al. 2006; Brater 2006; Ahrens & Schone 2008). As forces and processes derive from multiple sources, transborder/cross-border flows and interactions can lead to changes in the structure and functioning of residential areas around the border and consequently bring changes in spatial forms. The resultant research findings indicate functional changes in borders and the formation of deep and wide transborder/cross-border connections and relations, which emanate from global and transnational forces and processes.

Undoubtedly, such flows and interactions also widely exist or are on the rise in border areas of the world, especially border areas of developing countries. There is much evidence that Iran-Iraq border areas have undergone significant changes in the type and range of mutual flows and interactions in the past decade. Iraq-Iran bilateral relations have grown, especially after the overthrow of the Ba'ath regime (2003) for reasons such as religious and historical commonalities as well as political and economic interests. This has provided the conditions for the formal and informal initiation of economic, social, and cultural interactions. Kurdish border area and its interaction centre, i.e. Baneh and Marivan cities have not gone unnoticed from this trend and have established great ties and connections with border regions and larger cities of Iraq like As Sulaymaniyah and Arbil via formal and informal joint border markets. Accordingly, it is observed that these two cities have established direct economic relations with cross-border/transborder trade their comparative advantages relative to other neighbouring areas (see Planning and Economic Department of Economic Studies 2002, 79-83). The cities under study jointly cover 90% of Iranian Kurdistan province's borderline with Iraqi Kurdistan and hold extensive economic, social, and cultural relations with other areas despite impassable obstacles and terrains.

The purpose of this research is to explain the role of cross-border interactions in the evolution of the urban structure of border cities. Therefore, the structure of

the theoretical research literature is based on the precise definition of the two concepts of urban structure and cross-border interactions and the explanation of the relationship between these two. For this purpose, the authors have first tried to theoretically explain the role of cross-border interactions in urban structure changes, and the result is the derivation of a theoretical model for explaining the role of cross-border interactions in the urban structure of border cities. Then, to empirically examine this role and relationship using quantitative-survey and qualitative methods and from the point of view of two sample groups including cross-border trade activists and household heads. To answer the research questions, in addition to presenting the results of calculating the statistical indices related to the independent and dependent variables of the research, the results of 103 cross-border trade activists questionnaires and 385 household head questionnaires for the two cities of Baneh and Marivan through comparison of averages, Pearson correlation analysis, Multivariate regression analysis and path analysis were analyzed.

The basic questions of this research, the answers to which will lead to the explanation of the main research problem, are as follows;

1. What is the relationship between cross-border interactions and changes in the urban structure of the studied border cities? Which of the dimensions of cross-border interactions (economic, social-cultural, political-institutional and physical-environmental) has the greatest contribution to the transformation of the components of the urban structure of border cities?
2. What is the effect of cross-border interactions in terms of the level of organization on the transformation of the components of the urban structure of border cities?
3. What are the suggestions for playing the optimal role of cross-border interactions in directing the changes in the urban structure of the border cities of Baneh and Marivan?

2. Historical and Theoretical Background

Systematic study of the borders and border areas, particularly with an emphasis on avoiding historical-geographical outlooks on borders and typology of political boundaries, dates back to the early 1950s. Since then, the study of cross-border ties of people, products, and information; and varying effects of borders on the surrounding areas and different elements of social and natural visions on both sides of the border have led to hot debates in the form of different approaches (Table 1). In his original work, John House proposed an efficient operational model for studying transborder connections. In recent years, the practical applications of this model have emerged in the form of border talks, border cooperation, and management of social processes in border areas (Kolossof 2005, 607-612).

Table 1: Examples of the most relevant studies with this research

Researcher	Title of the Study	Key Points and Results
Herzog, Lawrence A. (1991)	Urban transnational structure during the global cities (transborder megacities in the United States and Mexico)	According to research findings, the movement of population, industry, and capital towards border areas and the following deformation of transnational urban areas across national borders are among the regional phenomena. The emergence of urban centres along international borders is reflective of a gradual integration pattern of border areas in the economic and financial cycle of the global socio-political system. The current structure of border cities can be attributed to the changing role of international borders.
Arreola, Daniel D. & Curtis, James R. (1993)	Border cities of Mexico: the skeleton of the landscape and character of the location	The researchers argue that "the US border with Mexico is an active area in terms of transborder interactions and exchanges, and people and goods, ideas and information, and capital and technology easily pass through the borders". Accordingly, they confirm that transborder forces along with socio-economic conditions, technology, relationships between cities, and cultural and ideological values strongly affect border cities in such a way that an urban structure different from the internal cities has been formed in the border area.
M, Perkman (1998)	Creation of governance institutions across the borders of Europe	The development of new international governance approaches has been effective in the formation of cross-border regions across all the borders of Europe and its developmental effects are significant on cities and border regions. He points out that the formation of cross-border regions leads to the development of existing settlements within such areas although this development can be fragile since it is severely affected by political developments and interactions and relationships between countries on both sides of the border.

Researcher	Title of the Study	Key Points and Results
Portnov, Boris A. & Pearlmutter, David (1999)	Sustainable development of cities in border areas	In this study, the effect of various factors, such as unfavourable climatic conditions, border situation, economic conditions, and governmental policies on the growth of the urban population in border areas is examined. Furthermore, the role of each of them in the instability in border areas of Israel's population is investigated. It is revealed that the economic downturn arising from the inhibitory function of borders is one of the most important factors affecting the instability of population growth in these regions.
S, Kratke (1999)	Cross-border regional integration issues (Case Study of Germany-Poland Border)	The economic factor is the main cause of the formation of transborder areas; and regional integration in the border regions of Germany and Poland is attributable to the development of regional connections and relations and the formation of a concept, entitled cross-border areas. Although Germany and Poland have experienced different development paths at the national macro-level, the expansion of cross-border connections has led to the integration of development in border regions and cities of both countries.
Church, A. and Reid, P.(1999)	Cross-border cooperation and institutionalizing political space	Using a qualitative method and documentary research, this study has examined institutional issues and cooperation between governments as well as the role this factor can have in the development of cities and border areas. The authors have focused on institutionalization dimensions and political interactions in cross-border areas and concluded that the administration of cities and border regions (not just borders) entails bilateral and multilateral cooperation in border regions.
Gilmer. R. W., Gurch, M., and	Border cities of Texas and the prospect for	This research, supported by the Federal Reserve Bank of Dallas, has been published in a report that raises this question: What are

Researcher	Title of the Study	Key Points and Results
Wang, T. (2001)	income growth	essentially border cities? It is found that the employment rate and income in border cities are higher than those of other cities. Based on some indicators, it is concluded that borders and border situations can bring the development of the surrounding cities, especially in economic respect.
Anderson, J., L. O'Dowd, Wilson, T. M.(2003)	New borders for the changing Europe: cross-border cooperation and governance	According to the findings of this study, the borders of countries were considered "margins and periphery" in every respect for a long time. However, they have become important places due to the globalization process and the creation of regional unions between countries (including the European Union). It is also noted that cooperation between countries on the borders and the production of governance approaches may act as important factors in the integration of settlements and areas around the borders. Moreover, it is asserted that borders filter out different social processes on both sides of the border. Since borders in the European Union have been converted from a phenomenon with a splitting nature into an interaction and collaboration nature, the developmental impacts of borders in the European Union have been considerable.
Brater, Paul A.(2006)	Multiple dimensions of border transport links connecting and dividing Singapore and Juara Indonesia	The results show that the development of transport and communication networks in border regions act as factors influencing the formation of cross-border areas. The main conclusion from this research in connection with cities can be that cities and border regions may be named as entry gateways of countries.
Bunnell, T., Sidawaym, D., and Grundy-Warr, C.	Reformation to the growth triangle: Cross-border Hinterland of	These authors have introduced the concept of cross-border Hinterland in the literature of borders and concluded that border relations and communications at the micro level have brought about the formation of Hinterland and

Researcher	Title of the Study	Key Points and Results
(2006)	Singapore	development in broader areas.
Brzosko-Sermak, Agnieszka (2007)	Checking the theoretical ideas on the border position of cities	Based on the findings, open borders provide an opportunity for development for even non-border cities. In their opinion, small and large cities in border areas border are the main target of border effects. These locations are not only the motor for regional economic development, but they are also centres for cultural and ideational innovation, social transformation, and political change.
Ni, Pengfei (2011)	Cities as a new engine for the development of cooperation between China and India	The findings suggest that the interaction and cooperation among border cities resulting from the development of border function can strengthen cooperation at the national level, increase trade in goods and necessary services, enjoy division of labour, create a win-win situation, and accelerate the economic development of cities. In short, interaction and cooperation between border cities can improve the living conditions of millions of people and globally promote harmonious and balanced growth.

Source: The authors, 2023.

2.1. Theoretical Background

The formation of links and relations and transborder/cross-border interactions as well as their effects on border areas all depend on the nature and role of borders. On the one hand, a closed political border prevents any interaction between neighbouring and adjacent regions; on the other hand, open borders are considered a communication bridge for transborder connections and flows. Understanding the communication function and/or preventive effects of borders depends on how to define borders and their function (Chen 2006, 25). Generally, there are two dominant prevailing views on the role of borders, especially in the literature on the development of city borders and regions. First, border acts as a dividing line; second, border acts as a contact area (Van Geenhuizen et al. 1996, 674; Newman 2003, 126-128; Laine 2007, 50; Wu 1998, 189; Feinstein & Dajani-Daoudi 2000, 4-6; kladivo et al. 2012, 49; Tykkylainen 2009, 346; Wasti-Walter 2009, 332; Moraczewska 2010, 329-331).

