

Research Paper: Analysis of Factors Affecting the Floating of the Rural Employed Population, Case Study: Khorasan Razavi Province

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ABSTRACT

Purpose: During the past two decades, metropolitan areas of Iran, including Mashhad, have experienced significant growth in urban development. However, the decrease of job opportunities in the rural areas and, in some cases, the depletion of the rural income sources have led to the "floating population" phenomenon in Iran. Rural workers are short-term migrants to cities to gain job opportunities and raise their incomes, sometimes becoming long-term residents.

Methods: Due to the lack of internal studies on the floating population, this study, based on the censuses of 2006 (1385) and 2011 (1390), sought to identify and analyze the factors affecting the floating population in Khorasan Razavi. The data were collected in 27 cities of the region and analyzed utilizing correlation, regression, and U Mann-Whitney Tests.

Results: According to the study, indicators such as the percentage of agricultural employees, industry employees, and literacy index showed a significant difference in favor of cities with a high floating employment rate. In addition, the percentage of agricultural, industrial, and service workers, and the literacy percentage index, both in the correlation test and in the regression test, showed a meaningful relationship with the dependent variable, the rate of floating employed population.

1. Introduction

A

ccording to the World Bank (2013), developing countries need to prepare to

accommodate the surplus population of 2.7 billion by 2050; Because migration sends countless and unpredictable people from rural areas to cities for various purposes (Brueckner & Lall, 2015, 1400). China has experienced the most significant population migration in human his-

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tory. The Sixth China National Census results in 2010 show that China has 221 million floating migrants or a floating population. China's Floating Population Development Report 2011, published by the National Population and Family Planning Commission (NPFPC), shows that the floating population has grown by nearly 10 million people each year over the past three years (Report of the Organization for Economic Co-operation and Development, 2013, 8). According to China Floating Population Development Report, this population reached 253 million in 2015 (Zang, 2019, 86). The prevailing trend is that the population flows from the suburbs, central and western regions to the eastern part. These dynamic population movements change China's population distribution in rural and urban areas and affect its regional distribution. In particular, since the beginning of the 21st century, significant changes have taken place in China's demographic map (OECD Report, 2013, 9). The growth of urbanization (Luo et al., 2018, 219), the reduction of opportunities (Fan & Li, 2018: 4), and natural disasters (Nguyen et al., 2015, 79) in rural areas are among the factors that changed the population distribution of rural and urban areas and led to the formation of the phenomenon of floating population or temporary migration.

In developing countries, rural households face various unpredictable and life-threatening events in economic and environmental dimensions (Nguyen et al., 2015: 79). In such situations, some countries, such as Iran, are experiencing a significant reduction in rural population; Because job opportunities are mainly concentrated in large cities (Andersson et al., 2018: 67). The growth of urbanization has profoundly impacted urban development (Zhang, 2016: 241). It has led to the floating migration of villagers to cities to achieve more significant economic opportunities (Mohabir, Jiang, & Ma, 2017: 101).

Based on urbanization, developing countries with high population growth rates and high internal migration rates face newer challenges than developed countries (You et al., 2018: 476). Economic growth has led to large floating populations from villages to cities and cities to better education, health care, leisure and entertainment facilities, higher incomes, and better living standards. Researchers have done a lot of studies on the purpose of floating population accommodation. Some studies have shown that most floating populations stay in large cities (Addanki & Venkataraman, 2017, 1). However, some studies have shown that the tendency of the floating population is not as valid as expected for residents, and many of them prefer to commute between rural and urban areas (Lehmann, 2012, Zhu, 2007). Socio-cultural conditions have

been essential for immigrants of the previous generation, while economic conditions are essential for younger immigrants and the new generation. According to Kharif (1992), economic factors have a significant impact on the temporary residence of the floating population in cities, while socio-cultural and institutional aspects will substantially affect the permanent home of the floating population (You et al, 2018, 477). From a social perspective, inequality between the origin (village/suburb) and destination (urban centers/metropolises) is one of the issues that has led to the formation of the phenomenon of the floating population. Knight (2013) believes that this inequality leads to backwardness in economic growth and low quality of urbanization, especially concerning the floating population (Shi & Liu, 2019, 2). The floating population is experiencing rapid growth (Li et al., 2019, 182). The concentration of population outside metropolitan areas and its lack of concentration has led to complex commute patterns between work and residence within metropolitan areas and suburbs. In the last few decades, researchers have done many studies to examine and evaluate the dynamics of daily trips. According to Zhu and Chen (2010), the migration processes of a floating population are more complex than can be identified by one or two factors, and more knowledge about migration flows in urban and rural destinations is needed. Horner (2004) has conducted many geographical studies on daily commuting and concentration stability. In addition, some studies focus on the structure and form of the city and the behavior of commuters. For example, Cervero's (1988) research in American cities showed that commute distance increases with employment decentralization (Pourahmad et al, 2013, 389). Furthermore, researchers such as Luo et al. (2018), Hao and Tang (2018), Shi and Liu (2019), and Fan and Li (2019) have studied the phenomenon of floating population.

Due to urbanization in Khorasan Razavi, especially in the last two decades, daily commuting from the surrounding villages to the cities is expanding. This phenomenon, known as the "floating population," involves severe problems in rural households' economic, social, and cultural structures, especially livelihood. The floating population is substantial because the daily commuting of the rural areas to the urban indicates the weakening and loss of income sources for villagers in the dimensions of agriculture, animal husbandry, and activities that may exist in the economic structure of the village. Economics is the leading cause of the floating population phenomenon, the initial studies of which were formed in China and systematically control the floating population in the population systems of different regions. The presence of floating populations in urban areas increases their desire

to stay in cities, intensifying the physical development of these regions and the pressure on urban infrastructure. Therefore, the phenomenon of the floating population requires serious attention in local, provincial, and national dimensions because all the efforts of balanced regional development are to provide the best conditions and facilities for the development of all areas, especially rural areas, and to reduce rural differences. In this way, the damage that may occur to rural and urban areas can be reduced due to their effects on each other. The issue of the floating population, especially in the current economic environment, which deals with biological threats like the coronavirus, is one of the fields of study that requires more attention that will certainly have an undeniable effect on the coefficient of the floating population in urban environments. Therefore, there is a gap in studies regarding strategies necessary to effectively manage the floating population phenomenon from a theoretical and functional perspective.

