Spatial-Temporal Patterns of the Distribution of the Ethnic Minorities in China's Urbanization

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Abstract

Since the initialization of economic reforms in 1978, China has undergone significant urbanization and modernization at an increasingly rapid pace, with the national urbanization rate increasing from 17.9% in 1978 to 57.4% in 2016. An increasingly significant portion of China's population is integrating itself into thriving urbanized areas. Though amounting to only 8.5% of the nation's total population (1.5 billion), China's ethnic minority population remains considerable in number. In the future, by adopting the National New-Type Urbanization Plan in 2014, China's urbanization is expected to evolve into a more human-oriented process, as the plan ambitiously aims to increase the urban population by another 200 million, most of which will consist of Chinese ethnic minorities. It is hoped that this increase will boost the urbanization rate among Chinese ethnic minorities. The gaps within existing literature and the practicality of improving the inclusivity of the urban minority population in the urbanization process legitimize the development of a comprehensive and retrospective study of the evolution of spatial-temporal dynamics of the distribution of Chinese ethnic groups with a Chinese urbanization perspective on a national scale. Based on national census data from 1990, 2000, and 2010, this study adopts the Standard Deviational Ellipse as a distributional trend measurement of minorities in urban China and determines four major new features of the distribution of the Chinese ethnic minorities over the last twenty-years in China's urbanization context. First, a three-stage peripheral-to-core transition pattern was observed. Second, it is observed that there is an escalating decline of the urban minority population in the central region of China, particularly since 2000. Third, national-level city agglomerations located in the eastern region of China have begun to play leading roles in minority urbanization, particularly those located in the Yangtze and Pearl River Delta. Fourth, in both China's west region and its autonomous areas, as continuous beneficiaries of supportive policies, metropolises, such as provincial capitals, have been shaped into important regional minority population concentrations. This study also allows for a better insight of Chinese urbanization processes and their inter/intra-relating mechanisms in ethnic minority areas. Finally, this study's

findings provide insightful and detailed information for scholars, policy and, ultimately, decision-makers, to improve the process for sustainable and inclusive urbanization in China.

Résumé

Depuis l'initialisation des réformes économiques en 1978, la Chine a connu une urbanisation et une modernisation d'un rythme accéléré, avec le taux d'urbanisation nationale passant de 17,9% en 1978, à 57,4% en 2016. En effet, une partie de plus en plus importante de la population chinoise s'intègre dans les zones urbanisées prospères. Bien qu'elle ne représente que 8,5% de la population totale de la Chine (1,5 milliard), la population des ethnies minoritaires chinoises demeure importante. Avec l'adoption du plan national d'urbanisme de type nouveau en 2014, l'urbanisation en Chine devrait se réformer en un processus plus humain, puisque le plan vise ambitieusement à accroitre la population urbaine de 200 millions de personnes supplémentaires, dont la majorité étant des ethnies minoritaires chinoises. Cette augmentation devrait donc stimuler le taux d'urbanisation parmi les ethnies minoritaires chinoises. L'aspect pratique de l'amélioration du taux d'urbanisation des groupes ethniques minoritaires chinoises, ainsi que les lacunes dans la littérature existante, soulignent un besoin légitime de développer une étude complète et rétrospective sur l'évolution de la dynamique spatio-temporelle de la distribution des groupes ethniques minoritaires chinoises, tout en adoptant une perspective d'urbanisation chinoise à l'échelle nationale. En utilisant les données du recensement national de 1990, 2000 et 2010, cette étude adopte le *Standard Deviational Ellipse* comme une mesure de tendance distributionnelle des ethnies minoritaires en Chine urbaine, en plus de l'utilisation d'approches spatiales-statistiques supplémentaires. Quatre nouvelles caractéristiques majeures de la répartition des minorités ethniques chinoises au cours du contexte d'urbanisation des derniers vingt ans, ont été déterminées à l'aide des méthodes susmentionnées. En premier lieu, un schéma de transition périphérique à noyau en trois étapes pour les ethnies minoritaires chinoises, a été déterminé. Deuxièmement, il y a un déclin croissant de la population des minorités ethniques urbaines en Chine centrale, en particulier depuis 2000. Troisièmement, les agglomérations urbaines situées en Chine orientale, ont commencé à jouer un rôle de premier plan dans le processus d'urbanisation des minorités ethniques, en particulier dans le delta du Yangtze et celui du Pearl River. Quatrièmement, à la fois dans la région occidentale de la Chine et dans ses

régions autonomes, les métropoles telles que les capitales provinciales, se sont transformées en importantes concentrations d'ethnies minoritaires chinoises régionales, et sont donc devenues des bénéficiaires réguliers de politiques de soutien. Cette étude permet également de mieux comprendre les processus d'urbanisation chinoises et leurs mécanismes inter/intra-communautaires dans les zones peuplées de minorités ethniques. Enfin, les résultats de cette étude sont capables de fournir des informations pertinentes et détaillées aux chercheurs, aux responsables des politiques et, en fin de compte, aux décideurs, pour améliorer l'urbanisation durable et inclusive en Chine.

摘要

自 1978 年改革开放以来，中国历经了高速城市化发展。在此期间，中国城市化率从 1978 年的 17.9%增至 2016 年的 57.35%。 随着越来越多的人口成为城市居民，少数民族人口虽然仅仅占中国人口的 8.5%左右，但是总数十分庞大。2014 年中国政府颁布国家新型城市化规划 2014-2022，其中明确中国城市化将更加以人为本。该规划的实施预计将增加 2 亿城市人口，其中很多将会是少数民族人口。从促进中国少数民族的城市化进程角度讲，此举将大有裨益。虽然中国少数民族相关的研究汗牛充栋，但是绝大部分的研究范围仅关注局部地区和某一（些）民族。进一步讲，研究当代少数民族时空动态演化对提升少数民族城市化质量具有很强现实意义。所以，以整个中国城市化为被背景视角，针对全中国民族人口分布的时空动态演化进行的综合研究将弥补该领域的空白。本研究采用统计和空间分析相结合的方法 (SDE 标准差椭圆)，以第四次，第五次第六次全国人口普查数据为基础，结合近二十年中国城市的相关地理系信息数据，深入了解过去 20 年中国少数民族在城市化大背景下的时空分布，得出该时段城市民族人口时空分布的四大新特征如下: 1）民族人口城市化过程呈现出三阶段边缘-核心变化趋势。2）中部地区城市民族人口流失呈明显加剧趋势。3）东部国家级城市群成为民族人口城市化新突出点，尤其以长三角，珠三角城市群为甚；未来很可能成为少数民族人口城市化的核心。4）西部/民族自治地方的主要城市，如省（自治区）首府等特别自二十一世纪以来持续享受政策扶植成为本地区民族人口聚居地。本研究结果也旨在更好地探寻中国城市化进程及其在少数民族地区内部以及互相之间的原理机制。最后，本研究结果能够为学者，以及政策制定执行机构提供洞察力和详细的信息，以期为更加可持续化，更和谐的中国城市化策略献计献策。

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LIST OF ACRONYMS

CL	County-Level
CCCPC	Central Committee of the Communist Party of China
CPC	Communist Party of China
CNBS	China National Bureau of Statistics
HKSAR	Hong Kong Special Administrative Region
HP	(Cities) Higher than Prefecture-Level
LREA	Law on Regional Ethnic Autonomy
MCSAR	Macao
MP	Municipality
NDRC	National Development and Reform Commission (of China)
PC	Provincial Capital
PL	Prefecture-Level
PRC	People's Republic of China
REA	Regional Ethnic Autonomy
SAR	Special Administrative Region
SDE	Standard Deviational Ellipse
SEZ	Special Economic Zones
SP	Sub-Provincial Level
TVE	Town and Village Enterprise
UNDESA	United Nations Department of Economic and Social Affairs
WTO	World Trade Organization
XPCC	Xinjiang Production and Construction Corps
XUAR	Xinjiang Uyghur Autonomous Region

LIST OF IMPORTANT PINYIN

Cities	*Chéng Shì or Chéng Zhèn*
China's Western Development Strategy	*Xī Bù Dà Kaī Fā Zhàn Lüè*
China's National New-Type Urbanization Plan	*Guó Jiā Xīn Xíng Chéng Shì Huà Guī Huà*
County-Level Cities	*Xiàn Jí Shì*
Cultural Revolution	*Wén Huà Dà Gé Mìn*
Economic Reforms	*Gaĭ Gé Kaī Fàng*
Ethnic minority population	*Mín Zú Rén Kŏu*
Floating Population	*Líu Dòng Rén Kŏu*
Guangxi Zhuang's Autonomous Region	*Guăng Xī Zhuàng Zú Zì Zhì Qū*
Hukou	*Hù Kŏu*
Inner Mongolia Autonomous Region	*Neì Měng Gŭ Zì Zhì Qū*
Land Reform	*Tŭ Găi*
Migrant workers	*Nóng Mín Gōng* or *Mín Gōng*
Municipalities	*Zhí Xiá Shì*
Nationality	*Mín Zú*
National New-Type Urbanization Plan	*Guó Jiā Xīn Xíng Chéng Shì Huà Guī Huà*
Prefecture-Level Cities	*Dì Jí Shì*
Reform and Opening Up	*Gaĭ Gé Kaī Fàng*
Sub-Provincial Cities	*Fù Shĕng Jí Chéng shì*
The Great Leaps Forward	*Dà Yuè Jìn*
Tibet Autonomous Regio*n*	*Xī Zàng Zì Zhì Qū*
Xinjiang Uygur Autonomous Region	*Xīn Jiāng Weí Wŭ ĕr Zì Zhì Qū*

Chapter 1. Introduction

1.1. Urbanization and Urban Ethnic Minority Population in China

As the world's most populated country with 55 ethnic minority groups[1], China has undergone rapid urbanization since the economic reforms (*Gaǐ Gé Kaī Fàng*)[2] in 1978, raising its urbanization rate from 17.9% in 1978 to 57.4% in 2016 (CNBS, 2017). It is evident that by the end of the first half of the 21st century, China's urbanization rate will continue to increase, reaching an estimated 73% with more than 1,000 million people living in urban areas (Gu *et al*., 2015).

However, Chinese ethnic minorities have not equally enjoyed this rapidly ensuing urbanization process. Though the latest statistics of the urbanization rate among the ethnic population available was conducted back in 2011, it suggests that for a long period, the urbanization rate among the ethnic minority population had been lower than that of the national average. By 2010, the ethnic minority population in China comprised just 8.5% of the total national population, with an urbanization rate of only 32.8%, which is much lower than the national average of 47.5% (CNBS, 2010). This lower rate of urbanization for Chinese ethnic minorities is most evident in the five Autonomous Regions,[3] which is demonstrated upon calculating the urban population percentage, according to ethnicity. In the Xizang Autonomous Region (*Xī Zàng Zì Zhì Qū*), 6.3 % of the ethnic minority population lives in cities, while 9.07% of the total provincial population lives in city areas. In the Neimenggu Autonomous Region (*Neì Měng Gǔ Zì Zhì Qū*), 23.8% of the ethnic minority

[1] According to the Chinese Governmental designation in Ethnicity, there are 56 nationalities in China including the Han Chinese who consists 92% of the national population, while the rest of the 55 nationalities contribution only 8% of the entire population. Thus, any nationality except for Han Chinese is regarded as the ethnic minority. In China, the ethnic minority population (*Mín Zú Rén Kǒu*) or minority population (*Shǎo Shù Mín Zú Rén Kǒu*) are the same concepts, regarding the non-Han Chinese (CNBS, 2010).

[2] In 1978, an economic reform which introduced the free market into China's development after Deng Xiaoping came into power. Before it, all commodities were rationed by governmental orders and could only be purchased by coupons, before which, the private businesses were prohibited (Gu *et al*., 2012).

[3] Also, being referred as the Ethnic Autonomous Regions, are the provincial-equivalent administrative division of China, in where lives a higher population of one or several ethnic minority groups. (CNBS, 2011). The Ethnic Autonomous is among the highest administration level (provincial-equivalent) of the Ethnic Autonomous Areas which were set up to facilitate the self-governance of ethnic minorities, as per the Law on Regional Ethnic Autonomy (REA) (Xia, 2009). See section 3.1.2.4.

population are urban dwellers, while the overall urban population comprises 32.4% of the provincial population. The Ningxia Hui Autonomous Region has 32.7% of its provincial population living in cities while the urban ethnic minority population makes up 17.9%. The Xinjiang Uygur Autonomous Region (*Xīn Jiāng Weí Wǔ ěr Zì Zhì Qū*) has the greatest gap between the ratios of the urban-dwelling ethnic minority population and the total urban population, as 12.6% of the ethnic minority population in Xinjiang are accounted for within the urban population, and 27.8% of the total population is comprised of urban dwellers. In Guangxi Zhuang's Autonomous Region (*Guǎng Xī Zhuàng Zú Zì Zhì Qū*), 18.1% of the provincial population live in cities, while 12.7 % of the ethnic minority population are city residents (CNBS, 2011).

The ethnic minority urbanization rate each year, though being lower than that of the national average level during these periods, has increased rapidly. From 1990 to 2000, the urbanization rate of the ethnic minority population increased by approximately 42.9% and 40.3%, from 1990 to 2000, and 2000 to 2010, respectively. In the recent National New-Type Urbanization Plan (*Guó Jiā Xīn Xíng Chéng Shì Huà Guī Huà*)[4], sustainability and harmony are emphasized as essential elements of "Healthy Urbanization." The implementation of this new urbanization strategy, including the plan to grant 100 million Hukou (*Hù Kǒu*)[5], will result in a massive migration surge to cities in the near future, consisting predominantly of an ethnic minority population (Chan, 2014).

Although there are many forms of research conducted on social exclusion, there is very little nationally-scaled research dedicated to understanding the spatial-temporal dynamics of the distribution of ethnic minorities from national, regional, and city scales. Thus, the importance of this research lies in understanding the spatial-temporal dynamics of ethnic minorities throughout China's urbanization process from 1990 to 2010. It will also attempt to understand the mechanisms in Chinese cities responsible for stimulating mobility and the formation of the distribution patterns

[4] Issued in March of 2014 as the first national official plan on urbanization issued by Chinese government (Taylor, 2015).

[5] Chinese House Registration System which was established in 1958, characterized dual citizenships: The Urban Hukou and Rural Hukou. The Urban and Rural Hukou differ on the basis of social welfare and accessibility to social-economic resources (Wu & Treiman, 2004). The reform that aimed to unify the dual citizenship was initialized in 2014.

of Chinese minorities, between 1990 and 2010, the period in which China transformed itself from a transitioning market economy to a liberalized market economy. Finally, this study's findings offer insightful and detailed information for scholars, decision-makers, and are highlight influential in policy implementation, all of which is crucial in improving sustainable and inclusive urbanization in China.

1.2. Structure of Thesis

This thesis consists of six chapters. The first chapter provides context with an introduction. The second chapter substantiates the necessities of conducting this research while supporting the research objectives through a review of recent literature. The third chapter comprises focused area (cities in China by 1990, 2000 and 2010) and group (all non-Han population is considered as the ethnic population), data (the 4^{th} 5^{th} and 6^{th} national census), methodologies (Standard Deviational Ellipse), and variables, along with other components that formulate the scope of the thesis' research. The fourth and fifth chapters describe and discuss based on the results of the spatial-analytical approaches. After summarizing the major research findings and conclusions, the empirical contributions and research limitations are discussed, serving as guidance for future research.

Chapter 2. Literature Review

2.1. Urbanization in Contemporary China

China, the world's most populated country, has enjoyed rapid economic development since the adoption of the economic reforms in 1978, resulting in an increase in the Chinese urbanization rate, raising from 16.5% in 1950 to 57.4% in 2016, which is almost a four-fold increase (CNBS, 2017).

2.1.1. The Historical Processes

Since the formation of the People's Republic of China (PRC) in 1949, urbanization processes initialized quickly, mainly due to the reconstructions and newfound social mobility as a result of the establishment of the socialist regime. During the 1949-1976 period, urbanization processes in China were influenced by central planning systems, such as the household registration system Hukou, by which the government directly controlled population movement in the context of the revolution, socialist ideology, and industrial production, which were more so priorities of the state than consumption and tertiary services (Chan, 2009). This type of deliberate governmental control, when considering urban population increase, caused the urbanization processes in this period to be insignificant, given that the urban population in China increased from 66.3 million (1951) to 172 million (1978) while the urban population ratio in comparison to the total population raised from 11.8% (1951) to 17.9% (1978) (Chan, 1985). By the year 1978, the economic reforms gradually introduced a free market economy which greatly accelerated the urbanization process in China. Within three decades, China became the most populated country, as well as having the second-largest economy in the world; its urban population rose from 172 million in 1978 (with 17.9% urbanization rate) to 793 million in 2016 (57.4%) (CNBS, 2017). In the next 15 years, the Chinese urban population is projected to rise to 70%, contributing substantially to the 67% global urban population ratio that was predicted by the UNDESA 2015 (Taylor, 2015).

2.1.2. Features of Contemporary Chinese Urbanization

In China, urbanization processes are complicated by a series of interrelated factors, the first factor of which is the Chinese perception and scope of urbanization. According to (Xu *et al*., 2007), Chinese urban systems consists of cities (*Chéng Shì*) and towns (*Zhèn or Chéng Zhèn*), in which the population is classified as the urban population in the census. The second factor lies in two sources, specifically economics and central planning, in which the driving forces of Chinese urbanization originate. Although China has adopted a free market economy since the economic reforms, central planning directives from all levels of government still play a decisive role in implementing urbanization processes, making China a unique urbanization case when compared to all other countries (Gaudreau & Cao, 2015).

The third factor is the presence of significant gaps when accounting for urbanization speed and quality between cities, even regions,[6] across China (Zeng, 2006). Cities in more developed areas, usually the coastal and eastern parts of the country, have a greater degree of urbanization as well as better financial status while inland cities may need more policies for promoting urbanization processes (Feng *et al*., 2016). Chinese minorities are typically concentrated in Northwestern China due to historical reasons. Case studies that were conducted in cities located in this region provide local insights into urban minorities. Compared to Eastern China, cities in Southwestern and Northeastern China have lower urbanization rates. Institutional factors have been playing a significant role in the urbanization of Western China since the initiation of China's Western Development Strategy (*Xī Bù Dà Kaī Fā Zhàn Lüè*)[7] (Gao & Zheng, 2006). In the context of urbanization in Western China, rural-urban income disparities, Han Chinese, and Chinese ethnic minority income disparities, as well as ethnic-spatial polarization, have escalated in the past 20

[6] There exists more than one way of territorial division on Chinese Regions. One is to simply divide China into Eastern, Central, and Western China (Wenqing, 2010). The other widely-accepted Six-Region division dates back to the administrative division established early as in 1949, dividing China into six administrative regions, which are the Northeastern (*Dōng Běi*). Northern China (*Huá Beǐ*) Eastern China (*Huá Dōng*), South Central China (*Zhōng Nán*), Southwestern (*Xī Nán*), Northwestern (*Xī Beǐ)* (Yang, 1990). In this study, the Eastern, Central and Western China division is adopted.

[7] Also, referred as The Development of the Western Region in China, a national strategy that issued in 2000.

years (Wang, 2006; Cao, 2010).

The last characteristic is the predicament that stems from social mobility and the household registration system of Hukou which was designed to limit migration. After the economic reforms, even without legal urban residency rights, over 200 million rural residents moved to cities in search of better employment opportunities. These urban dwellers are often required to supplement, monetarily, services and social benefits that are free to urban Hukou residents. Although it has been years since the reform on the current Hukou system was proposed, which aimed to reduce the inequalities in the context of social benefits, the actualization of these reforms did not take effect until 2014. However, the dilemma between the demands of rapid urbanization and its backlash created concerns about the urgency in phasing the Hukou system completely; the speed at which the Chinese government should implement Hukou reform also remains a question (Cao *et al*., 2014; Qiu, 2003a, b, d).

2.1.2.1. Social Mobility and Chinese Urbanization

Since the social-economic context in China is a mixture of central planning and a free-market-oriented model, governmental interventions from all levels still play a crucial role in implementing urbanization (Gu *et al*., 2006). Governmental intervention and orders not only yielded architectural wonders, but was also responsible for creating social issues, such the discontent with Hukou and improper land acquisition by the government, resulting in tensions between people (Yu, 1994; Liu *et al*., 2015).

The institution-led reforms, as a product of both central planning and free-market model, are important components of urbanization. This was discussed by Zhu (2006), Liu (2000) and, Gu and Kesteloot (1997b), and dates back to the early 1980s, when the housing reform was conducted after the economic reforms were initialized to enable private rights for property ownership. The incentive for the housing reform originated from exacerbating financial burdens and the housing shortage left by the decentralization of urban administrative power from the central government as a key point in economic reforms (Ma, 1990a). As a direct result of the housing reform, the rate of

urbanization increased drastically (Knox & McCarthy, 2005).

2.1.2.1.1. The Housing Reform

The allocation of housing in China, prior to the housing reform period, relied on the direction from either the local government or state-owned enterprises (Gao, 2010). This housing reform and allocation caused housing shortages, and financial burdens to government and state-owned enterprises, as well as zoning issues (Wang & Murie, 2000). To alleviate the tensions mentioned above and to achieve the goal of egalitarianism in housing, the Chinese government decided to relax the restrictions on private property by allowing the transferring, leasing and mortgaging of private property (Li & Huang, 2006). In 1998, they removed the policies that caused the allocation of welfare housing and the establishing of a market-oriented housing system, and instead initialized a significant increase in housing construction and population migration, which subsequently became the main drivers of urban expansion in China (Chen *et al*., 2011).

2.1.2.1.2. Hukou System Reform

Since the implementation of Hukou in 1958, Chinese citizens have been assigned with either an agricultural household status (henceforth referred to as rural Hukou) or non-agricultural household type (urban Hukou) (Chen & Fan, 2016). The assigned Hukou type determines the level of accessibility to resources and social welfare benefits, such as admission to certain schools, not to mention healthcare accessibility and insurance. As China's cities possess superior socioeconomic resources compared to its rural counterparts, urban Hukou has been accompanied by better accessibility to benefits over a long period of time; however, these benefits are exclusively for urban Hukou holders (Chan, 2009).

The controversial Hukou system has been extensively studied by scholars all around the world. Chan (2009), Liu (2005), described Hukou as a discriminatory policy that creates two different societies in China, preventing the Chinese rural population from accessing quality socio-economic resources and social benefits. Treiman (2012) stated that for more than 20 years, rural migrant

workers who sought jobs in cities could hardly enjoy the benefits of being an urban citizen, such as the urban health insurance and endowment insurance, which are exclusively provided for urban dwellers. Migrant workers (*Nóng Mín Gōng* or *Mín Gōng*) who possessed rural Hukou are typically paid lower salaries, and are hired as cheap laborers, frequently bearing the brunt of social injustices, such as not being paid. The opposing voices towards the current Hukou system can also be heard from scholars like Zhu (2006) who state that the traditional Hukou is becoming an increasingly undesirable means of preventing a large number of migrants from being integrated into urbanization processes.

While the feasibility of the eradication of the Hukou system is a continuous source of debate, there have been several modifications to the current Hukou system which have been welcomed by supporters such as Song (2017), who advocates for the necessity of Hukou reform in changing the national economy from a heavy reliance on exports to domestic consumption; and Chan (2012) who believes reform to the Hukou system is compelling because of the increasingly educated and right-conscious rural younger generations who are demanding equal opportunities. The most recent major reform of Hukou system is the China's National New-Type Urbanization Plan which especially claims to give rural migrants who are currently living and working in cities and towns where the population is lower than 3 million full residency rights by 2020 (Chan, 2014).

A more recent article by Li *et al*., (2015) reveals an interesting cause for the Chinese government's eagerness to urbanize rural areas. Between 2004 and 2013, the Chinese government had approved the conversion of roughly 4.7 million hectares of agricultural land into the urban and industrial land. Consequently, around one million Chinese peasants, willingly or unwillingly, traded their land rights for urban Hukou status. The author also believes that it is the urban industrial and agrarian capitals that are pushing the government to reform the Hukou system. By issuing the rural population with the urban Hukou, the land rights that are exclusively affiliated with the rural Hukou could be relieved, therefore legitimating the land to be available for development.

2.1.2.1.3. Landownership and Land Rights

Chinese urban Hukou and its associated advantages and entitlements are considered motivations to reside in cities, and the key entitlement provided by rural Hukou is the access to village land, which also has a significant effect on urbanization (Miao, 2003; 1998).

After 1949, the Land Ownership Reform (*Tǔ Gǎi*) was initialized, which aims to fulfill social egalitarianism by redistributing land that used to be owned by landlords to the poor (Domes, 1973). After such reform on land ownerships, by 1958, all land was either state-owned in urban areas or collectively owned in rural areas by further reform on land ownership[8] (Lippit, 1974). The current system of converting farmland into the urban land is a hybrid system that consists of government control and market functions. This hybrid system was established in 1988[9] as the China Land Administration Bureau was specifically founded for land policy reform, land allocation, acquisition and monitoring developments of the land (Zhang, 2000). The subsequent adoption of the Land Use Rights after the establishment of as the China Land Administration Bureau enabled the private sectors and even capable individuals to have access to the state-owned land, therefore to stimulate the land market development in China (Zhang, 2000). As Ding (2003) describes, the Land Use Right defines two levels of land markets: the first level describes a "government to land users" flow, in which local governments lease land to users for the conveyance fees; the second level defines transactions between land users who possess land use right and are willing to sublease to third parties. Alongside the promotions to the real estate and housing development, for local government, the Land Use Right also generates significant revenues for other large-scale urban projects. It focuses on two areas to consolidate legitimately owned land, especially rural land that is collectively owned. The first is to convert the collectively owned land into state-owned status due to the non-transferability of collectively owned land. The second is to simply institutionalize

[8] There were only a few exceptions in recently liberated areas like Xinjiang and Xizang where land ownership reform was complicated by ethnicity (Ding, 2003).

[9] The brief history of the land market in PRC is as follows. Before 1978, all lands were collectively owned and prohibited from transfer even between state-owned enterprises, let alone between private sectors (Zhang, 2000). The liberalization of the land market began with the pass of the Land Administration Law in 1986, which enables the Land Use Rights can be transferred to institutions, or even eligible private sectors (Qu *et al*., 1995; Ding, 2003).

local government with the power to expropriate land from farmers at a relatively low price then sell it to developers at a higher price. Ding (2003) states this land acquisition process is a monopoly of the local government and happens more frequently in towns (*Chéng Zhèn* or *Zhèn*) that bridge rural areas to larger cities. Despite the benefits of public land leasing for the financial support of urban projects, the improper land acquisition also creates social tensions (Ho, 2001). These tensions are sometimes exacerbated by the injustices rooted in the ambiguities in the law responsible for creating the stipulations of land leasing policies (Ding, 2007).