From the first perspective, international borders have the separating role of political entities (Prescott 1979, 60). Generally, border areas are places where two or more formal and legal systems (political-official) will contact each other. This means that borders are barriers that prevent cross-border activities and relationships (Wasti-Walter 2009, 332). On the contrary, borders also have a connecting and linking function. This means that inhabitants of border regions can benefit from the differences existing among the neighbouring countries and expand the variety of cross-border activities, including economic, social, and cultural ones. Excellent conditions for the formation of such relationships exist in some areas where ethnic minorities are familiar with the language and culture of the region across the border (Ibid: 332).

2.1.1. Transborder Interactions and Urban Development of Border Cities

As one of the founders of the regional economy, Losch (1940) compared border effects after increasing geographical distance between locations. Borders affect the position and location of economic activities and often lead to economic isolation of border areas in the national production system (Perkmann & Sum 2002). Economists refer to borders as barriers to international trade and threats to military intervention. Accordingly, they view border areas as useless and weak (Hansen 1978, 247). However, the effect of political borders is not limited only to economic and security dimensions. It is believed that when cross-border interaction is limited, people will become separated from each other; the exchange of goods, services, and ideas will be minimized; threats arising from early violence will emerge; residents of the two border sides will become deprived of familiarity with cultural and religious heritage; and they will be deprived of understanding each other's feelings and perceptions (Feinstein & Dajani-Daoudi 2000, 28). Therefore, this perspective opts for the view that border regions are geographically and spatially considered marginal and peripheral areas; do not attract much attention in economic and political terms; and often experience poor conditions (Takeuchi 2006, 155). In addition, they have a low population density and suffer from the effects of emigration (Miosga 2008, 15).

However, following the dominance of the communicative function of borders, a network of cross-border relationships is formed and people on both sides of the border find mutual interest in Joint work because of cultural ties and/or economic reasons, which is referred to as "face-to-face" relations (Wasti-Walter 2009, 333). Merckx (2000) believes that when the deterrent effect of borders is reduced, new forms of movement and displacement along the borderline will lead to the creation of dynamic inter-relationships and even new identities and institutions are formed to create stronger bonds (Laine 2007, 52). Trade liberalization and the movement of production factors also lead to a wider

market along with increased use of scaled economies; therefore, opportunities for the specialization and development of industries are created. This means that former border regions and settlements become the larger part of the market economy and the special effect of border reopening will be positive (Tykkylainen 2009, 350). The lower deterrent effect and consequent benefit of border residents from the advantages of border proximity play an influential role in strengthening border areas towards changing their peripheral positions in national space into an international centre. Border reopening creates new opportunities, interactions, and contacts, develops the scope of market penetration, and intensifies competition on both sides of the border regions (Laine 2007, 52). The socioeconomic development of these regions brings about spatial changes in cities and their belonging villages. Of course, this development in border cities has been different according to the political decisions and activities of states and neighbouring countries (Pena 2002, 3-18). Regarding the border area of Germany and Poland, Knippschild (2008, 106) argued that border interactions and cooperation between the two countries became limited only to international relations before 1990 because of the existence of the Iron Curtain; therefore, personal contacts between Germans and Poles were almost impossible. However, political boundaries gradually lost their deterrent function and became a place for interaction between the two countries by the early 1990s, the collapse of the Iron Curtain, and the reunification of the two Germanys (Wieckowski 2009, 89). These new conditions have provided the adjacent border areas, especially urban settlements with an unexpected opportunity to establish cross-border interactions and cooperation. Research has shown that the most important developmental effects observed in Germanic-Polish border are the result of cross-border interactions and cooperation, including the creation of new trade opportunities, increased employment and reduced unemployment, economic growth and demand for workforce, betterment of living standards, development of infrastructures and facilities, particularly in border cities, development of tourism, development of measures and activities to protect the environment, etc. (Kratke 1998; Stryjakiewicz & Kaczmarek 1997; Stryjakiewicz 1998; Stiller 2003; Ladysz 2006; Knippschild 2008; Dolata 2008; Wieckowski 2009). Herzog (1991 and 1994) conducted a study on the US-Mexico border region and stated that border cities belong to the country where they are located and their structure is influenced by ecological situation, social geography, morphology of street network, and physical design. However, these cities represent a model of mutual relations and interactions over the border. In other words, transborder cities owe their structure and organization to the changing role of international borders (Herzog 1991; 1994). Arreola & Curtis (1993) asserted that "the US-Mexico border is an active region in terms of transborder

interactions and exchanges; and people and products, ideas and information, and capital and technology pass almost easily through the borders. They argued that transnational forces along with socio-economic conditions, technology, relationships between cities, cultural values, and ideology so strongly affect border cities that an urban structure different from other cities of the country has been formed in the US-Mexico border.

Shenzhen-Hong Kong border is also an example of an interactive region in Asia where two different political-administrative systems survive together and benefit from each other's advantages. In these mutual relations, Shenzhen takes advantage of Hong Kong's job opportunities and Hong Kong uses cheap labour and Shenzhen's abundant undeveloped land (Wu 1998, 191). According to Young (2006, 81), the border area between China and Hong Kong has undergone many changes in the past two decades and has changed from an isolated border region into a border region with peaceful relations in the late 1970s and, then, into a dependent border region in the mid-1990s. Wu (1998) describes the effects and consequences of the intensification of mutual relations between Hong Kong and Mainland China: "When transborder development began in 1979 on the China-Hong Kong border, Shenzhen area was small and economically challenged. There were agricultural areas around it and it was under the firm control of the state border. After two decades, Shenzhen became a developed and prosperous region, which was extremely different from the rest of China". Chan (1998) enumerated the changes and transformations resulting from the interactions between Hong Kong and mainland China in the Pearl River Delta region as follows: the development of industry and agriculture as well as prosperity of informal economy, spatial development (reducing the primate city phenomenon in Guangdong province, the growth of medium-sized cities, increased urban population, increased attention to areas of city margins), infrastructure development and investment (development of railway, roads, water, telecommunications, and power plants), population growth, and increased capital flows. With an increase in cross-border interactions and their growth to a cross-border cooperation level, more attention was paid to the quality of the urban environment, the booming economy of cities brought prosperity and economic justice for residents, and quality of life was improved (Wu 1998; Chan 1998; Yang 2006; Hui et al. 2011).

Thus, the presence or absence of cross-border/transborder interactions in border areas arising from the deterrent or connective function of borders can have opposite and two-fold effects. This means that border regions and cities are regarded as the marginal and peripheral areas that have fallen behind the macro-level flow of national and international development when borders are closed and the ties between residential areas on both sides of the border have been broken. Consequently, emigration in border cities will be intensified, the size of

the urban population will be reduced, the economy will become reliant upon traditional activities, and eventually, the peripheral situation of border cities will be aggravated. On the other hand, the reduction of deterrent effects of borders and increase of transborder relations and interactions lead to the following results: change of border regions and cities as a gateway to the outside world, population stabilization, increased potential immigration power of border cities, development of transport infrastructures, expansion of the sphere of influence across the border, economic development of service-trade, tourism development, and ultimately development of border cities (Figure 1). "In this situation, border regions and cities will become new growth areas whose positive effects can be observed across the border." (Erkut & Ozgen 2003, 14)

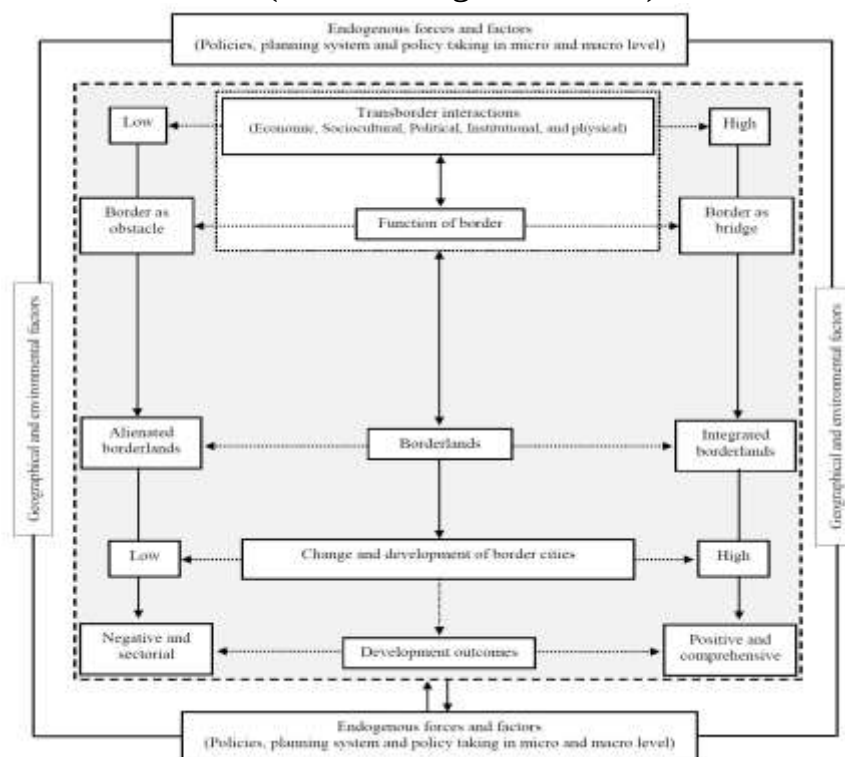


Figure 1: Theoretical model on the effectiveness of transborder interactions in urban development of border cities (source: authors, 2023)

3. Research Methodology

Considering the subject and nature of this research, a quantitative survey method was used for the conduct of this study. The use of this methodology in the study is in line with the research type, i.e. a longitudinal study. In this research, two variables, namely transborder interactions and urban development of border cities are explored. In this regard, the most important research indicators were extracted based on previous studies and theoretical foundations of the research as well as the initial field test. Accordingly, four dimensions entitled economic, socio-cultural, politico-institutional, and physical-

environmental and 26 indicators were obtained for transborder interactions (Table 2).