Based on the census data of the Statistics Center of Iran, the primary purpose of this study is to investigate the factors affecting the expansion of the rural floating population in Khorasan Razavi province. According to the requests by researchers and planners, the floating population study was conducted by the Iranian Population and Housing Census in 2006 for the first time and

then in 2011. The finding of these reports is examined in the following. Thus, based on the estimates made by the Statistics Center of Iran of the floating population in the years 85 (2006) and 90 (2011), this study has studied the working floating population in the cities of Khorasan Razavi province.

The table 1 provides an overview of foreign and domestic studies related to the research topic.

China is a leading country in both the study and the executive dimension of the floating population phenomenon. China has conducted various studies regarding immigration patterns (both men and women), immigrant motivations, residence intention, floating population living conditions in urban areas, economic developments, and floating population adaptation to urban society in the last three decades. The importance of this issue in recent decades, following the growth of metropolises and commuting to urban areas, especially from rural and suburban areas, even in developed countries, has led them to, in addition to accepting a floating population in urban areas, think about managing them, especially at the origin. The present study seeks to identify the factors affecting the phenomenon of rural floating population in Khorasan Razavi based on data from the Statistics Center of Iran in 85 and 90.

Table 1. Literature Review

Researchers	Title	Conclusion
Hao and Tang (2018)	What keeps China's floating population from moving?	In this study, researchers examined the reasons for the residence of rural immigrants who vary in urban destinations with socio-economic backgrounds. The research findings showed that the factors that motivate rural migrants to live in cities are significantly different from the factors that force them to migrate. Among these, social and economic resources and a sense of security are the most prominent factors that affect the goals for immigrants to stay in cities.
You et al (2018)	Settlement intention characteristics and determinants in floating population in Chinese border cities	Findings showed that human capital, economic conditions, family stability, social security, cultural and social environment all influenced the purpose of the floating population to stay in border cities (generally in eastern China).
Luo et al (2018)	Urban land expansion and the floating population in China: for production or for living?	In this study, researchers examined the effects of floating population on urban land through the relationship between floating population and land expansion from the land for production and land for life. Their research findings based on structural equations showed that floating populations alone do not directly affect land expansion but indirectly affect production and life processes. Interestingly, the living conditions of the floating population do not affect the increase in construction directly.
Tan et al (2017)	Influence factors on settlement intention for floating population in urban area: a China study	Socio-economic, occupational, institutional, neighborhood, and destination characteristics are among the studied items to the residence of the floating population in urban destinations based on a regression model. In addition, research findings show that enjoying social welfare benefits, housing, and better social integration are among the factors that lead to a long-term residence.
Gu and Ma (2013)	Investigation and analysis of a floating population's settlement intention and environmental concerns: a case study in the Shawan River Basin in Shenzhen, China	According to the research findings, those who were more inclined to stay in Shenzhen for a long time cited their monthly salary as the main reason.

Table 1. Literature Review

Researchers	Title	Conclusion
Mansourian et al (1397) (2018)	Transition from Urban Labor Market to Regional Labor Market in Iran: an Analysis of Floating Population Data	The study shows that 9.05% of the urban working population of the country move daily between urban areas; However, the spatial distribution of the floating urban working population is very heterogeneous. The main centers of floating population concentration are metropolitan areas of the country such as Tehran and Isfahan. The transition from the metropolis to the metro area has caused the labor market in urban areas to expand into a regional labor market by increasing its spatial scope and a large volume of daily commuting from residence to work at long distances. Changes in the spatial structure of Iran's metropolises and the transition to metropolitan areas have led to more daily commuting from the suburbs to the central cities due to the dominance of the single-core model. However, there are signs of the intra-suburban commute from the central cities to the suburbs.
Mansourian et al (1396) (2018)	Spatial Analysis of Rural Floating Population Employed in Urban Areas	The results show that the share of the rural labor force working in urban areas in 1390 (2011) was equal to 12.8%. However, its distribution is not uniform in the country's provinces, and Mazandaran, Tehran, and Khorasan Razavi have the highest floating rural working population rate. Based on the exploratory analysis of spatial data identified three main centers of concentration of rural floating employed population, including metropolitan areas of Tehran and Isfahan, and the country's southwest with the focus on Bushehr. Concentration and diversity of economic activities in the industry and services are the most critical factors that can explain the formation of the main centers of daily movement from rural to urban areas with the aim of work.
Rajaei et al (1394) (2012)	Exploratory Analysis of Spatial Data of Daily Trips in Rural Areas, Case: Villages around Metropolitan Regions	According to the research findings, there are daily trips in all country's metropolises, but they differ in terms of spatial distribution. In the metropolis of Isfahan, the proportion of the rural population who worked or studied outside their place of residence was higher than in other metropolises of the country. After that, the municipalities of Tehran, Tabriz, Shiraz, and Mashhad were in the following ranks. According to the results obtained from spatial statistics of autocorrelation (Moran) and high and low clusters (G statistic), these values are clustered in the metropolis of Isfahan. They locally include the rural areas around the metro of Isfahan. In other words, the places adjacent to the main city have the highest population moving to other areas, with the majority going to urban places to study and work.
Pourahmad et al (1392) (2013)	Spatial Analysis of Commuting Population for Work and Education Around of Metropolis Area (Case Study: Tehran Metropolis Area)	Daily commuting to work or study in the metropolitan villages of Tehran in three situations from village to city, from village to village, and from city to village was analyzed and determined. Two large clusters in the south of Tehran are the most important centers for sending people to work or study in urban areas, including Rey, Pakdasht, Robat Karim, and Shahriyar. Pakdasht is also the most important hub for sending people to rural places for work or study. Going of the population from urban to rural areas shows that these values have a random pattern for the entire metropolitan area of Tehran. In other words, there are no special centers with this feature in the metropolis of Tehran. Still, Rudehen, Pardis, Pishva, Pakdasht, Bumehen, Nasirabad, and Shahedshahr send the most considerable population to rural areas for work or education.
Amini Nejad and Mahjoorian (1389) (2010)	The Study of Social and Economic – Traffic Effects on Long Time Commuting	The phenomenon of business trips outside Vazvan is a predominant phenomenon that, on the one hand, is due to the lack of job opportunities in this city and, on the other hand, is about the strong attractions of Isfahan's mother city. This trend is still going on despite the relative dissatisfaction with jobs and relatively long distances. Meanwhile, the main factor in the continuation of these daily trips is the desire of families and employees to stay in Vazvan. Frequency data show that about 82% (173 people) had little satisfaction with their supervisor's business trips. Although most of the business travelers or 173 of them had little satisfaction with commute, the results of the regression coefficient showed that there is a strong and direct relationship between the two variables of family satisfaction to stay at the residence with the variable of interest in travel (0/672) that is the main factor of the interest in continuing business trips in the city of Vazvan.
(2006)		Findings showed that from the perspective of women, the main factor affecting daily commute is low income, the most important advantage of migration is increasing revenue, and the most critical problem is food insecurity for women. Also found a significant relationship between income, occupation of husbands, marital status, amount of agricultural land, and rural women's education with their daily commuting. The regression analysis results also showed that about 45% of the changes in the daily migration rate of rural women could be explained and predicted through income variables and the amount of agricultural land.