2.1.2.2. Rural Urbanization or Townization[10]

Scholars have disagreed on the definition of rural urbanization in China due to the literal context defined by the government as being with Chinese characteristics (Sheng *et al*., 2009). Some scholars point out that this definition of rural urbanization serves as compensation for the limitations of the traditional way of defining urbanization, giving different definitions of rural urbanization (Chai *et al*., 2009). For example, when considering location, rural urbanization is a socioeconomic transition resulting in developed non-agricultural industries, further characterized by increasing population within towns (*Zhèn*). A more systematic definition of rural urbanization was given by Zhou (1997) who pointed out a multi-dimensional construction based on a transformation of lifestyles and civilization, stating that there are five dimensions in the process of rural urbanization. The first dimension lies in the changes of vocation, which, in the Chinese context, is the increase of non-agricultural laborers. The second process is about increasing secondary and tertiary industries. The third dimension is concerned with the urbanized lifestyle, while the fourth focuses on the prevalence of mass media usage. The fifth is based on enhanced education quality and the subsequently modernized values.

In the urbanization process, the stage where traditional agricultural economy evolved into an urban economy is very important. In the context of China, due to the relative scarcity of land per

[10] A neologism inspired by Chinese terminology to specify the development of towns where the rural and urban boundaries are blurred (Guldin, 1996).

capita, the town plays a decisive role in rural urbanization (Guldin, 2004). The towns that directly deal with the countryside are the lowest administration in China's hierarchical government systems; however, like cities (*Chéng Shì*), people living in towns are also considered urban populations (Li *et al.*, 2015). Gu *et al*., (2015) emphasize that towns, as an important part of China's urbanization, deserve policy attention. In a bid to reach the goal of building the new socialist countryside, the Fifth Plenary Sessions of the 16th Central Committee of the Communist Party in 2005 identified the importance of rural urbanization, emphasizing the town, though smaller in scale and lower in administrative level, is the key to bridge cities to the countryside.

Regarding employment transition, rural urbanization resulted in consolidating land from farmers, which further enhanced the employment transition from agriculture to industries, literally producing population movements (Chen & Wang, 1999; Fan, 1998). This is a classic example demonstrating why migrant workers, otherwise known as the floating population[11] (*Líu Dòng Rén Kǒu*), move to cities.

Also, a more recent incentive that was observed specifically by Li (2015) is the agrarian capitals who share the common interests of urban industrial capitals that intend to push the government to separate the land rights from rural Hukou by urbanizing rural areas. Ultimately, lands could be consolidated for better commercial use. The consolidation of land and the decreasingly enticing urban Hukou to the rural population created resistances to rural urbanization among the rural population.

Rural urbanization in China is also regionally ethnicity-based, given that Chinese minorities are spatially concentrated in remote areas (Gustafsson, & Shi. 2003). For example, in Western China, where agriculture dominates social and economic life, rural urbanization should be urgently initialized to promote the local economy, thereby reducing economic disparities. In some cases, the

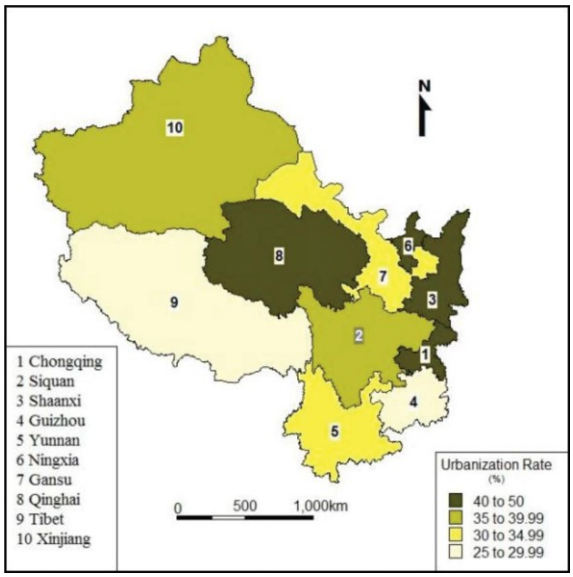
[11] Floating population refers to those who have rural Hukou but residing in cities for jobs, educations etc. (Zhang *et al*., 2003). Once they are issued with urban Hukou by the reform, they become statistically counted as urban population by the census.

land acquisition process to encourage rural urbanization encountered more resistance due to localized ethnic minority issues. Cao (2010), in his case study, stated that in the Xinjiang Autonomous Region, rural-urban disparities, and Han-ethnic disparities are being escalated by ethnic minority spatial distribution for reasons that are complicated; it is compelling to have minorities included in the country's social, economic reforms. Due to the above reasons, urbanization in Western China will be discussed further in the next section.

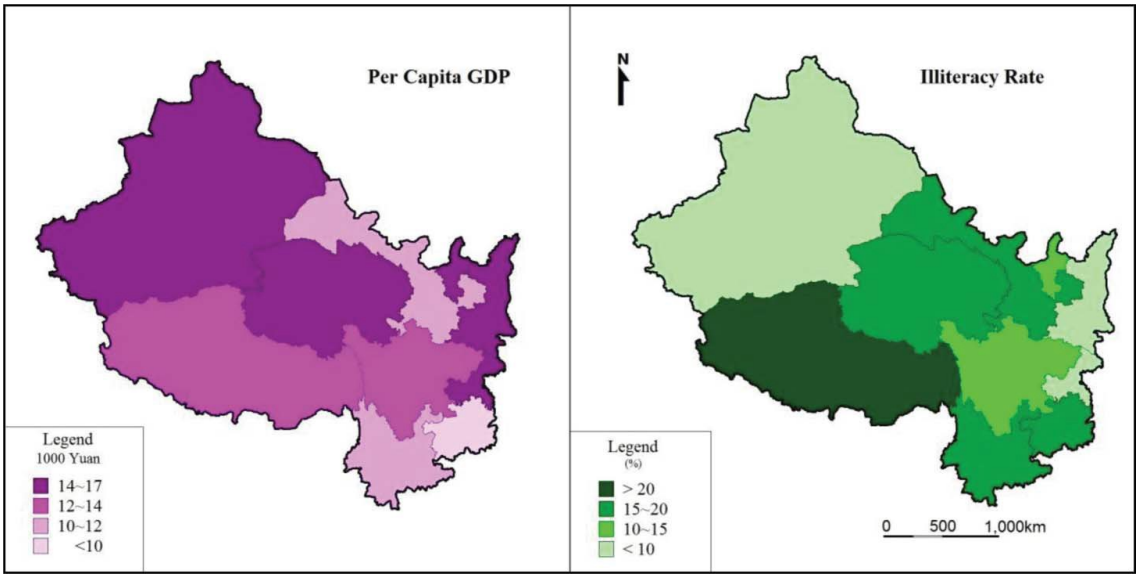
2.1.2.3. Urbanization in Western China

Since the economic reforms in 1978, rapid urban expansion has exacerbated geographic inequality in China. According to CNBS (2014), in 2013, the urbanization rate in Western China[12] was only 45.9% when compared to the national level of 53.7%. There are also disparities in urbanization among provinces in Western China. Anwaer *et al*., (2013) classified (shown in Map 2.1.) the provinces of Western China by their urbanization rates. Chongqing, Shaanxi, Ningxia, and Qinghai ranked the highest, with urbanization rates ranging from 40%-48%. They were followed by Sichuan and Xinjiang, which have urbanization rates ranging from 35%–40%, ranking as second highest. Gansu and Yunnan ranked third, while Guizhou and Tibet were the least urbanized provinces by 2008. The relatively low urbanization rate in Western China and the intra-regional urbanization disparities are particularly related to some socio-economic factors, such as the uneven economic development and relatively high rates of illiteracy (Map 2.2.) (Deng & Bai, 2014). However, to fill the gap between urban development in Western China and the rest of China, China initialized the China's Western Development Strategy which encouraged that development in Western Chinese cities should be prioritized in all social-economic sectors. Since 2000, the gaps between cities in Eastern and Western China now ceased to expand (Anwaer *et al*., 2013).

[12] Anwaer *et al*., (2013) adopted one of multiple regional division in which the Western China consists of the following provinces: Chongqing Shaanxi, Ningxia Qinghai, Sichuan, Xinjiang, Gansu Yunnan provinces, Guizhou, and Tibet, where Chinese ethnic minorities are concentrated. The regional division to Eastern, Central and Western China is based on both economic and territorial factors. The regional division of China's territory is discussed in later chapters.



Map 2.1. Provincial Urbanization Rate in Western China
Source: Anwaer & Cao, 2008



Map 2.2. Provincial Illiteracy Rates and GDP Per Capita in Western China
Source: Anwaer & Cao, 2008

2.2.3. Driving Forces in the Contemporary Chinese Urbanization Process

The driving forces of Chinese urbanization processes have varied over time since the socioeconomic context changed. A three-phase division of the contemporary history of China since 1949 has been widely adopted by scholars such as Han (2010), Kamal-Chaoui *et al*. (2009) and

Chen (2008), the phases of which consist of the pre-reform phase (1949-1978), the early post-reform phase[13] (1979-1996) and the transitional phase (1996-present).

2.1.3.1. The Pre-Reform Phase (1949-1978)

Before the economic reforms period beginning in 1978, China experienced a near-stagnant rate urbanization, with only a 0.2% annual growth rate in urbanization (Zhang *et al*., 2016). Within this phase, the first eight years (1949-1957) was a steadily growing period of China's urbanization, as it grew from 10.6% in 1949 to 15.4% (Yongnian & Tong, 2016). From 1957 to 1965, Chinese urbanization experienced a period of radical growth. Beginning in 1957, the initialization of the Great Leap Forward (*Dà Yuè Jìn*)[14] triggered a large-scale rural-to-urban government-led population mobilization to accelerate the impractical modernization in urbanization, during which many administrative areas were promoted to cities according to the influx of population (Gu *et al*., 2014; Peng, 1987). Through this radical campaign, the urbanization rate in China climaxed at 19% in 1960, as the number of cities rose from 176 in 1957 to 209 in 1961 (Han, 2010). Being burdened by radical urbanization, as well as the unrealistic attempt of rapid development during the great leap forward, the Chinese government decided to enforce the Hukou system to limit population migration, and eliminated a number of established cities (Mallee, 2000). Through a series of restricted orders, the number of cities was brought back from 209 in 1961 to 169 in 1965, and the urbanization rate stabilized at 18% (Chan, 1994). The outbreak of the Cultural Revolution (*Wén Huà Dà Gé Mìng*)[15] (1966-1976) marks the decade-long pause of urbanization in China. Known as "Ten Years of Chaos," turmoil rendered a nation-wide stagnation in urban development (Ebanks & Cheng, 1990). In summary, the driving forces in the Pre-Reform Phase were predominantly

[13] Also, referred as "The Revival Phase" (Han, p.48)

[14] "The Great Leap Forward was a new economic development strategy proposed by the Chinese government in 1958 that sought to meet the following objectives: grain and steel production would both be doubled within one year. However, the Chinese government underestimated the importance of capital and high technology to realize these objectives" (Han, 2010, p. 50).

[15] "The Cultural Revolution, which occurred from May 1966 to October 1976, was initiated and directed by Mao Zedong. This movement represents the continuation of the Maoist re-conquest of China" (Han, 2010, p.51)

political orders. The enforcement of the Hukou system successfully restricted population mobility.

2.1.3.2. The Revival Phase (1978-1996)

The economic reforms of 1978 facilitated the introduction of several new factors that greatly influenced the contemporary urbanization patterns in China. The first factor was a relaxation of restrictions imposed on rural-to-urban migrants[16], in addition to the control over the process of designating new cities. Rural laborers were required to fill a large labor gap of small industries established and owned by the county-level cities or towns, also known as Town and Village Enterprises (TVEs) (Han, 2010; Miao, 1998). Urban development between 1979 and 1996 was largely triggered by the growth of small cities and towns, which also helped TVEs prosper (Warner, 1996; Ding & Warner, 2001). According to CNBS (1983, 1991 and 1998), the number of cities in China increased from 193 in 1978 to 666 in 1996, along with a notable increase in the population within medium-sized and small cities (Zhao, 2001).

China's primary strategy on urbanization during this period switched to "controlling urban development in big cities, proposing moderate development in medium-sized cities, and encouraging development in small cities and towns" (Han, 2010, P.153). The effect of such policy change is shown in Table 1. The population growth in small cities (population of less than 0.2 million); accounted for 13% and 21.4% of the national urban population in 1980 and 1995, respectively; the increases of urban population in small cities is significant.

The second driving force of urban development during this period was the establishment of four Special Economic Zones[17] (SEZ), and the allowance of foreign investments. Realizing the advantage possessed by the coastal cities, in 1979, the first five SEZs were established as

[16] A large amount of rural labor surplus was a consequence of the Household Responsibility System (HRS) as a part of the economic reforms that was applicable to farmland, resulting in the obligation to produce productivity quotas for households, which enabled them to advertise surplus production of their own farmland instead of an aggregate representation (Han, 2010, P. 52).

[17] "During the economic reforms period, Special Economic Zones (SEZs) were implemented to operate as test zones for growth and development, as well as incentives like tax reduction or exemption to attract foreign investment and technological advancement. The early SEZ consists of Shenzhen, Zhuhai, Shantou, and Xiamen, with Hainan" (Zeng, 2010. P.223).

experimental sites for a free market economy and being an autonomous zone of receiving foreign investment (Cheng & Kwan, 2000). Encouraged by the success and of SEZs, more cities[18] were designated as market-oriented cities in which foreign investment was encouraged to build the free market. The SEZ policy initiated extensive construction of coastal economically reformed cities, consequently reviving urban development in China, a process that had arguably ceased since the 1960s (Kamal-Chaoui *et al*. 2009; Sun, 1992).

As concluded by scholars above, during the Revival Phase (1979-1996), the medium-sized, as well as the small cities, accounted for the majority of city growth. This was a result of both the relaxation of state control in multiple aspects, and the marketization that was encouraged by the economic reforms.

2.1.3.3. The Transitional Phase (1996-Present)

Since the mid-1990s, the Chinese government began to modify its urban development policy, shifting from an emphasis on the preferential treatment of smaller cities to a focus of development and enhancement of all city sizes. (Kamal-Chaoui *et al*. 2009). Coupled with economic gaps between rural and urban areas, this change in strategy precipitated a noteworthy temporary migration from the countryside to medium and large cities due to off-farm employment opportunities, making the transition to employment and the resulting population movement towards medium and large cities the main driving forces of Chinese urbanization (Ning, 1998; Ning, 2000).

Consequential to rural migration and the increase in city sizes, environmental degradation and obstacles from the level of institutions required further institutional reform. For example, the dual citizenship left by the current Hukou resulted, not only discriminated against rural-to-urban migrants' accessibility to social benefits, but also opportunities for employment (Songyan, 2004). Also, market-oriented public housing was overpriced, and the lack of low-rent housing reduced the

[18] 14 coastal cities (designated in 1984), and 13 border cities (designated in 2000) (Han, 2010).

accessibility of affordable housing to the public (Feng & Wu, 2015). In response to these problems and to achieve sustainable urbanization, the National New-Type Urbanization Plan was approved in March of 2014 and issued by the Central Committee of the Communist Party of China (CCCPC) and the State Council. For the first time, an official plan on Chinese urbanization had been designed and translated into a political goal (Ahlers, 2015).

2.2. Understanding the Ethnic Minority Experience in Contemporary China

China deals with ethnic issues according to the Marxist theory of creating unity by treating ethnicities equally. Unlike most countries around the world where being a member of a particular ethnic group is based on self-identification, the Chinese government assigns citizens' nationality (*Mín Zú*) by issuing official identity documents at birth (Maurer-Fazio & Hasmath, 2014). By 2015, China has officially designated 56 nationalities, among which, the Han Chinese comprise 91.92% of the entire population. Due to the large proportion of Han Chinese, the entire Non-Han Chinese population is officially and statistically considered as ethnic minority peoples or, ethnic Chinese (*Shǎo Shù Mín Zú* or *Mín Zú Rén Kǒu*).

2.2.1. Ethnic Identification in China

Due to China's socialist regime, Stalin's definition of nationality underpins the theoretical basis for defining and conducting scientific research on nationality (Liao, 2007). Stalin's four criteria[19]for nationality identity, rooted in Marxism and Leninism, was adopted by the People's Republic of China (PRC) to formalize the ethnicity status by issuing official designation on ethnicities (Wu, 1990). By the 1980s, the contemporary recognition of 56 Chinese ethnic minorities was finalized by continuously assessing minorities' social history, language, religion, and economic life (Liao, 2007).

[19] "common language, common territory, common economic life, and common psychological dispositions" (Wu, 1990, P. 15).

2.2.2. Ethnology in China since 1949

After the foundation of the People's Republic of China (PRC) and the regime of Soviet-Model socialism, the study on ethnicity in China was remodeled as the Soviet Ethnology, whose priority is to serve the state construction and national policy-making (Shengmin, 2009). During the Cold War era, until 1979, Chinese ethnology isolated itself from countries, with the exception of a few, which followed the socialist regime. After the economic reforms in 1978, academic communication with the western world was resumed. Later in the 1990s, challenged by the global-wide nationalism after the end of the Cold War, the level of the sophistication of ethnology in China had been greatly improved and communicated with another school of ethnology; in the 21st century, a school of Chinese Ethnology was formed (Yang, 2009).

Furthermore, since the economic reforms in 1978, the topic of Chinese Ethnology resumed in academia with western schools and was released from the constraints of ideology. Studies on Chinese minorities, conducted by domestic and foreign scholars flourished. At the beginning of the 21st century, as rapid urbanization increased from Chinese economic prosperity, more studies were conducted focusing on the reciprocal influence of urban minorities and the various social-economic issues that stem from the urbanization processes (Cao, 2010; Cao & Dehoorne, 2009; Yang, 2009).

2.2.3. Studies from National, Regional and City Scales

The national scale census data are frequently used to examine minorities from the perspective of urbanization. Early in 1987, Poston and Shu (1987), based on the 1984 census, conducted a systematic study of the demographic and socio-economic composition of 15 minorities in China. The study was completed with the perspective of the assimilationist theory and determined that 15 ethnic minorities vary in similarity to Han Chinese. While the Hui, Manchurian, and Mongolian ethnicities were much more similar to Han regarding social-economic characteristics, and were more integrated into Han society, the visible minorities or minorities concentrated in geographically remote areas, such as the Uyghur, Bai, and Yi were less similar to Han in various socio-economic aspects. The conclusion outlined by Poston and Shu (1987) indicated that by the

end of the 1980s, China's policy on ethnicity, which was to fulfill socio-economic advancement, has only been achieved amongst a few minorities. At the national scale, Zhang and Zeng (2005), by employing the census from 1990 and 2000, concluded that the Dongxiang Ethnicity had the lowest urbanization rate of 4.40%, while the Russian ethnicity had the highest rate of 81.40%; and the migration of the ethnic minority population in China is lower than the average of the Chinese population. Luo (2008) analyzed minorities' urban-rural distribution by adopting the spatial-temporal approach, based on the 1% population sample survey in 2005. Luo concluded that Hukou reform, marketization, and social-economic development increased the social mobility of minorities. Lu *et al.* (2007), based on the 2000 census, conducted a multidimensional study of minorities in Northeastern China based on six factors: ethnicity, regions, rural-urban, industries, jobs, and educations; and found a worrying gender imbalance among minorities. At the provincial scale, with the help of the 1990 and 2000 census, Li (2006) focused on the variation in minorities in Guizhou Province.

At the regional scale, different regional divisions have been imposed according to various criteria, such as the six-region division that divides China's territories as Northeastern, Northwestern, Northern, Southeastern, Southwestern, and Southern China, each of which is unique in the social-economic and natural-physical contexts. Gao and Liu (2005), focused on ethnic Chinese and their preservation of native language, inter-racial marriage and cultural traditions on urbanization in Northwestern China. Cao (2008), conducted a comprehensive research on spatial inequality in children's schooling in Gansu province, Northwestern China. Chen (2006), after researching minorities in Southwestern China, proposed considering the metropolitan, extra-large, and large cities as the nuclei in the promotion of minorities' urbanization. Zhang (2005) studied the consumption structure of minorities in Southwestern China and concluded that a higher Engel's coefficient[20] among minorities is a result of urbanization.

[20] Named after the statistician Ernst Engel (1821–1896), the Engel coefficient (also referred as Engel's law) indicates the proportion of household income spent on food, ranging from 0 to 1. Usually, it predicts that the proportion of income expenditure spent on food falls as income increases (Zimmerman, 1932).

Studies focused on the provincial scale (especially in ethnic autonomous regions), drew the attention of scholars by analyzing different aspects of minorities in an urban environment. Cao (2010), Remesh (2012), Wu & Song (2014), Zang (2011) and Zang (2010) focused on the Uyghur people in the Xinjiang Autonomous Region, China, and found that the market transition (from centrally planned to market-oriented), institutional transition (obstructing social egalitarianism), population migration, and the resulting ethnic preferences significantly affected the distribution of Uyghur people in cities. Remesh (2012) mentioned that the current urban demography in Xinjiang Autonomous Region was formed by governmental led mass migration of Han Chinese into Xinjiang in 1950s-1970s. During that time, the Han population from other regions settled in cities in Xinjiang in large numbers, permanently changing the local residential and occupational structure. Zang (2007) and Howell (2011) focused on the urban labor market segregation caused by the market transition in Xinjiang since the economic reforms in 1978, and revealed that the discrimination exists resulting from linguistic gaps (Uyghur language vs. predominant Mandarin spoken by Han Chinese) and lack of education in Uyghurs (in comparison to Han Chinese). They concluded that the labor market segregation would be reflected in the social-spatial structure of cities, hence affecting the patterns of urbanization. Cao (2010), after researching the role of the spatial distribution of ethnic groups while focusing on the Xinjiang Uyghur Autonomous Region in Western China, suggested that income disparities between rural and urban areas and the disparities between ethnic minorities and the Chinese Han majority are in an entanglement. Additionally, this is complicated by the differences in the social and cultural identity of Han and minorities, creating challenges for future urban development in ethnic minority regions. In the book, *Urban Anthropology in China*, written by Guldin and Southall (1993), research conducted in Beijing and Guangzhou focused on ethnic minority population revealed that ethnic minority communities in cities that formed before the 1990s were affected by both socioeconomic factors, and political-institutional factors.

2.2.4. Inclusions and Adaptations to Cities

The floating population[21] in Chinese cities, for example, has been triggered by the rural-urban gaps in social and economic well-being (Cao *et al.*, 2000). Like the Han Chinese, Chinese ethnic minorities joined the army of temporary urban residents for employment opportunities. In specific cities, such as Shanghai, where ethnic dwellers are more integrated, the ethnic minority population consists of diverse ethnic groups, but are comprised mainly of working-age people with secondary education; however, the occupation structures and the education level varies significantly through ethnicities (Sun *et al.*, 2008). A case study by Li (2006) that was conducted in Wuhan discovered that for minorities, economic, social and cultural psychology are three different levels of inclusion and adaptation to cities; and their success depends on three major factors: household registration status, ethnic background, and personal ability.

The ethnic minority floating population faces obstacles such as the uncertainty of their household registration status and related social welfare and customs, in addition to cultural and religious factors that complicate the ethnic labor market (Jiu *et al*., 2007). Regarding the occupation, income, marital status, and residential location, Jiu *et al.,* (2007) indicate that the temporary ethnic minority residents in Chengdu are mostly married and concentrated within the tertiary industry and labor-intensive business, have a lower educational level and subsequently lower income. The authors proposed that to settle the problems affecting the ethnic minority floating population, new regulations and policies such as guaranteed welfare, structural changes in industries, increased investment in the education of the ethnic population, and the education of the public to reduce discrimination and exclusion are paramount to a more inclusive urbanization process. With the perspective of urban multiculturalism, private sectors among minorities are important contributors. Business prosperity and multiculturalism in cities greatly improve inter and intra-national cohesion (Feng, 2005). In the city of Baise, Guangxi Province, ethnic integration has been increasingly

[21] Resulted from the massive internal migration in China, this terminology refers to the dwellers who migrated to cities without the local Hukou, or with temporary residence permit, and therefore excluded from the local social welfare system. The size of population now exceeds 160 million (CNBS, 2015).

promoted among local Zhuang ethnic and Han Chinese, both of which have benefited from economic prosperity and rapid urbanization.

2.2.5. Inter-Ethnic and Han-Ethnic Relationship

The inter-ethnic relationship and the relationship between Han and Ethnic China are important factors in Chinese urbanization. Since the economic reforms in 1978, the urban environment in China became increasingly multi-ethnic. Frequent incidents that violated minority's social-economic welfare and customs called for a well-tested and mature mechanism to deal with ethnic urban relationships. Lin (2009) conducted an ethnic relation study in Qingdao and Weihai and proposed to improve ethnic policies and regulation through, increasing the collaboration between institutions while also focusing on public education-related to national unity. The author then concluded that improvements at the institutional level, such as laws and regulations to ensure minorities' social-economic, cultural-religious welfare, are critical in maintaining healthy ethnic relations in cities.

Unlike the Han Chinese, most of whom are primarily atheists, many minorities in China are religious. The reciprocal influence of religions and urbanization processes drew the attention of scholars. In the less developed regions, such as Guangxi Province, the practice of religious activities is a contribution to local development, as the social networks of religion increase connectivity and population aggregation (Chen, 2006). In more developed regions, religions are suffering difficulties in adapting religious activities into a secular urban environment in where the atheist Han Chinese is predominant. Zhou and Yang (2008) studied Islam in Chinese cities and concluded that to integrate better religious minorities into cities, guidance from the institutional level is required, by which the cities should be more inclusive of religious minorities.

There is official bilingualism in Autonomous Regions such as Xinjiang, Xizang, and Neimenggu, where both Mandarin and the local ethnic language are used in an urban context. In Urumqi, the capital city of Xinjiang Autonomous Region, where the Uyghur population consists of a large proportion of the local population, the local Uyghur people revealed discontent while

completing a public survey, stating that the Uyghur language, both written and spoken, degraded considerably in the last three decades (Weiler, 2015). The Uyghur language degradation in Urumqi is not uncommon; upon a detailed examination of Uyghur young people and Uyghur students in Beijing, Wu (2007) confirmed that in modern Chinese urban environments where Mandarin is the predominant language, younger Uyghurs are becoming more and more bilingual while being less proficient in their native tongue.

