

Research on the Characteristics of the Population Flow Network of the Main Ethnic Minorities in Northwest China

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Abstract: In the context of the development of the western region and the new situation of population mobility, the role of the minority floating population, who bear the dual attributes of national culture and floating personnel, has become increasingly prominent. Based on the national floating population dynamic monitoring data, this paper examines the floating scale and network characteristics of the main ethnic minorities (Hui, Uyghur, and Tibetan) in Northwest China. The results show that there are commonalities and differences among the three main ethnic groups, and the commonality is manifested in the preference for inflows to provincial capital cities and ethnic autonomous regions, with typical economic orientation and homogenous source orientation.

Keywords: Ethnic minorities, Population mobility, Temporal and spatial characteristics, Northwest China.

1. Introduction

As one of the largest and most far-reaching geographic processes since the reform and opening up [1], the flow and migration of population has always been an important concern and key influencing factor for the development of population. According to the "Report on the Development of China's Floating Population" (2020) issued by the National Family Planning Commission, in 2016, China's floating population reached 247 million. Paying attention to the population movement of ethnic minorities is related to the smooth realization of ethnic equality and ethnic unity [2]. The ethnic minority floating population with the dual attributes of national culture and floating personnel is of great significance for activating the economy[3].

Most of the literature starts from the unique identity, relationship, culture and other aspects of ethnic minorities[4]. Individual ethnic factors have a greater impact on urban integration and social adaptation[5]. Due to differences in language and customs, ethnic minorities have lost high-skilled, high-paying jobs[6], more than 70% of the minority migrants work much more than the standard working hours per week[7]. Xin-Zhe Zheng expounded the correlation between the migration of ethnic minorities and the relationship between urban ethnic groups[8]. The research on ethnic minority floating population in Northwest China mainly focuses on reasons for migration, characteristics of migration[9]. Most of them are young and middle-aged men; more are married; there is a tendency of family mobility[10]. Affected by differences in ethnic culture, religion, psychology, the ethnic minority floating population has differences compared with the Han floating population[11]. It is a gradual and dynamic process from social migration, social integration to social integration of minority migrants[12]. The overall situation of the floating population of ethnic minorities in the northwest is not optimistic, and it is difficult to guarantee their rights and interests[13]. Due to their uniqueness, ethnic minorities are quite different from the Han people in the direction and reasons of migration. In terms of

the characteristics of ethnic minorities' migration, on the whole, most of the ethnic minorities live in the west, mainly in the province[14], the migration of ethnic populations to the eastern region is remarkable, and inter-ethnic exchanges are becoming more frequent [15]. At the same time, the trend of ethnic mobility and migration based on policy orientation is becoming more and more obvious[16].

Historically, due to the combined effects of famine, war, and economic factors, the ethnic minorities in the northwest often migrated abnormally[17].

2. Study Area and Data Sources

2.1. Study area

Northwest China is located between 73°E~110°E and 30°N~48°N. It covers five provincial-level regions of Gansu, Ningxia, Xinjiang, Qinghai and Shanxi administrative district.

2.2. Data sources

The population data in this paper are mainly from the China Migrants Dynamic Survey conducted by the National Health Commission. The research scope of this paper is Gansu, Ningxia, Xinjiang, Qinghai, and Shaanxi provinces (regions). The Hui, Uyghur, and Tibetan, who account for more than 80% of the minority population flow in the northwest region were selected as the research objects.

3. Research Methods

3.1. Geographic Concentration Index

The geographic concentration index is an important geographic index used to measure the balance of the distribution of things. The formula[18] is:

$$G = 100 \times \sqrt{\sum_{i=1}^n (X_i/T)^2} \quad (1)$$

G is the geographic concentration index; n is the total

number of regions; X_i is the size of the floating population in the region; T is the total size of the floating population.

3.2. Social Network Analysis

The degree of network connectivity is used to measure the possibility of direct connection between node i and other nodes j in the floating population contact network[19].

$$I_{ij} = K_{ij} + K_{ji}, (i, j = 1, 2, 3, \dots, n) \quad (2)$$

In the formula, I_{ij} is the number of edges connecting the i node and the j node; K_{ij} and K_{ji} respectively represent the number of paths of the floating population starting from the i node (j node) and finally reaching the j node (i node). Proximity centrality is used to describe the position of a node in the population flow network. Formula [19] is

$$CC = \frac{n-1}{\sum_{j=1, j \neq i} d_{ij}} \quad (3)$$

where CC is the proximity centrality of city i ; d_{ij} is the path length between node i and node j ; n is the number of nodes.

4. Results and Analysis

4.1. Analysis of flow scale characteristics

The flow of the three major ethnic minorities in the

northwest region was counted by direction, region and time, and the flow scale in different years was obtained, and analyzed and compared:

The advantages are very prominent. Especially the Hui and Uyghurs, the northwest region is their main migration area, and it is also the main ethnic group participating in the flow of ethnic minorities in the northwest region.