2. Literature Review

Out-migration is one of the main factors of population change and the most important external factor of change in the spatial structure of the population (Ghalandarian & Dadashpour, 2017, 226). This is often related to dif-

ferent perceptions of income differences and the relative abundance of job opportunities in other regions. Ravenstein's Laws of Migration (1885) show that people move mainly for economic reasons. He notes that most migration flows occur at short distances, and as the distance between the two places increases, the frequency

of relocations decreases. From this perspective, migration responds to regional development differences and the friction of distance (Hao and Tang, 2018, 32). In a similar study, Sjaastad (1962) argues that according to neoclassical theory (Gibson et al., 2019: 99), migration is recognized as a consequence of an imbalance between labor supply and demand across regions (Hao and Tang, 2018, 32) and is a factor in maximizing individual interests (Wang et al., 2019, 71). Chai and Karin Chai (1997) argue that the temporary out-migration of the rural population to urban areas has several positive effects, including increasing individual farmers' freedoms, reducing unemployment, reducing rural poverty, and reducing the rural income gap to the urban population. In addition, temporary migrants or rural floating populations in urban areas contribute to the development of the urban private sector by providing the necessary and cheap labor and contributing to the growth of the urban economy. On the other hand, increasing migration to cities raises concerns about the quality of life due to overcrowding, employment issues, increasing pressure on urban infrastructure and facilities, and law and order problems (Chai & Karin Chai, 1997, 1041-1043. Qi et al, 2017, 16).

Migration from rural to urban areas seems inevitable, but social deprivation based on rural-urban socialist divisions continues. Immigrants in the Hukou system (used in China and Taiwan) are classified into two groups. Individuals who immigrate through various government channels and enjoy state residency rights and those who change their residency voluntarily and without official permission. Terms such as "temporary," "floating," or non-Hukou population (Du et al., 2018, 3185) mean that the floating population is considered outsiders and transients and is not intended to reside permanently in cities (Geo & Ma, 2013, 170). Migration from rural to urban areas and from less developed regions to more developed ones is an integral part of the economic development process. Large-scale floating populations attract the attention of governments and the public sector and have therefore been the subject of many studies. Some studies focus on out-migration patterns and group characteristics of floating populations. These studies show that migrants between rural and urban areas are often redundant workers who move from their residences to more developed regions. Other studies look at the determinants and mechanisms of migration. These studies indicate that unbalanced economic development between different areas and abundant job opportunities in cities are among the main factors attracting the floating population (Qiao et al, 2016, 366).

The rural floating employed population

Traveling to cities to work and return to origin was common in the first two decades of land reform (the 1980s and 1990s). Temporary or circular migration has been the ultimate goal of migrant workers earning money in cities and sending it home. According to Chang (2009) and Fan (2011), cities were the only job and income centers that provided more available opportunities for earnings and employment (Hao & Tang, 2018, 31; Fan & Li, 2018, 4). Other aspects of urban life, such as high living standards, better services and infrastructure, and an attractive urban lifestyle, were almost irrelevant to villagers' decision to migrate to cities. Thus, living in cities has rarely been part of the demands of rural immigrants. However, the situation has changed in the last decade. Rural migration has become more and more aimed at earning a higher income, living longer in cities, and enjoying better amenities (Hao & Tang, 2018: 31-32). As a result, floating populations have a weak, fragile, and perhaps temporary connection to their new homes, leading to urban instability (Logan, 2011, 16).

According to a 2010 UN report, more than 50 percent of the world's population lives in urban areas, which will increase to 60 percent by 2030, given the rate of urbanization. A large floating population in cities has caused problems for urban management. It has created social and natural issues such as land resources, poverty, human-land communication tensions, lack of public resources, and traffic jams (Luo et al., 2018: 219). Sharma (2013) outlines three main reasons for rural to urban commute; The first reason is the unbalanced spatial development and the apparent decline of social and economic indicators from the core (city) to the suburbs (rural areas). For example, wages and incomes decrease as the distance to the city increases. Therefore, people living in areas closer to the city who have good transportation links try to take advantage of the wage slope in urban areas and the minimum rents in rural areas by commuting to nearby cities. The second reason is the change in the spatial distribution of economic activities and the improvement of transportation facilities. And the third factor is the expansion of suburban or rural areas in the vicinity of cities or urban gatherings. These areas act as a link between urban and rural settlements and combine features of urban and rural areas, including cheap land, better access, basic facilities, and affordable housing (Mansourian et al, 2017, 625-626). He et al. (2016) state that from a Production

- Traditional commute or suburban-central city, this pattern is formed when a person resides in the suburbs and works in the central city.

- Intra-suburban commuting is formed when the place of residence and work of commuters are in the suburbs.
- When residents of the central city commute to the suburbs, reverse commutes occur.

When the inhabitants of a metropolitan area (city or suburb) move out of the region’s territory or people living outside the metro area move into it, they are foreign commuters (Mansourian et al., 1397: 54). Of course, census data in Iran include only the first and third types of this model studied in this study.