2.3. Research Objective and Questions

As mentioned in the earlier chapters of the thesis, the research objective is motivated by the practicality of improving the urbanization rate among the minority population, as articulated in the National New-Type Urbanization Plan. Also, China's National New-Type Urbanization Plan is in alignment with the New Urban Agenda,[22] which aims to promote the inclusiveness and sustainability of the future urbanization process (Yang, Wu, & Gong, 2017). It can be expected that building cities that are equally inclusive for China's ethnic minority population will be prioritized. Thus, it is required to conduct a comprehensive and retrospective study of the evolution of spatial-temporal dynamics of the distribution of minority populations in China from an urbanization perspective, all important and useful information for scholars and practitioners in the field of urban development.

Secondly, the research objective is also motivated by inevitable gaps in the literature, in which a spatial-temporal analysis of ethnic minority distribution on a national scale within the context of urbanization was absent. Regarding the scope of the topic, the existing studies focus extensively on urbanization issues, ranging from the local to national levels with various perspectives. In the realm of spatial-temporal urban research, most studies focus on the physical morphology of one or a few specific cities, or on one ethnic group, or on the floating population, for example. Within the field of urban ethnic studies, there are many studies which focus on Chinese ethnic minorities with

[22] Proposed in the Habitat III conference that was held in Quito, Ecuador, between October 17-20, 2016. http://habitat3.org/wp-content/uploads/NUA-English.pdf

the urbanization perspectives, but the scale ranges from local to provincial.

Based on the current literature, it is evident that existing research focusing on the spatial-temporal dynamics of the ethnic minorities in the context of China's urbanization from the national level, which may exert significant reciprocal influence on sustainable urbanization in China, remains scant. Moreover, the use of census data from 1990, 2000, and 2010 will greatly enhance the capability of facilitating a better understanding of the reciprocal influence of the ethnic minority distributional trend and Chinese sustainable urbanization challenges. Therefore, the research objective is to ***understand the spatial-temporal patterns of ethnic minorities' distribution in the urbanization context of China from 1990 to 2010***. To fulfill this research objective, the following specific questions will be addressed:

1. How has the spatial-temporal dynamics of the Chinese ethnic minority population evolved in National and Regional Scales in the three different urban strategy contexts in the 1990s, 2000s, and 2010s?
2. At the city scale, how have the spatial-temporal distributional dynamics of the urban ethnic minority transformed over the three decades?
3. Stemming from the first and second questions, what new features of spatial-temporal distribution dynamics of the urban ethnic minority in China can be observed?

2.4. Conceptual Frameworks

The conceptual framework (Figure 1) suggests the logical basis of fulfilling the research objectives. There are three periods of focus (1990, 2000 and 2010) which will be explored chronologically, each representing the statistics drawn from the national census conducted in each respective year. Also, the three periods represent three distinctive transitional socio-economic contexts during which the national urbanization strategies were adopted. As Figure 2.1. demonstrates, there are three phases in this study that focus on the national, regional and city scales. Research at the national scale contextualizes the ethnic minority population and urbanization realm in China within the context of the spatially-temporal perspective. The regional scale study acts as

a transition between the national and city scales, suggesting a territorial division of Chinese territories as the Eastern, Central and Western China[23] (explained in section 3.1.2.2). Each of the regions possesses a distinctive social-economic context which is also a distinctive factor of the spatial-temporal distribution dynamics of the ethnic minority population and the urbanization. Research at the city scale takes a greater look at the spatial-temporal distribution dynamics of the ethnic minority population only in cities. The city-scale study was conducted in two parts: To begin, it was crucial to inherit the regional division as the primary scope and adopt the classification of seven national-level city agglomerations to understand the distinctive spatial-temporal distribution dynamics of the urban ethnic minorities in Eastern, Central, and Western China. Second, applying the Standard Deviational Ellipse (SDE) and based a three-tier urban administrative level system, the research examines in-depth the distinctive spatial-temporal distribution dynamics of the urban ethnic minorities in the administration context. This study argues for the necessity of integrating different institutional and economic reforms to help to understand the spatial-temporal dynamics of the urban ethnic minorities in China.

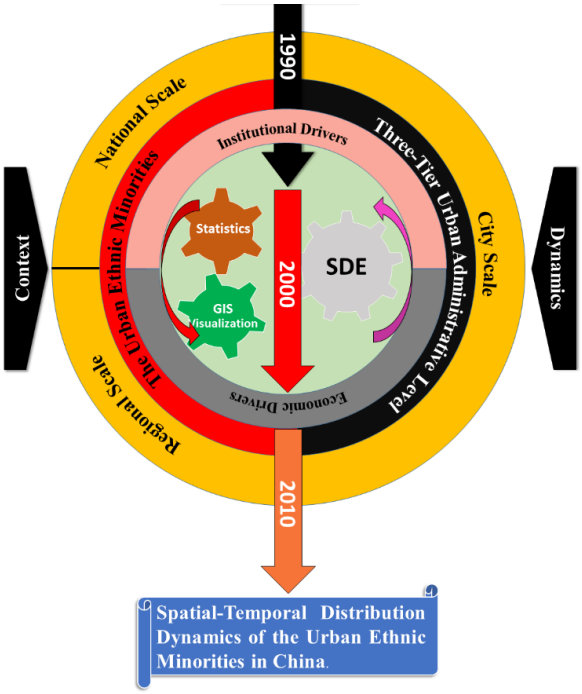


Figure 2.1. Conceptual Framework

[23] Later are referred as the Eastern, Central and Western Region (of China).

Chapter 3. Methodology

To answer the outlined research questions, this chapter presents the study dimensions and scopes, the study area and focused population selection rationale, as well as data sources and the required computational formulas. This chapter concludes with a systematic and detailed explanation of the primary method used, which is the standard deviational ellipse.

3.1. Studied Period, Areas and Ethnic Minority Population

3.1.1. Overview

Chovanec (2009) states that China is a mosaic of several distinct regions, each of which is characterized by diverse resources, dynamics, and historical characters. After the foundation of the People's Republic of China (PRC) in 1949, the territorial and the administrative divisions of contemporary China were formalized and remained stable with only a few adjustments. Today's China consists of 34 provincial-level administrative regions which include 23 provinces, four municipalities directly under the central government, five Autonomous Regions, and two Special Administrative Regions known as Hong Kong and Macau (Zhendong, 2005; Liu, 2006) (Map 3.1.). Nationally, the administrative division of China has had only one major change since 1990, which was the promotion of Chongqing into a municipality in 1997 (Li *et al*., 2010). However, Hongkong, Macao, and Taiwan are not included in the census and other national statistics; therefore, the territorial focus of this study is mainland China.

3.1.2. Study Period and Area

Following the completion of the 6th census in 2011, it has been two decades since 1990 during which rapid urbanization had a dramatic impact on the distribution of the ethnic minority population (Cao, 2010). Thus, this study focuses on two periods: 1) from 1990 to 2000, and 2) from 2000 to 2010. The studied area of this research is divided into multiple scales, each of which

represents a scope for better understanding the spatial-temporal dynamics of the urban ethnic population in China.

Map 3.1. Provincial Administrative Division of China

All China Data Center, 2010

3.1.2.1. National Scale

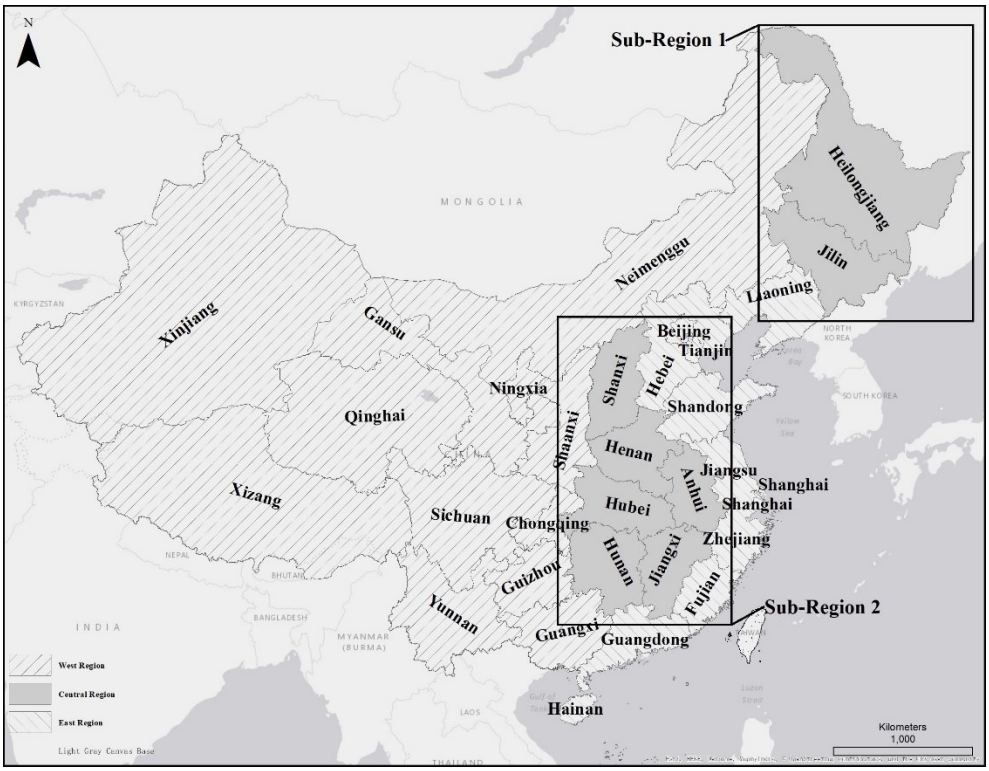
At this scale, all cities in China, regardless of their administrative levels, serve as the platform of urban China. This scale is designed to contextualize the urban ethnic minority population dynamics in China.

3.1.2.2. Regional Scale

This study categorizes the regional division of China's territories as the Eastern, Central[24], and

[24] As demonstrated in Map 3.2., the Central Region consists of two sub-regions. The first one (referred as sub-region 1) is located in Northeastern China, consisting two provinces, namely Jilin and Heilongjiang. The other sub-region (referred as sub-region 2) is located in the central part of China, consisting six provinces, namely Shanxi, Henan, Anhui, Hubei, Hunan and Jiangxi.

Western regions[25]. Each region is characterized by its respective social-economic contexts regarding resources, policy implementations, and ethnic minority distributions. These distinctions also suggest that there are differences in urbanization which translate into distinct urban minority experiences from region to region. There have been few changes to the regional division, such as designating Chongqing as the fourth municipality in China, its incorporation into the western region, and the integration of Inner Mongolia and Guangxi into the western region under the *China's Western Development Strategy* in 2000 (Qi *et al*., 2013). The current official division is depicted in Map 3.2.



Map 3.2. The Territorial Division in China[26]

Source: All China Data Center, 2010

[25] The Fourth Session of the Sixth National People's Congress introduced the division of China as East, Central and West (Goodman, 2013; Yang, 1990). The Eighth National People's Congress in 1997 made further adjustments to the division, reclassifying the formerly Central province Neimenggu and Guangxi as provinces in West China (Lai, 2002).

[26] The **Eastern region** includes Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, and Hainan. The **Central region** includes Shanxi, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, and Hunan. The **Western region** includes Sichuan, Chongqing, Guizhou, Yunnan, Xizang, Shaanxi, Gansu, Qinghai, Ningxia, Xinjiang, Guangxi and Inner Mongolia (Neimenggu).

3.1.2.3. City Scale

Each city in China is somewhat unique when considering the urban ethnic minority context, as cities hold different socio-economic conditions from one another; and the Chinese administrative level is essential in setting these conditions. Since the foundation of the PRC in 1949, a nested administrative hierarchical system was set up by the central government in achieving the management of the country, and has experienced little change since economic reforms in 1978 (Oksenberg, 2001). In such a framework, the institutional power, authority, and resources are distributed, maintained, and regulated at different levels by top-down executive orders (Chung, 2007). Cities, too, are differentiated by organizational hierarchy based on possessing varying levels of power, such as political and economic strength, and population size. Hereafter in this study, the administrative hierarchy of Chinese cities will be referred to as an administrative level. As shown in Table 3.1., the city administrative level system includes the following four levels, with the first of which maintaining the highest level of socioeconomic and political influence, and, logically, the last possessing that of the lowest:

Table 3.1. The Official Administrative Level of Chinese Cities

<table>
<tr><th colspan="2">Governmental Administrative Level</th></tr>
<tr><td colspan="2">Municipality (MP)</td></tr>
<tr><td>Sub-Provincial (SP)</td><td rowspan="2">Provincial Capitals (PC)</td></tr>
<tr><td>Prefecture-Level (PL)</td></tr>
<tr><td colspan="2">County-Level (CL)</td></tr>
</table>

Source: CNBS, 1991, 2001 and 2011

1) **Municipalities** (*Zhí Xiá Shì*): the highest city level of administration in China. A municipality is a provincial-equivalent city under the direct control of the central government (Smyth & Qian, 2008). There are four municipalities in China: Beijing, Tianjin, Shanghai, Chongqing. Each district in a municipality is equivalent to a county in the census.

2) **Sub-Provincial** Cities (*Fù Shěng Jí Chéng shì*): the second highest level of city in China. Most of the Sub-Provincial Level cities are the capitals of their respective provinces (Shen, 2007).

The designation of the Sub-Provincial Level cities was a decision made by the Central Organization Committee in February of 1994, which promoted 16 Prefecture-Level municipalities to the newly created Sub-Provincial-Level municipalities (Zheng, Wang & Li, 2007). Shortly after, in 1997, Chongqing, which was then one of the 16 Sub-Provincial-Level municipalities, was promoted into the fourth Municipality in China, leaving the current number of Sub-Provincial-Level municipality at 15 (Qin, 2010).

3) **Prefecture-Level** Cities (*Dì Jí Shì*): it is lower than a province but higher than a county in China's administrative hierarchical system. The classic concept of prefectural-level city technically includes all capital cities of a province or provincial-level regions (Song & Zhang, 2002). There are 15 prefectural-level cities whose social-economic status is superior, and have been promoted into the sub-provincial city (Shen, 2007). Since most of the prefectural-level cities were renamed from and promoted from the prefectures in the 1980s, county-level cities, and counties were merged into one unified jurisdiction, along with the main central urban area. For a prefecture-level city, only the sub-division named "District, *Shì Qū*," is considered as an urban area, and is also equivalent to a county in the census (Yu, Zhang & Luo, 2010; Mertha, 2005).

4) **County-Level** Cities (*Xiàn Jí Shì*): This is the lowest municipal administrative level and usually lies in the jurisdiction of prefecture-level divisions, though there exist cases in which the county-level cities are under the direct control of the province (Landry, 2008). Similar to the Prefectural-Level cities, County-level cities consist of cities in the strictest sense of the word and the surrounding large administrative units containing towns and villages (Yu, Zhang & Luo, 2010; Mertha, 2005). Only the area named after "District, *Shì Qū*" is regarded as an urban area in the Census.

It is worth noting that among the 27 **Provincial Capitals** (*Shěng Huì Chéng Shì*) in mainland China, 10 are sub-provincial cities while the rest are institutionally regarded as prefecture-level. As being the central metropolis of a province or an autonomous region, provincial capitals are usually much superior to most of the prefecture-level cities when considering variables such as population

and economic power. Therefore, the current city hierarchical system does not reflect the important roles of the provincial capitals as they are divided and classified into sub-provincial and prefecture-level. Additionally, many scholars, such as Chen & Partridge (2013), Wu & Treiman (2004), reclassified the provincial capitals as a level above the prefecture.

In order to simplify the analysis, this study modifies the current city hierarchical system by extracting the provincial capitals from the prefecture level, regrouping them alongside the level of Municipalities, and Sub-Provincial level cities; this new group is designated as Cities Higher than Prefecture Level (**HP**). Therefore, the new city hierarchical system proposed for this study will be 1) Cities Higher than Prefecture Level (**HP**), 2) Prefecture-Level Cities (**PL**), and 3) County-Level Cities (**CL**) (Table 3.2.).

Table 3.2. Reclassification of City Administrative Level

Governmental Administrative Level	Regrouped Administrative Level	Quantity of City		
		1990	2000	2010
MP	**HP**	30	36	36
SP				
PC				
PL	**PL**	154	227	250
CL	**CL**	266	405	368
		Total Quantity		
		450	667	654

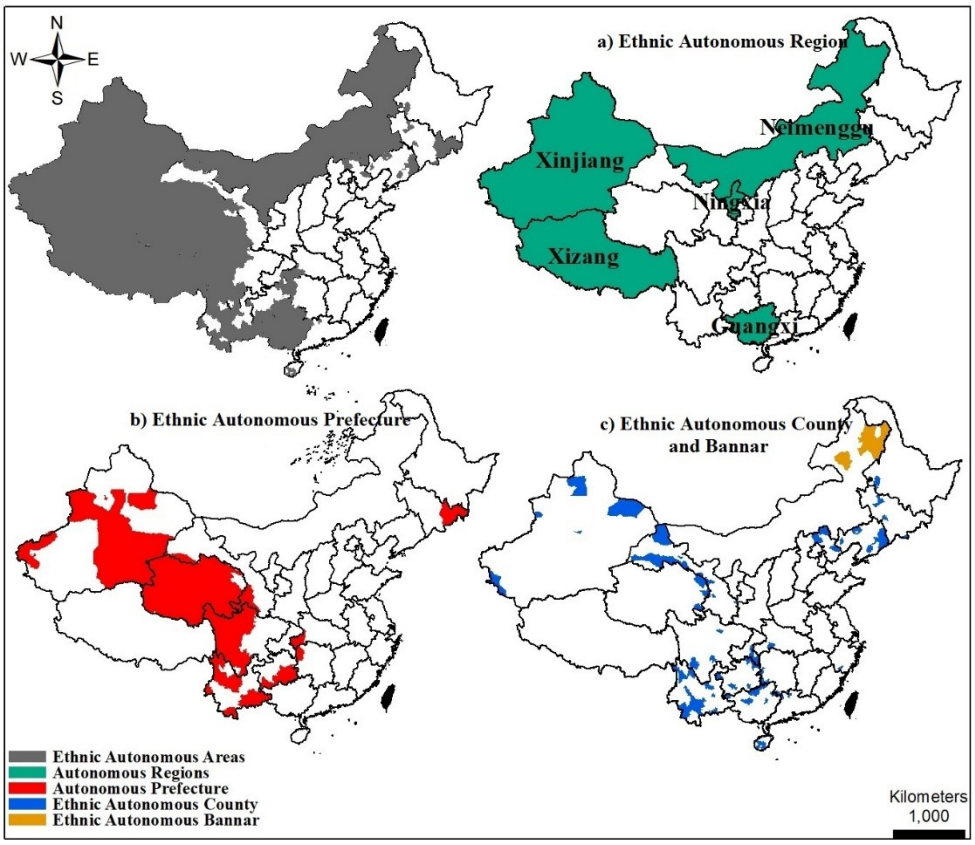
Source: CNBS, 1991, 2001 and 2011

3.1.2.4. Ethnic Autonomous Areas

Though the ethnic minority population is much smaller in size, in many places, it constitutes a large portion of the local population. Ethnic Autonomous Areas were set up to facilitate the self-governance of ethnic minorities, as per the Law on Regional Ethnic Autonomy[27] (REA) (Xia, 2009). Such areas are composed of three administrative levels (Map 3.3.), which are: 1) Ethnic Autonomous Regions (Provincial Level) (Map 3.3. a), 2) Autonomous Prefectures (Prefecture-City

[27] "The Law on Regional Ethnic Autonomy (LREA) claims that it fully respects and guarantees the right of minority ethnic groups to administer their internal affairs and adherence to the principle of equality, unity and common prosperity for all Minzu in China" (Xia, 2009, P. 542).

Level) (Map 3.3. b), 3) Autonomous Counties, and Autonomous Banners (County Level) (Map 3.3. c). Autonomous areas in China consist of 64% of China's national territory, and its coverage largely overlaps with the Western Region. However, when looking at the population, the autonomous areas consists of only 13.8 % (1,88.5 million) of the total national population, but also includes 77.5% (88.14 million) of the nation's total ethnic minority population (CNBS 2010).



Map 3.3. Ethnic Autonomous Areas from all Levels in China
Source: CNBS 1991, 2001 and 2011; All China Data Center, 2010

The autonomous areas' highest administrative level is the autonomous regions[28]. There are five autonomous regions in China, which consist of the Xinjiang Uyghur Autonomous Region, the Xizang Autonomous Region, the Ningxia Hui Autonomous Region, the Neimenggu Autonomous Region, and the Guangxi Zhuang Autonomous Region. The intermediate level of the autonomous

[28] An Autonomous Region in China is equivalent to a province.

area is the autonomous prefecture, and there are autonomous prefectures located in non-autonomous provinces. For example, in Qinghai Province, nearly the entire province consists of an autonomous prefecture, with the exception of its provincial capital, the city of Xining. The bottom level of autonomous areas is designated in two forms: 1) Autonomous Counties, and 2) The Autonomous Banners, which are equivalent to counties at the administrative level.

3.1.3. Defining the Urban Ethnic Minority

In comparison with the Han Chinese, who make up nearly 91.5% of the total Chinese population, minorities consist of 55 different ethnic groups (*Shǎo Shù Mín Zú*), which comprises 8.5% (114 million) of the Chinese total population (CNBS, 2015). Unlike other government jurisdictions, where ethnic group membership is based on self-identification, the Chinese government assigns citizens' nationality (*Mín Zú*) by issuing official identity documents at a citizen's birth (Maurer-Fazio & Hasmath, 2015). The contemporary recognition and classification of Chinese ethnic minorities are based on an assessment of minorities' social history, language, religion, and economic life. For simplicity reasons in this study, all non-Han Chinese, regardless of their nationalities, were understood to be ethnic minorities which reside in cities and were therefore considered as the urban ethnic minority population.

3.2. Data Resource

Since 1949, a total of six censuses have been conducted. Since 1990, the census is scheduled to be conducted once every ten years. The latest census (the 6th census)[29] was undertaken in 2010, the result of which was published in 2011. This study utilized data from the 4th, 5th and 6th census as the primary data source for the ethnic population by cities. The city statistical yearbook of China from each year are also adopted to track changes in the number of cities, jurisdictions and administrative levels. For the spatial analysis of data, this study uses County-Level Geographic

[29] The 1st census was conducted in 1953, the 2nd in 1964; the 3rd in 1982; the 4th, 5th, and 6th were conducted in 1990, 2000 and 2010 accordingly.

Units from 2000, and 2010, produced by the All-China Data Center[30], University of Michigan, based on the information provided by China's National Bureau of Statistics.

3.2.1. Selection of Variables

As can be observed in Table 3.3., four population-related variables are selected from the census to determine the national ethnic minority population and that of its cities. Three variables are retrieved from the City Statistical Year Book to track the changes among cities' administrative level, quantity, and jurisdictions.

Table 3.3. Selection of Variables

	Variable	1990	2000	2010
Ethnic Minority Population[31]	National Total Population	√	√	√
	National Han Population	√	√	√
	Total Population by County/District[32]	√	√	√
	Han Population by County/District	√	√	√
Cities in China	Administrative Level	√	√	√
	Jurisdiction Name	√	√	√
	Quantity of City	√	√	√
	Spatial Analysis Data			
	County-Level Geographic Units[33]	√	√	√

√" means the availability of the variable in this period.

3.2.2. Challenges and Limitations

In preparing for this study, there was limited access to certain levels of data and limitations of the census itself which are necessarily reflected in the study analysis.

3.2.2.1. Different Ways of Conducting a Census

Although the Chinese census provides the total population data for different geographic levels,

[30] www.chinadatalonline.org

[31] As the non-Han population is considered an ethnic minority, it is calculated by subtracting the Han population from the total population as $Mn\_Pop = Total\_Pop - Han\_Pop$.

[32] The basic geographical unit in according to the census is the county. The county-level units in China include counties, county-level cities, and county-equivalent districts in cities.

[33] The polygons of 1990 geographic units are extrapolated from 2000 polygons according to the administrative and jurisdictional changes outlined in the City Statistical Year Book of China 1990 and 2000.

population by ethnic minority groups for such levels is challenging to derive. The most detailed national census data available without special permission was conducted at the county-level geographic scale. For prefecture-level cities and those of higher levels, the census was conducted in county-level urban districts, county-level cities, and counties in jurisdictions. Therefore, the urban population of prefecture-level cities and cities of higher levels can only be understood by adding the populations of urban districts. However, the population of county-level cities represents the sum of populations in urban areas, towns, and rural villages, lying within their jurisdictions.

3.2.2.2. Evolving Administrative Divisions and Classification

Administrative divisions and levels experienced rapid change since the 1990s, resulting in discrepancies between the annual City Statistical Yearbooks of China and Census datasets. The total number of cities recorded and their administrative levels changed over a relatively short period. For example, the 5th National Census of China was initialized on November 1st, 2000 and required several months to complete, while the 2000 City Statistical Yearbook was compiled based on 1999 statistics. To avoid possible errors caused by the different times of completion, this study will exclusively use the jurisdictions and city classifications documented in the national census.

3.2.2.3. The Extensive Number of Administrative Units

According to the Chinese National Bureau of Statistics (CNBS 1990, 2000, and 2010), there were 2867 basic geographical units in China in 2010 including, 860 urban districts in cities at the prefecture level or above, 368 county-level cities and 1632 counties or autonomous banners (county-equivalent ethnic autonomous unit). In 2000 there were 2867 basic geographical units in China, including 787 urban districts in cities at the prefecture level or above, 405 county-level cities, and 1675 counties or autonomous banners. In 1990 there were 2805 basic geographical units in China, including 636 urban districts in cities at the prefecture level or above, 266 county-level cities, and 1897 counties or autonomous banners. As demonstrated above, the number of urban districts and county-level cities varies notably between 1990 to 2000, but the total number of basic

geographical units during this time remains relatively unchanged, with a mere increase of 62 units.

3.2.2.4. The Debate Over the Chinese Urbanization Rate and Urban Population

According to the China National Bureau of Statistics (CNBS), the official urbanization rate of China was calculated as follows: population in cities and towns (regardless of agricultural and non-agricultural Hukou) divided by the national population.

The urban population refers to people residing in cities and towns. This study, due to the difficulties in retrieving both demographic data and spatial data of minorities in China, focuses on cities across different levels. Towns, however, in which the population is counted as urban, are excluded from analysis as related data is not available.