Table 2: Dimensions and indicators of urban transborder interactions

Variable	Dimension	Indicator
transborder interactions	Economic	The degree of accessibility to the market across the border and vice versa; the sales and purchase of products and services to and from the other side of the border and vice versa; the number of deposits across the border and vice versa; the investment amount by the private sector, government, and cooperatives across the border and vice versa; the amount of joint investment by the private sector, government, and cooperatives across the border and vice versa; the degree of inclination to the cross-border labour market and vice versa; and the tendency to receive products and services from across the border and vice versa
	Sociocultural	Visiting (familial, cultural including ceremonies and memorials, and educational & scientific) of the other side of borders and vice versa; the tendency to marriage and creation of in-law kinship with the other side of borders and vice versa; the tourists coming from across the border and vice versa; the leisure and entertainment spent across the border and vice versa; the familiarity with cities and villages across the border and vice versa; the access to and use of mass media (TV and radio) and vice versa; and willingness to products (manufacturing and cultural services including books, magazines, newspapers, etc.) across the border and vice versa
	Politico-institutional	The number of meetings of high-ranking political delegations on both sides of the border at local and national levels; the accessibility to the other side of the border for participating in local and regional conferences and seminars and vice versa; quality of accessibility to the other side of the border for participating in local and

	regional conferences and seminars and vice versa; the strengthening of transnational identity and a sense of greater solidarity with the inhabitants of the other side of the border; and the intensity of transnational identity and a sense of greater solidarity with the inhabitants of the other side of the border
Physical-environmental	Quantity and quality of access to information and communication across the border and vice versa; the transborder movement of public transport; degree of accessibility to transborder transportation services; and volumes of road vehicles traffic from transborder communication roads

Source: Authors, summarized and extracted from the research literature, 2023.
To measure urban development, four major dimensions, 14 major indexes, and 54 indicators were chosen (Table 3).

Table 3: Indicators and indexes of urban development in border cities

Variable	Dimension	Index	Indicator
Urban development in border cities	Economic	Employment and income	Job creation, job variety, type of job, level of job satisfaction, family income, satisfaction with income, and savings
		Housing and services	The economic value of land and housing, the number of rented houses, the quality domain of access to public services and infrastructure, and access to public services and infrastructure
		Justice and economic welfare	Reduced poverty and deprivation, entertainment and travel cost share in the household basket; and range of investment incentives (desire to boost economic activity)
	Sociocultural	Education	Motivation to continue education and average knowledge of the population
		Population dynamics	Population growth rate, rate of active population, mortality rate, the amount and number of

		immigrants, and migration incentives
	Health	Quantity of health care services; health care quality, and degree of life satisfaction
	Societal security	Crime rates, divorce and family fragmentation, social solidarity, and social trust
Politico-institutional	Institutional capital	The allocated governmental funds for development and prosperity, public institutions and local government income, satisfaction with the performance of governmental and local public institutions, the employment rate of skilled manpower in the local management, and the number of NGOs
	Partnership	Public participation in politics and local management
Physical-environmental	Physical quality of residence	Quality domain of construction and the use of durable materials; and quality of building facilities and equipment
	Access and communication	The quality domain of access roads and passages, the beauty (cleaning, painting, etc.) of the urban landscape, access to public transportation, cost and duration of urban trips, and intensity of daily traffic
	Land use	Uncontrolled construction, destruction of agricultural lands, and the amount of public and green spaces
	Urban services	People's access to public and basic services
	Environmental Health	Household and construction waste, surface water pollution, destruction of forests and jungles, soil

pollution, noise pollution, and uncontrolled exploitation of the places with tourism potential

Source: Authors, summarized and extracted from the research literature, 2023.

Two distinct groups, including economic activists in transborder trade activities and family heads in Baneh and Marivan, constituted the statistical population of this study. In terms of the first group, i.e. economic activists in transborder trade activities, the snowball sampling method was used to determine the sample size since the total population for Marivan and Baneh was not set and quick access to the samples was difficult. According to this method, the sample size for the first target group was obtained equal to 103 participants for Marivan (59) and Baneh (44).

The second group includes all family heads in Marivan and Baneh cities. It is noteworthy that the total households living in Marivan and Baneh cities were selected as the second group sample since no comparison between the two cities was desired. Based on the detailed results of the General Census of Population and Housing (2016), the total number of households in Marivan (39,368 households) and Baneh (30,743 households) cities equalled 70,111. Since family heads (households) living in the two cities constitute the analysis units in this study, the Cochran formula was used to obtain the sample size. After the determination of the sample size for the second group, the statistical population was obtained (382 participants). Then, questionnaire distribution was done in both cities through quota sampling. A simple random sampling method was also used to distribute the prepared questionnaires among the family heads of households in Marivan and Baneh cities. In this method, all family heads of households are given the same probability of being selected, so this method is the best method to achieve the purpose of the research. It should be noted that first, 165 questionnaires were completed in Baneh city during 5 consecutive days, and then they were referred to Marivan city and the number of 220 questionnaires were completed during 7 days. Thus, the final number of questionnaires reached a total of 385 questionnaires (Table 4).

Table 4: The number of questionnaires distributed and collected in the cities under study

City	Estimates of the number and distribution of questionnaires	The number of completed questionnaires
Marivan	218	220
Baneh	164	165
Total	382	385

In the following, the indicators of transborder interactions and urban development in border cities were measured via the Likert scale from the viewpoint of cross-border trade activists and family heads. To measure and operationalize the research indicators, two questionnaires with some modifications were separately designed for both groups. Then, a limited pre-test was conducted to assess the reliability of the questionnaires and Cronbach's alpha coefficients were obtained equal to .862 and .789 for the transborder trade activists' questionnaire and family heads' questionnaire, respectively. In the analysis phase, descriptive results of the study were presented, examined, and confirmed for both variables using statistical tests. Finally, the relationship between transborder interactions and urban development in border cities was explored using regression analysis.

4. Case Studies

4.1. Geographical location

The political border under study (Iraqi Kurdistan and Iranian Kurdistan border) is 230 kilometres in length. Kurdistan province takes up 14.3% of the total length of Iran-Iraq political borders and 33.9% of Iran's political borders with Iraqi Kurdistan. The present case study includes the border cities of Marivan and Baneh in the border region of Iranian Kurdistan and Iraqi Kurdistan. The border city of Marivan is located at a distance of 125 km West of Sanandaj and is considered the third largest city of the province with a population of 110,464 people in 2011. Baneh city, with a population of 85,190 in 2011, lies at a distance of 55 and 224 kilometres West of Saez and Sanandaj, respectively and is regarded as the last urban point at the north of the province on the border with Iraqi Kurdistan. The distance between Baneh and Marivan cities from the borderline is 21 and 20 kilometres, respectively (Map 1).



Map 1: Geographic and political location of the cities under study

4.2. Demographic characteristics of the cities under study

The review of the population change trend in Baneh and Marivan in 45 years (1966-2011) suggests that the population of these cities has been on the rise despite significant volatilities and a sharp population decline in this period. The remarkable point about the urban developments in these cities is that their population between 1976-1986 experienced a significant decrease due to the

Iraq-Iran war and civil unrest inside the province. This is unlike most cities of the country that experienced an increase in population in this decade because of rural-urban migration and government incentive policies. However, the population of these cities suddenly had a sharp increase in the next decade (1986-1996) with the end of war and the dominance of peace and security in the region. In the 1996-2006 and 2006-2011 periods, Baneh and Marivan were placed at the top with relatively high growth rates of population among cities of the province. The following chart shows the trend of population growth in the province in the 1986-2011 period (Chart 1).