Floating population in the general population and housing census in 2006 and 2011

The General Population and Housing Census of Iran in 2006 show that out of a total population of 31,892,163 employed or students aged ten and over, 3,827,750 or about 12/2%, their workplace or education was in another city or settlement. Five years later, in 2011, out of a total population of 32,648,550 employed and students aged ten and over, 5,654,325 or about 17/3% were employed or educated in another city or settlement. The floating population of the country, during this period, experienced an increase of 756,387. However, these figures show that the rural area depends more on the urban area regarding jobs and education. Over time, it shows that the rural and the urban areas are closer to each other in this regard. It is predicted that with the expansion of various economic and service functions in rural areas,

the volume and proportion of the floating population will increase, especially among the urban population.

Also, the general population and housing census of 1390 (2011) show that the number of employees aged ten and over in rural areas of Iran was about 6,077,869. About 79 percent of them worked in the rural where they live. More than 3% declared their place of employment as a village other than the village where they live. A significant part of the country’s rural workers, or more precisely 783,209 rural workers of the country, were working in neighboring cities where they live, which was 12.89% of the rural employed population of Iran. Meanwhile, about 5% of rural workers did not declare their place of employment (Table 3).

The 2006 general population and housing census in rural areas of Khorasan Razavi show that the number of employees aged ten and over was 587,933, of which about 98/03% (523,448) were employed in the village where they live. The rural floating population working in cities increased by more than 4641 in 2011, which increased the share of the floating population in the total employed population from about 7.64% to 9.5%. The 2011 General Population and Housing Census results show that the number of employees aged ten and over in rural areas of Khorasan Razavi was 520,689, of which 430,367 (82.7%) were employed in the village where they live (Table 4).

Table 2. Population employed or students aged 10 and over by workplace or study (2006 and 2011)

Year	Description	Total	Employed/ Student in your city or village	Employed/ Student in another city	Employed/ Student in another city	Not stated
2006	number	31.892.163	27.531.980	3.082.524	790.226	487.433
	percentage	100	86/3	9/7	2/5	1/5
2011	number	32.648.550	32.648.550	4.853.000	801.325	493.225
	percentage	81/2	81.2	14/9	2/4	1/5

Source: General Population and Housing Census 2006 and 2011



Table 3. Rural employed population in Iran by workplace (2006 and 2011)

Year	2006		2011	
	frequency	percentage	frequency	percentage
Workplace				
Employees 10 years and older	9.375.749	100	6.077.869	100
Working in their village	7.329.242	78.17	4.800.159	78.98
Working in another city	1.345.638	14.35	783.209	12.89
Working in another village	559.252	5,96	192.294	3.16
Not stated	141.617	1.51	283.227	4.97

Source: General Population and Housing Census 2006 and 2011



Table 4. Rural employed population in Khorasan Razavi according to the workplace in 2006 and 2011

Description	2006		2011	
	frequency	percentage	frequency	Percentage
Workplace				
Employees 10 years and older	587.933	100	520.689	100
Working in their village	523.448	89.03	430.367	82.7
Working in another city	44.893	7.64	49.534	9.5
Working in another village	16.351	2/78	14.721	2/8
Not stated	3.241	0/55	0	0

Source: General Population and Housing Census 2006 and 2011



The 2011 census at the county level shows that the highest percentage of the floating population of the rural workers in the city is related to Bajestan (22/1%), Mashhad (17/2%), Torbat-e-Jam (12/7%), Binaloud (11/8%),

Khaf (11/8%), Quchan (10/9%), and Kashmar (10/4%) respectively. On the other hand, the lowest floating population is related to Sarakhs (1/5%), Zaveh (3/1%), Dargaz (3/4%), and Kalat (3/6%), respectively (Table 5).

Table 5. Rural employed population in the cities of Khorasan Razavi by workplace (2011)

City	Rural total	Working in their village	Working in the city	Percentage of employees in the city	Employees in another village	Percentage of employees in other settlements	Not stated
Bakharz	11.606	9.777	990	8/53	298	2/57	541
Bajestan	6.017	4.443	1.328	22/1	44	./73	202
Bardaskan	13.459	11.458	903	6/71	518	3/85	580
Binaloud	9.781	7.787	1.159	11/85	93	0/95	724
Taybad	9.241	7.861	804	8/7	272	2/94	304
Firouzeh	11.596	9.673	1.131	9/8	355	3/06	437
Torbat-e-Jam	39.542	31.364	5/025	12/71	1.084	2/74	2.069
Torbat Heydariyeh	22.295	18.869	1.372	6/2	435	1/95	1.619
Joghatay	12.153	10.652	471	3/9	399	3/28	631
Jovaen	12.975	11.017	554	4/3	469	3/61	935
Chenaran	20.026	15.551	1.923	9/6	1.589	7/93	963
Khalil Abad	11.226	9.952	894	8/0	108	0/96	272
Khaf	17.558	14.137	2.070	11/8	585	3/33	766
Khoshab	10.992	9.614	751	6/8	363	3/30	264
Dargaz	10.823	10.018	366	3/4	103	0/95	336
Rashtkhar	15.344	13.261	759	4/9	419	2/73	905
Zaveh	19.850	17.088	610	3/1	351	1/77	1.801
Sabzevar	26.665	23.263	1.367	5/1	297	1/11	1.738
Sarakhs	12.323	10.890	183	1/5	412	3/34	838
Fariman	12.097	9.216	1.019	8/4	990	8/18	872
Quchan	22.726	18.974	2.485	10/9	180	0/79	1.087
Kashmar	22.959	18.873	2.378	10/4	535	2/33	1.173
Kalat	7.944	7.151	283	3/6	196	2/47	314
Gonabad	11.723	9.947	960	8/2	173	1/48	643
Mashhad	84.968	63.717	14.660	17/2	2.953	3/48	3.638
Mahvelat	9.826	9.062	416	4/2	93	0/95	255
Neyshabur	54.974	46.752	4.673	8/5	1.407	2/56	2.142
Total	520.689	430.367	49.534	9/5	14.721	2/83	26.067

Source: General Population and Housing Census 2011



Table 6. Rural employed population in the cities of Khorasan Razavi by workplace (2006)