There is one change concerning sampling that needs to be explained more thoroughly. Since 2009, when calculating the urban population, the City Statistic Year Book of China no longer distinguishes urban residence from an individual's household registration status, which is a large caveat when attempting to distinguish urban and rural residents simply by identifying the household registration status[34]. Therefore, a two-fold method was used to calculate the urban population in cities at different levels. First, the urban population in Chinese cities at the prefecture level and above is defined as the sum of its urban districts (*市区总人口 Shì Qū Zǒng Rén Kǒu*). Each urban district is county equivalent and has its census differentiated by ethnic groups. For cities from this level, the total population in municipal jurisdiction areas *(全市总人口 Quán Shì Zǒng Rén Kǒu)* is not adopted as it takes into account all citizens who are currently residing in a city's jurisdiction. Usually, there are multiple counties in which the populations mainly consist of rural dwellers within prefecture-level cities and above. Using the total population in urban district areas only measures the population that resides in the urban districts by the end of the year,

[34] For a long period, only the population whose household registration status is non-agricultural *非农户口* were considered legitimate urban dwellers and were taken into account as urban population in census. However, as urbanization increased, the proportion of the urban population with agricultural household registration status *农业户口* also increased. Also, since 2009, the census stopped differentiating the non-agricultural/agricultural household registration status by ethnic groups. As such, using the population of current dwellers regardless of household registration status as urban population is necessary.

regardless of household registration status. Second, in county-level cities, the census does not distinguish the urban area from the jurisdiction, therefore denoting all citizens residing within the city as part of the urban population.

3.3. Analysis Methods

Neither maps nor statistics alone would be sufficient in measuring the spatial characteristics of minorities in Chinese cities. This section briefly outlines an approach that integrates both maps and statistics with the method of Standard Deviational Ellipse (SDE).

3.3.1. Standard Deviational Ellipse and GIS Visualization

The Standard Deviational Ellipses method was initially proposed by Lefever (1926) and is therefore sometimes referred to as Lefever's SDE. As a centrographic technique, the output of SDE is pictured by the locus of the X coordinate's standard deviation of a set of geographic units as they rotate around the mean area center in a Cartesian coordinate system (Gong, 2002). Furfey (1927) questioned whether the shape was truly an ellipse, but there has been a long-standing consensus that the SDE is a powerful application in two-dimensional spatial analysis of a set of locations when the orientation and shape of the distribution are highly sought after. Yuill (1971) stated that by the 1970s, the SDE was rarely used by geographers as it requires significant computational power that was not widely available until later years. Following progress in GIS technology and the popularization of personal computers, the SDE became a versatile GIS tool to plot the spatial distributional trend of any set of geographic locations. As a spatial-analytical GIS software, ArcGIS 10.5 incorporates the spatial and statistical data with automatic results visualization. Such an advantage aids in the mapping of SDE results as well as the other variations in minority populations retrieved from the census data used to support the analysis. This study uses this automated SDE tool in ArcGIS 10.5 (a typical result is shown in Figure 3.1.) as this research aims to understand the pattern of spatial-temporal distribution among urban minority populations in China.

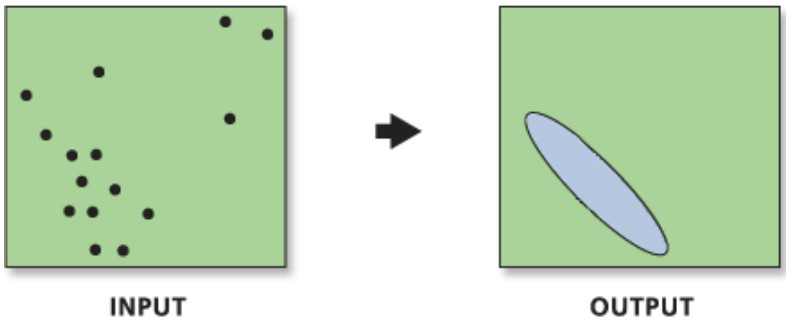


Figure 3.1. A Typical Result of SED Tool in ArcGIS
Source: ESRI, 2010

To meet this research objective, the following indexes from the SDE results are employed and demonstrated in the following paragraphs: the center of gravity, orientation, shapes of the ellipse, and coverage size.

3.3.1.1. Formula of Center of Gravity (CG)

Prior to obtaining the CG, the area mean center of a certain set of geographic units must be determined. According to ESRI ArcGIS Help (2012), the area mean center of the SDE is drawn through the following formula labeled as Eq.1, where x_i and y_i, representing the coordination of the geographic feature i (for the purposes of this paper, the geographic feature will be observed as the geographic position of city i), while the $\bar{x}$ and $\bar{y}$ represent the mean center of the geographic feature of i, then the SDEx and SDEy are the coordination of the area mean center.

$$\mathbf{DE}x = \sqrt{\frac{\sum_{i=1}^{n}(x_i-\bar{x})^2}{n}} \quad \mathbf{SDE}y = \sqrt{\frac{\sum_{i=1}^{n}(y_i-\bar{y})^2}{n}} \quad \textbf{(Eq.1)}$$

Source: Esri, 2010

However, as Eq.1 above demonstrates, the coordination of the geographic feature (in this study will be the position of each city) is not sufficient to understand the distribution patterns of urban minorities. The CG of urban minority population distribution must rely on the minority population within cities. In his publication titled *The Standard Deviational Ellipse; An Updated Tool for Spatial Description,* Yuill (1971) suggests using a weighted value to redefine the weighted mean center of a geographic unit, which therefore redefines SDE results via Eq.1. The computational

formula of using a weighted value is defined in Eq.2 where wi represents the value in absolute number measured at ith location. The CG could then be calculated as the new coordination of the area mean center in Eq.1 using the new weighted mean center $\bar{x}$, $\bar{y}$.

$$\bar{x}=\frac{\sum_{i=1}^{n} xiwi}{\sum_{i=1}^{n} wi} \quad \bar{y}=\frac{\sum_{i=1}^{n} yiwi}{\sum_{i=1}^{n} wi} \quad \textbf{(Eq.2)}$$

Source: Yuill, 1971

For the difference between simply using the coordination of the geographic unit and using weighted value, Yuill (1971) gives a great example in his article shown in Figure 3.2. The left quadrant depicts the real distributional trend of hay-producing farms in a hypothetical region while the figure on the right is the distributional pattern of the same farms but weighted by the hay production yield. The same farms where the size of a rectangle is equal to hay production yield has a SDE that is very different from the one with only dot-represented locations in shape and orientation. The new area mean center of the ellipse on the right is the CG of hay production distribution. It can be ascertained that, in this research, using the minority population by the city as a weighted value is feasible and legitimate.

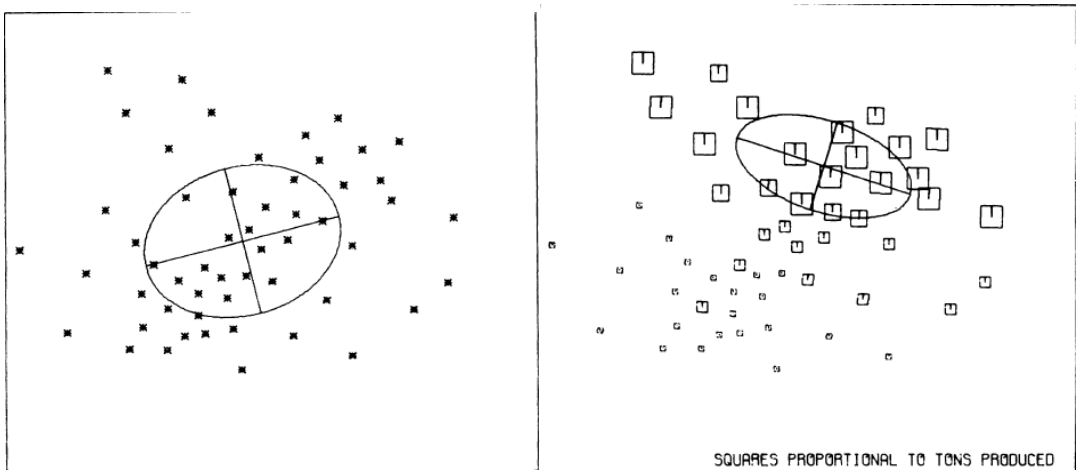


Figure 3.2. How Does the Weighted Value Affect the SDE

Source: Yuill, 1971

3.3.1.2. The Orientation of the Ellipse

The orientation of the SDE measure in azimuth angle (0°at 12 o'clock) in ArcGIS, is given by

Eq.3, where $\tilde{x}i$ & $\tilde{y}i$ represents the deviation of the X-Y coordinate from the means center, and xi yi, as those in Eq.1, are the coordination of geographic unit i.

$$\tan\theta = \frac{a+b}{c}$$

$$\mathbf{a} = \left(\sum_{i=1}^{n}\tilde{\bar{x}}_i^2 - \sum_{i=1}^{n}\tilde{\bar{y}}_i^2\right) \boldsymbol{b} = \sqrt{\left(\sum_{i=1}^{n}\tilde{\bar{x}}_i^2 - \sum_{i=1}^{n}\tilde{\bar{y}}_i^2\right)^2 + 4\left(\sum_{i=1}^{n}\tilde{x}i\tilde{y}i\right)^2} \boldsymbol{c} = 2\sum_{i=1}^{n}\tilde{x}i\tilde{y}i \quad \textbf{(Eq.3)}$$

Source: Esri 2010

3.3.1.3. The Shape and Elongation of Ellipse

The elongation of the SDE along the X and Y axis is another key feature of the SDE that determines the form of the SDE. The standard deviation of the X axis and Y axis is defined as Eq.4, where θ represents the azimuth angle resulted by Eq.3 above.

$$\boldsymbol{\sigma x} = \sqrt{2}\sqrt{\frac{\sum_{i=1}^{n}(\tilde{x}i\cos\theta - \tilde{y}\sin\theta)^2}{n}} \quad \boldsymbol{\sigma y} = \sqrt{2}\sqrt{\frac{\sum_{i=1}^{n}(\tilde{x}i\sin\theta - \tilde{y}\cos\theta)^2}{n}} \quad \textbf{(Eq.4)}$$

Source: Esri, 2010

3.3.1.4. The Area Size of the Ellipse

Having the equation of ellipse's area $A = \pi ab$, where *a* represents the X and *b* for the Y axis, the area size of the ellipse will be easily calculable.

Chapter 4. Dynamics of Urban Ethnic Minorities Distribution in China

This chapter will begin with an overview of the ethno-regional context in China, then explores how cities in China have been changed when considering the perspective of the urban minorities in three administrative levels, as well as three regions. This analysis will then follow a section exploring cities according to the variation of the ethnic minority population. The final section will adopt the Standard Deviational Ellipse (SDE) to examine the urban minority population distribution dynamics amongst cities.

4.1. An Overview of the Ethno-Regional Context in China

4.1.1. Demographic Changes to Minorities in Urban China

From a demographics perspective, the ethnic minority population experienced a steady growth of the total national population. As shown in Figure 4.1., unleashed by the economic reforms in 1978, the ethnic minority population was 67.2 million and only consisted of 6.7% of the total national population. In 1990, the ethnic minority population increased to 91.2 million and represented 8% of the total population. Since 2000, the ethnic minority population reached 106.4 million and then increased to 113.8 million in 2010, representing 8.4% and 8.5% of the total population respectively. In 2015, when the one-percent population sampling survey was conducted,

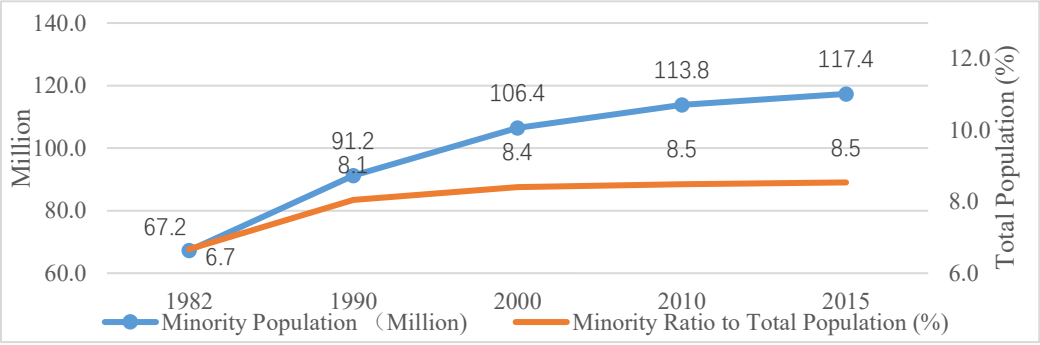


Figure 4.1. National Ethnic Minority Population

Source: CNBS 1991, 2001 and 2011

the ethnic minority population was estimated to reach 117.3 million, which comprised 8.5 % of the national population (CNBS 1983-2015).

Although the ethnic minority population kept increasing notably during the last 35 years, from the perspective of urbanization, the urban minority population did not increase proportionally. Demonstrated in Figure 4-2, in the 1990 census, the urban minority population was 14.9 million. When comparing this with the total ethnic minority population by that year, the ethnic minority urbanization rate in 1990 was 16.4%. In the 2000 census, the urban minorities increased to 24.9 million, with its urbanization rate increasing respectively to 23.4%; this demonstrates an increase by 43%. The 2010 census reveals that there was 37.3 out of 113.8 million ethnic minorities population living in cities and towns (CNBS, 2011). When compared to those in 1990 (14.9%) and 2000 (24.9%), the urbanization rate of the ethnic minorities in 2010 increased to 32.8%. Respectively, the national urbanization rates were 26.4%, in 1990, 36.2% in 2000, and 49.9% in 2010; all were higher than that of the ethnic minority population in 1990, 2000 and 2010 respectively.

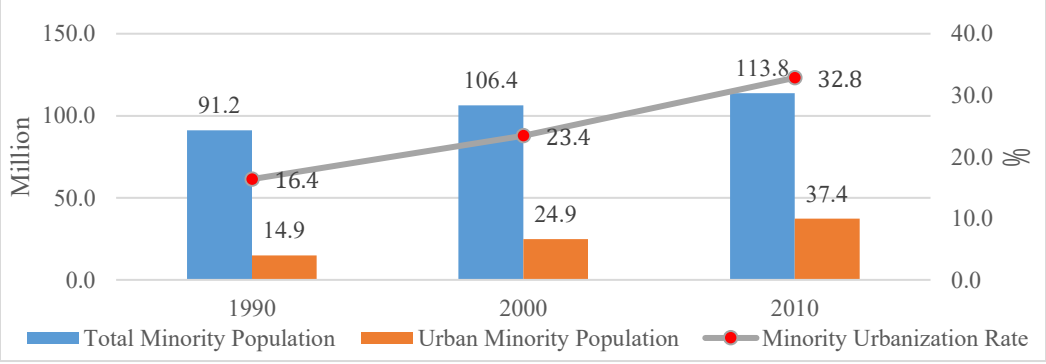


Figure 4.2. National Ethnic Minority Population and Urbanization Rate
Source: CNBS 1991, 2001 and 2011

The ethnic minority urbanization rate in each year, though being lower than that of the national average level during these periods, however, grew faster than that of the national population. From 1990 to 2000, the ethnic minority population urbanization rate increased by 42.9%, while the national urbanization rate grew by 37.1%. From 2000 to 2010, the urbanization rate amongst the

ethnic minorities rose by 40.3%, while the national urbanization rate increased by 37%. These statistics show that higher ethnic minority urbanization rates in these two decades have been reducing the gap between the national and ethnic minority population urbanization rates.

4.2. Minority Urbanization in Cities

Since the economic reforms of 1978, the urbanization process took off, accelerating even further in the 1990s; therefore, as urban China changed, the distribution of ethnic urban dwellers was redefined accordingly (Chen *et al*., 2017).

4.2.1. Chinese Cities in Transition since 1990

According to the National Development and Reform Commission (NDRC), the changes to cities in China occurred in three ways, first through the establishment of new cities. Second, in addition to the increase in the quantity of cities through city establishment, the lower-level cities merged into the jurisdiction of a city from a higher administrative level. For example, a county-level city from 1990 merged into a neighboring prefecture-level city to become an urban district (equivalent to a county in the city administrative system in China). The third way is by changing the position in the administrative hierarchical system[35]. As the socio-economic context of a city evolves, its level of administration may change. Specifically, referring back to Chapter 3, the administrative level of a city could be promoted from that of a county-level city to a prefecture-level city, or a prefecture-level city reclassified as a higher than prefecture level city. These transformations among the administrative levels are a result of the improvement of socio-economical changes within the affected regions.

4.2.2. Reviewing City Change in the Ethno-Regional Context

From the perspective of ethnic minorities, the variation in the quantity of Chinese cities between 1990 and 2010 was examined based on changes to cities in China, which occurred in three

[35] Please refer to the Chapter 3 Methodology 3.1.2.3.

ways as outlined above.

4.2.2.1. The Establishment of New Cities

As demonstrated in Table 4.1. and Map 4.1., the establishment of new cities climaxed between 1990 and 2000, and a total number of 230 new cities were established throughout China during this decade.

Table 4.1. New Established Cities[36]

	1990-2000						2000-2010					
Total Numbers	230						16					
Regions	E:122		C: 62		W:46		E:0		C:0		W: 16	
Administrative Levels	PL:18			CL:212			PL:12			CL:4		
	E:6	C:6	W:6	E:116	C:56	W:40	E:0	C:0	W:12	E:0	C:0	W:4
In Autonomous	PL:2			CL:19			PL:8			CL:4		

Source: CNBS 1991, 2001 and 2011
Note: E=Eastern Region; C=Central Region; W=Western Region; PL=Prefecture-Level Cities; CL=County-Level Cities.

Considering the newly established cities, they contributed 24% (6 million) to the total urban ethnic minority population in 2000. At the regional level between 1990 and 2000, among the new cities, 53% (122) were in the eastern region, 27% (62) were in the central region, and 20% (46) were in the western region (Map 4.1. A1.). When considering the urban ethnic minorities, the eastern region received the majority of new cities and contributed 38% (2.3 out of 6 million) to the urban minority growth from 1990 to 2000. The central region experienced half as much of the new cities as the eastern region, however, only contributing 11.7% (0.7 million) to the urban ethnic minority population growth. When considering the western region, while it experienced a growth of one-third the new cities in the country's eastern region, it only contributed 50% (3 million) of the urban ethnic minority population growth by the year 2000, due to the preponderance of the ethnic minority population in the western region. Also, from 1990 to 2000, the emergence of 21 cities located in autonomous areas[37] accounted for 9.1% of the overall newly established cities, among

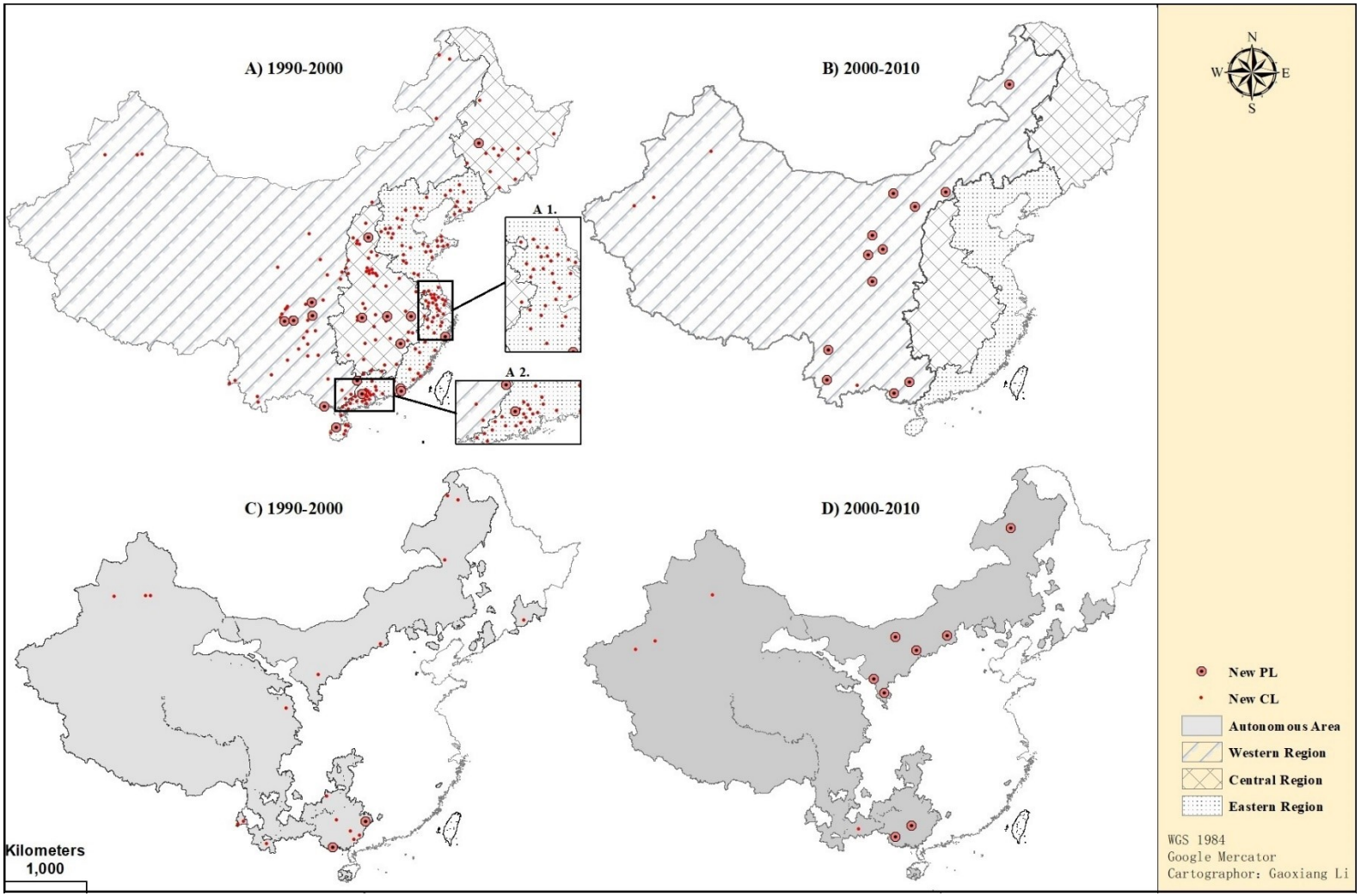
[36] Please refer to the Appendix 1 for the list of new established cities.
[37] Referring back to Chapter 3, the autonomous areas largely overlaps with the western region by geographic coverage.

which two and 19 are prefecture-level cities and county-level cities, respectively (Map 4.1. C.); those 21 cities consist of 43% (2.6 of 6 million) of the growth of the urban ethnic population contributed by the establishment of new cities.

Among the 230 new cities, from 1990 to 2000, the composition of the city administrative levels comprised approximately 8% (18) prefecture-level cities and 92% (212) county-level cities. From 2000 to 2010, among the 16 newly-established cities, 25% (4) were prefecture-level cities and 75% (12) were county-level cities. More precisely, from 1990 to 2000, the 18 newly-emerged prefecture-level cities were evenly distributed throughout China, with six of them in each region. The regional distribution of the newly-emerged 212 county-level cities resembles the level of development of each region: 54.7% (116) in the eastern region, 26.4% (56) in the central region, and 18.8% (40) in the western region (Map 4.1. A.).

From 2000 to 2010, the establishment of new cities was reduced to only 18, and occurred exclusively in the western region, contributing 4.8% (1.8 million) of the total urban ethnic minority population by 2000 (Map 4.1. B.). 75% (12) of the cities were located in ethnic autonomous areas, contributing 89% (1.6 out of 1.8 million) of the growth of the urban ethnic population (Map 4.1. D.). There were eight newly-established prefecture-level cities and four county-level cities in autonomous areas. In this decade-long period, autonomous areas received three times as many newly-emerged cities than the rest of China. This phenomenon corresponds greatly to the implementation of China's Western Development Strategy.

Based on the analysis of the above content, a clear transition concerning the establishment of cities can be observed. Between 1990 and 2000, as the Eastern Region experienced major city growth, the establishment of new cities was primarily dominated by county-level cities which are largely located in the eastern region. There are two hotspots where new cities are concentrated, such as the eastern coastal area, including the Yangtze River Delta (see Map 4.1. A1.), and the



Map 4.1. New Established Cities by Decade Since 1990

Source: CNBS 1991, 2001 and 2011; All China Data Center, 2010

Southeastern coastal area, including Pearl River Delta, (see Map 4.1. A2.). Beginning in the 1980s, the quantity of township enterprises flourished, and experienced high labor demand, greatly fueling the establishment of county-level cities. It can be argued that simply forming a city in an effort to urbanize is an archaic method. Therefore, from 2000 to 2010, the establishment of new cities was almost brought to a halt in the eastern and central regions, with only 16 cities exclusively established in the western region, with the majority of the new cities during this period being established as prefecture-level cities located in ethnic autonomous areas (Map 4.1. D.). The transition of the establishment of new cities from the eastern region to the western region coincides with the implementation of China's Western Development Strategy since 2000, aiming to reduce the regional socio-economic gaps throughout the urbanization process.

4.2.2.2. Cities Promoted to Higher Administrative Levels

A city may be promoted into a higher administrative level as the urbanization process enables more sophisticated urban functions, or as needed by policymaking. As shown in Table 4.2., there were 81 cities that were promoted to a higher administrative level. When considering regional divisions, 33% (27), 39.5% (32), and 26% (21) of the 81 promotions occurred in the eastern, central and western regions, respectively. Also, within the 81 cases of promotion of the administrative level, 80% (65) of cities were promoted from county-level to prefecture-level, 19.7% (16) cities were promoted from prefecture-level to cities higher than prefecture level.

Regarding the 65 prefecture-level cities after promotion, the central region experienced the majority of the promoted-to-prefecture cases as it contributed 45% (29 out of 65) cases; the eastern and western regions have contributed 26% (17) and 29% (19), respectively. As for the 16 cities being promoted to higher-than-prefecture level, most of the promotion undoubtedly occurred in the eastern region, as 62% (10 out of 16) were located in the eastern region, 19% (3) and 19% (3) were located in the central and western regions, respectively[38] (Map 4.2. A.). The autonomous areas,

[38] The western region experienced the only municipality promotion case through which, the city of Chongqing, a former prefecture-level city in Sichuan Province, was promoted to the fourth municipality in China in 1998 (CNBS,

however, did not seem to enjoy much of the wave of promotion as there were only 7% (6 out of 81) located in autonomous areas which largely overlaps the western region, and all were prefecture-level cities promoted from the county level (Map 4.2. C.).