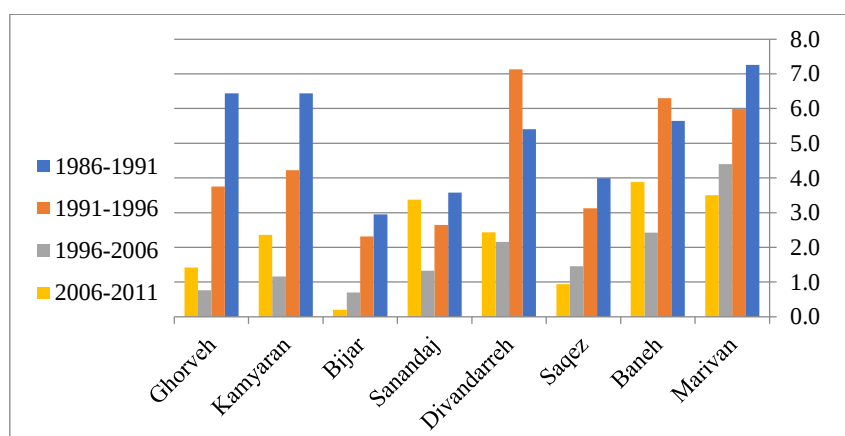


Chart 1: The trend of population growth rate in the province (1986 to 2011)

4.3. Economic features and structure of the cities under study

In 1996, 2006 and 2011, the employment rate of Baneh was 88.6, 87.0, and 90.3 percent, respectively and this rate was 88.2, 82.8, and 66.2% for Marivan, respectively. Thus, Marivan's employment rate underwent a substantial decline from 1996 to 2011 while Baneh's employment rate decreased and then increased. A quick look at the employment situation in Baneh and Marivan cities in 2011 shows that the employment structure of both cities shares many similarities despite some differences. In Baneh, wholesale and retail trade, construction, transportation, storage and communications, public administration and defence, compulsory social security, and unknown activities respectively constituted the major jobs taken by people. In Marivan, wholesale and retail trade, unknown and undeclared activities, education, Transport, storage and communications were the most frequently held jobs by people, respectively. The employment trend by major groups active in Baneh and Marivan within the 1996-2006 and 2006-2011 periods shows that Unknown and undeclared activities and Real estate, renting and business activities had the highest growth rates among the groups associated with border trade activities (Chart 2 & 3).

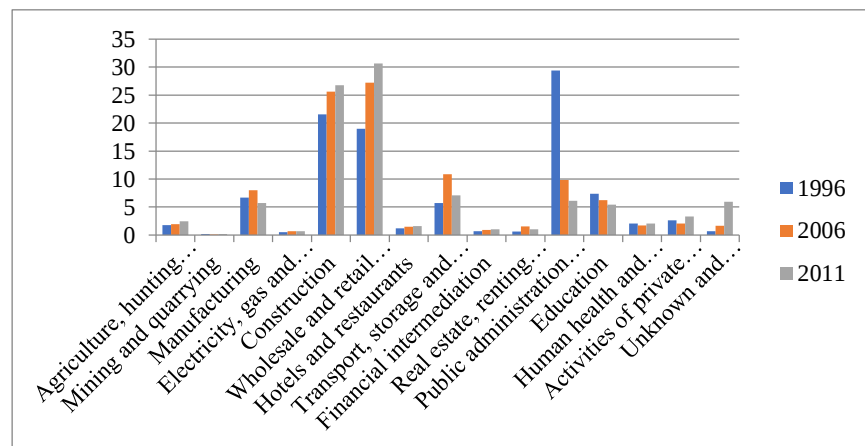


Chart 2: The main group activities of employees with 10 or more years in Baneh (percentage)

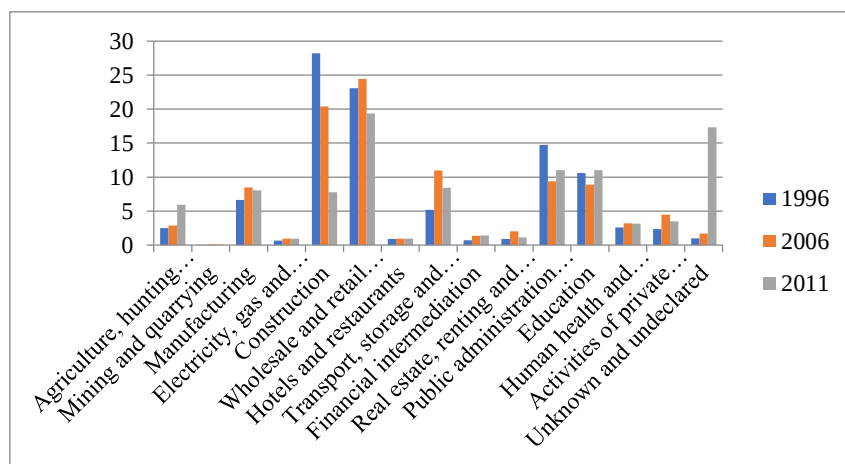


Chart 3: The main group activities of employees with 10 or more years in Marivan (percentage)

Based on the results obtained from the calculation of location coefficient, Baneh and Marivan in 1996, 2006 and 2011 generally had basic activities in group activities, such as construction, wholesale and retail trade, hotels and restaurants, Activities of private households as employers and undifferentiated production activities of private households, and unknown and undeclared activities despite some changes and differences (Table 5).

Table 5: Location coefficient results for Baneh and Marivan

Main economic activity group	Baneh			Marivan		
	Statistical Year			Statistical Year		
	1996	2006	2011	1996	2006	2011
Agriculture, hunting forestry and fishing	0.40	0.42	0.39	0.57	0.62	0.73
Mining and quarrying	0.50	0.90	0.61	0.05	0.56	0.34
Manufacturing	0.61	0.81	0.65	0.61	0.85	0.96

Electricity, gas and water supply	0.56	0.67	0.51	0.66	0.87	0.66
Construction	1.08	1.41	1.69	1.42	1.12	0.55
Wholesale and retail trade; repair of motor vehicles and motorcycles	0.99	1.26	1.65	1.08	1.13	1.04
Hotels and restaurants	1.31	1.46	1.50	0.96	1.04	0.84
Transport, storage and communications	0.84	0.91	0.72	0.76	0.92	0.82
Financial intermediation	0.60	0.60	0.61	0.57	0.86	0.83
Real estate, renting and business activities	0.68	0.77	0.89	0.96	1.00	0.94
Public administration and defence; compulsory social security	1.60	0.92	0.62	0.80	0.87	0.99
Education	0.76	0.63	0.60	1.08	0.90	1.20
Human health and social work activities	0.72	0.54	0.69	0.92	1.00	1.01
Activities of private households as employers and undifferentiated production activities of private households	1.09	0.82	1.10	0.98	1.76	1.16
Unknown and undeclared activities	0.51	1.11	0.68	0.76	1.14	2.16

Source: Authors, based on calculations based on General Census of Population and Housing, years 1996, 2006, and 2011.

5. Research Findings

5.1. Change trend of transborder interactions in Iran-Iraq's Kurdistan border

In recent decades, especially after the fall of the Ba'ath regime in Iraq (2003) and the increase of friendly relations between Iran and Iraq, transborder interactions in Iran-Iraq's Kurdistan border rose and legal and official interactions in the region gradually grew as a result of new trends. It is worth noting that formal/informal economic border interactions between both sides have considerably declined in recent years (2010 onwards) due to the effects of international sanctions against Iran and the formation of political unrest in Iraq (civil war with the terrorist groups).

In general, the Iran-Iraq border interactions can be divided into two categories formal/legal and informal interactions. The transformation trend and increased transborder interactions (particularly socio-economic interactions) have been depicted for the area under study area before and after the fall of the Ba'ath regime in Iraq (2003).

5.1.1. Formal/informal economic transborder interactions

According to the statistics released by the Customs Office of the Islamic Republic of Iran and Iran Foreign Trade Promotion Organization documents, the history of formal economic relations between Iran and Iraq, especially Kurdistan dates back to 1991 (www.tpo.ir). Since 1998, economic exchanges between the two countries, particularly with Iraqi Kurdistan entered a new phase and joint border markets, which had been gradually founded in 1991, began to work (the Islamic Republic of Iran Customs; Razini & Bastani 2002). It should be noted that the establishment of 12 joint border markets had been permitted on the border between the countries from 1991 to 2002. From among these markets, 9 ones had become active and three markets, including Tileh-Kooh, Khosravi, and Mehran had not become active due to Iraq's unwillingness (Razini & Bastani 2002). Thus, by the end of 1991, the economic transactions between the two countries were limited to economic exchanges with Iraqi Kurdistan. Kurdistan Province established the first joint border with the Iraqi Kurdistan market and marked the official start of economic relations with Iraqi Kurdistan. Then, the regional economic interactions were developed with the establishment of two other joint markets in the 1990s.

Table 6: Features of formal and market borders between Iraq and Iran's Kurdistan

Prov ince	Formal border/ market	Border type/ market	Function	Work ing time	Esa blish ment year	Former status (before 2003)	Current status (after 2003)
Kurd istan	Bashmagh Market of Marivan	Special	Freight	8-20	1992	Active	Active
	Bashmagh terminal	Formal	Passenger, freight, and transit	8-20	2006	Not Establis hed	Active
	Siranband market of Baneh	Special	Freight	8-16	1996	Active	Active
	Saif market of Saghez	Special	Freight	8-14	1999	Active	Active

Source: Office of Economic Studies and Economic Planning, Ministry of Commerce 2002; Road Maintenance & Transportation Organization (www.rmto.ir)

Trade (exports and imports): As per the statistics released by Islamic Republic of Iran Customs, the net weight of trade with Iraqi Kurdistan province

has increased from 9645.1 tons in 1998 to 872655.8 tons in 2011. In terms of monetary value, their value has increased from 13142.9 dollars in 1998 to 872655.8 dollars in 2011 (Chart 4).