Cities	Total	Employed into their villages	Employed into the Cities	Percentage	Employed into other villages	Percentage	un
Taybad	18.402	17.239	795	4/3	280	1/76	88
Torbat Heydariyeh	42.641	38.754	3.049	7/2	543	1/76	295
Torbat-e-Jam	37.312	31.736	4.182	11/2	1.114	1/76	280
Dargaz	12.851	12.438	229	1/8	137	1/76	47
Sabzevar	71.531	67.107	2.817	3/9	1.349	1/76	258
Quchan	23.407	21.198	1.951	8/3	45	1/76	213
Kashmar	26.534	24.698	1.316	5	351	1/76	169
Gonabad	22.828	20.120	1.672	7/3	969	1/76	67
Mashhad	124.476	106.225	14.317	11/5	3.131	1/76	803
Neyshabur	80.765	69.326	6.957	8/6	4.227	1/76	255
Chenaran	21.332	19.107	1.711	8	362	1/76	152
Khaf	17.228	14.722	1.255	7/3	1.175	1/76	76
Sarakhs	14.470	13.682	390	2/7	272	1/76	126
Fariman	12.139	10.634	697	5/7	717	1/76	91
Bardaskan	16.205	14.185	1079	6/7	856	1/76	85
Rashtkhar	16.781	15.276	1100	6/6	317	1/76	88
Kalat	8.894	8.375	267	3	223	1/76	29
Khalil Abad	9.627	8.827	641	6/7	98	1/76	61
Mahvelat	10.510	9.799	468	4/5	185	1/67	58
Total	587.933	523.448	44.893	7/6	16.351	2/78	3241

Source: General Population and Housing Census 2011



A comparison of the floating rural working population at the county level between 2011 and 2006 shows the following changes in the cities of the province: this ratio in Mashhad (5/8%), Kashmar (5/4%), Khaf (4/5%), and Taybad (4/4%) increased, in Rashtkhar and Torbat Heydariyeh (1/7% and 1%, respectively) decreased, and

in Bardaskan does not show any change. Since the cities of Bakharz, Bajestan, Binaloud, Firouzeh, Joghatay, Jovaen, Khoshab, and Zaveh were not in the provincial divisions of Khorasan in 2006, in Figure (2), the trend line is shown only for the cities whose floating population has been calculated in the 2006 and 2011 censuses.

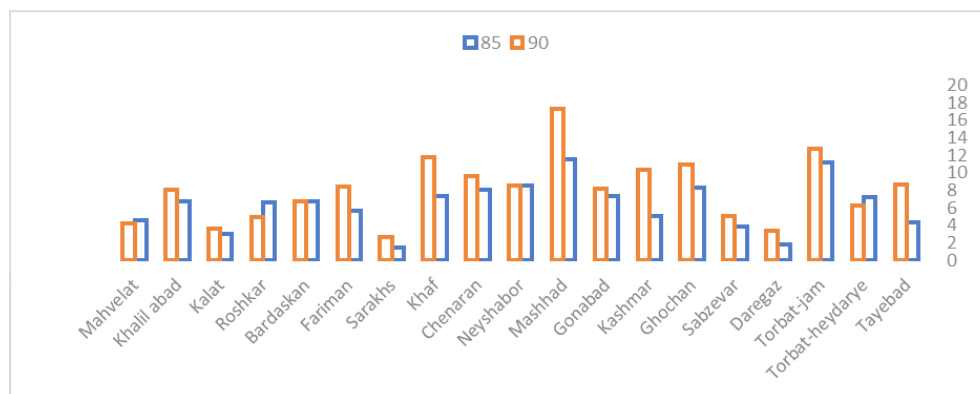


Figure 1. Comparison of the rural floating population working in cities of Khorasan Razavi province in 1385 and 1390



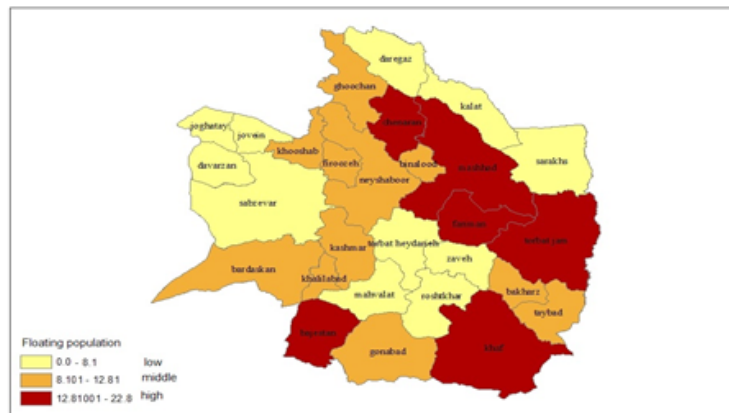


Figure 2. Rural floating population of cities in Khorasan Razavi province Source: Statistics Center of Iran



3. Methodology

The present study is descriptive-analytical, and its statistical population includes the entire rural employees in urban areas of Khorasan Razavi province. Therefore, the scale of the research is county level. The present study used the general population and housing census data of Iran in 2006 and 2011 to collect information called “open data.” “Open data” is one of the most important trends in today’s world of information technology. In the International Charter definition, open data is a public good that people can use to create value, insight, ideas, and

services to create a better world for all. Data openness means that anyone, anywhere, anytime, can freely access, use, modify, share, and redistribute it at the lowest possible cost. Accordingly, identified 19 factors to affect the dependent variable, namely “floating population.” These components are given in the following figure in 4 sections: employment, agriculture, population and human development, and infrastructure and society. Of course, the data related to the floating population is not available to everyone, and the order was sent through the Statistics Center of Iran website for a small fee.

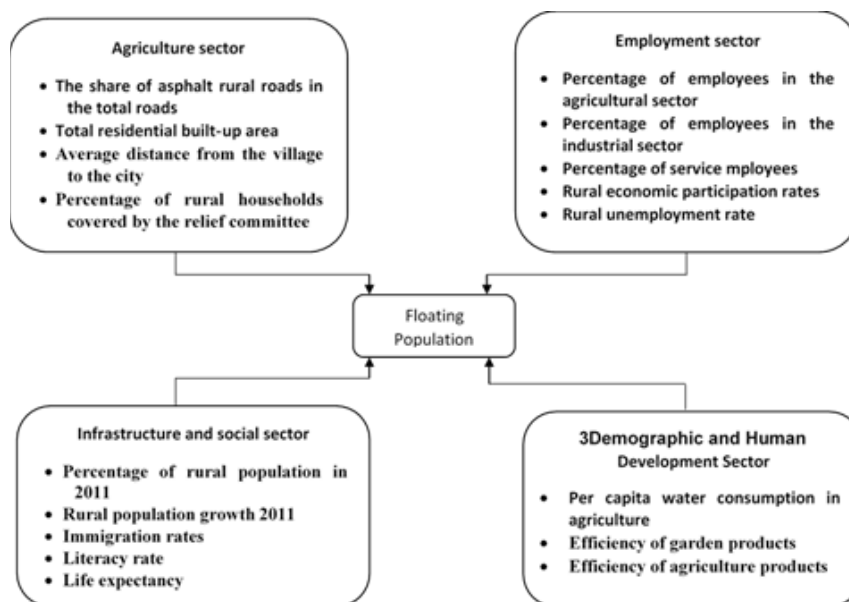


Figure 3. Possible effective indicators of rural floating population. Source: Statistics Center of Iran



