**Application of Centrographic Analysis to the Study of Ethnic Groups Migration in Xinjiang, China, 1949-2004**

**Dr. Huhua Cao**

Department of Geography, University of Ottawa, Canada

**M.Sc. Anwaer Maimaitiming**

Life and Environmental Sciences Institute, Xinjiang Normal University, China

February 2006, Ottawa, Canada

---

**Introduction**

There are various reasons as to why populations choose to migrate; these can range from the quest for better land and resources, escape from war and persecution, the pursuit of wealth and even the opportunity to start a new life. These are voluntary choices for migrating; however, not all migration results from such choices.

With the contemporary economic growth both globally and locally, the process of population mobility in China has attracted more and more attention from Chinese and international scholars (Kofahl et al, 2001; 2005; Bate, 2001; Nan, 1998; Tian, 1988; B. Sun, 1984; Tan, 1987). A large amount of literature concludes that the phenomenon of migration in China is influenced by the following four factors: (1) Economic; (2) Institutional; (3) Environmental; and (4) Geographic.

Though there has been extensive research conducted on the population movement phenomenon in China, most of the focus has been concentrated on general population and inter- provincial migration of the Han Chinese (see Figure 2). Research on the mobility of ethnic minorities in Xinjiang is rather scarce (see Figure 3). Very little research has been conducted on the migration of ethnic groups within minority regions. Therefore, this study aims at focusing on the mobility of various ethnic groups in Xinjiang, China from 1949 to 2004.

**Methodology and Data**

**Division of ethnic groups.** With the exception of the Han, all other nationalities including the Uygurs are considered as minorities.

**Geographic Exit, Entry Period, and Period:** The county level administrative unit in Xinjiang is selected as the geographic unit for this study. There are 87 county level units in the province spread throughout the three major geographic regions, namely Northern, Southern, and Eastern Xinjiang (see Figure 1). The mobility pattern of different ethnic groups is analyzed on the basis of these two geographical levels. The population data for county and ethnic groups in this study was retrieved from the Xinjiang Review over the past 50 years, Xinjiang, 1950, 2000, and Xinjiang Yearbook (1994). To better analyze the patterns and dynamics of mobility following the foundation of the People's Republic of China, we have selected a study period of 50 years (1949-2004).

**Ethnic Mobility in Xinjiang**

Over the past decades, the spatial and temporal distribution throughout Xinjiang of both Han and other minority groups was significantly altered, particularly due to the establishment of the Xinjiang Production and Construction Corps (Xingcong) and the development of the Xinjiang Agricultural Development Region. The centrographic analysis shows the significant re-organization of spatial diffusions for two ethnic groups in Xinjiang over the past five decades (as observed in Figures 5 and 6), which consist of six thematic maps. The three maps in Figure 5 correspond to time periods 1949, 1978 and 2004, with each map containing three ellipses: the green ellipse represents the total population, the red one represents minority population; and the blue one represents the Han population. The three maps in Figure 6 with two ellipses: the green ellipse represents the mobility of the total population; the red one represents minority population; and the blue one represents the Han population. The maps in Figure 6 with two ellipses: the green ellipse represents the mobility of the total population; the red one represents minority population; and the blue one represents the Han population. The maps in Figure 6 with two ellipses: the green ellipse represents the mobility of the total population; the red one represents minority population; and the blue one represents the Han population.

The movement of the Ellipses’ Centers of Gravity (CG) in 1949, the distance between the CG of Han and Minorities was measured at 510 km. In 1978, the CG for the Han population moved 60 km towards East, while that for the minorities moved more than 90 km to the North. The distance between them decreased to near 400 km. By 2004, the Han CG had slightly moved 90 km to the Northeast, while the CG of minorities continued to course toward the Northwest having moved over 15 km. The difference between the two decreased further to 45 km. The movement of CG for Han populations from 1949 to 1978 seems to be associated with the establishment of the Xinjiang Production and Construction Corps, mainly established in Northern Xinjiang. It is also moving East because of higher urbanization rates and better living conditions in that area. The ongoing movement of minority CG’s to the North is mainly due to a result of economic disparities between different geographic units in Xinjiang (as see Figure 4 and Table 2). The relatively higher level of economic and infra-economic conditions as well as overall accessibility to education in Northern Xinjiang (Xinjiang, 2000) have attracted some minority populations to move to the Northern part of Xinjiang in the hope of finding better employment opportunities and increased living standards.

**Evolution of the Area of Ellipses and Changes in Their Major and Minor Axes**

Statistics from table 2 confirm that the ellipse-area representing the Han Chinese in 1940 was 238,300 km². However, over the last five decades this figure significantly dropped to 176,600 km² by 2004, a decrease of 25%. Conversely the ellipses representing the minority populations increased significantly from 272,500km² in 1949 to 267,500km² in 1978, an increase of almost 15%. Following this trend and up until 2004, the ellipse-area demonstrated a distinctive decreasing trend.