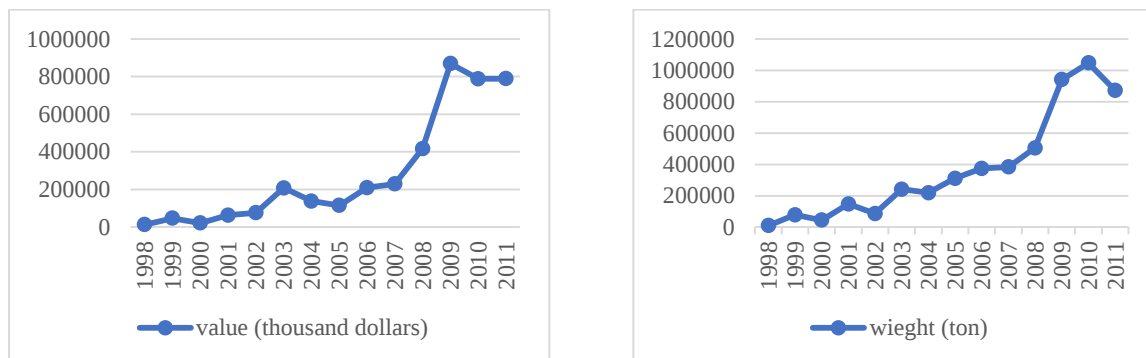


Chart 4: Volume of trade (import and export) in the border area between Iranian and Iraqi Kurdistan in 1998-2011.

Economic interactions of Iranian and Iraqi Kurdistan do not lead to trade transactions through accredited and formal ports. A substantial portion of trade transactions in the border region is informally fulfilled through formal principles and/or border vacuums. According to the Secretariat of the Commission for Fight against the Smuggling of Iranian Kurdistan, trafficking discoveries during 2006-2011 cost 149,741 million tomans (Chart 5). The most important discoveries of contraband items include tobacco, petroleum products, audio-visual and home appliances, fabric, rice, and tea.

Statistics released by Iranian Kurdistan's Customs from 2007 to 2011 also indicate that the monetary value of smuggling discoveries in this period has experienced such an ascending mode despite annual fluctuations that it reached from 795, 9940 dollars in 2007 to 11,182,680 dollars in 2011 (Chart 6).

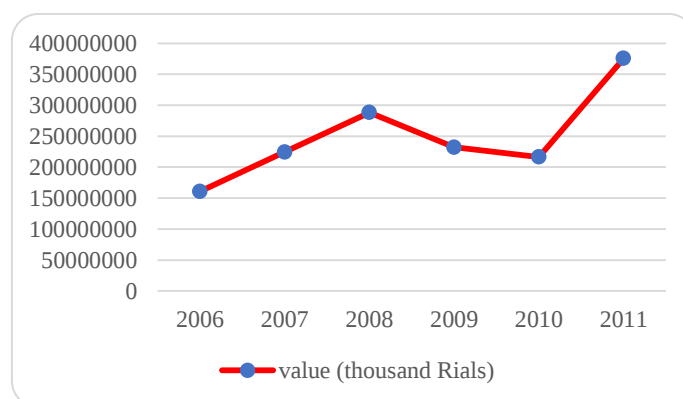


Chart 5: Value of smuggling discoveries in Iraq and Iran's Kurdistan border region (2006-2011)

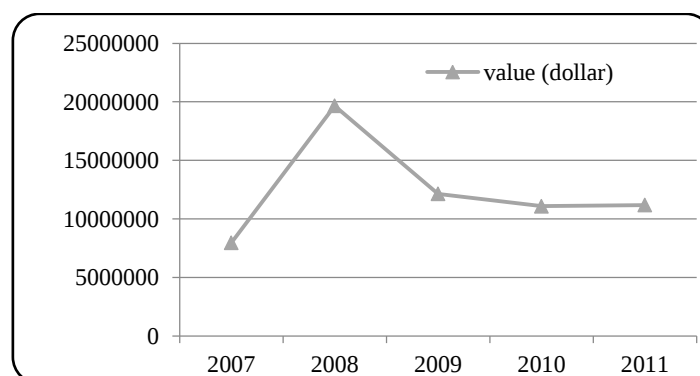


Chart 6: Statistics about smuggling discoveries by Iran's Kurdistan customs (2007-2011)

Export of technical and engineering services: According to a report released by the Iran Trade Promotion Organization, the export of technical and engineering services to Iraq, particularly to Iraqi Kurdistan has been negligible up to 2013. Based on the estimate made in the 2004-2012 period, the number of 23 contracts (42.6%) from among a total of 54 contracts signed between Iran and Iraq to the value of 3,430,957,112 dollars belongs to Iraqi Kurdistan. Some of them have been signed by companies located in the province and the province's labour force has been used in some cases because of racial, ethnic, and linguistic similarities with the other side of the border.

5.1.2. Physical interactions

Transit (passage of goods and heavy vehicles): According to customs data of the Islamic Republic of Iran, foreign transit of the country with the origin and destination of Iraqi Kurdistan has had a large growth over the years 2005 to 2012. Indeed, it has reached from 3578 tons and 34300 dollars in 2005 to 953000 tons and 1,427,461,566 dollars in 2012.

The commodity groups transited from the Iranian and Iraqi Kurdistan border include fuel, food, and automobiles, respectively.

According to the country transit calendar in 2005, Bashmagh and Marivan customs were placed in the eighteenth rank of foreign transit among customs origins with 3578 tons or .04 per cent. In 2012, this was improved to 953000 tons or 8.77% and the third rank. Moreover, in terms of foreign transit among customs destinations, Bashmagh and Marivan customs' activities reached from 5 tons or .0% in 2005 to 854140 tons or 7.86% and the third rank in 2012.

5.1.3. Socio-cultural interactions

Entry and exit of people (for jobs, visiting, services, education, etc.): Until 2008, most residents of the two regions commuted either through official ports in other provinces sharing borders with Iraq or illegally via smuggling. According to statistical data, the total volume of land border commute in the

region under study has reached from 171,909 people (entry and exit) in 2008 to 533,783 people in 2011. The review of land border crossing and commute shows that 81,647 people have entered the province through the land border and 90,262 people exited the border and entered Iraqi Kurdistan in 2008. In contrast, 265,227 have entered the province and 268,556 people exited from Iranian Kurdistan borders and entered Iraqi Kurdistan in 2011 (Chart 7).

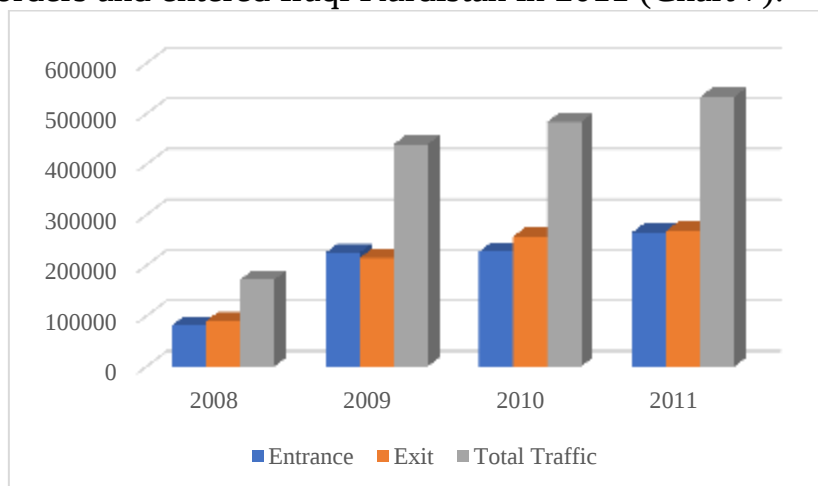


Chart 7: Entrance and exit of passengers from land borders by vehicles and on foot (2008-2011)

In terms of passenger transportation by air, it can be stated that the air flight path between Sanandaj and As Sulaymaniyah was established in 2011 and two back-and-forth flights are operative per week based on reports of the IT office and statistical reviews of the organization's national airline. According to the Civil Aviation Organization, the number of 7465 passengers (3547 exits and 3918 entries) commuted between Sanandaj and Sulaimaniyah with 178 flights in 2011. In 2012, the same number of flights carried 8071 passengers (4341 exits and 3730 entries).

5.2. The descriptive results of transborder interactions based on questionnaire data

Description of transborder interactions based on trade activists' questionnaire: The values and statistics obtained for the main dimensions of transborder interactions after 2003 include economic interactions (3.29), socio-cultural interactions (3.03), politico-institutional interactions (3.75) and physical-environmental interactions (3.15) and they are all above average. It is noteworthy that the obtained value for transborder interactions after 2003 equals 3.30, which is above average, as well. The results of the trade activists' questionnaire showed that the highest levels of changes in different dimensions of transborder interactions in the period under review pertain to politico-institutional interaction and physical-environmental interactions (Table 7).