These 19 factors are the percentage of employees in the agricultural sector; Percentage of employees in the industrial sector; Percentage of service employees; Rural economic participation rates; Rural unemployment rate; Percentage of rural households covered by the relief committee; Percentage of the rural population in 1390; Per capita water consumption in agriculture; Share of rural asphalt roads in total roads; Efficiency of garden products; Crop efficiency; Rural population growth in 1390; Total residential infrastructure; Average distance from the village to the city; Human development (including literacy rate; life expectancy; per capita income); And migration rates. Table (7) lists the sources of research indicators.

Table 8 shows the data related to 19 indicators extracted from 27 cities of Khorasan Razavi province.

It is noted that the values related to the floating employed population rate were obtained from the sum of

the two columns, “Percentage employed in the city” and “Percentage employed in another village,” given in Table 5. Thus, according to the study’s primary purpose, the analysis of practical factors among the 19 factors on the rate of rural floating population in Khorasan Razavi for data analysis, correlation test, linear regression, and non-parametric Mann-Whitney U test was used.

4. Findings

Initially, the normality of data distribution was checked by the Shapiro-Wilk test. The Shapiro-Wilk test is recommended for low-volume data. In the Shapiro-Wilk test, when the significance level is higher than 0/05, the assumption that the data is normal is accepted. Table (9) shows the results of the Shapiro-Wilk test of research variables.

Table 7. Resources extracted from research indicators

indicators	Resources	Description	
1	Percentage of employees in the agricultural sector		
2	Percentage of employees in the industrial sector		
3	Percentage of service employees	Economic, social and cultural report of the cities of Khorasan Razavi in 2017	
4	Rural economic participation rates		
5	Rural unemployment rate		
6	Percentage of rural households covered by the relief committee		
7	Percentage of rural population in 2011		The index “Percentage of rural households covered by the Relief Committee” is calculated from the number of the rural population of the city covered by the Relief Committee on the number of the rural population of the city.
8	Per capita water consumption in agriculture		Per capita water consumption in the agricultural sector: The total volume of water consumption in the agricultural sector (in a million cubic meters) divided by the number of rural households in the city.
9	The share of asphalt rural roads in the total roads	Economic, social and cultural report of Khorasan Razavi cities in 2017 and general population and housing census in 2016	
10	Efficiency of garden products		
11	Rural population growth 2011		
12	Total residential built-up area	This number has been calculated using the 2011 census.	
13	Average distance from the village to the city	This number has been calculated using the census of 2011 and the planning studies of Khorasan Razavi province in 2014.	
14	Literacy rate	Economic, social and cultural report of the cities of Khorasan Razavi in 2017 and the general population and housing census in 2016	
15	Life expectancy	Planning studies of Khorasan Razavi province in 2014	
16	income per capita		
17	human development		
18	Immigration rates	General Census of Population and Housing in 2016	

Table 8. Data on independent factors affecting the rate of rural floating employed population

	City	Percentage of employees in the agricultural sector	Percentage of employees in the industrial sector	Percentage of service employees	Rural economic participation rates	Rural unemployment rate	Percentage of rural households covered by the relief committee	Percentage of rural population in 2011	Per capita water consumption in agriculture	The share of asphalt rural roads in the total roads
1	Bajestan	52/1	24/1	23/8	46/3	5/5	39/3	52/3	4639/4	46
2	Mashhad	25/8	20/6	53/6	42/4	5/5	7/4	9/7	4888/3	57/8
3	Chenaran	47/9	9/8	42/2	37/9	7	6/6	53/7	17927/6	54/7
4	Fariman	62/8	9/6	27/6	39/4	8/7	10/6	41/8	19357/7	25/2
5	Torbat-e-Jam	55/4	6/4	38/2	39/1	15/1	16/8	52/1	1089/3	50/1
6	Khaf	50/3	9/9	39/8	40/4	10/6	17/5	54	9850/9	62/1
7	Binaloud	34/4	20/2	45/4	40/2	5/8	6	53/6	-	-
8	Firouzeh	67/9	7/5	24/5	41/4	13/3	17/2	83/1	12/5	68/8
9	Kashmar	46/1	21/7	32/2	46/4	6/4	18/3	38/9	6952/6	61/3
10	Quchan	60/7	4/1	35/2	40/9	14/6	15	42	5358/1	56
11	Taybad	57/4	6/2	36/3	39/7	8/4	10/7	33/7	22100/4	43/1
12	Bakharz	61/4	5/7	32/9	39/2	14/8	15/5	84/3	1832/3	66/7
13	Neyshabur	57/4	11/5	31/1	41/4	9/3	11	37/9	12215/3	56/2
14	Bardaskan	65/2	8/1	26/7	40/6	12/5	13/6	53	20873/8	34
15	Khoshab	67/9	6/2	26/2	49/6	3/4	16/4	86	11774/6	50/8
16	Gonabad	47/3	12/7	40	39/2	6/1	17	42/9	10079/7	53/9
17	Khalil Abad	66/5	11/5	21/9	40/5	6/1	7/7	65/2	-	77/4
18	Torbat Heydaryeh	54/1	9/1	36/8	38/3	9/6	15/7	33/3	11296/1	64/2
19	Jovaen	60/3	10	29/7	43/5	6/2	13/1	74/4	16234/2	74/8
20	Rashtkhar	60/7	10/7	28/4	40/3	9/8	16/9	78	19247/6	68/9
21	Joghatay	61/5	8/6	29/9	40/2	6/9	13/7	82/9	15359/5	51/3
22	Sabzevar	66/3	8/4	25/3	42/4	12/6	20/6	24/2	16018/7	42/2
23	Kalat	67/2	2/6	30/2	38/8	15/4	20	69/6	3328/4	27/5
24	Mahvelat	62/6	7/1	30/4	39/1	9/7	17/4	59/2	19386/8	51/2
25	Zaveh	66/1	11/2	22/7	42/3	11/5	16/9	86/4	9104/2	70/5
26	Sarakhs	58/4	9/9	31/7	42/2	18/2	12/4	57	22338/5	60/1
27	Dargaz	77/8	1/5	20/6	53/2	3/1	22/3	40/9	6960/6	45
28	Bajestan	0/52	3/23	-	101/2	18/1	-	-	-	-
29	Mashhad	8/37	18/83	-1/526	73/6	19/1	0/90	72	23785/4	0/73
30	Chenaran	9/78	15/32	-0/441	78	12/5	0/82	72/8	16063/8	0/35
31	Fariman	10/63	8/85	0/9	74/5	14/7	0/85	79	15615/6	0/64
32	Torbat-e-Jam	1/52	9/72	0/211	74	17/8	0/83	72/5	14314/3	0/30
33	Khaf	0/40	10/67	0/884	82	18/5	0/79	72/57	13706/8	0/21
34	Binaloud	7/12	2/55	-	-	8/7	-	-	-	-
35	Firouzeh	2/14	6/20	-	-	11/3	-	-	-	-
36	Kashmar	3/44	12/73	0/213	75/9	12/4	0/82	77	21977/1	0/69
37	Quchan	10/76	3/7	-2/013	65/5	16/9	0/82	70/4	16259/4	0/26
38	Bakharz	0/52	3/23	-	85/4	14/6	-	-	-	-
39	Neyshabur	3/23	9/01	-16/6	75/2	11/9	0/84	72/8	20156/4	0/52