4.2. The temporal and spatial asymmetry of floating population

The geographic concentration index was selected for comparative calculation.

In the Hui population flow, Gansu and Ningxia are important net outflow places. From 2012 to 2018, the changes in the Hui floating population were reflected in the intensification of population loss in Gansu and the weakening of Xinjiang's attractiveness. Tibetans are distributed in Qinghai and Gansu. These two regions also have outstanding performance in terms of the scale of Tibetan population flow. In terms of the distribution of floating population, the Tibetans show a strong concentration. The population flow of the Uyghurs has remained relatively stable.

4.3. Complexity of connections

4.3.1. Integrity

The Hui nationality has the highest network integrity, followed by the Tibetan nationality, and finally the Uyghur nationality (Table 1). The overall network connectivity and integrity of the Hui and Tibetans have improved.

Table 1. Network connectivity

Time	Nationality	province				
		Gansu	Ningxia	Qinghai	Shaanxi	Xinjiang
2012	Hui	1.06	1.44	1.62	1	1.13
	Uyгур	0.66	0.5	—	—	0.93
	Tibetan	0.8	—	1.11	1	0.6
2018	Hui	1.26	1.3	1.54	1.2	1.02
	Uyгур	—	—	—	—	0.94
	Tibetan	0.86	—	1.2	—	0.75

4.3.2. Network Centrality

The degree centrality of the three major ethnic minorities

is shown in Figures 1.

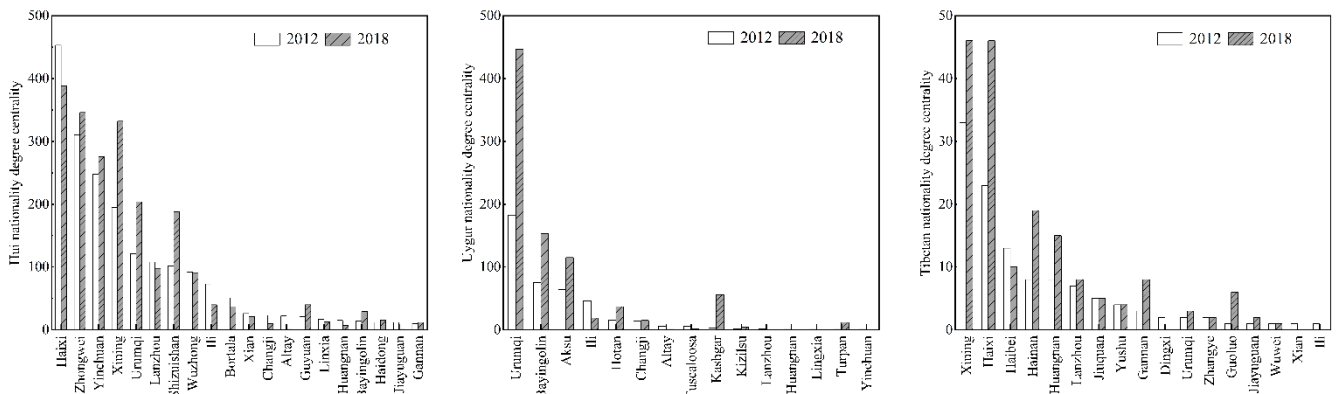


Figure 1. Nationality degree centrality

From Figure 1, the areas with high centrality in the Hui population flow network include Haixi Prefecture, Zhongwei. These areas attract Hui people by virtue of their ethnic advantages. Urumqi has always occupied an absolute control position in the Uyghur population flow network. The centrality of Kashgar, Bayingoleng and other places has

always remained at the forefront, and Kashgar's control power has been further strengthened. In the Tibetan mobile network, Xining and Haixi have the strongest control, Lanzhou and Gannan have strong attractiveness to Tibetans.

4.3.3. Approaching centrality

We further analyze the key cities and regions in the mobile

network. The status of Urumqi, Xi'an, Changji in the Hui mobility network increased significantly. The rise in the rankings of Urumqi and Xi'an reflects the importance of provincial capitals in the Hui mobility network. The places with high closeness centrality are mostly distributed in the center of the province. In the Uyghur mobile network, Aksu has a more prominent position; cities outside the Xinjiang are less close to centrality. There are many high-grade highways running through the whole territory.

5. Discussion and Conclusions

5.1. Discussion

The total number of floating population has remained high in recent years. The population mobility network has been studied, and the problem of network hierarchy has been characterized. This paper finds that the main ethnic minority population flow network in Northwest China is also complex and hierarchical, but compared with developed areas, the network is less complete and less hierarchical. This paper finds that there are commonalities and differences in the three major ethnic minority population flow networks in Northwest China, and the commonalities are manifested in significant economic orientation and homology source orientation.