Table 4.2. Cities Promoted to Higher Administrative Level[39]

	1990-2000						2000-2010		
Total Numbers	81						14		
Regions	E:27		C: 32		W:21		E:2	C:0	W: 12
Administrative Levels	PL:65			HP:16			PL:14		
	E:17	C:29	W:19	E:10	C:3	W:3	W:14		
In Autonomous	PL:6						PL:2		

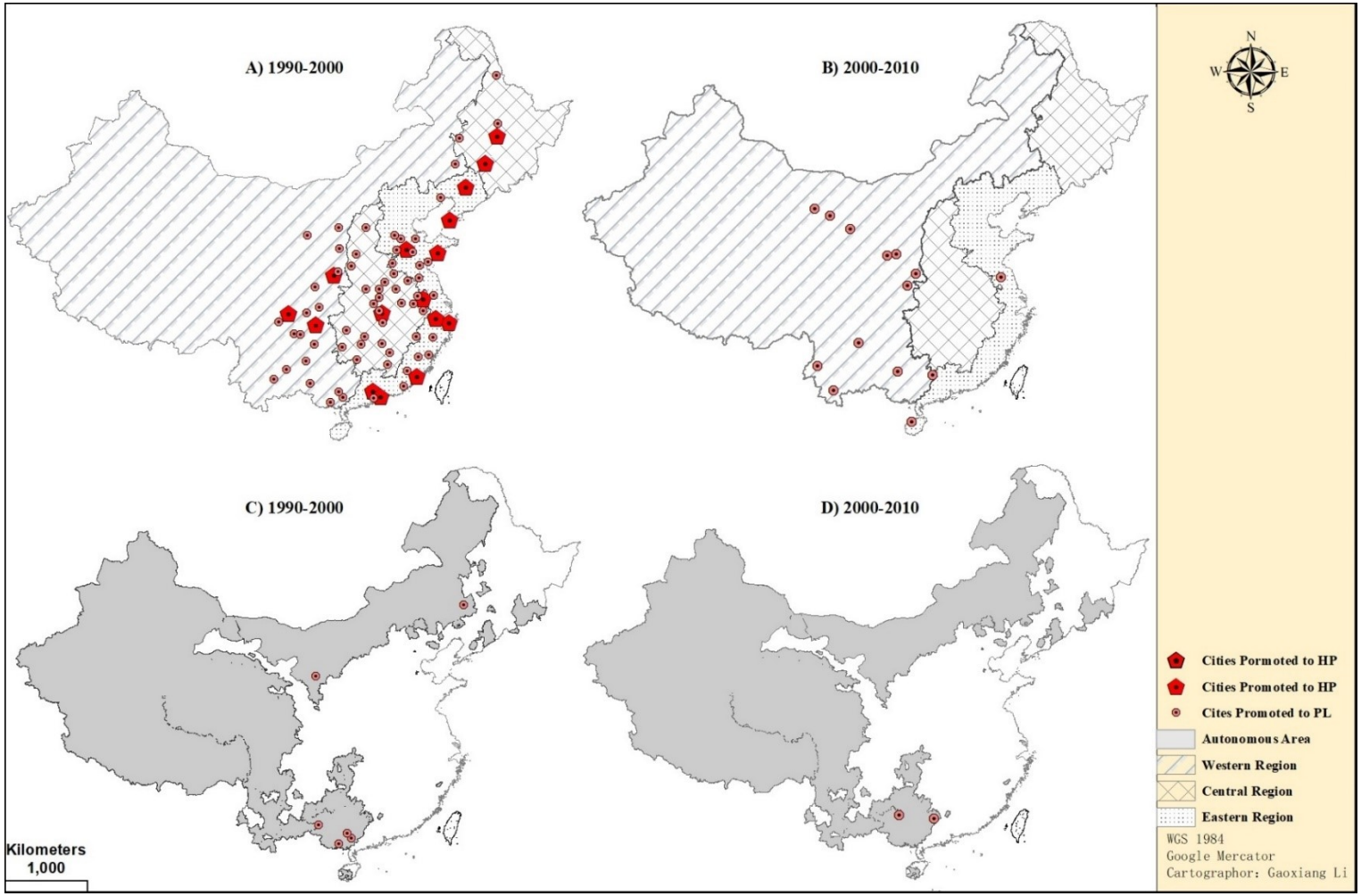
Source: CNBS 1991, 2001 and 2011
Note: HP=Cities Higher than Prefecture Level

From 2000 to 2010, there were not as many promotion cases as in the previous decade. The overall number of promotion cities that occurred during this decade is only 14, with 86% (12 out of 14) and 14% (2) located in the western and eastern regions respectively (Map 4.2. B.). It can be observed that the promotions during this decade predominantly occur in the western region, and all were county to prefecture level promotions. As for the autonomous areas, there were only 15% (2 out of 14) of cases in which county-level cities were promoted to the prefecture level (Map 4.2. D.).

It can be observed that between 1990 and 2000, although the majority of city promotions were located in the central region, the eastern region was prioritized as a part of national urbanization strategy since most of the cities that were promoted to higher than prefecture level are located in this region. Then, from 2000 to 2010, the promotion primarily occurred in the western region as a result of the implementation of China's Western Development Strategy; no city was promoted above the prefecture level during this decade.

1999).

[39] Cities higher than prefecture level, including municipalities, sub-provincial cities and provincial capitals (referring back to Chapter 3 Methodologies). Also, for the list of cities promoted to higher levels, please refer to Appendix 2.



Map 4.2. Cities Promoted to Higher Administrative Level since 1990

Source: CNBS 1991, 2001 and 2011; All China Data Center, 2010

4.2.2.3. Cities Merged into Higher Jurisdictions[40]

As cities grow both in size and economic power, larger cities often merge with smaller cities neighboring their jurisdictional boundaries. As Table 4.3. demonstrates, from 1990 to 2000, among the 13 cities merged into higher jurisdictions, 15.3% (2) are located in the eastern region, 38.4% (5) in the central region, and 46.1% (6) in the western region. Statistics show that the majority of these merges, specifically where small cities merge into higher jurisdictions, occurred in the western region. This distribution of merged cities was largely caused by the political orders. The merge of the city was believed to trigger urbanization in the Western Region where there was a wealth of resources but a low rate of urbanization[41].

Table 4.3. Cities Merged into Higher Jurisdiction[42]

	1990-2000					2000-2010				
Total Number:	13					31				
Region	E:2		C:5		W:6	E:19		C:3		W:9
Administrative Level	CL: 12			PL:4		PL: 0			CL: 31	
	E	C:5	W:5	E:0	C:1 W:3	E:	C:0	W:0	E:18	C:3 W:8
In Autonomous	0					5 CL				

Source: CNBS 1991, 2001 and 2011

From 2000 to 2010, the city-merging trend increased significantly. By 2010, there were 31 cities that merged into higher jurisdictions across China. At the regional level, the distribution of these merged cities is as follows: 61% (19) merges, not surprisingly, happened in the eastern region where the urbanization rate was the highest amongst the three regions. Outside of the eastern region, 10% (3) of city merges occurred in the central region, and the remaining 29% (9) occurred in the western region. All 29 merges that occurred during this decade are comprised of county-level cities that merged into prefecture-level cities, or with that of urban districts.

4.3. Ethnic Minority Distributions in Cities

This section contextualizes the proportion of urban minorities from cities divided by regions, as well as the three-level administrative hierarchy. Following this, the section will move to an in-depth description of that which represents, not only the urban minority population, but also its

[40] Please refer to the Appendix 3 for the list of cities that merged into higher jurisdictions.
[41] With exception to this trend of merging in the western region, one prefecture-level city in this region merged into the Chongqing municipality (Qin, 2010).
[42] Please refer to Appendix 3 for the list of cities merged into higher jurisdiction.

contribution to the total urban minorities. Furthermore, the section will continue by exploring the variation of cities according to minority growth and decline, as depicted in two schematic maps and a table.

4.3.1. Distributional Transformation between 1990 and 2000

Demonstrated in Table 4.4., in 1990, cities in the eastern, central and western region contributed 25.1%, 25.2%, and 49.6%, respectively, to the total urban minorities. Regarding the number of cities, there were 119 cities located in the western region, compared to 157 and 171 in the eastern and central region. Cities located in the western region, though being the fewest, however, host nearly half of the national urban minority population.

Table 4.4. Urban Ethnic Population and its Percentage

Cities Location	1990		2000		2010	
	Ethnic Population (Million)	Numbers of City	Ethnic Population (Million)	Numbers of City	Ethnic Population (Million)	Numbers of City
E	4.3 (25.1%)	157	7.8 (28.3%)	276	11.8 (32.3%)	258
C	4.3 (25.2%)	171	5.5 (19.7%)	228	5.2 (14.4%)	225
W	8.4 (49.6%)	119	14.4 (51.9%)	159	19.4 (53.2%)	167
Cities by Level						
CL	9.7 (60.3%)	266	14.3 (52.8%)	405	14.4 (39.4%)	367
PL	3.2 (19.7%)	154	7.1 (26.2%)	226	12.9 (35.3%)	251
HP	3.2 (20%)	30	5.7 (20.9%)	36	9.2 (25.2%)	36

Source: CNBS 1991, 2001 and 2011
Note: (%) means the proportion in percentage to the national total urban ethnic minority population.

In 2000, the urban minorities in cities located in the eastern region accounted for a higher proportion (from 25.1% to 28.3%) as the number of cities in this region increased to 276, outperforming cities in other regions. However, the cities in the central region contribute even less to the total urban minorities (there was a decline from 25.2% in 1990, to 19.7% in 2000). Apparently, even though the number of cities increased to 228 in 2000, the urban minority population growth was lower in the central region than that of other regions. It is also worth noting that cities in the western region became increasingly dominant in contributing to the total urban ethnic population, with its proportion increasing from 49.6% to 51.9%. Though increased to 159, the number of cities in the western region was still the lowest of all three regions. This pattern demonstrates that although the urban minority population grew faster in cities in the eastern region, the western region was still dominant in terms of its urban minority population.

When considering the administrative level, compared to 1990, the total urban minorities in 2000 consisted of a lower population from the county-level cities (decreased from 60.3% in 1990 to 52.8% in 2000). While the quantity of cities within this level increased from 266 (1990) to 405 (2000), county-level cities remained dominant both in contribution to the urban ethnic minority population and quantity of cities. The prefecture-level cities' contribution increased notably, from 19.7% to 26.2%, while the quantity of prefecture-level cities also increased significantly from 154 to 226 cities. Cities higher than the prefecture-level slightly increased by 0.9%, from 20% to 20.9%, while the total number of this city level only increased from 30 (1990) to 36 (2000). A trend of a faster-growing ethnic population existed in prefecture-level cities during the first decade (1990-2000).

4.3.2. Distributional Transformation between 2000 and 2010

Compared to 2000, the proportion of the total urban minority population accounted for in cities located in the eastern region increased remarkably, from 28.3% in 2000 to 32.3% in 2010, but the quantity of cities dropped from 276 to 258 in 2000 and 2010, respectively. Unexpectedly, the proportion accounted by cities in the central region declined to 14.4%; while the number of cities remained almost the same as in 2000. As for cities located in Western China, they continued to contribute a bit more (51.9% to 53.2%), while the number of cities also rose to 167.

When looking at administrative levels, county-level cities continued to account for less of the total urban minorities (there was a decrease from 52.8% to 39.4%, and the total number of cities decreased to 368). The faster growing urban minorities persisted in prefecture-level cities, experiencing an even higher rate of increase in its percentage to the national urban minority population (increasing from 26.2% up to 35.3%), while the quantity of cities, increased from 226 to 250 in 2000 and 2010, respectively. The quantity of cities above prefecture-level did not experience any change, but increased notably in the urban minority population proportion, from 20.9% in 2000 to 25.2% in 2010.

4.3.3. Summary

Based on the above evidence, the urban ethnic minority population distribution by region demonstrates a trend in which the cities in the western and eastern regions became increasingly attractive to ethnic minorities. Particularly, the cities in the western region, while few, contributed extensively to the total urban minority due to the traditional concentration of minorities in the

western region, therefore having the most notable concentration of the ethnic population. The growth of the urban minorities became the most significant among cities located in the eastern region since 2000 and accounted for an increasingly higher total of the urban minority population. Since the eastern region was prioritized in the national urbanization process, and considering its superior economic status relative to the other regions, the ethnic minorities were largely attracted to cities located in the eastern regions. However, while the eastern and western regions experienced an increase in the urban minorities, the central region experienced a decline in its urban minority population since 2000; ethnic minorities became more attracted to the success of the eastern region or felt more secure in the western region due to China's Western Development Strategy.

When considering the three-level administrative hierarchy, it can be concluded that county-level cities are being gradually less favored by the ethnic minority population, particularly noticeable after 2000. This phenomenon was revealed as the ethnic minority population dwelling in this level of the city remained stagnant between 2000 and 2010, while the contribution to the total urban ethnic minority population continued to decrease. Though the ethnic minority population maintained growth in prefecture-level and higher level cities, the prefecture-level cities outperformed when considering the concentration of the urban ethnic minority population. In contrast to the prefecture-level cities whose quantity grew extensively (154 in 1990, 226 in 2000, and 251 in 2010), the higher than prefecture-level cities remained low in quantity, and did not experience significant change (there was an increase from 30 in 1990 to 36 in 2000, and has since then remained unchanged). Considering the limited number of cities higher than prefecture level, the growth of the ethnic minority population was quite significant, demonstrating an evident trend of concentration of the minority population in the future.

4.4. Reviewing Cities in Change according to Urban Minorities

To compare cities across a timeline, the permanence of a city is a precondition, meaning that a city's jurisdiction should be neither merged into higher level jurisdictions nor reclassified as a non-city area, but remain consistent in its status. Among all unchanged cites[43], the variation of the ethnic minority population per city is an important parameter which reveals urbanization and its impact on ethnic minority populations (Table 4.5.).

[43] From 1990 to 2000, 437 cities maintained their jurisdictions. From 2000 to 2010, there were 638 cities that remained unchanged in their jurisdictions.

Table 4.5. Variation of Cities by Minority Growth/Decline.

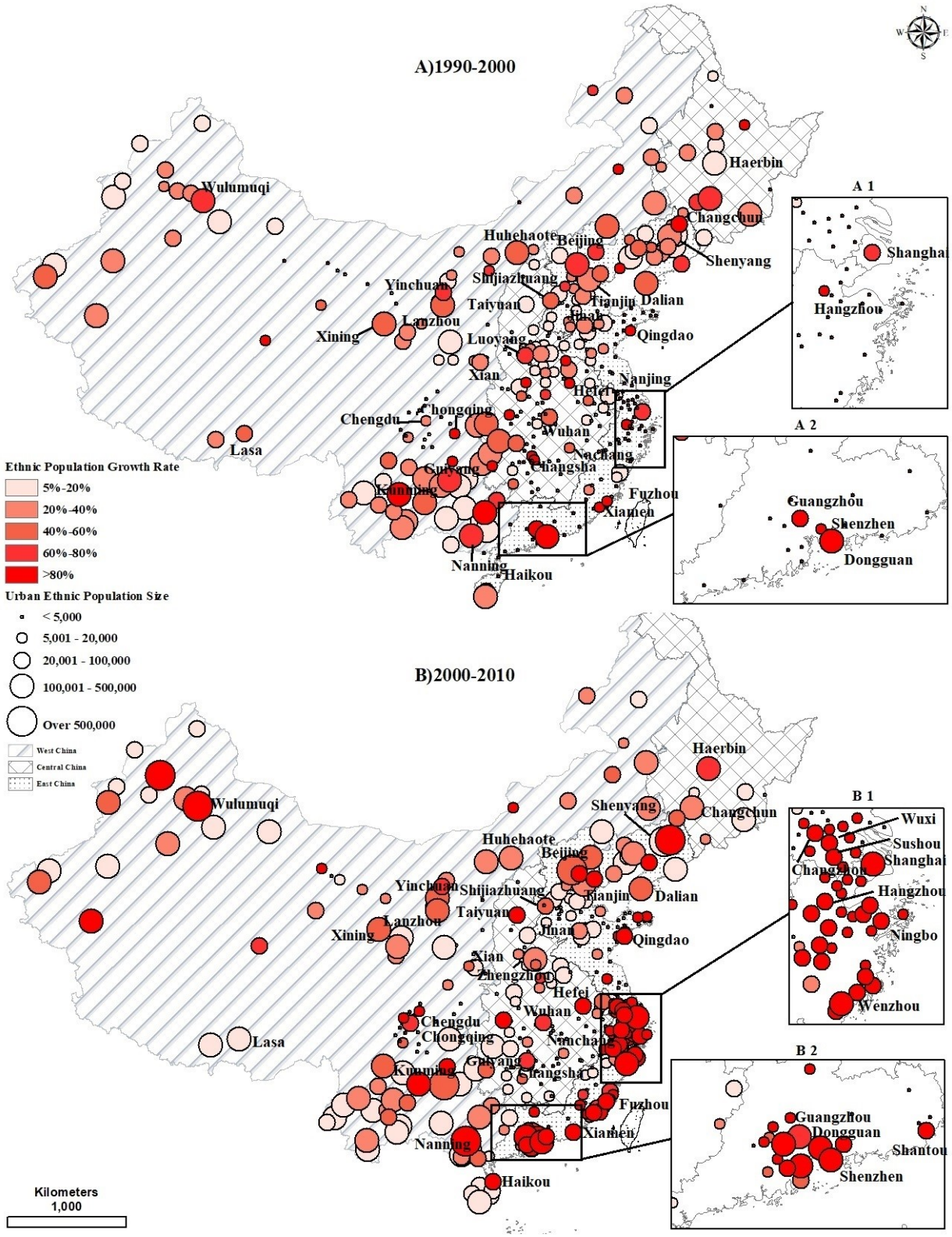
1990-2000				2000-2010			
Growth 381	E	C	W	Growth 401	E	C	W
	147	127	104		188	101	112
	In Autonomous Areas				In Autonomous Areas		
	65				65		
Decline 56	E	C	W	Decline 237	E	C	W
	8	39	9		71	124	39
	In Autonomous Areas				In Autonomous Areas		
	5				20		

Source: CNBS 1991, 2001 and 2011

4.4.1. Cities with a Growing Ethnic Minority Population

Between 1900 and 2000, 87.2% (381 out of 437) of cities experienced increases in the ethnic minority population, while 12.9% (56) experienced a range of decline in the ethnic minority population. At the regional level, the ethnic population increased in various degrees within 147 cities (38.5%) in the eastern region, in 33.3% (127) of the cities in the central region, and in 104 (27.2%) cities in the western region; there were 17% (65 out of 381) of cities located in ethnic autonomous areas that experienced increased ethnic minority population rates.

From 2000 to 2010, 62.8% (401 of 638) of cities experienced ethnic minority population growth, while 37.1% (237) experienced a range of decline in the ethnic minority population. From a regional perspective, 46.9% (188), 25.2% (101) and 27.9% (112) of the cities that experienced increases in urban minorities are located in the eastern, central and western regions, respectively. Compared with the previous decade, there are fewer cities in the central region with growing urban minorities (from 127 to 101). This may confirm a trend of outward migration among the ethnic minority populations, or lower concentrations of these populations within the central region. Contrastingly, there are more cities that experienced increases in their ethnic minority population in the eastern region when compared to the previous decade (from 147 to 188). Among the cities that experienced an ethnic minority population increase, 16.2% (65 out of 401) cities are located in ethnic autonomous areas.



Map 4.3. Cities with Growing Urban Minority Population

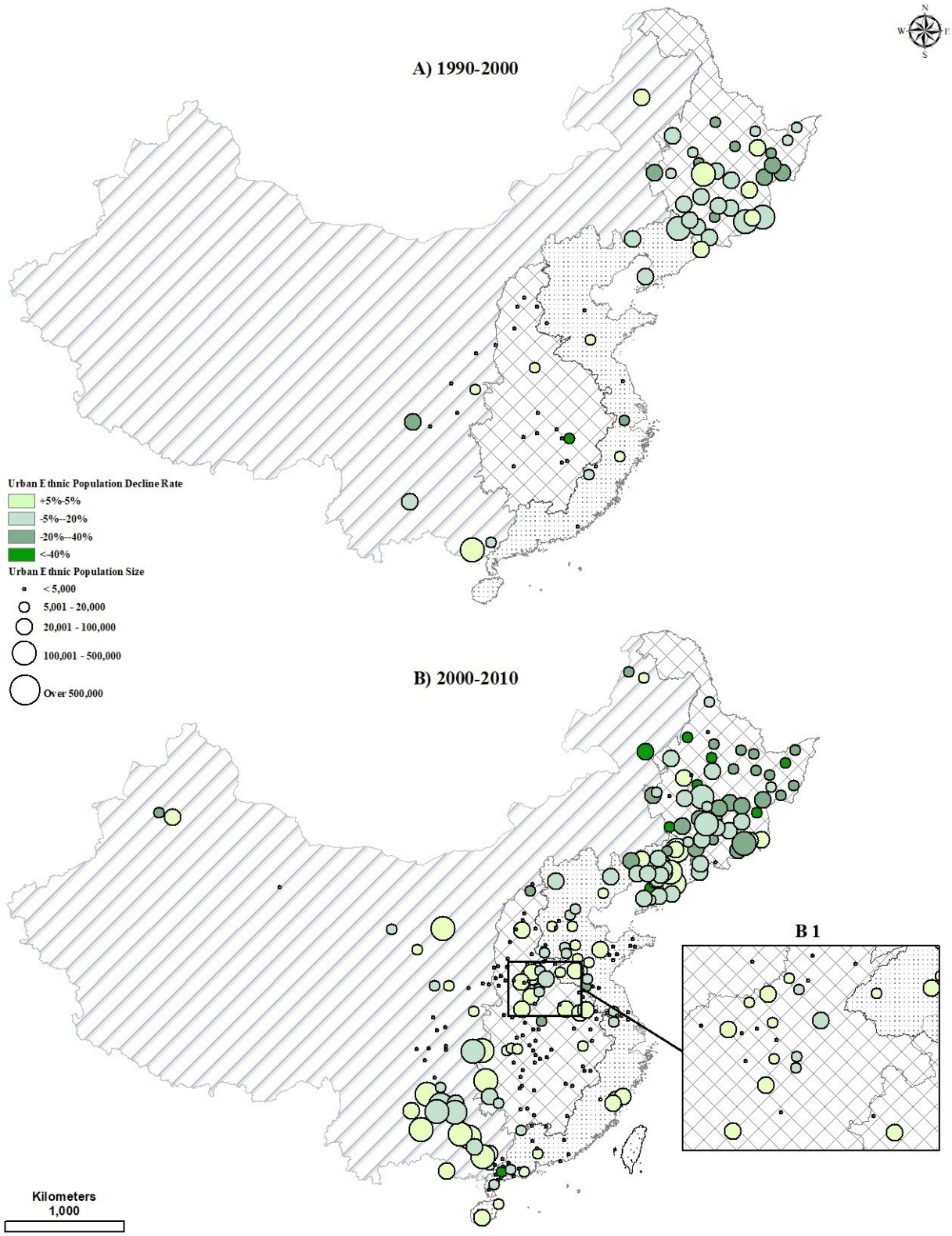
Source: CNBS 1991, 2001 and 2011

The distribution of cities with growing urban minorities demonstrate the following features. First, there are two hot spots in which the urban minorities underwent the most extensive growth during this two-decade period, such as the eastern coastal area, especially the Yangtze River Delta (Map 4.3. A1. and B1.) and the southeastern coastal area, including the Pearl River Delta (Map 4.3. A2. and B2.). The significant urban minority growth within these two areas clearly coincided with the economic prosperity and the accompanying high rate of urbanization that began in the early 1990s. Furthermore, as Map 4.3. A. and B demonstrate, urban minorities have continued to grow in all cities higher than prefecture level. If divided regionally, it is evident that in the central and western regions, cities higher than prefecture level have played important roles in urban minority growth. Particularly in the western region, which largely overlaps the ethnic autonomous areas, large, urbanizing cities have become increasingly favored by local minorities to begin their integration into urbanized lives.

4.4.2. Cities with Declining Ethnic Minority Population

Between 1990 and 2000, 12.8% (56 out of 437) cities, experienced varying decreases. For cities with a declining ethnic minority during this period, 14.2% (eight) were located in the eastern region, 69.6% (39) were located in the central region, and 16% (nine) were located in the western region (Table 8 and Map 4.4. A). From 2000 to 2010, 37.1% (237) of cities experienced various declines in the ethnic minority population. More cities experienced a decline in their ethnic population during this time. There were 30% (71) of cities in the eastern region, 52.3% (124) of cities in the central region, and 16.4% (39) of cities in the western region that experienced various rates of decline in their ethnic minority populations (Table 4.5. and Map 4.4. B).

For cities that experienced declines in their ethnic population, 8.4% (20) were in ethnic autonomous areas; there are significantly more cities in non-ethnic autonomous areas that experienced a decline in their ethnic populations. However, the total number of cities increased quite extensively since the last decade.



Map 4.4. Cities with Declining Urban Minority Population

Source: CNBS 1991, 2001 and 2011

4.4.3. Summary

When considering the above evidence, it is clear that cities in the central region contained much of the declining urban minority population. Beginning in 1990, the declining trend of urban minorities became pervasive, first in sub-region 1[44] (northeastern provinces) of the central region (Map 4.4. A.), where industry and state-owned enterprises became stagnant, due to a sluggish local economy. Most interestingly, since 2000, cities in sub-region 2 of the central region (the central part of China) began to demonstrate a pervasive decline in urban minorities while the same situation among cities in northeastern provinces persisted (Map 4.4. B-B1).

The general decline of urban minorities in the central region is associated with two factors that were confirmed in previous sections. The first factor of consideration is that cities within the eastern region possess a superior economy. Additionally, the implementation of the China Western Development Strategy ensured preferences for cities in the western region in which natural resources are more plentiful. Therefore, the central region experienced a lack of the advantages enjoyed by the eastern and western regions which attracted more ethnic minorities. Another area which experienced a decline in its urban ethnic minority population since 2000 is Southwestern China. The proximity of local cities to the Pearl River Delta is undoubtedly the major influence on the urban minority population decline, due to higher economic prosperity in this area.

4.5. The Transitional Patterns of the Urban Ethnic Minority Population

This section discusses the Standard Deviational Ellipse (SDE) results that represent the ethnic minorities in County-Level, Prefecture-Level and Higher than Prefecture Level cities, accordingly. A general characterization of SDE results is followed by a further exploration of the subtle variation in the ethnic minority distribution with thematic data. The section then ends with a summary that concludes the quantity of cities within each level that contributes to the SDE of all cities regardless of the administrative level and their causalities.