Furthermore, the major axes of the ellipse representing both the Han and minority populations moved to the North and East. The major axes of the ellipse representing the Han was calculated at 852 km in 1949, 671 km in 1978 and 620 km in 2004, yielding a difference of approximately 231 km. 23% form 1949 to 1978. The length of the minor axes, however, increased by 5 km in the first period (1949-1978) and then fell by 5 km in the second period. The length of major axes of the ellipse representing minorities was measured at 1200 km in 1949, 990 km in 1978 and 978 km in 2004, illustrating a 12% decrease over a period of near 35 years. By 2004, it measured 978 km, demonstrating a 2% decrease. However, the minor axes demonstrated hardly any change. It was calculated at 378 km in 1949, 378 km in 1978, and 378 km in 2004.

The consequence of increased number of Han and other ethnic minorities since representing both Han and minority populations have affected the topology of Xinjiang.

**Migration and Government Policy in Xinjiang**

Government Migration Policy-The Role of the Xinjiang Production and Construction Corps

The government Migration policy during the periods under research had considerable effects on the ethnic mobility in Xinjiang. The government set up by the state in the early 1950s, was the Xinjiang Production and Construction Corps. They mainly distributed to areas with backward infrastructure and water source areas. By 1978, the presence of Han Chinese had increased to near 42%. Meanwhile, the distribution of other minorities remained unchanged.

**Cultural factors**

Due to the 1995s migration to Xinjiang from other provinces reached a total of 465,000 million Han, 85% suited in Northern Xinjiang along the economic belt of the Tarim-Minjiang. According to Ralby (1989), new immigrants settled in areas that were closest to their home area. Other reasons for migration included the Xinjiang Production and Construction Corps, the proportion of Han populations in Northern Xinjiang, especially along the Xinjiang-Minjiang route (see Figure 7). This was undoubtedly due to the fact that non-accultegrated migrants to Northern Xinjiang are reasons culturally.

**Regional Socio-economic Dynamics**

The socio-economic context of three geographic units in Xinjiang demonstrate significant disparity due to historical, political and geographical factors. As shown in Figure 7, the socio-economic framework in Xinjiang is clearly at an advantage compared to the rest of the country. The urban percentage has increased to 35% (almost twice) in Central and Eastern Xinjiang, while the urban percentage in Xinjiang (Xinjiang, 2000) was only 15, less than half that of Southern Xinjiang. In 2004, 97% of provincial investments were concentrated in this region; the per capita GDP is 135,892, twice as large as that of Northern Xinjiang.

**Conclusion**

The study of the People’s Republic of China, Xinjiang experienced significant inter and intra population movements. As a result, ethnic geographic distribution changed considerably. The M6 and M10 total population displayed by this study, these geographic factors, this study demonstrates that both Han Chinese and minorities in Xinjiang experienced significant mobility over the past fifty years. Results of our study made a number of pertinent conclusions to be drawn, including that the fact that there were indeed several factors explaining the mobility of ethnic groups. One of the major observations based on this study has focused on the distribution of both Han and minorities within Xinjiang. The centrographic analysis can be seen in our study illustrate that both these groups have demonstrated a tendency to migrate northwards over the past fifty years. Based on the evidence of the ellipse, it was observed that the Han population has moved more and more contracted in Northern Xinjiang, especially along the economic belt on the Northern side of Taklimakan Mountain, while other minority groups were distributed much more evenly throughout Xinjiang.

Further major observations emphasized the fact that there were several factors which have influenced the mobility of ethnic groups within Xinjiang. These include: the governmental migration policy, cultural similarity, as well as economic and geographic factors. During the first three years of the development of Xinjiang, Government Migration Policy prevailed as an immediate impact to the settlement of the populations in the Northern Xinjiang. The foundation of Xinjiang Production and Construction Corps played an important role in ethnic group mobility. After the economic reforms of 1978, for reasons of cultural similarity and other economic factors, Han mobility and migration within Xinjiang were accelerated. Various economic and geographic factors, such as per capita income, agricultural productivity, industrialization level and city size, have affected the distribution of Han and minorities. However, the distribution of Han has had a positive effect on the distribution of minorities, while the distribution of desert has had the negative effect on them.

**Reference**

China’s urban population on the Move (ZhongguoChengzhengRenkouQianyi)

Huhua Cao, M.Sc. Anwaer Maimaitiming

Department of Geography, Life and Environmental Sciences Institute, University of Ottawa, Canada

Xinjiang Normal University, China

February 2006, Ottawa, Canada

**Produced by Anwaer Maimaitiming, March 2006, Ottawa, Canada**