5.2. Conclusion

Based on the national floating population dynamic monitoring data, this paper systematically examines the temporal and spatial patterns and network characteristics of population flows of major ethnic groups in Northwest China. The result shows: the scale of flow is generally limited, but its importance can-not be underestimated; the time and space of inflow and outflow are asymmetric, the distribution of outflow is more concentrated, and the distribution of inflow is relatively scattered; the complexity of connections, the network integrity of the Uyghur people is the worst, and the network is the most Simple, the Hui people have the best integrity, and the network is the most complex.

References

- [1] Zhu Yu; Lin Liyue; Ke Wenqian. Trends in Internal Migration and Mobility: International Experiences and Their Implications for China [J]. Population Research, 2016, 40(05): 50-60.
- [2] He Lihua; Cheng Aihua. Characteristics, Changes and Influences of the Population Migration of the Ethnic Minorities: An Analysis Based on the data of the Recent Two Aggregate Date of the National Population Census [J]. Ethno-National Studies, 2016(06): 23-38, 124.
- [3] ZHAO Feng; FAN Zheng. Employment Promotion, Institutional Guarantee and Residing Preference of Floating Populations from Ethnic Minority [J]. Journal of Lanzhou University of Finance and Economics, 2018, 34(06): 65-74+98.
- [4] LI Xiao-wa. An Analysis of the Characteristics of Minority Floating Population in the Pearl River Delta [J]. Journal of North Minzu University, 2020(04): 79-84.
- [5] TIAN Jin-wen; MA Zi-lia. Research on the Economic Integration of the Floating Urban Minority Population in the Northwest Region [J]. Northwest Population Journal, 2021, 42(01): 117-126.
- [6] Hu Zhaoyi. Life style changes and social adaptation of urban minority floating population-- Take Hubei Province as an example [J]. Journal of Hui Muslim Minority Studies, 2018, 28(01): 44-50.
- [7] XIE Yong. Employment status of ethnic minority migrants and the relevant determinants [J]. Journal of Yunnan Minzu University (Social Sciences), 2019, 36(04): 84-91.
- [8] Zheng Xinzhe; Zhou Jinghong. A Research into the Ethnic Population Floating and Urban Ethnic Relations [J]. Journal of South-Central Minzu University (Humanities and Social Sciences), 2002(04): 52-59.
- [9] Hou Haikun. Study on urban adaptation of Muslim floating population in Northwest cities-Take Lanzhou City as an example [J]. Heilongjiang National Series, 2012(2): 45-51.
- [10] Tang Duoxian. Analysis on the structural characteristics of the floating population of minority nationalities in Northwest cities-Take the investigation of Lanzhou City as an example [J]. Population and Society, 2007(04): 23-26.
- [11] Guo Jianyong. The new characteristics and influence of floating population in Northwest minority areas [J]. New West, 2014 (22): 12-13.
- [12] Shi Shiyue; Ni Jiayu. Embedment and integration-Research on social migration, integration and integration of the floating population of Hui Nationality in Yiwu [J]. Journal of Hui Muslim Minority Studies, 2020, 30(04): 19-25.
- [13] Zhang Zhang; Li Peiguang. The Survey and Analysis of Minority Floating Population in Northwest China—The examples of Xi'an, Lanzhou, Baotou, Xining and Urumqi [J]. Journal of Inner Mongolia Minzu University (Social Sciences), 2015, 41(01): 58-61+125.
- [14] Su Lifeng. A Study on the Flow Characteristics of Ethnic Minority Population and Its Employment Quality [J]. Ethno-National Studies, 2015(05): 16-29+123-124.
- [15] Gao Xiangdong; Wang Xinxian; Zhu Beiqian. Distribution and Change of the Ethnic Minority Population in China: A "Hu Line" Perspective [J]. Population Research, 2016, 40(03): 3-17.
- [16] WANG Zhuo; ZHANG Ling-hua. The Spatial Distribution of Population in 31 Chinese Provinces: 1990~2010 [J]. Northwest Population Journal, 2019, 40(01): 29-39.
- [17] Yan Lijuan; Li Hongtan. A study on the Migration of Ethnic Minority Population in Northwest China during the Period of the Republic of [J]. China's Borderland History and Geography Studies, 2008(02): 100-106+150.
- [18] YUE Ju; DAI Xiangyi. Temporal and Spatial Pattern of Cultural Heritage in Beijing-Tianjin-Hebei Region and Its Influencing Factors: A Case Study of Cultural Relic Protection Unit [J]. Economic Geography, 2020, 40(12): 221-230.
- [19] LI Zhuowei; WANG Binyan; WANG Shijun; TIAN Junfeng. Relationship of Urban Network Corridor Area Based on Multiple Flows: A Case Study of Liaoxi Corridor [J]. Economic Geography, 2020, 40(10): 74-82.