Table 8. Data on independent factors affecting the rate of rural floating employed population

	City	Percentage of employees in the agricultural sector	Percentage of employees in the industrial sector	Percentage of service employees	Rural economic participation rates	Rural unemployment rate	Percentage of rural households covered by the relief committee	Percentage of rural population in 2011	Per capita water consumption in agriculture	The share of asphalt rural roads in the total roads
40	Bardaskan	2/1	4/52	0/987	80/8	17/8	0/80	74/8	19646/8	0/49
41	Khoshab	1/17	6/03	-	70	21/5	-	-	-	-
42	Gonabad	1/30	6/08	-6/426	99/9	13/9	0/84	75/7	21753/7	0/67
43	Khalil Ababd	7/05	9/50	10/989	94	8/2	0/79	77	14920/7	0/42
44	Torbat Heydariyeh	1/06	12/74	-11/347	86	11/5	0/81	75/15	18354	0/48
45	Rashtkhar	0/24	7/54	0/626	88	14/4	0/77	75/15	15340/3	0/32
46	Joghatay	2/14	14/87	-	84	18/4	-	-	-	-
47	Sabzevar	1/54	5/13	-16	80/8	21/2	0/81	72/5	19575	0/43
48	Kalat	2/52	0/77	-1/974	68/7	22/1	0/74	74/7	14405/8	0/22
49	Mahvelat	0/73	9/88	-9/806	83/4	11/4	0/78	75/15	16306/2	0/37
50	Zaveh	0/22	11/37	-	79/9	18/2	-	-	-	-
51	Sarakhs	1	4/05	0/014	71/7	24/2	0/82	74/5	15866/9	0/40
52	Dargaz	7	2/26	-1/526	55/9	18/2	0/83	73/3	18571/9	0/46

Source: General Population and Housing Census 2006 and 2011

**Table 9.** Normal distribution of data through Shapiro-Wilk test

1	Percentage of employees in the agricultural sector	0/133	11	Crop efficiency	0/673
2	Percentage of employees in the industrial sector	0/049	12	Rural population growth in 2011	0/022
3	Percentage of service employees	0/550	13	Total residential built-up area	0/989
4	Rural economic participation rates	0/000	14	Average distance from the village to the city	0/797
5	Rural unemployment rate	0/708	15	Literacy rate	0/291
6	Percentage of rural households covered by the relief committee	0/459	16	Life expectancy	0/672
7	Percentage of rural population in 2011	0/956	17	Income per capita	0/299
8	Per capita water consumption in agriculture	0/243	18	human development	0/281
9	Percentage of asphalt rural roads from total roads	0/000	19	Immigration rates	0/544
10	Efficiency of garden products	0/002	20	Floating employed population	0/495

Source: Research Findings



According to the findings of the above table, in the factors of “percentage of employees in the industrial sector” (0/049); “Rural Economic Participation Rate” (0/000); “Percentage of asphalt rural roads from all roads” (0/000); “Efficiency of horticultural products” (0/002); and “Rural population growth in 2011” (0/022), the assumption of normality of the factors is rejected and confirmed in

other factors. Therefore, the Pearson correlation test was first performed in the inferential section between factors with the floating population rate variable. Then, the factors whose correlation was confirmed were entered into a regression equation for the regression test to determine the effect of each of these indicators on the dependent variable “floating employed population rate.”

According to the findings in Table 10, out of 19 factors, directly correlated only four of them, including the percentage of agricultural employees inversely, the percentage of industrial employees, the share of service employees, and the literacy rate with the floating population variable. In other words, it has a smaller floating employed population in areas where the agricultural sector has a larger share of the labor force. Conversely, the floating rural working population has expanded in areas where the industrial and service sectors are more prosperous. Therefore, the economy's general structure can be considered the main factor in spreading the floating population phenomenon in the province.

According to Table 11, the regression test results show that the ratio of employment in agriculture, literacy rate, employment in industry, and services has the most significant impact on floating population rates.

Accordingly, if the agricultural sector cannot create employment following the population structure of villages through structural change, especially in Bajestan, Taybad, Mashhad, and Khaf, we will see a further expansion of the floating rural population working in cities. But, of course, the growth in industry and services in rural areas can shift the destination of the working floating population from the city to the rural areas, and this is one

of the crucial measures that has emerged in more developed countries. Using Mann-Whitney non-parametric test answers the question of which of the four factors are significantly different between the two city groups. The purpose is to investigate the significant difference between the two categories of cities with higher floating population rates and below-average (10/9%), including 13 and 14 cities. The Mann-Whitney test is used to test the difference between two independent groups.