As a versatile GIS tool, the Standard Deviational Ellipse (SDE) helps to delineate the geographical distribution trend by summarizing the dispersion and orientation of the concerned features (Wang, Shi, & Miao, 2015). Although there are several approaches to achieve the results of SDE, the one that is featured in this section is computed through a toolset from the ArcGIS 10.5, using the location of cities in China from 1990, 2000, and 2010 as observed samples, and the urban

[44] Referring to Chapter 3, the central region consists of sub-region 1 and sub-region 2.

minority population as the weighted value. As shown in Map 4.5., the primary analysis results consist of four schematic sub-maps, each of which corresponds to cities categorized by four levels: 1) All cities regardless of their level; 2) County-level cities; 3) Prefecture-level cities; and 3) cities higher than the prefecture-level. Each submap also includes three hierarchical ellipses representing the SDE results from 1990, 2000, and 2010 in the corresponding level of the city, and a set of thematic data shown in Table 4.6.: 1) the center of gravity[45] (Map 4.6.); 2) the shape or elongation measured by the short (X) and long (Y) axis; 3) the orientation of the ellipse; 4) the spatial area of the ellipse.

Table 4.6. Schematic Data of SDE Results

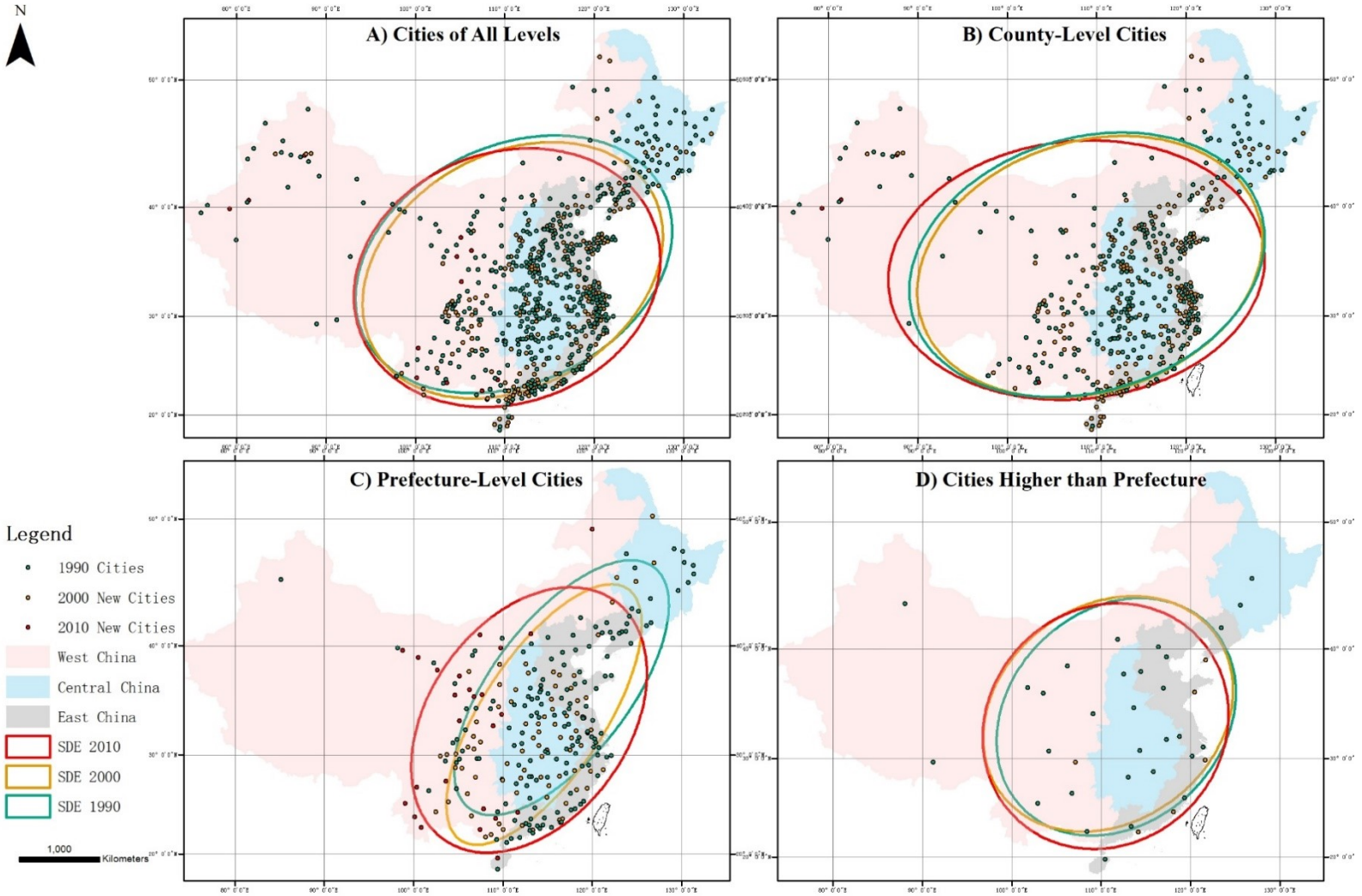
All Levels	X-Axis (km)	Y-Axis (km)	Area Size (km^2)	Orientation °
1990	1,475	2,072	9,605,687	64.24
2000	1,450	1,987	9,053,965	60.56
2010	1,559	1,952	9,565,043	69.85
CL	X-Axis (km)	Y-Axis (km)	Area Size (km^2)	Orientation °
1990	1,581	2,264	11,247,804	73.26
2000	1,561	2,200	10,796,154	72.55
2010	1,606	2,352	11,875,648	84.16
PL	X-Axis (km)	Y-Axis (km)	Area Size (km^2)	Orientation °
1990	854	1,890	5,072,982	37.58
2000	757	1,880	4,475,586	33.54
2010	1,240	1,829	7,128,530	35.71
HP	X-Axis (km)	Y-Axis (km)	Area Size (km^2)	Orientation °
1990	1,325	1,628	6,778,068	46.07
2000	1,342	1,663	7,015,530	53.14
2010	1,456	1,600	7,324,209	45.22

4.5.1. County-Levels Cities

Map 4.5. B) demonstrates the general variation trend of the ellipse of county-level cities in the two-decade period. From 1990 to 2000, the ellipse moves slightly southeastward, but shrinks from the northwest towards the southeast, while remaining stable in orientation. From 2000 to 2010, the change in the ellipse is quite extensive, with the position of the ellipse moving southwestward and rotating significantly clockwise. It is also visible that the X and Y axis extend slightly.

When examining the formations of the ellipses, from 1990 to 2000, they are getting slightly closer to a round in exteriors (0.70 vs. 0.71 in X and Y axis ratio) as the 2000 ellipse shrinks 1.2% and 2.8% on the X and Y axes respectively, making the 2000 ellipse 4% smaller in its area

[45] The center of gravity (CG), helps to locate and measure the movement of the ellipse. A series of weighted centers of gravity are identified in Map 11 to represent the spatial distribution of the ethnic minorities in cities by year.



Map 4.5. SDE Results of Cities from All Levels in 1990, 2000, and 2010

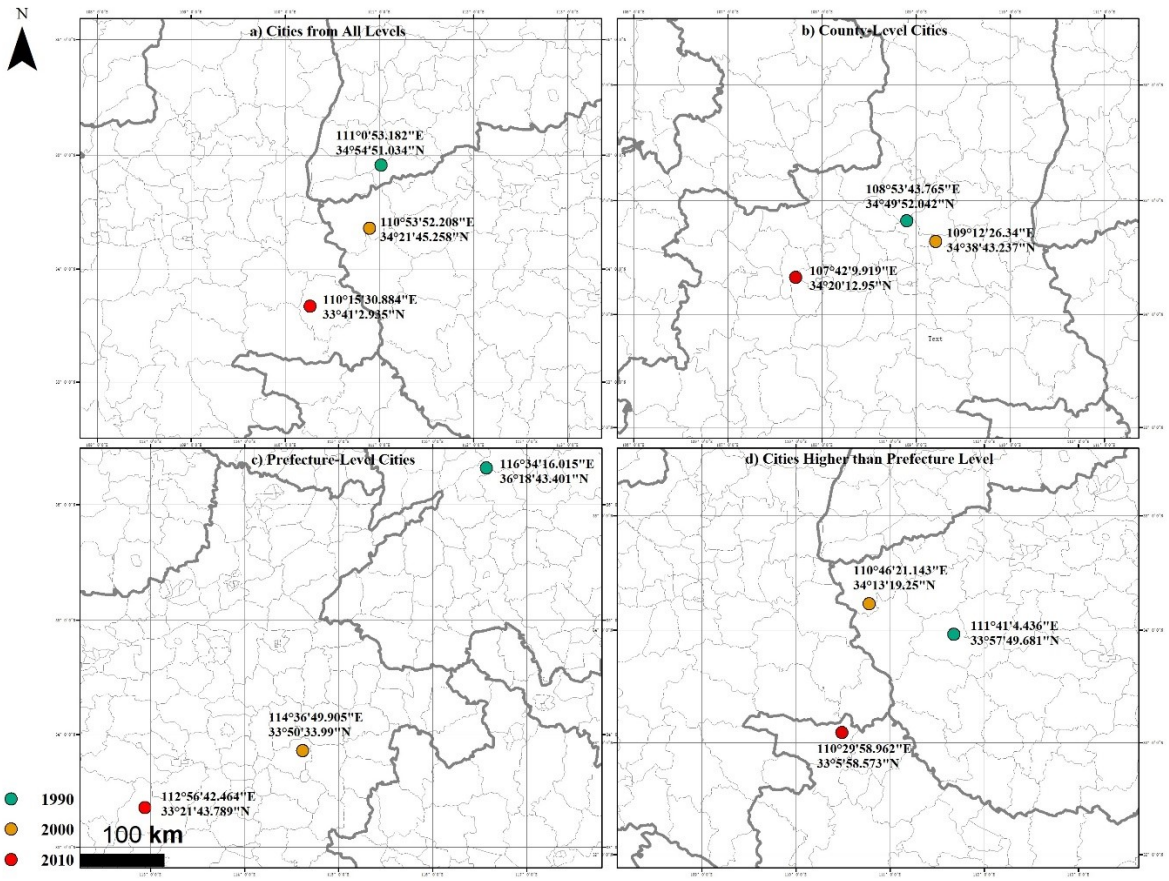
Source: CNBS 1991, 2001 and 2011; All China Data Center, 2011

coverage (10,796,154 km^2 in 2000 vs. 11,247,804 km^2 in 1990). From 2000 to 2010, the ellipse is extended on both the X and Y axes; it is elongated 2.9% on the X axis, and 7% on the Y axis, making the year 2010 ellipse 10% bigger than that of 2000 (coverage size of 2010 ellipse is 11,875,648 km^2). The change in the year 2010 ellipse form slightly reduces the X and Y axis ratio to 0.68.

Regarding the azimuthal variation of the ellipses, the ellipse in 1990 tilts at the azimuth of 73.2°, pointing east-northeastward; the ellipse of 2000 rotates counterclockwise 0.7°, maintaining 72.5°. From 2000 to 2010, the ellipse rotates clockwise 11.6°, reaching an azimuth angle of 84.2°, a notable eastward orientation. From 1990 to 2000, as demonstrated in Map 4.6. b), the CG representing the spatial distribution of the ethnic minorities in county-level cities moves southeastwards 42km (35km eastward and 25km southward, from Sanyuan County, Shaanxi Province, to the city of Xiaan, located in the Yanliang District. In the next decade, the CG does not follow the same trajectory as it did in the previous decade. Instead, it moves 172km south-westwards (166km westward and 42km southward), towards Meixian County, Shanxi Province. The CG is displaced 146km southwest by the west and remains within Shaanxi Province.

4.5.2. Prefecture-Levels Cities

In this scenario, there have been a fair number of changes of prefecture-level cities during this two-decade period. Shown as Map 4.5. D., from 1990 to 2000, the ellipse moves southwestward significantly along the Y axis with no visible changes in formation. The ellipse shortens 11.3%, and 0.05% on the X and Y axes, respectively, and its shape becomes even more flattened (X/Y ratio 0.40 in 2000 vs. 0.45 in 1990). From 2000 to 2010, the ellipse's southwestward movement continues, but to a lesser degree, while the expansion begins along the X-axis exponentially towards the northwest and southeast, making the year 2010 ellipse much wider than that in 1990 and 2000. The 2010 ellipse greatly expands 39% on the X-axis and 2.8% on the Y axis, becoming closer to a round in exterior (X and Y axis 0.40 in vs 0.68 in 2000), Also, the coverage area of the year 2000 ellipse is about 12% smaller (5,072,928 km^2 in 1990 vs. 4,475,586 km^2 in 2000) than that of the 1990 ellipse. From 2000 to 2010, the area size increases by nearly 60% (from 4,475,586 to 7,128,530 km^2, by 59.3%).



Map 4.6. Cities' SDE Gravity Centers Distribution

Source: CNBS 1991, 2001 and 2011; All China Data Center, 2010

Furthermore, there is a great variation of an X and Y ratio across years and its causalities. The drop in the X and Y ratio from 1990 to 2000 demonstrates a centralizing trend of the ethnic minority distribution in prefecture-level cities as more cities from this level are becoming more established in the central and eastern regions. The abrupt increase in the X and Y ratio from 2000 to 2010 demonstrates a great increase in the homogeneity of the ethnic minority distribution in prefecture-level cities.

Compared with the 1990 prefecture-level ellipse, that of 2000 rotates counterclockwise 4° (33.5°). The northwards orientation indicates the prefecture-level cities in the northern region experienced faster growth in their minority populations in the 1990s, pulling the azimuth angle around 4° northwards. Since the year 2000, prefecture-level cities in Southeastern China outperformed in minority population growth; the 2010 ellipse was pulled to rotate clockwise 2.2° (at 35.7°).

Using the CG schematic data to characterize the CG movement, Map 4.6. c.) demonstrates the CG moves notably 398km southwestward (218km westward and 335km southward), from Pingyin County in Shandong Province (1990) all the way to Xihua County in Henan Province (2000). Then during the next decade, it continues to move 198 km southwestward (186km westward and 67km southward), reaching Fangcheng County in Henan Province (2010). The total CG displacement from 1990 to 2010 is southwestward 572km, stretching across two provinces.

4.5.3. Cities Higher than Prefecture Level

As illustrated in Map 4.5. D.), the ellipse of cities higher than prefecture level experienced the least amount of change in terms of shape and position compared to other cities. Moreover, although being the least in number (36), cities above the prefecture level are the metropolises that are hosting the largest ethnic minorities per city. Cities from this level receive increasingly more ethnic minorities as the population in these cities continues to expand throughout the decades,[46] and the contribution by cities from this level to the total urban ethnic minority population also experiences a continuous increase.[47]Also, the ellipses presenting the ethnic minority distribution in this level of cities are the closest of all levels to a round, meaning the ethnic minority distribution in cities above the prefecture-level has the highest level of homogeneity.

In general, from 1990 to 2000, the ellipse experiences a minimum change in the northeast, then moves towards the northwest using the northeast boundary as a fulcrum, while shrinking in the southeastern quadrant. From 2000 to 2010, the ellipse moves notably southward, but is also pulled slightly westward, while extending in the southeastern quadrant, remaining stable in the northeastern quadrant.

When considering the exterior, from 1990 to 2000, the ellipse expands 1.3% and 2.1% on the X & Y axes respectively, raising the ellipse area size by 3.5%, (6,778,068 km^2 in 1990 vs. 7,015,530 km^2 in 2000), mainly expanding towards Northwestern China; the X and Y axis ratio stabilizes at 0.8. The 2010 ellipse continues to elongate 8.5% on the X axis, but shortens 3.8% on the Y axis, resulting in a 4.4% larger ellipse area size than that of 2000 (7,015,530 km^2 in 2000 vs. 7,324,209 km^2 in 2010); at this point, the X-Y ratio is now 0.91, the closest of all to a round.

As shown in Map 4.6.d), from 1990 to 2000, the CG moves 106km northwestward (100km

[46] Referring to Table8: 3.2 million in 1990 vs 5.7 million in 2000 vs 9.2 million in 2010.

[47] The contribution to the total urban minority population by cities higher than prefecture level also increases continuously. (Referring to Table 8: 20% in 1990 vs 20.9% in 2000 vs 25.2% in 2010).

westward and 37km northward) from the City of Lingbao, Henan Province to Luanchuan County in Henan. During the next decade, the 2010 CG moves southwestwards 283km (153km southward and 32km westward), stopping at Yunxi County, Hubei Province. Compared to 1990, the 2000 ellipse rotates clockwise 7° (reaching 53.7°); however, during the next decade, the 2010 ellipse rotates counterclockwise 8° (maintaining at 45.2°).

4.5.4. The General Trend of Urban Minorities Distribution Using SDE

In this section, urban China is considered as all cities across different administration levels. As demonstrated in Map 4.5. a), beginning in 1990, the ellipse change is trending towards the south. From 2000 to 2010, the southward trend accelerates and begins deflecting more towards the southeast. Over time, the ellipses remain stabilized near the left quadrant of the Y-axis while gradually shrinking inward at the other end, representing Northeastern China. This inward shrinkage is rather notable from 1990 to 2000, but accelerates from 2000 to 2010. For the change along the X axis, the ellipse shrinks a little bit inward in the northwestern quadrant from 1990 to 2000. This trend then alternates, from 2000 to 2010, extending the boundary even further than what it was in 1990. The most obvious expansion of the ellipses happens in the southeastern quadrant. From 1990 to 2000, the expansion is only notable towards the southeast but becomes several times more evident from 2000 to 2010.

From 1990 to 2000, the CG representing the weighted spatial distribution of the ethnic minority in all cities moves southwards and slightly westwards by 77 km (74km southward and 14km westward) between the city of Yuncheng and Pinglu County in Henan Province to Lingbao County, Shanxi Province. From 2000 to 2010, this CG maintains the southwestward movement but begins to move more westward. Specifically, the gravity center moves southwestward by 115km (70 km by southward and 92km westward), located in Danfeng County, Shanxi Province (Map 4.6. a).

Compared to the 1990 ellipse, whose rotation azimuth is 64.2°, the year 2000 ellipse rotates counterclockwise around 3.7°, stabilizing to 60.5°. The 3.7° counterclockwise rotation, though not very significant, is the result of a faster urban minority growth-rate in prefecture-level cities located in Northwestern China between 1990 and 2000. However, the orientation of the 2010 ellipse changes to 69.8°, rotating clockwise 9.3° from that of the 2000 ellipse; this rather significant clockwise rotation is due to a significant urban minority growth in prefecture-level cities located in Southeastern China.

The CG track of the movement of all cities coincides with the change in the urban ethnic minority population. The total displacement of CG is south-by-southwestward 190km, stretching across three provinces, Shanxi, Henan, and Shaanxi. The form and area size of an ellipse is determined by the extension of the X and Y axis. Compared to that of 1990, the 2000 ellipse is shortened on both the X and Y axis, specifically by 1.7% (25km) and 4.1% (85km) in the X and Y axes, respectively. The Y-axis shrinks more than three times as much as the X-axis, readjusting the X and Y ratio from 0.71 to 0.72. From 2000 to 2010, the X-axis of the year 2010 increases by 7.5% (109 km) and the Y-axis shortens by 1.7% (35km), increasing the X and Y axis ratio to 0.79. The area size of the ellipse changes with the X and Y axis. Compared to 1990, the 2000 ellipse drops by 5.7% in the area size (9,605,687 km^2 in 1990 vs 9,053,965 km^2 in 2000), but by 2010, it increases by 5.6% (9,565,043 km^2 in 2010). The increasing X and Y axis ratio demonstrates a more homogeneous distribution of the urban ethnic minorities whose population has gradually increased in almost all cities.

4.5.5. Summary

Based on the discussion of SDE results, a summary can be drawn before proceeding to the next chapter. It can be concluded that the transformation of the SDE of all cities is a result of two major pulling powers and one inward shrinking force (Figure 4.3.).

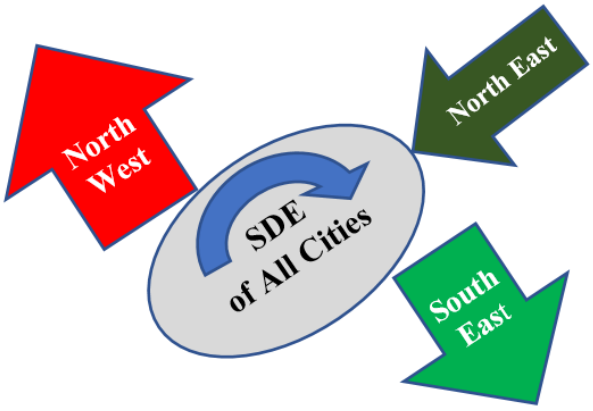


Figure 4.3. The Three Forces Imposed on Urban China SDE

Initially, a pulling power from the southeastern coastal area imposed by the growth of the urban minority population resulted in extensive urbanization within the region, especially in the Yangtze and the Pearl River Delta. From 1990 to 2000, county-level cites contributed significantly in pulling the SDE of all cities southeastward, as the labor-hungry flourishing township enterprises

contributed greatly to the urban minority growth in county-level cities. However, since 2000, large-scale manufacturing industries in larger cities especially benefiting from China's accession to the WTO in 2001, quickly developed a larger labor demand, consequently initializing rapid growth of urban minority population. As such, cities located in southeastern China experienced the most significant urban minority growth, forming a new hot spot of urban minority distribution. By comparing the schematic maps of SDE results, it can be observed that between 2000 to2010, prefecture-level cities and above within Southeastern China are attributed primarily to the southeastward force as this region accounts for the highest urban minority growth.

Additionally, there was another pulling power from Northwestern China as a result of the significant growth of the ethnic urban minority population in this region. Urbanization in Northwestern China is primarily managed administratively. As Maps 4.5. b) and c) demonstrate, this force was not very effective until after 2000; the implementation of the China Western Development Strategy (CWDS) was instrumental in helping the northeastern pulling power become more effective. In northwestern provinces, such as Xinjiang, Gansu, Ningxia and Qinghai, such a national strategy, in conjunction with its affiliated supportive policies, has succeeded in stimulating urbanization in Northwestern China. Furthermore, specifically since 2000, a series of new cities, ranging from county to prefecture level, were established. The preponderance of the ethnic minority population within the western region has provided cities located in Western China significant advantages for integrating more minority urban dwellers, imposing a greater westward pulling power to the ellipse of all cities. It is also worth noting that even before the implementation of the CWDS, cities above the prefecture level already accounted for an increase in the northwestward pulling power (Map 4.5. D). Between 1990 and 2000, the growth of the urban minority population was prominent in large cities located in Northwestern China, such as Urumchi[48] (the capital city of Xinjiang Uyghur Autonomous Region), Lanzhou (the capital city of Gansu Province), and Yinchuan (the capital city of Ningxia Hui Autonomous Region). Also, when comparing all schematic maps, there is a resemblance between the SDE of all cities and cities higher than prefecture level along the northwestern boundaries (Map 4.5. a) & d)). This phenomenon confirms that major cities play a key role in the concentration of the urban minority population distribution in Northwestern China.

Furthermore, the force generated by the decline of urban minorities in Northeastern China

[48] Also, referred as Wulumuqi in Pinyin.

resulted in the inward shrinkage of the ellipse. Compared to other parts of China, Northeastern China has been plagued by decades of economic stagnation due to the declining heavy industries and ill-reformed state-owned enterprises. Comparisons between Map 4.5. b) & c) reveal that since 1990, there is an evident inward shrinkage within Northeastern China within cities across all three levels. However, Map 4.5. c) indicates that the most evident shrinkage was influenced by prefecture level cities in Northeastern China, suggesting a decline of the urban minority population.

Chapter 5. New Features of Urban Ethnic Minority Population Distribution

Based on the analysis in the previous chapter, this chapter will present four main transformed characteristics of spatial-temporal distributions of the urban ethnic minority population in China. The first transformed characteristic is identified as the spatial aggregation of the urban minority population in cities. Stemming from this, the second discussion will move to an examination of the decline of minority population distribution in the central region. The third one will explore how city agglomerations[49] play new roles in ethnic minority population distribution dynamics since 1990. Finally, the last part of the chapter will focus on the cities located in autonomous areas/the western region, and how provincial capitals play an important role in absorbing urban minorities.

5.1. Spatial-Aggregation of Urban Ethnic Minorities

As concluded in the previous chapter, it has been realized that, from a city level perspective, county-level cities became less favored by ethnic minorities as they accounted for increasingly less of the total urban minority population. Contrastingly, cities from prefecture level and above had been contributing increasingly more to the total urban minorities. Particularly in prefecture-level cities, the urban minority population experienced the most prominent growth.

5.1.1. Declining Role of County-Level Cities

From 1990 to 2000, during the 8th and 9th Five-Year Plans, China's urbanization policy experienced a significant transition. The 8th Five-Year Plan (1990-1995) emphasized the "strict control of the population size of large cities (higher than the prefecture level), continued rational development of medium-sized cities (prefecture-level cities), and encourages the development of small cities (county-level cities)" (Fan *et al*., 2012, p. 478; Fang, 2009, p.20). Moreover, the 9th Five-Year Plan (1995-2000) was adjusted, and the government placed much emphasis on integration of "moderate cities of different sizes, encouraging the promotion of well-developed towns into small cities (county-level cities)." Powered by the relaxation of household restriction

[49] In some case, also being referred as Metropolitan Regions in China, there are seven national city agglomerations that play important roles, such as being larger economic, transportation and administrative centers in China: The Yangtze River Delta (city agglomeration), Pearl River Delta, Jing-Jin-Ji, Central China (or Zhongyuan), Middle Reach of Yangtze River, Ha-Chang, and Chengyu.

on rural-urban migration, and also supported by the prosperity of enterprises owned by small cities or towns (*Xiāng Zhèn Qǐ Yè*), county-level cities prospered in both quantity (the number of county-level cities increased from 266 in 1990 to 405 in 2000, and its population size grew significantly (Han, 2010; Fang, 2009, p.21). Therefore, the total ethnic minority population in county-level cities increased from 9.76 million (1990) to 14.33 million (2000), which grew by almost 50%.

From 2000 to 2010, the 10th and 11th Five-Year Plans further adjusted the urbanization strategy, which could be summarized as "[an emphasis placed on medium-sized cities], and large metropolises [were] encouraged to play their pivotal roles in coordinating urban development (the 10th Five-Year Plan)," and "[placing an emphasis] on the formation of city agglomerations, therefore [enhancing] the central roles of large cities (the 11th Five-Year Plan)" (Fang, 2009, p.22; Naughton, 2005, p.7). Compared with the two previous plans, these policies emphasized an importance on the development of medium and larger cities. This change in urban strategy quickly came into effect on small cities. From 2000 to 2010 (See Figure 5.1.), except for a decline in the number of cities, urban minorities in county-level cities stabilized in 2010 (14.37 million). Moreover, these cities contribute continuously less to the national urban ethnic population, as they accounted for 60.3%, 52.8%, and 39.4%, respectively, of the urban ethnic minority population in county-level cities in 1990, 2000 and 2010 respectively (Figure 5.2.).