Table 7: Mean and standard deviation of the four-dimension transborder interactions based on the results of trade activists' questionnaire

Dimensions	Cross-border interactions during the rule of the Ba'ath regime (Before 2003)			Cross-border interactions after the fall of the Ba'ath regime (from 2003 onward)		
	Mean	SD	Rank based on mean	Mean	SD	Rank based on mean
Economic interactions	1.95	0.74	2	3.29	0.52	2
Socio-cultural interactions	1.96	0.65	1	3.03	0.36	4
Politico-institutional interactions	1.94	0.80	3	3.75	0.65	1
Physical-environmental interactions	1.58	0.62	4	3.15	0.63	3
Total transborder interactions	1.86	0.56	-	3.30	0.33	-

Description of transborder interactions based on family heads' questionnaire: Based on Table 8, the total mean value for transborder interactions equals 1.73 and 3.10 after and before 2003, respectively. The values and statistics obtained for the main dimensions of transborder interactions after 2003 include economic interactions (3.19), socio-cultural interactions (3.05), politico-institutional interactions (3.11), and physical-environmental interactions (3.05) and they are all above average. The results of the family heads' questionnaire showed that the highest levels of changes in different dimensions of transborder interactions in the period under review belong to physical-environmental and economic interactions (Table 8).

Table 8: Mean and standard deviation of the four-dimension transborder interactions based on the results of family heads' questionnaire

Dimensions	Cross-border interactions during the rule of the Ba'ath regime (Before 2003)			Cross-border interactions after the fall of the Ba'ath regime (from 2003 onward)		
	Mean	SD	Rank based on mean	Mean	SD	Rank based on mean
Economic interactions	1.75	0.69	3	3.19	0.82	1

Socio-cultural interactions	1.85	0.60	1	3.05	0.80	3
Politico-institutional interactions	1.82	0.71	2	3.11	0.90	2
Physical-environmental interactions	1.50	0.58	4	3.05	0.49	3
Total transborder interactions	1.73	0.48	-	3.10	0.60	-

5.3. Description of urban development based on questionnaire data

Situation of the cities under study based on main dimensions of urban development in line with border trade activists' questionnaire: The descriptive results of the dependent variable showed that socio-cultural and economic dimensions have taken up the maximum and minimum mean values in both Baneh and Marivan from among the four dimensions of urban development, respectively. In addition, socio-cultural (3.46), physical-environmental (3.28), politico-institutional (3.22), and economic (3.06) dimensions were respectively assessed as moderate to high. It should be noted that the total amount of urban development for Baneh, Marivan, and the total of both cities equalled 3.24, 3.27, and 3.26, respectively (Table 9).

Table 9: Mean and standard deviation of the four dimensions and total amount of urban development (trade activists' questionnaire)

Dimensions	Baneh		Marivan		Total	
	Mean	SD	Mean	SD	Mean	SD
Economic	3.14	0.28	3.00	0.39	3.06	0.35
Socio-cultural	3.41	0.28	3.50	0.24	3.46	0.26
Politico-institutional	3.19	0.26	3.26	0.21	3.22	0.23
Physical-environmental	3.20	0.33	3.33	0.30	3.28	0.32
Urban development	3.24	0.15	3.27	0.13	3.26	0.14

Situation of the cities under study based on main dimensions of urban development in line with family heads' questionnaire: Based on the descriptive results, physical-environmental (3.36) and sociocultural (3.10) dimensions in Baneh and physical-environmental (3.25) and economic (2.84) dimensions in Marivan hold the maximum and minimum mean values, respectively. In terms of the total mean value of both cities, physical-environmental (3.30) and economic (2.96) dimensions have taken up the highest and lowest values, respectively. Furthermore, physical-environmental (3.30), politico-institutional (3.16), and socio-cultural (3.00) dimensions were assessed

as moderate to high while economic dimension (2.96) was reported to be lower than the mean value. It should be noted that the total amount of urban development for Baneh, and Marivan, and the total value of both cities equaled 3.18, 3.05, and 3.10, respectively (Table 10).

Table 10: Mean and standard deviation of the four dimensions and total amount of urban development (family heads' questionnaire)

Total	Baneh		Marivan		Total	
	SD	Mean	SD	SD	Mean	SD
Economic	3.12	0.55	2.84	0.56	2.96	0.57
Socio-cultural	3.10	0.44	2.92	0.46	3.00	0.46
Politico-institutional	3.12	0.35	3.19	0.43	3.16	0.40
Physical-environmental	3.36	0.35	3.25	0.35	3.30	0.35
Urban development	3.18	0.21	3.05	0.25	3.10	0.24

5.4. On the relationship between transborder interactions and urban development of border cities based on questionnaire data

Regression analysis and Pearson test were performed to review and analyze the relationship between transborder interactions and urban development. This analysis was conducted separately for each group. Pearson's test results are presented in Table (11).

Table 11: Correlation between transborder interactions and urban development based on trade activists' questionnaire data

Variable		Results		
Independent variable	Dependent variable	N	r	Sig.
Transborder interactions	Urban development	103	**0.538	0.000

**. Correlation is significant at the 0.01 level (2-tailed).

According to Pearson correlation results for the border trade activists' questionnaire with a confidence level of .99, one can argue that there is a significant relationship between transborder interactions and urban development. Thus, the relevant null hypothesis is rejected. The correlation between transborder interactions and urban development equals .538, which is representative of a moderate correlation between the two variables.

Pearson correlation results for family heads' questionnaire showed that there is a significant relationship between transborder interactions and urban development. Thus, the relevant null hypothesis is rejected. The correlation between transborder interactions and urban development equals 0.484 (Table 12).

Table 12: Correlation between transborder interactions and urban development based on family heads' questionnaire data

Variable		Results		
Independent variable	Dependent variable	N	r	Sig.
Transborder interactions	Urban development	385	**0.484	0.000

**. Correlation is significant at the 0.01 level (2-tailed).

Correlation and regression analysis of the dimensions of transborder interactions and urban structural changes in border cities: At first, the Pearson test is used to do regression analysis and identify the relationship between the main dimensions of transborder interactions (economic, socio-cultural, politico-institutional, and physical-environmental interactions) and urban development as well as the relation between these dimensions together. As it is observed in Table (13), urban development is significantly correlated with economic (0.512), physical-environmental (0.407), and politico-institutional (0.219) interactions from the perspective of trade activists.

Table 13: The correlation between the four dimensions of transborder interactions and urban development based on border trade activists' responses

Variable		Results		
Independent variable	Dependent variable	N	r	Sig.
Economic	Urban development	103	**0.512	0.000
Socio-cultural		103	0.154	0.120
Politico-institutional		103	*0.219	0.026
Physical-environmental		103	**0.407	0.000

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

However, based on the data obtained from the family heads' questionnaire, all four main dimensions of transborder interactions are significantly correlated with urban development ($P=0.000$). The correlation coefficients for economic, socio-cultural, politico-institutional, and physical-environmental dimensions were 0.427, 0.392, 0.359, and 0.355, respectively (Table 14).

Table 14: The correlation between the four dimensions of transborder interactions and urban development based on family heads' responses

Variable		Results		
Independent variable	Dependent variable	N	r	Sig.
Economic	Urban development	385	**0.427	0.000
Socio-cultural		385	**0.392	0.000
Politico-institutional		385	**0.359	0.000
Physical-environmental		385	**0.355	0.000

**. Correlation is significant at the 0.01 level (2-tailed).

Now, regression analysis is conducted to specify the magnitude of correlation of each dimension with urban development based on trade activists' and family heads' questionnaires.

Table 15 summarizes regression analysis results representing the correlation of economic, socio-cultural, physical-environmental, and politico-institutional interactions with urban development.

Table 15: Summary of regression analysis representing the correlation between transborder interactions (dimensions) and urban development

Target population	Multiple correlation coefficient	Coefficient of determination	Adjusted coefficient of determination	Estimation error of standard deviation
Border trade activists	^a 0.592	0.350	0.324	0.11815

a. Predictors: (Constant), economic, socio-cultural, politico-institutional, and physical-environmental interactions

Based on regression analysis results of the transborder trade activists' questionnaire, urban development of border cities holds a correlation coefficient of 59% with dimensions of transborder interactions. The adjusted coefficient of determination shows that 32.4% of the variation in urban development has been accounted for through the linear combination of economic, socio-cultural, physical-environmental, and politico-institutional interactions. In other words, dimensions of transborder interactions can explain 32.4% of the variation in the dependent variable. In addition, the calculated value for F at the confidence level of 0.99 indicates that the linear combination of independent variables can significantly explain and predict variation in the dependent variable (Table 16).

Table 16: Regression significance of transborder interactions' dimensions on urban development

ANOVA

Model	Sum of Squares	Df	Mean Squares	F	Sig.
1 Regression effect	0.737	4	0.184	13.198	^a 0.000
Remainder	1.368	98	0.014		
Total	2.105	102			

a. Predictors: (Constant), economic, socio-cultural, politico-institutional, and physical-environmental interactions

b. Dependent Variable: urban development

Finally, economic, politico-institutional, and physical-environmental interactions have a significant effect on the urban development of border cities based on standardized coefficients. In terms of the intensity of factors' effectiveness in the urban development of border cities, economic interactions with an impact factor of 0.418 have the highest impact on the urban development of border cities. Following economic interactions, the two dimensions, i.e. physical-environmental and politico-institutional interactions with impact factors of 0.234 and 0.213 have been respectively effective in urban development (Table 17). It should be noted that socio-cultural interactions have no significant effect on the urban development of the border cities.