The findings of Table 13 show that the most important differences between the two groups of the studied city are in the fields of "percentage of employees in the agricultural sector," "percentage of employees in the service sector," and "literacy percentage." In other words, rural floating populations with weak agricultural structures are more likely to be attracted to higher cities in terms of services and literacy. On the other hand, although employment in the industrial sector is higher in urban areas with high floating populations, they did not differ significantly from the corresponding cities according to this test. These achievements mean that in Bajestan, Mashhad, Chenaran, Fariman, Torbat-e-Jam, and Khaf, the floating working population rate has increased for two main reasons: agricultural employment's weakness and the expansion of service jobs, which are mainly concentrated in cities.

Table 10. Correlation matrix between factors and floating employed population

		Percentage of employees in the agricultural sector	Percentage of employees in the industrial sector	Percentage of service employees	Literacy rate
Floating Employed Population	Correlation coefficient	-0/612	0/559	0/460	0/602
	Significance level	0/001	0/002	0/016	0/006

Source: Research Findings



Table 11. Linear regression test in relation to the indicators affecting the floating working population rate

indicators	R ² adjusted	ANOVA		regression		
		F-value	Significance level	Standardized beta coefficient	Coefficient t	Significance level
1 Percentage of employees in the agricultural sector	0/350	15/002	0/001	-0/612	-3/873	0/001
2 Percentage of employees in the industrial sector	0/284	11/333	0/002	0/559	3/366	0/002
3 Percentage of service employees	0/180	6/699	0/016	0/460	2/588	0/016
4 Literacy rate	0/325	9/677	0/006	0/602	3/111	0/006

Source: Research Findings



Table 12. Classification of cities based on the average rate of floating employed population

	Cities	Floating Population rate		Cities	Floating Population rate
1	Bajestan	22/80	1	Bardaskan	10/56
2	Mashhad	20/73	2	Khoshab	10/13
3	Chenaran	17/54	3	Gonabad	9/66
4	Fariman	16/61	4	Khalil Ababd	8/93
5	Torbat-e-Jam	15/45	5	Torbat Heydariyeh	8/10
6	Khaf	15/12	6	Jovaen	7/88
7	Binaloud	12/80	7	Rashtkhar	7/68
8	Firouzeh	12/81	8	Joghatay	7/16
9	Kashmar	12/69	9	Sabzevar	6/24
10	Quchan	11/73	10	Kalat	6/03
11	Taybad	11/64	11	Mahvelat	5/18
12	Bakharz	11/10	12	Zaveh	4/84
13	Neyshabur	11/06	13	Sarakhs	4/83
			14	Dargaz	4/33

Source: Research Findings

**Table 13.** U Mann-Whitney test to examine the significance of the difference between the two groups of cities

		Mean			
1	Percentage of employees in the agricultural sector	Up	9/92	-2/572	0/010
		Down	17/79		
2	Percentage of employees in the industrial sector	Up	15/15	-0/728	0/467
		Down	12/93		
3	Percentage of service employees	Up	17/96	-2/329	0/020
		Down	10/57		
4	Literacy rate	Up	13/22	-2/368	0/018
		down	7/10		

Source: Research Findings



5. Discussion

Finally, to control the floating rural employed population in cities and the consequences of this type of migration that leads to living in urban destinations, the first step is to strengthen the employment share of the agricultural sector with effective mechanisms such as the commercial agriculture boom and necessary incentives. Otherwise, we will see an increase in the floating population rate (given the beta of 61.2%). Therefore, reducing the concentration of service and industrial activities in cities is better in the second and simultaneous step. Reducing the concentration of service and industrial activities in cities is a solution that is the basis of optimal spatial planning in more developed countries and has led to ideal results. But the point here is what are the local poli-

cies and logic. Yong and Goldstein (1990) and McErlean and Wu (2003), in their studies, argued that government policies in urban sprawl indeed lead to the movement of immigrants to cities to find work (Li, 2006). According to the research findings, the “percentage of employees in industry and services” with a high beta coefficient has a positive and significant effect on the rural floating employed population rate. In other words, industrial development, the concentration of services in urban areas or close to them, and the need for cheap and obedient labor have increased the floating population. However, from a pessimistic perspective, most floating populations migrating to cities, especially newcomers, are unskilled, leading to consequences such as staying in urban destinations. Of course, due to income and employment instability follows other harms.

From an optimistic perspective, metropolises like Mashhad need a floating population to balance a skilled and unskilled workforce. These cases require precise and comprehensive management approaches between the origin (villages) and destination (cities). But another factor that is part of the dimensions of “human development” and should be considered vital to the younger generation is the literacy of the villagers because this group is less inclined to agricultural or livestock jobs. According to the results, with the increase in literacy rate in rural areas on the one hand and the weakness of agriculture in creating jobs commensurate with demand and more concentration of industrial and service activities in cities or adjacent cities, on the other hand, floating population phenomenon has been strengthened during the year from 2006 to 2011. This trend is expected to grow significantly in the future. But the direction of the floating population in the future depends on where the employment centers are concentrated in the three major economic sectors. The favorable perspective is that these centers are located in the depths of rural areas and the centers of the complex and selected rural areas and areas with unique potential.

According to the contents regarding the decrease of floating population in rural areas, what has caused the formation and increase of floating population in rural areas of Khorasan Razavi is employment. For this purpose, the following suggestions are presented:

Solving the problems of farmers in rural areas, which, of course, in the last decade due to successive droughts in the province has suffered from many issues, especially in terms of water resources and rising costs. Therefore, since the rural economy is based on agricultural and related jobs, it is better to solve the problems of this sector in advance.

Employment development and job creation infrastructure, especially in tourism such as ecotourism.

Helping villagers to develop rural entrepreneurship that can do in various fields such as agriculture (such as the production of medicinal plants), horticulture, industry (such as conversion and complementary industries in agriculture), and even service businesses (such as the establishment of local markets nearby Tourism prospects).

Creating a value chain in rural areas for a specific business does not require villagers to commute to urban areas and only go to cities to offer the final product or marketing measures. For example, we can mention livestock products that can create all the necessary substrates to

produce livestock products on an industrial scale in rural areas.

Support rural cooperatives such as handicrafts and costumes to develop businesses that do not require much capital.

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Conflict of Interest

The authors declared no conflicts of interest.

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