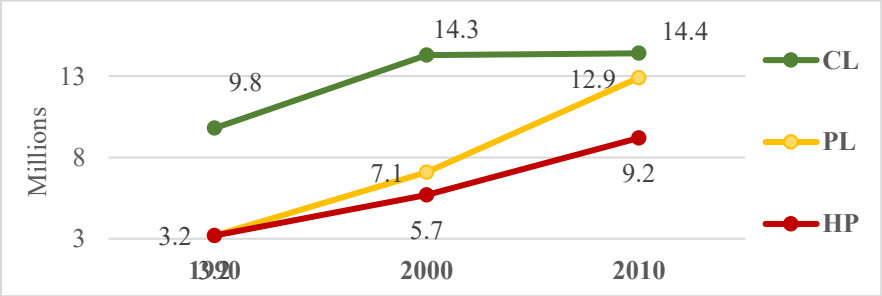


Figure 5.1. Urban Minority Population Contributed by Cities
Source: CNBS, 1991, 2001 and 2011
Note: CL=County Level, PL=Prefecture Level, HP=Higher than Prefecture Level

5.1.2. Increasing Importance of Prefecture-Level Cities and Cities above

The adjustment of urban strategies during the 10th and 11th Five-Year Plans have a significant impact on the urban ethnic minority population distribution, not only on county-level cities, but also on two other administrative city levels. As observed in Figure 5.1., between 1990 and 2000, as planned by the 8th and 9th Five-Year Plans, the growth of urban minorities in prefecture-level

cities and cities above this category were similar to that of county-level cities. However, from 2000 to 2010, benefitting from a greater emphasis placed on the development of medium and large cities, more prefecture-level cities appeared[50](from 226 in 2000 to 250 in 2010), the urban minorities dwelling in this city-level significantly increased by 82% (from 7.1 million in 2000 to 12.9 million in 2010), contributing 9.1% more (26.2% in 2000 to 35.3% in 2010) to the national urban minority (Figure 5.2.). Cities above the prefecture level experienced a notable increase in the urban minority population, increasing by 62% (from 5.69 million in 2000 to 9.21 million in 2010), even though its increase is not as high as that of prefecture level cities; their contribution to the national urban minority population increased from 20.9% to 25.2%.

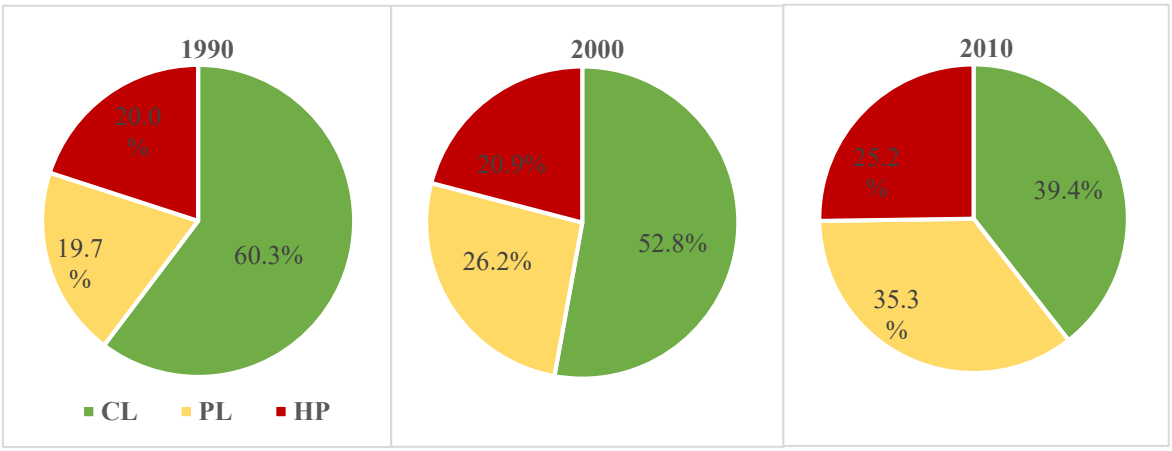


Figure 5.2. Urban Minority Population to the National Total Urban Minority Population
Source: CNBS, 1991, 2001 and 2011

5.1.3. Summary: A Periphery to Core Transition

Based on the above analysis, a trend is believed to exist demonstrating that urban minorities had been migrating from county-level cities to prefecture-level cities and above since 1990. This trend became more pronounced due to its rapid acceleration after 2000. The 10th and 11th Five-Year Plans began to emphasize the central roles of large cities in coordinating urban development. Contrary to this pattern, smaller cities can also be regarded as peripheries in urban development. By observing this migration pattern, it is possible to notice a peripheral-to-core model in which the urban minorities gradually migrate from county-level cities to higher level cities (from peripheries to the cores, in other words).

[50] As stated in Chapter 3 and 4, the increase in the number of prefecture-level cities are contributed by establishing new cities or promoting a county-level city to prefecture level.

The inspiration of this peripheryl-to-core model can also be credited to Cao *et al.,* (2005), whose case study depicts the evolution of the distribution of urban French-speaking communities over time in New Brunswick, Canada. In Cao's study, the urban minority distribution pattern is considered a process of spatial aggregation. Larger cities act as cores in the distribution of the urban minority population while smaller cities act as peripheries. This similar pattern is also easily applied to this research when referring to cities from the county and prefecture levels and beyond. A periphery (county-level cities) to core (prefecture-level cities first, and then, eventually cities above the prefecture level) model is displayed in Figure 5.3. below.

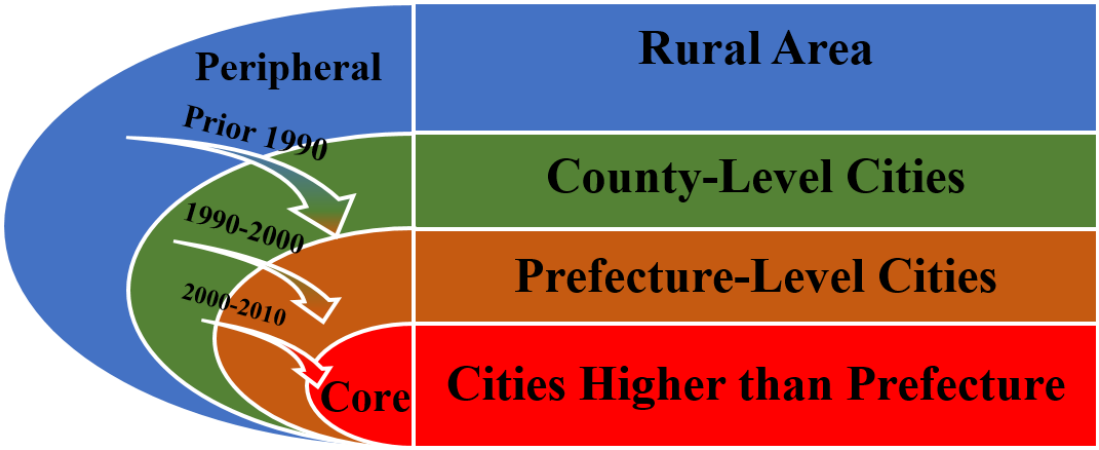


Figure 5.3. Core to Peripheral Transition

The periphery to core transition of urban minority concentration has been observed in three stages. First, between 1990 and 2000, the county-level cities (core) experienced the highest urban minority growth as ethnic minorities migrated from rural areas (peripheral). Additionally, county-level cities were especially supported by the urbanization policies during this period, and therefore greatly benefited from the flourishing of township enterprises. In the same period, the urban minority growth rate in prefecture-level cities began to accelerate. Second, from 2000 to 2010, as the urban minority population in county-level cities gradually stabilized, prefecture-level cities experienced the highest level of population growth among urban ethnic minorities. The prefecture-level cities became thus the major urban minority concentration. During this stage, county-level cities are the peripheries while cities from the prefecture-level are in the core position. Furthermore, in the same period, cities above the prefecture level began to grow significantly. If such a trend continues, it is highly likely that cities above the prefecture level will eventually replace prefecture-

level cities and become a new concentration of urban minorities in the near future. This three-leveled framework of the periphery-to-core spatial aggregation pattern demonstrates an urbanization progression, as more urban minorities tend to migrate to larger cities with a better socio-economic outlook.

5.2. Decline of Urban Minorities in the Central Region

Although the urban minority grew from 4.3 million (1990) to 5.5 million (2000) in the central region due to the momentum resulted from the urban development strategy that favoring small cities, it began to decline in the next decade (dropping from 5.5 million in 2000 to 5.3 million in 2010) (Figure 5.4.). Expanding from this, Figure 5.5., which compares the growth of the urban ethnic minority population in each region, demonstrates a different trend than that of the one made by the total urban population. The eastern region, not surprisingly, continued to increase its contribution to the national minority population (25.1% in 1990 to 32.3%). The percentage contributed by the urban ethnic minority population in the western region, unlike the total urban population, continued to grow throughout the years (49.6% in 1990 to 53.2% in 2010). The percentage contributed by the urban ethnic minority population in the central region demonstrates a continuous decline, dropping from 25.2% in 1990 (very close to that of the eastern region) to 19.7% in 2000; and to 14.4% in 2010 (the lowest among those of the three regions by that year).

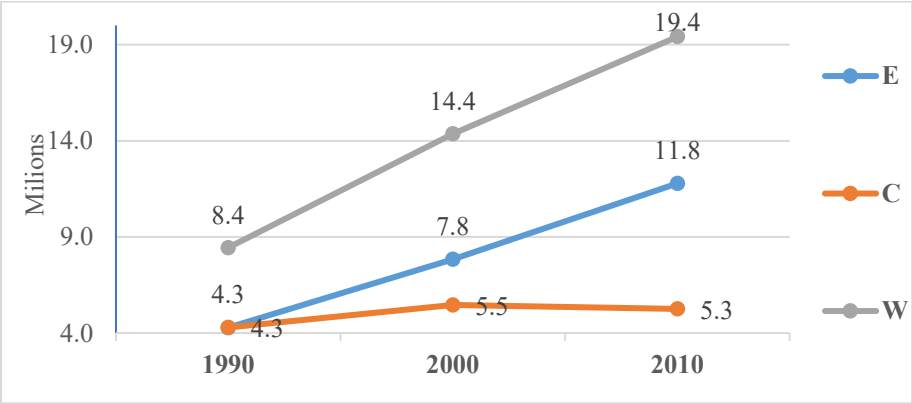


Figure 5.4. Urban Total Minority Population by Regional Division
Source: CNBS, 1991, 2001 and 2011
Note: E=Eastern Region, C=Central Region, W=Western Region

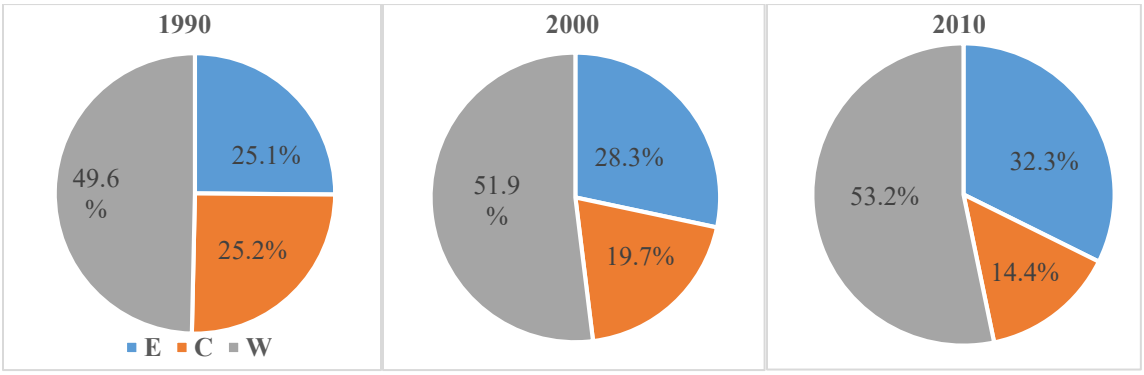


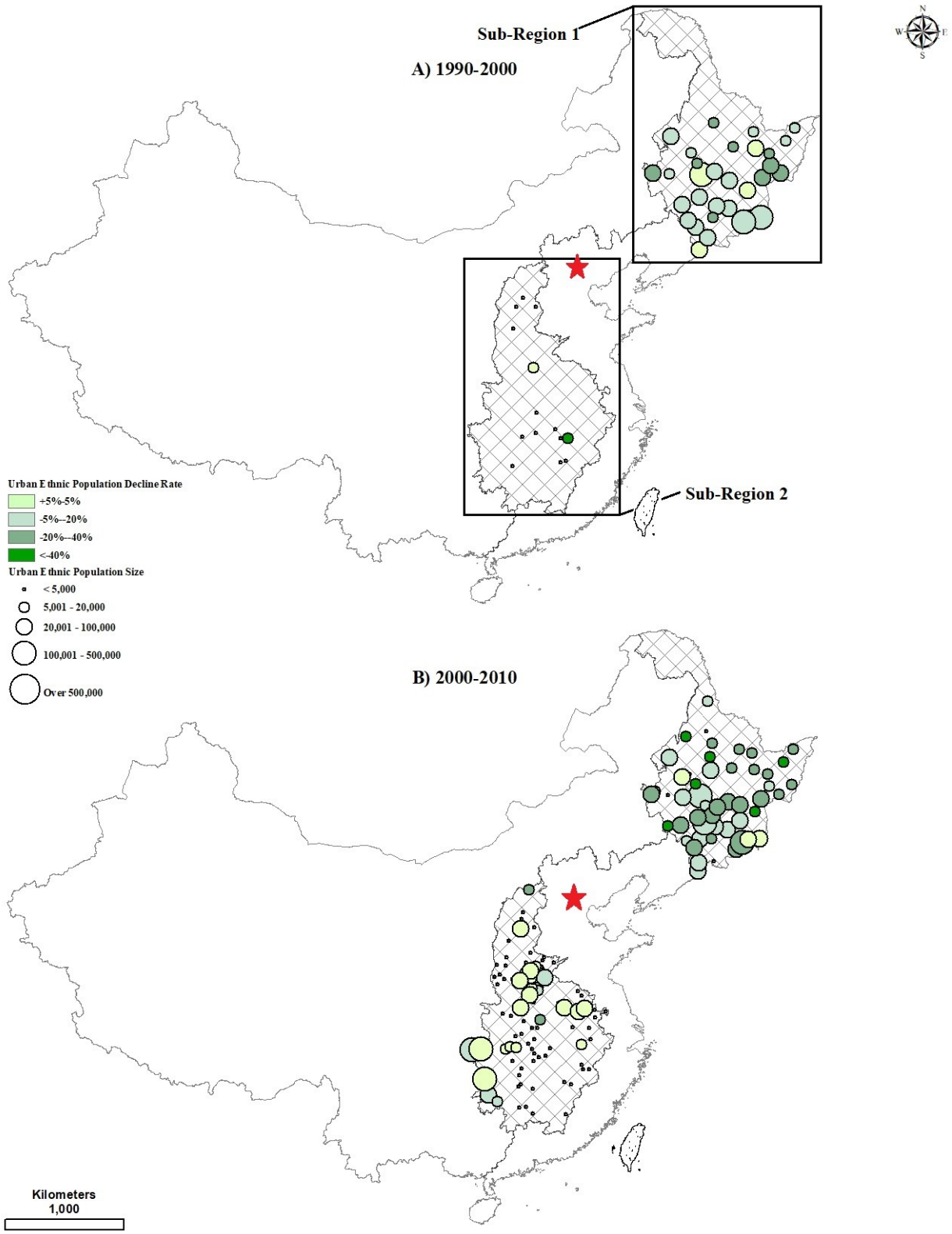
Figure 5.5. Regional Urban Minority Population to National Urban Minority Population
Source: CNBS, 1991, 2001 and 2011

5.2.1. Comparison of Two Sub-Regions[51]

A schematic map (Map 5.1.) is made to depict the two-decade declining trend of urban minorities among cities located in the two sub-regions in the central region. The urban minority decline became pervasive, first among cities located in sub-region 1 (Northeastern China). Between 1990 and 2000, there were 39 cities that experienced urban minority decline in the central region, 32 of which were located in the sub-region 1. Contrastingly, only eight of those were located in sub-region 2 (the central part of China) (Map 5.1. A.).

From 2000 to 2010, the declining trend of urban minorities in sub-region 1 escalated as it occurred in 62 cities. Moreover, compared with the previous decade (1990-2000), this trend became pervasive in sub-region 2 as well, as cities with decreasing urban minorities increased to 62, almost eight times as much of that in the last decade (Map 5.1 b)). Alternatively, when looking at the statistics[52], it is also evident that between the two decades (1990-2000; 2000-2010), fewer cities in the central region experienced urban minority growth.[53] Only a few cities continued to maintain a growing ethnic minority population, such as cities higher than the prefecture-level, provincial capitals, or prefecture-level cities where the ethnic minority populations have been historically concentrated.

[51] Referring to Chapter 3, the central region consists of two sub-regions.
[52] Refer to Table 4.4.
[53] From 1990 to 2000, there were 127 cities with the central region experienced urban minorities growth. This number dropped to 101 between 2000 and 2010.



Map 5.1. Urban Minorities Decline Rate by Regional Divisions

Source: CNBS, 1991, 2001 and 2011; All China Data Center, 2010

5.2.2. Summary

It is evident that the decline of the urban minority population in the central region occurred based on two scenarios. First, in the early 1990's, there had been an apparent minority population decline amongst cities located in sub-region 1 of the central region. This primarily resulted from the relative economic stagnation that appeared earlier on in the economic reforms of 1978, as the reform-induced liberalization and marketization gradually impaired the advantages of state-owned enterprises, most of which are the heavy industries.

Second, since 2000, more cities located in the sub-region 2 began to experience urban minority decline as the same kind of decline persisted among cities in sub-region 1. There existed multiple reasons for the urban minority decline in the central region (Figure 5.6.). Inter-regionally, cities within the eastern region possessed a superior economy, therefore making them more attractive for the ethnic minorities. On the other hand, the implementation of the China Western Development Strategy ensured increasingly more preferences for cities in the western region. Intra-regionally, in the central region itself, there is a trend of an increasing concentration of minority populations in a few cities higher than the prefecture level, the majority of which are the provincial capitals within the central region; this was due to the advantages of the position in the administrative hierarchical system. Cities higher than prefecture also act as areas of concentration for urban minorities, attracting more urban minorities from lower level cities, which are considered to be in the peripheral within this region.

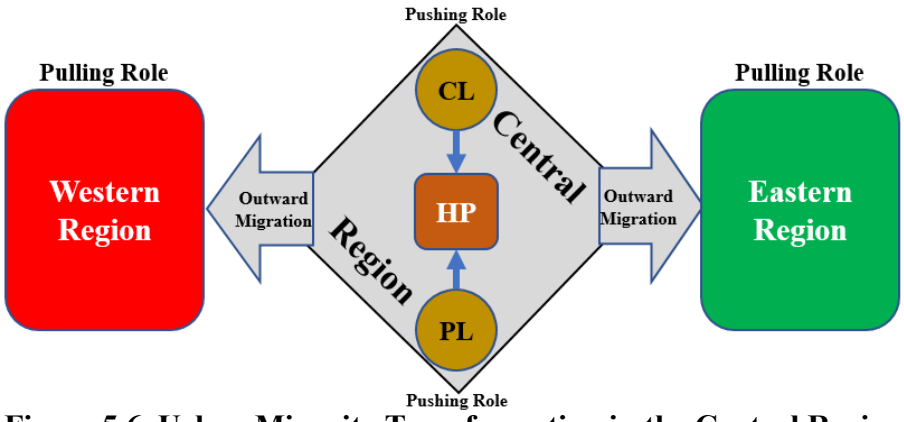


Figure 5.6. Urban Minority Transformation in the Central Region

5.3. The New Roles of City Agglomeration[54]

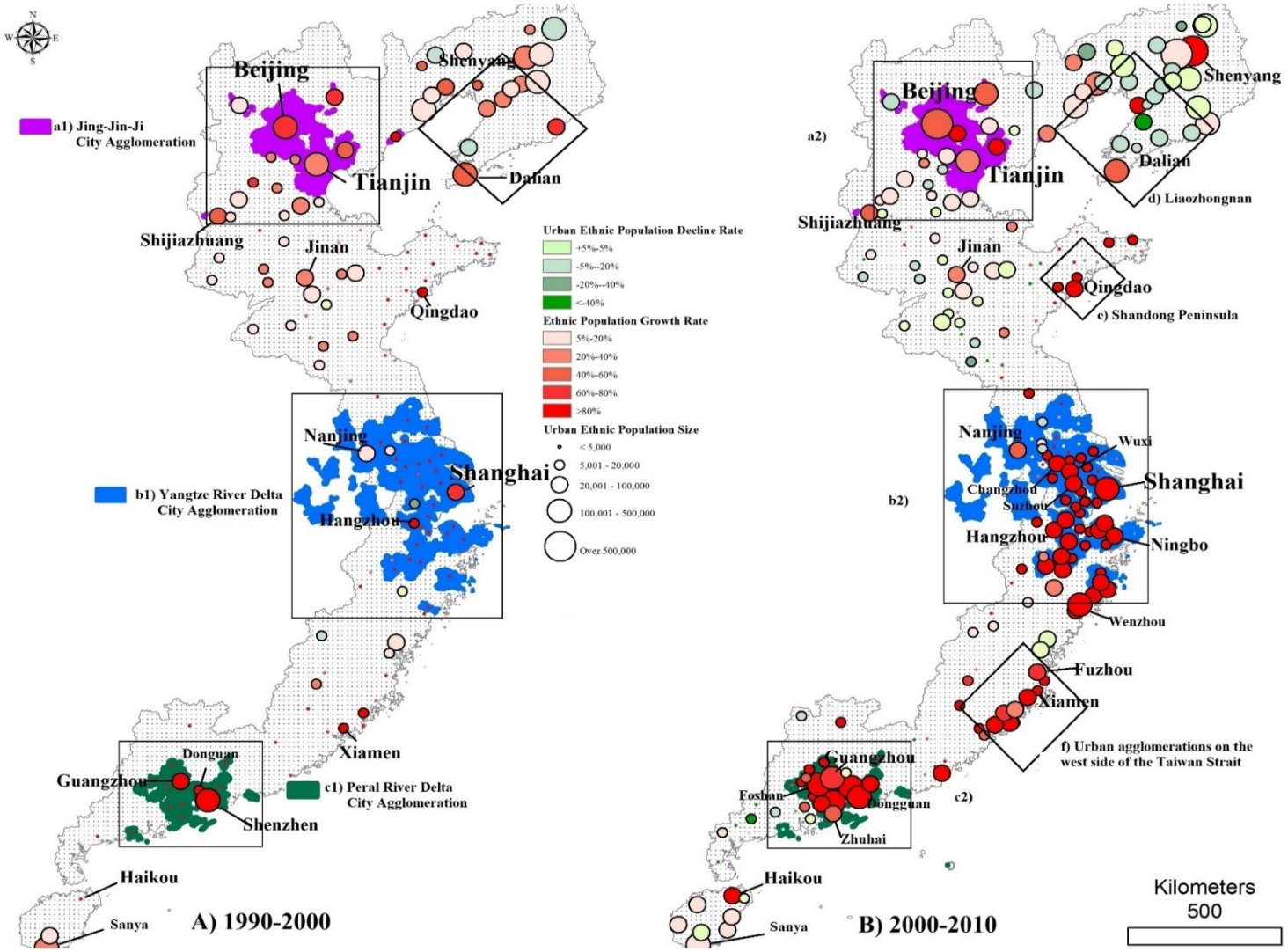
Stemming from the previous section, this section discusses the new roles of city agglomerations in China in shaping the current spatial distribution dynamics of urban ethnic minorities, as well as how the spatial distribution pattern of urban ethnic minority populations has evolved in city agglomerations at the national level.

During the 11th Five-Year Plan (2005-2010), the city agglomeration was defined as "the major form of urban development." There are seven national-level city agglomerations in China: The Yangtze River Delta, Pearl River Delta, Jing-Jin-Ji, Zhongyuan, Yangtze River Middle Reach, Ha-Chang, and Chengyu (NDRC, 2016). Though remaining elusive in precisely conceptualizing the city agglomeration, scholars such as Fang & Yu (2017), Fang *et al.* (2005) and Listengurt (1975) generally characterize the city agglomeration under the following scopes: First, by the territory, the city agglomerations associate separate urbanized areas with continuity. Second, the population is concentrated in city agglomerations. Third, the separate urbanized areas that form the city agglomerations remain in continuous economic and social relationships. Scott (2001, p.2) emphasizes the importance of city agglomerations [in the context of globalization] as being "a fundamental role in global competition and the global division of labor." Nevertheless, in China's rapid urbanization context, the city agglomeration, undoubtedly, plays an important role in understanding the spatial-temporal dynamics of urban ethnic minorities. Three schematic maps (Map. 5.2-5.4) are displayed, each of which represents the ethnic minority population size and variation speed in city agglomerations located in the eastern, central and western regions.

5.3.1. Changing Roles of City Agglomerations in the Eastern Region

As shown in Map 5.2., the eastern region has three national-level city agglomerations, which are the Yangtze River Delta, the Pearl River Delta, and the Jing-Jin-Jin. The first two city agglomerations experienced the most outstanding growth amongst the minority population within a 20-year period, developing a large ethnic minority population by 2010 (Map 5.2. b1 vs. b2; Map 5.2. c1 vs. c2). Cities such as Shanghai, Ningbo, Hangzhou, Shenzhen, and Guangzhou experienced the fastest growth amongst their ethnic minority population; almost all cities among these two agglomerations, regardless of their size or administrative level, experienced a surge in their ethnic minority populations since 1990.

[54] Also, referred as urban agglomeration by other research.



Map 5.2. Urban Minority Population Variation in City Agglomerations in Eastern China

Source: CNBS 1991, 2001, and 2011.