Table 17: Intensity of factors' effectiveness of the independent variables in the dependent variable
Coefficients

Model	Non-standard Coefficients		Standardized Coefficients	t	Sig.
	(β)	Error (β)	(β)		
y-intercept	2.574	0.128		20.043	0.000
Economic	0.116	0.025	0.418	4.595	0.000
Socio-cultural	-0.014	0.035	-0.034	-0.392	0.696
¹ Politico-institutional	0.047	0.018	0.213	2.612	0.010
Physical-environmental	0.053	0.021	0.234	3.511	0.014

a. Dependent Variable: urban development

Following the presentation of regression analysis on questionnaire data about border trade activists, this was also done on questionnaire data about family heads. Table 18 summarizes regression analysis results representing the correlation of economic, socio-cultural, physical-environmental, and politico-institutional interactions with urban development based on family heads' questionnaire.

Table 18: Regression summary of transborder interactions' dimensions with urban development

Target population	Multiple correlation coefficient	Coefficient of determination	Adjusted coefficient of determination	Estimation error of standard deviation
Family	^a 0.498	0.248	0.240	0.21013

heads				
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a. Predictors: (Constant), economic, socio-cultural, politico-institutional, and physical-environmental interactions

Based on regression analysis results of family heads' questionnaire data, urban development of border cities shares a correlation coefficient of 49.8% with dimensions of transborder interactions. Furthermore, the adjusted coefficient of determination shows that 24.0% of the variation in urban development has been explained by the linear combination of economic, socio-cultural, physical-environmental, and politico-institutional interactions. In other words, dimensions of transborder interactions can explain 24.0% of the variation in the dependent variable. In addition, the calculated value for F at the confidence level of 0.99 indicates that the linear combination of independent variables can significantly explain and predict variation in the dependent variable (Table 19).

Table 19: Regression significance of transborder interactions' dimensions on urban development

ANOVA^b

Model	Sum of Squares	Df	Mean Squares	F	Sig.
1 Regression effect	5.539	4	1.385	31.362	^a 0.000
Remainder	16.778	380	0.044		
Total	22.317	384			

a. Predictors: (Constant), economic, socio-cultural, politico-institutional, and physical-environmental interactions

b. Dependent Variable: urban development

Finally, economic and physical-environmental interactions have a significant effect on the urban development of border cities based on standardized coefficients. In terms of the intensity of factors' effectiveness in the urban development of border cities, economic interactions with an impact factor of .255 have the highest impact on the urban development of border cities. Following economic interactions, physical-environmental interactions with an impact factor of 0.162 have been effective in urban development (Table 20). It should be noted that socio-cultural and politico-institutional interactions have no significant effect on the urban development of the border cities.

Table 20: Intensity of factors' effectiveness of the independent variables in the dependent variable
Coefficients

Model	Non-standard Coefficients		Standardized Coefficients	t	Sig.
	(β)	Error (β)	(β)		
y-intercept	2.434	0.70		34.891	0.000
Economic	0.075	0.016	0.255	4.713	0.000
Socio-cultural	0.030	0.020	0.101	1.554	0.121
¹ Politico-institutional	0.031	0.016	0.116	1.954	0.051
Physical-environmental	0.079	0.025	0.162	3.103	0.002

a. Dependent Variable: urban development

6. Discussion

Official statistics and data showed that transborder interactions have sharply increased in Iranian and Iraqi Kurdistan along with political developments in Iraq (2003). The review of the selected indicators shows that transborder interactions have increased despite a downward trend of some indicators in recent years. In addition, the change ratio and growth rate are still positive (Table 21).

Table 21: Change ratio and growth rate of transborder interactions' indexes in the border region of Iranian and Iraqi Kurdistan

Index		1998-2002		2003-2007		2008-2011	
		Change ratio	Growth rate	Change ratio	Growth rate	Change ratio	Growth rate
The total amount of trade exchanges(Export and Import)	Weight (kg)	8825.3	145.5	59.0	9.7	113.3	16.4
	Value (dollar)	482.2	42.24	9.90	1.9	80.0	12.5
Export of technical and engineering services	Value (dollar)	-	-	14.1	0.4	231.4	27.1
Smuggling of commodities and currencies	Value (thousand Rials)	-	-	-	-	13.4	2.5

Total land commute of passengers	Number	.	.	.	.	226.7	26.7
The total number of people who entered Iranian Kurdistan through land borders	Number	.	.	.	.	245.0	28.1
Total number of people leaving Iran to Iraqi Kurdistan through land borders	Number	.	.	.	.	210.2	25.4
The total number of Iraqi tourists entered Iranian Kurdistan through land borders	Number	-	-	208.7	25.3	4971.9	119.3
Transit of goods (arrivals and departures)	Weight (kg)	.	.	-	-	680.0	50.8
	Value (million Rials)	.	.	-	-	804.4	55.3

The results of the economic permeability of Kurdistan borders based on trade volume (exports and imports) represent a sharp increase in the permeability of the borders of the region (Table 22).

Table 22: Results of economic permeability of regional borders based on trade volume

Index		Year			
		1998	2003	2008	2012
Economic permeability of borders	Weight (ton)	41.94	1049.34	2195.54	4683.32
	Value (thousand dollars)	57.14	905.37	1812.59	3262.28

According to the field survey findings, transborder interactions have experienced considerable growth. The minute difference between the two groups in transborder interactions is attributable to the different understandings of groups. However, both groups confirm that transborder interactions in Iranian and Iraqi Kurdistan have increased in recent decades (Figure 2).

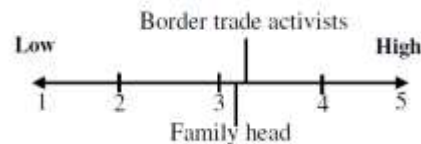


Figure 2: Mean value of transborder interactions based on the field survey findings (after 2003)

However, the review and evaluation of urban development indicators also revealed that the point-to-point situation of most of the indicators has improved from 1996 to 2011 (Table 23). On the other hand, the indicators whose mean values for Baneh and Marivan are better than urban areas' mean values in 2011 have experienced an ascending status in terms of the number and variety in 1996. In the meantime, the promotion and improvement of socio-cultural and physical indicators of urban development have been dramatic for both Baneh and Marivan compared with the mean of other urban areas of the province. It should be noted that the situation of Baneh is a little different from that of Marivan in some economic indicators such that Baneh's status is better. Qualitative findings from field interviews indicate that some government measures, including the internationalization of the Bashmagh-Marivan border in 2007 have led to greater control of informal border traffic and commute, the presence of large native companies and business leaders in the marketplace, a consequent decrease of small businesses, and gradual elimination of the middle-class and low-income people in Marivan from the border trade process. On the other hand, domestic tourists' tendency to buy goods from Baneh and its greater prosperity are among the main reasons for the improved status of some indicators in this city.

Table 23: Socioeconomic indicators in Baneh and Marivan and its comparison with the mean of urban areas of Iranian Kurdistan

Indicator	1996			2011		
	Baneh	Marivan	The mean of urban areas	Baneh	Marivan	The mean of urban areas
Actual employment rate	88.60	88.16	89.91	90.28	66.24	81.42
Actual employment rate	90.68	91.50	90.00	89.82	58.91	68.81

Indicator	1996			2011		
	Baneh	Marivan	The mean of urban areas	Baneh	Marivan	The mean of urban areas
of women						
The proportion of service sector employees to total employees	66.24	61.05	62.33	56.86	56.79	56.40
Number of transactions recorded per 1,000 people	73.09	15.35	36.10	291.33	338.06	265.49
Dependency ratio	0.83	0.87	0.80	0.47	0.43	0.38
The participation rate of the labour force	38.80	31.56	34.31	38.36	38.00	38.38
Housing ownership rate of families	68.12	67.42	65.36	60.82	55.29	56.40
Population growth rate	6.30	5.99	3.65	3.88	3.50	2.87
Mortality rate	22.84	23.31	18.89	4.04	3.97	4.65
Net migration rate	0.43	-0.26	-3.06	0.12	-0.45	-2.17
Unemployment rate (gross)	10.97	10.46	9.88	3.73	12.83	7.13
Total literacy rate	73.61	74.42	76.80	80.74	82.05	82.32
Number of general practitioners per 10,000 people	3.97	3.80	4.63	2.44	2.21	3.62
The proportion of divorced people from the married population (10 years and above)	0.61	0.65	0.74	1.12	1.29	1.58
Household density per dwelling	1.12	1.08	1.20	1.03	1.02	1.04
Average number of people in residential rooms	1.78	1.67	1.75	1.17	1.26	1.29
Per capita residential substructure (m ²)	16.65	17.87	18.50	27.45	27.60	24.43
Percentage of newly built dwellings (less than 5 years of construction)	25.30	23.60	14.91	28.39	26.16	18.54

Indicator	1996			2011		
	Baneh	Marivan	The mean of urban areas	Baneh	Marivan	The mean of urban areas
Percentage of residential units with facilities (at least kitchen, bathroom, and toilet)	57.16	87.63	65.53	98.94	99.13	98.99
Percentage of residential units with piped water	55.58	94.01	87.91	84.98	97.78	97.39
Percentage of residential units with electricity	96.78	98.42	98.22	96.90	98.93	99.33
Number of building permits issued per 1,000 people	2.90	10.95	4.77	5.16	0.28	4.91

The descriptive findings of the survey confirm the aforementioned results. Based on border trade activists' and family heads' questionnaires, dimensions and indicators of urban development have experienced positive changes. Both groups believe that the greatest changes have occurred in physical-environmental, socio-cultural, and politico-institutional dimensions that are surprisingly consistent with the findings of urban development such that the improvement of physical-environmental and politico-institutional dimensions is represented. However, the remarkable point in this research is the dissatisfaction of target groups with the situation of some economic indicators in border cities. Severe economic sanctions against Iran, unprecedented devaluation of Rial, and increased political unrest and civil war in Iraq are among the main reasons for this situation, especially after 2009. These reasons largely stem from the macro-political and economic conditions of the country and the Middle East. As per the statistics, these factors have been both effective in reducing the amount of transborder interactions and in the fragile economy of the two cities, which are substantially dependent upon border trades.

The analytical results of the study indicate the existence of a significant correlation between transborder interactions and urban development such that an increase in the amount of transborder interactions has also transformed components of urban development. Pearson correlation results showed that there is a significant relationship between transborder interactions and urban development from the perspective of both trade activists and family heads

($P=.000$). Moreover, it should be noted that economic interactions with coefficients of .512 and .427 held the highest correlation with urban development based on trade activists and family heads' responses, respectively. Regression analysis results also confirm the Pearson correlation results in that economic interactions with impact factors of .418 and .255 had the greatest effect on the urban development of border cities from the viewpoint of trade activists and family heads, respectively. Based on these findings, it can be argued that economic interactions are one of the main causes of urban change and development in border cities. This finding can be accounted for by the fact that economic interactions, or intensification of economic permeability of borders, can have an important role in the change and development of border cities.

7. Conclusion

Border cities of Iranian Kurdistan are newly exposed to all kinds of transborder events and interactions and the socioeconomic life of these cities has been tied to the border. These transborder exchanges and interactions that increased succeeding the fall of the Ba'ath regime in Iraq and the initiation of relations between Iran and Iraq exerted a great influence on the border cities, which are the main target of these effects. Based on the field findings of this research, the highest change in urban development indexes of Baneh and Marivan returns to the following items, despite some minor differences: improvement of physical quality of living such as the use of innovative construction materials and techniques, equipment of buildings with all kinds of installations and facilities, population dynamics, i.e. population growth, rural-urban migration, betterment of health indices like paying more attention to personal health and improvement of family nutrition, access and urban communication like higher quality of passages, appearance organization of streets, housing and services like excessive rise in the price of land and buildings, high cost of rental and social security like reduction of types of crime, and strengthening of marriages. The comparison of statistical indicators of urban development in Baneh and Marivan with those of Kurdistan urban areas revealed that the most important effects of transborder interactions can be observed in the betterment of socio-cultural indicators, such as population growth rate, mortality rate, net migration rate, and proportion of divorced people from among the married population; and physical indicators such as household density in housing units, average number of people in residential rooms, per capita residential substructure, and modernization of urban housing.

In addition, transborder interactions have played a significant role in the economic structure of Baneh and Marivan since they have led to the development of service sector activities as well as the development of

employment in the informal sector. However, education and literacy are the important indexes that have been negatively affected by the increase in transborder interactions. Many teenagers and young people have failed access to higher education because of increased informal job opportunities in Baneh and Marivan and frustration with the employment prospects for graduates of various academic disciplines.

However, it can be concluded that the communicative function of borders leads to the widespread favourable developmental effects in surrounding areas. In this regard, researchers have referred to the idea of expansion of relations and cross-border/transborder interactions as an approach for the development of border areas. Experience of other countries and different border regions of the world such as the U.S.-Mexico, Germany-Poland, China-Hong Kong, etc. borders is evidence for this claim.

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پوخته

ناوچه سنوورییه‌کان وه‌ک به‌شیک له پیکهاته‌ی فه‌زایی ولاتان داده‌نریت که دهر‌فه‌تیکیان هه‌یه به‌ره‌و گۆرینی سیستهمی نابووری ناوچه‌یی فرانتیه‌شنال. لهم پیه‌ه‌ندیه‌دا شاره سنوورییه‌کانی کوردستانی ئێران له سالانی رابردودا له ریگه‌ی بازاری سنووری هاوبه‌شی فه‌رمی و نافه‌رمی پیه‌ه‌ندی قوولیان له‌گه‌ل لایه‌نه‌کانی دیکه‌ی سنووردا هه‌بووه.

ئهم توێژینه‌وه‌یه نامانجی لیکۆلینه‌وه‌ی په‌یه‌ه‌ندی نێوان کارلیکه‌کانی سنوور به‌زاندن و گه‌شه‌ه‌ندنی شاره‌کانی بانه و مه‌ریوانه. ئهمه‌ش به‌ شیوازی چه‌ندایه‌تی و راپرسی له‌ روانگه‌ی دوو گروپی نمونه‌یه‌وه ئه‌نجامدرا، له‌وانه‌ش چالاکوانانی بازرگانی سنووری و سه‌روکی بنه‌ماله.

به‌ پشت به‌ستن به‌ ئه‌نجامه‌کان، کارلیکه‌کانی سنوور به‌زاندن له‌ ناوچه‌یه‌ی که لیکۆلینه‌وه‌ی له‌سه‌ر ده‌کریت، زیاده‌بوونیان به‌خۆوه بینیه‌وه، به‌تایبه‌تی دوا‌ی پروخانی رژی‌می به‌عس له‌ عێراق. هه‌روه‌ها دۆزینه‌وه وه‌سفیه‌یه‌کان به‌هاکانی مامناوه‌ندی ۳،۲۶ و ۳،۱۱ یان بو چالاکوانانی بازرگانی سنوور به‌زاندن و سه‌روکی خیزانه‌کان له‌ رووی گه‌شه‌پێدانی شارمه‌کانه‌وه به‌ ریکه‌موت نیشان دا. پاشان له‌ وه‌لامی پرسیری سه‌ره‌کی توێژینه‌وه‌که‌دا، په‌یه‌ه‌ندی به‌رچاو له‌ نێوان کارلیکه‌کانی دهر‌مه‌وه‌ی سنوور و گه‌شه‌ه‌ندنی شاره‌کانی شاره سنوورییه‌کان دۆزرایه‌وه. ئهم په‌یه‌ه‌ندییه‌ له‌ ئاستی ناوه‌ندیدا هه‌لسه‌نگینراوه. به‌پێی ئه‌نجامه‌کانی په‌یه‌ه‌ندی پیرسۆن هه‌روه‌ها ده‌ریانخست که کارلیکه‌ نابوورییه‌کان له‌ نێوان ره‌ه‌نده جیاوازمه‌کانی کارلیکه‌کانی سنوور به‌زێندا به‌رزترین په‌یه‌ه‌ندی له‌گه‌ل پیکهاته‌کانی گه‌شه‌پێدانی شاره‌کاندا هه‌یه.

وشه‌ی سه‌ره‌کی: کارلیکه‌کانی سنوور به‌زاندن، گه‌شه‌پێدانی شار، شاره سنوورییه‌کان، بانه، مه‌ریوان.

ملخص

تعتبر المناطق الحدودية جزءاً من البنية المكانية للدول التي لديها فرصة لتغيير النظام الاقتصادي الإقليمي العابر للحدود. وفي هذا الصدد، كانت للمدن الحدودية في كردستان الإيرانية علاقات عميقة مع جوانب أخرى من الحدود من خلال أسواق حدودية مشتركة رسمية وغير رسمية في السنوات السابقة. تهدف هذه الدراسة إلى استكشاف العلاقة بين التفاعلات عبر الحدود وتطور مدينتي بانه ومريوان. وقد تم ذلك من خلال الأساليب الكمية والمسحية من وجهات نظر مجموعتين من العينة، بما في ذلك نشاط التجارة الحدودية ورؤساء الأسر.

وبناءً على النتائج، شهدت التفاعلات عبر الحدود في المنطقة قيد الدراسة زيادة، وخاصة بعد سقوط نظام البعث في العراق. وأظهرت النتائج الوصفية أيضاً قيمةً متوسطة بلغت ٣,٢٦ و ٣,١١ لنشاط التجارة عبر الحدود ورؤساء الأسر من حيث التنمية الحضرية على التوالي. ثم، استجابةً للسؤال البحثي الرئيسي، تم العثور على ارتباط مهم بين التفاعلات عبر الحدود والتنمية الحضرية للمدن الحدودية. وقد تم تقييم هذا الارتباط على المستوى المتوسط. وبحسب نتائج معامل ارتباط بيرسون، أظهرت أيضاً أن التفاعلات الاقتصادية بين الأبعاد المختلفة للتفاعلات عبر الحدود تتمتع بأعلى ارتباط بمكونات التنمية الحضرية. الكلمات المفتاحية: التفاعلات عبر الحدود، التنمية الحضرية، المدن الحدودية، بانه، مريوان.