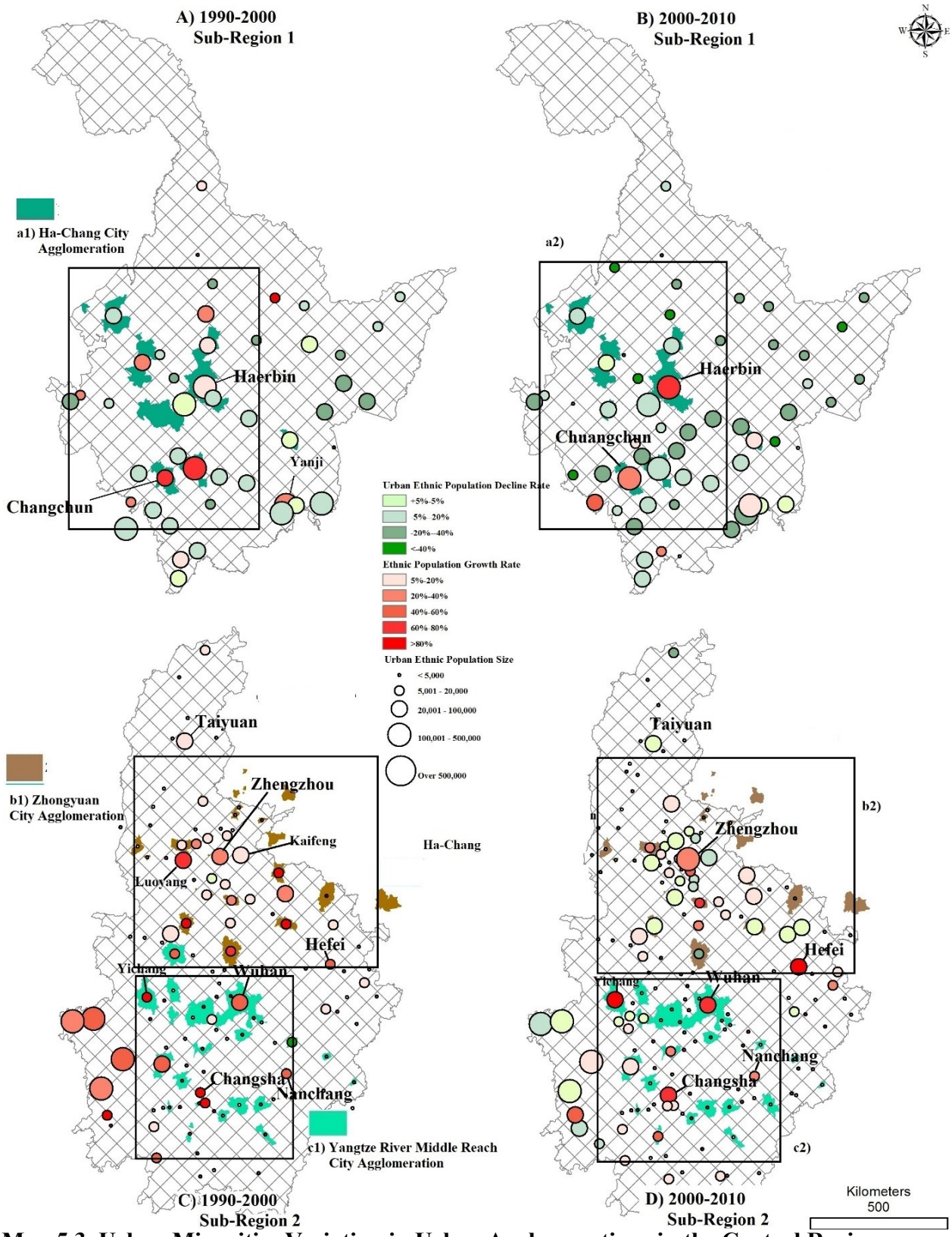
While it experienced a less rapid growth in its ethnic minority population, the Jing-Jin-Jin city agglomeration also developed a large ethnic minority population by 2010 (Map 5.2. a1 vs. a2.). The core cities in the Jing-Jin-Ji include the country's capital, Beijing, as well as Tianjin, one of the four municipalities[55] (Liu & Cao, 2017). In these areas, the influence of the household registration system (Hukou) remained stricter than other cities in China. This might be one of the reasons that the growth rates amongst the ethnic minority population were lower than the other two agglomerations.

There are other three important non-national city agglomerations in the eastern region (Fang *et al*., 2005). The first is Liaozhongnan (Map 5.2. d.) in the Liaodong peninsula. Between 1990 and 2000, most cities in this agglomeration experienced growth in their ethnic minority population, but there was a variable degree of decline between 2000 and 2010. The city of Shenyang, the capital city of Liaoning, and Dalian, the second largest city hosting an important harbor in Liaodong Peninsula, continuously experienced a significant increase (more than 60%) in their urban minority population. It can be assumed that the urban ethnic minority population in Liaozhongnan city agglomeration demonstrates a gathering trend towards the local metropolis. Second, in the Shandong Peninsula (Map 5.2. e.), the ethnic minority population continued to grow in the capital city of Shandong, Jinan, as well as Qingdao. Qingdao's population continued to increase rapidly (more than 80% from 1990 to 2010; same rate between 2000 and 2010) since 1990. Third, in Fujian province, the city agglomeration consists of Fuzhou, Xiamen, and other nearby cities,[56]forming another hotspot of rapid ethnic minority population growth (higher than 80% every decade) since 2000 (Map 5.2. f.).

5.3.2. City Agglomerations in the Central Region

As shown in Map 5.3., there are three national-level city agglomerations in the central region, which are the Ha-Chang (located in the sub-region 1), the Zhongyuan and the Yangtze River Middle Reach city agglomeration (located in sub-region 2). From 1990 to 2000, as shown in Map 5.3. a1, the Ha-Change city agglomeration demonstrated a clear trend of decline in the ethnic minority population, with only two capital cities, Haerbin (capital city of Heilongjiang Province) and Changchun (capital city of Jilin Province), experienced a growing urban minority population

[55] Referring back to Chapter 3, Chinese four municipalities are Beijing, Tianjin, Shanghai and Chongqing.
[56] Also, referred as Urban agglomerations on the west side of the Taiwan Straits.



Map 5.3. Urban Minorities Variation in Urban Agglomerations in the Central Region

Source: CNBS, 1991, 2001 and 2011; All China Data Center, 2011.

(5%-20% in Haerbin and over 60% in Changchun). This phenomenon confirms the urban minority population is becoming increasingly concentrated in local capital cities and migrating to other regions, as demonstrated in previous sections. From 2000 to 2010, this situation persisted as the urban minority continued declining in among nearly all cities except for the provincial capitals (see Map 5.3. a2). The situation in Ha-Chang city agglomeration is congruent with the causality; the pervasive economic stagnation in the northeastern region unleashed outward migration amongst the urban minority population (Sun *et al*., 2012).

Compared to the two other agglomerations within the central region, the Zhongyuan city agglomeration (located in sub-region 2) is the youngest national level city agglomeration, consisting of only one provincial capital (Zhengzhou) but a large number of prefecture and county level cities across several provinces. As demonstrated in Map 5.3. b1-b2., from 1990 to 2000, all provincial capitals, as well as large local cities, had a notable increase in their ethnic minority population. In the following decade (2000-2010), the rate of decline amongst the urban minority population became more apparent since only the capital city, namely Zhengzhou, had a growing minority population. This phenomenon confirmed once more the trend of urban minority decline in the central region.

Throughout the 20-year period, within the Yangtze River Middle Reach city agglomeration, there are four provincial capitals, as well as a single prefecture-level city known as Yichang, which experienced an increased concentration in their ethnic minority populations. As the closest city to the Three Gorges Hydro Dam, Yichang undoubtedly became the ideal destination for many migrants from the Three Gorges area, many of which were ethnic minorities (Li *et al*., 2001). Other cities, except cities within the ethnic autonomous prefectures, primarily experienced a trend of growth in their minority population from 1990 to 2000, followed by declining rates in the following decade.

5.3.3. Summary

As concluded from the discussion above, the three city agglomerations[57] located in the eastern region experienced the most rapid urban minority population growth, and this growth can be attributed to two major reasons. First, large cities and the city agglomerations were especially emphasized by the 10th and 11th Five-Year Plan, ensuring a good development strategy from an

[57] Jin-Jing-Ji, Yangtze River Delta, and Pearl River Delta city agglomerations.

administrative perspective. Second, China's accession to the World Trade Organization (WTO) in 2001 unleashed a massive scale of industrialization, increasing the labor demand enormously (He &Wang, 2012). Particularly, the Yangtze River Delta and Pearl River Delta city agglomerations become the hot spots of urban minority population concentration (Sachs & Woo, 2003). The growth reached the highest in large cities and gradually diminished among smaller cities. On the contrary, city agglomerations in the central and western regions experienced redistribution within the context of a decline in the urban minority population. More specifically, as the urban minority population gradually concentrated at a few core cities such as provincial capitals, while cities in the periphery, the county-level cities, and even some prefecture-level cities experienced a decline in urban minorities. Compared with those located in the eastern region, the development of city agglomerations in the central region was also limited by the region's disadvantaged socioeconomic context.

5.4. Minority Urbanization in Ethnic Autonomous Areas/Western Region

Referring to the previous chapter, the ethnic autonomous areas largely overlap with the western region. The autonomous areas and the western region consists of 64% and 71% of China's national territory respectively, containing 71% and 75% of the ethnic minority population within China (CNBS, 2015). The prevalence of the minority population in the autonomous area/western region highlights why it is important to understand the spatial-temporal distribution dynamics of the ethnic minority population (Wang, 2017). Thus, this section discusses the new roles of cities located in Chinese autonomous areas/the western region in shaping the current spatial distribution of ethnic minorities. A schematic map (Map 5.4.) is produced to represent the urban ethnic minority population sizes in cities located in ethnic autonomous areas/the western region, as well as the growth rate of the urban ethnic minority population between 1990 and 2010.

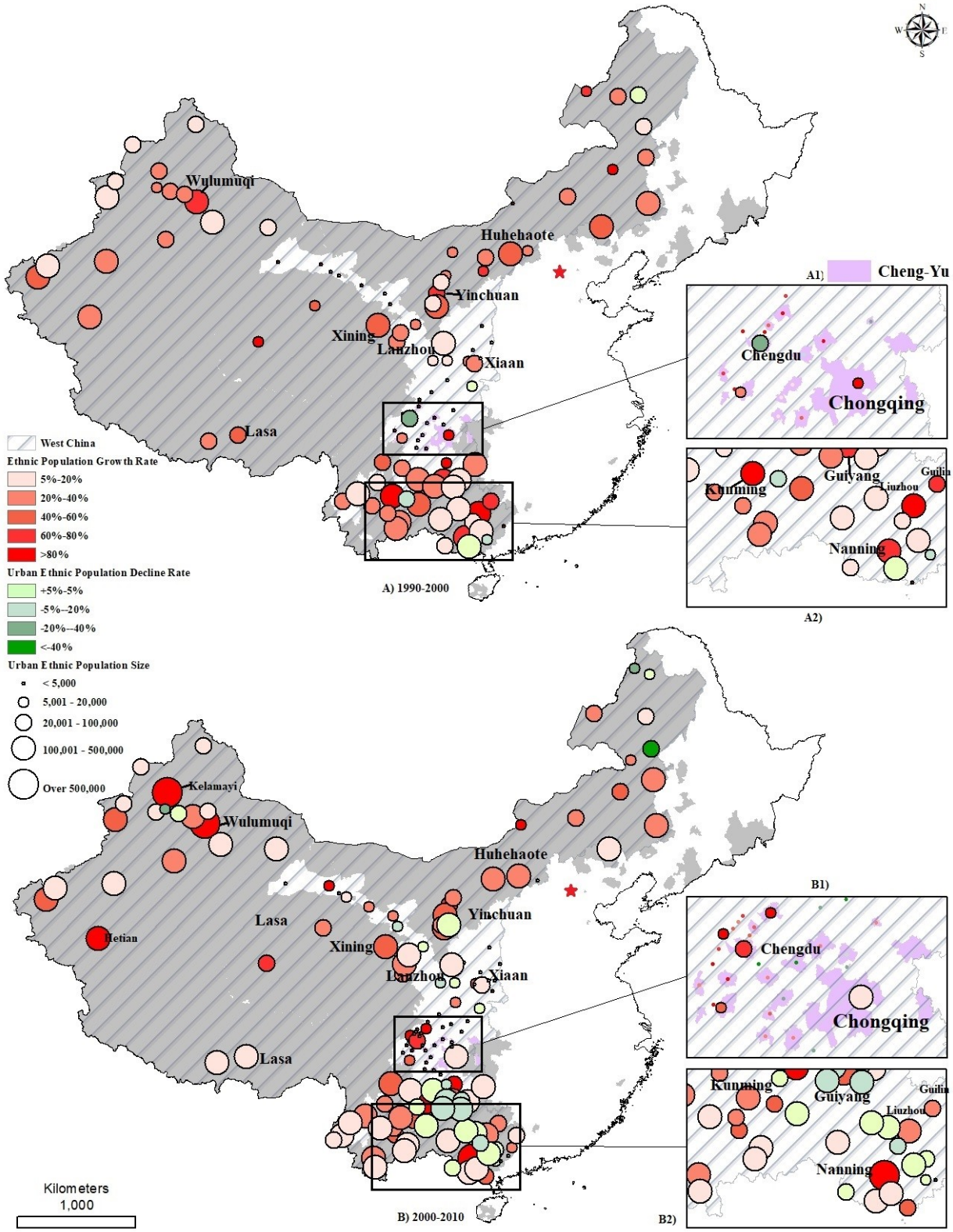
5.4.1. Important Roles of Provincial Capitals and Large Cities

Due to the proximity to the local ethnic minority population concentrations, cities, especially the capital cities in the western region, are more favored by the ethnic minorities who decide to begin an urban life, thus playing an important role in ethnic minority urbanization (Wang, 2017; Li *et al*., 2017). Map 5.4. demonstrates that the urban minorities in almost every provincial capital within this region experienced continuous growth over since 1990.

Northwestern and Southwestern China are the two key sub-regions within the western region, where the ethnic minorities are especially concentrated. In Northwestern China, specifically, capital cities like Wulumuqi (capital of Xinjiang Uygur Autonomous Region), Lanzhou (capital of Gansu Province), Yinchuan (capital of Ningxia Hui Autonomous Region), Huhehaote (capital of Neimenggu Autonomous Region) and Xining (capital of Qinghai Province) have become increasingly important in local urban minority growth as being pivotal in the development of the western regions and trading routes that connect the eastern region with Central Asia (Li *et al*., 2017; Cao, 2010). Especially since 2000, it is also worth noting that, besides the provincial capitals, there are also the cities in autonomous prefectures, for example, Kelamayi[58] and Hetian[59], where the local minority populations are culturally and traditionally concentrated, and gradually formed a sub-center of an urban minorities concentration, resulting in a high rate of increase in their minority population. (An & Maimaitiming, 2013). It can be concluded that provincial capitals and some cities with a larger ethnic minority population formed a local concentration of ethnic minorities.

In Southwestern China, as demonstrated in Map 5.4. A2-B2, the capital cities such as Kunming (capital of Yunnan Province), Guiyang (capital of Guizhou Province) and Nanning (capital of Guangxi Zhuang Autonomous Region), experienced continuous, prominent growth in urban minorities from 1990 to 2010, while the other lower level cities nearby began to lose their urban minorities, particularly since 2000. These capitals cities, as well as Liuzhou[60] and Guilin[61], formed a local concentration of the urban minorities (Li *et al*., 2017). However, the potential attractiveness of these provincial capitals towards the minority population has been gradually challenged, as cities within Southwestern China are among the closest to the eastern region, geographically speaking. The eastern region has the attractiveness of being economically successful, drawing a significant number of ethnic minorities from Southwestern China (Zhang & Bao, 2015).

[58] A flourishing oil refinery and petroleum based in Xinjiang.
[59] A county-level city regarded as one of the agricultural center in Xinjiang.
[60] A prefecture-level city in Guangxi Zhuang Autonomous Region with well-developed manufacturing industries.
[61] A prefecture-level city in Guangxi Zhuang Autonomous Region reputed to be a tourism center.



Map 5.4. Urban Minority Variation in Autonomous Area/Western Region

Source: CNBS, 1991, 2001 and 2011; All China Data Center, 2010

5.4.2. City Agglomerations in Western China Region/Ethnic Autonomous Areas

As shown in Map 5.4. A1-B1, there is only one national level city agglomeration in the western region, known as the Cheng-Yu city agglomeration, which consists of Chengdu, the capital city of Sichuan, and Chongqing, the only municipality in the western region. As Chongqing was promoted into a municipality in 1997, it experienced rapid growth (a rate of higher than 80%) in its ethnic minority population from 1990 to 2000. However, it should be clarified that the significant nominal increase of the ethnic minority population in Chongqing after its promotion is also largely credited to the merging of several prefecture-level cities, which contained many ethnic minority communities (Qin, 2010; Shaoquan, Zhijian, & Guojie, 2004; Lavely, 2001). In the following decade (2000-2010), Chongqing, with a larger ethnic minority population, still experienced a 5-20% growth in the ethnic minority population. The city of Chengdu was the only provincial capital that experienced a decline in its ethnic minority population between 1990 and 2000 (NBSC 2000 & 2010); while counterproductive, the decline in the ethnic minority population is largely credited to Chongqing being promoted into a Municipality, as well as related jurisdictional changes. In the following decade, both Chongqing and Chengdu had variable rates of increase in their ethnic minority population.

5.4.3. Summary

Concluding from the analysis above, in Northwestern China, provincial capitals had become increasingly crucial in the concentration of the urban minority population, as many of those capitals were of particular focus in China's Western Development Strategy since 2000. Even before this, capitals' prominent roles in urban minority concentration were fostered by superior socio-economical conditions as opposed to other cities in the northwestern region. Also, some cities may have benefited from a particular industrial or geographical advantage and formed the center of the urban minority concentration other than the provincial capitals.

In the southwestern region, provincial capitals played a similar role as those in the northwestern region, but have been increasingly challenged by attraction from cities in the eastern regions as its superior economy gravitated urban minorities from the southwestern region. The prefecture-level cities of Southwestern China still play an important role in urban ethnic minority distribution due to their predominant ethnic minority populations. However, it is hard to say if they will impose as many attractions to the local ethnic minority population compared to overwhelming urbanization in the nearby province.

Cheng-Yu city agglomeration, as the only city agglomeration in the western region, did act as a local urban minority concentration. It can be observed that the majority of the urban minority within this agglomeration became increasingly concentrated in core cities in this agglomeration, namely Chengdu and Chongqing, which is similarly distributed as that of in the city agglomerations in the central region. However, if compared with the Yangtze River Delta and Pearl River Delta city agglomerations in the eastern region, the Cheng-Yu, though benefitting from China's Western Development Strategy, was not as attractive to ethnic minorities, given that the growth of the urban ethnic minorities was less prominent. The less prominent urban minority concentration in Cheng-Yu agglomeration was mainly attributed to the relative socio-economic disadvantages of the western region.

Chapter 6. Conclusion

This chapter begins with a review of this study's context, scope, and objectives, before offering general conclusions and empirical contributions drawn from research results described in Chapters 4 and 5. This chapter concludes by outlining this research's limitations and future directions.

6.1. Research Review

This study conducts a comprehensive examination of the spatial-temporal distribution dynamics of ethnic minorities in China's urbanization processes by employing national census data from 1990, 2000 and 2010. This research's scope is defined through a contextualization of urbanization in contemporary China.

China experienced tremendous economic success throughout the 1990s, culminating with the country's accession to the WTO (2001). The resulting rapid urbanization was fueled by the continued liberalization of the household registration system, alternatively known as the *Hukou* system, which resulted in a substantial increase in the urban ethnic minority population. Despite this, the urbanization rate of the ethnic minority population remains much lower than that of the national average (32.8% for ethnic minorities vs. 49.9% for the national average, in 2010). The National New-Type Urbanization Plan was launched in 2014 to explore different possibilities for improving an unprecedented urbanization period in China; an example of such a possibility is the attainment of a more human-oriented and inclusive urbanization, as well as overcoming many other challenges related to the rapid urbanization experienced over the last few decades (Chen et al., 2016; Taylor, 2015). In alignment with the New Urban Agenda of 2016, this national plan also ambitiously aims to incorporate more of the minority population as urban dwellers to promote the inclusivity within the urbanization process (Yang, Wu, & Gong, 2017; Chan, 2014). With the realization of studies on nationwide urban minority distribution dynamics, employing data from the last three censuses have been largely vacant, and this empirical research providing otherwise helpful knowledge for practitioners and scholars to achieve such an ambitious goal is warmly

welcomed. A series of findings are concluded and summarized below:

6.1.1. Spatial Aggregation of Urban Minorities: A Peripheral to Core Transition

The peripheral to core transition of urban minority concentration has been realized in three stages. Frist, between 1990 and 2000, due to the urbanization policy preferences and the subsequent flourishing township enterprises, a large number of ethnic minorities decide to begin their urban lives in county-level cities. In such a context, county-level cities were considered as the core while rural areas were the peripheral. Second, from 2000 to 2010, the major urban minority concentration moved to prefecture-level cities, rendering cities of this level as the new core while county-level cities, where urban minorities were migrating away from them, became the new peripherals. It can be confirmed that the transition of the peripheral-to-core spatial aggregation demonstrates an urbanizational progress among urban minorities as more urban minorities migrate to larger cities in where the socio-economic resources are superior. Third, this momentum highly likely persisted after 2010. Therefore, cities higher than prefecture level might have been gradually becoming the major concentrations of urban minorities.

6.1.2. Decline of the Urban Minorities in Central Region

The urban ethnic minority population began to decline early in 1990 in sub-region 1 of the central region due to the stagnation of heavy industries and state-owned enterprises. From 2000 to 2010, this decrease in ethnic minority populations persisted and became pervasive in sub-region 2. Inter-regionally, this was a result of cities within the eastern region possessing a superior economy, therefore making them more attractive for the ethnic minorities. In addition to this, cities in the western region greatly benefited from the implementation of the China Western Development Strategy; they became even more attractive to the minority population from the central region. Within the central region, due to the advantages of the position in the administrative hierarchical system, cities above the prefecture-level had also become increasingly attractive to the minority population from lower level cities.

6.1.3. Changing Roles of City Agglomerations in the Eastern Region

Beginning in 1990, then fueled by the flourishing manufacturing industries due to China's accession to the WTO later in 2001, the three city agglomerations[62] located in the eastern region experienced the most rapid urban minority population growth. Particularly, in the Yangtze River Delta and Pearl River Delta, it is predictable that the momentum of the tremendous urban minority population growth will persist and continue to be the hot spots of urban minority population concentration.

6.1.4. Important Roles of Provincial Capitals in the Ethnic Autonomous Areas/Western Region

Specifically, in the northwestern region, provincial capitals have become increasingly important to local urban minority growth, thus pivotal in the development of the western regions and trading routes that connect the eastern region with Central Asia. Provincial capitals in the southwestern region played similar roles as those located in Northwestern China; however, these capitals experienced challenges by cities from the eastern region who were more attractive to urban minorities due to their heightened socio-economic status.

6.2. Empirical Contributions

The research findings have generated multiple empirical contributions. First, the four major findings provide necessary knowledge beneficial to practitioners through delineating and measuring the twenty-year spatial-temporal distributional pattern of China's ethnic minority population in cities, therefore, helping to improve sustainable and inclusive urbanization in China.

Second, this study adopted the Standard Deviational Ellipse (SDE) to delineate the urban ethnic minority population distributional dynamics over a two-decade period with thematic data: 1) The center of gravity; 2) The shape or elongation measured by the short (X) and long (Y) axis; 3) The orientation of the ellipse; and 4) The spatial area of the ellipse. The national scale SDE was

[62] Jin-Jing-Ji, Yangtze River Delta, and Pearl River Delta city agglomerations.

also formulated to focus on cities from three different administrative levels: county level, prefecture level, and higher-than-prefecture level.

However, being a burgeoning and versatile tool for spatial-temporal analysis, the SDE has seldom been adopted in ethnic minority research in China. Wong (2000) examines ethnic integration and spatial segregation of the Chinese population by adopting SDE. Another study by Lu (2014), used the SDE to examine the small probability events amongst the Hui ethnic group dating back to the Qing dynasty. It is evident that current studies on Chinese ethnic minorities which employ SDE are very few and lack up-to-date censuses. With a series of schematic maps depicting the Chinese urban ethnic minority distributional changes from 1990 to 2010, this study helps provide, not only a better understanding of spatial-temporal distribution dynamics of Chinese urban ethnic minorities, which can serve both government policy-making and academic research, but also act as a manifestation of the versatility of GIS as a tool in ethno-related and urban studies.

Additionally, this research adopted the most up-to-date 2010 census data available in China and conducted a holistic study of urban ethnic minority distribution between 1990 and 2010. As the Chinese government only conducts a national census every ten years due to a large population size and a vast territory to cover, the latest census was conducted in 2010 and published in 2011. It has been almost six years since the release of this most recent census, which has resulted in some studies on ethnic minorities in China. For instance, in 2013, Deng and Gao (2013) explored the changes of the ethnic minority population in the Western Region with the 2010 census. However, national level ethnic researches focused on China are substantially less, and it is even rarer, if narrowing the scope, to focus on spatial-temporal distribution dynamics of Chinese urban ethnic minorities from 1990 to 2010. This research, by combining the up-to-date census and the three-level administrative hierarchy amongst Chinese cities helps to provide references for studies on the urban ethnic minorities in China throughout their urbanization process, particularly in the ethno-urban context.

Regarding the national scale, this study outlines the spatial-temporal distribution of Chinese

ethnic minorities within the context of urbanization, providing a general perspective on its dynamics from 1990 to 2010. The key contributions surface by adopting urban China as the scope, as opposed to other research on minorities in China that were conducted, focusing on a smaller scale. For example, China as the scope, particularly the regions with an abundance of ethnic minorities, has been of interest to many scholars, such as Zhang (2005), Lu *et al*. (2007), and Anwaer *et al*. (2013, 2008). Looking at the ethnic minorities from the provincial-level, especially focusing on the ethnic autonomous regions in China, is another popular scope of research interest for scholars such as Cao (2010), Zang (2011), Remesh (2012), Hasmath (2014), and Wu & Song (2014).

Finally, this is a study conducted in the English language about the ethnic minority population in China; most previous studies on the ethnic minorities in urban China have been conducted in Mandarin. The availability of this research in English will be advantageous for the western scholarship.

6.3. Limitations and Directions for Future Studies

Although this study enables a better understanding of the spatial-temporal distribution dynamics of ethnic minorities in China's New-Era Urbanization, there are a few limitations to this research, but optimistically new opportunities for future research.

First, unlike those of cities at the prefecture level and above, censuses of county-level cities do not specify whether the population in such jurisdictions is comprised of urban or rural dwellers. Therefore, this study has had to compromise by taking the total population in county-level cities' jurisdiction into account, which may generate statistical bias.

Second, as this study regards all non-Han Chinese, regardless of their ethnic groups, future studies will be able to add to the literature by examining specific ethnic groups, as socio-economic conditions and spatial patterns vary among them. For instance, the Korean-Chinese demonstrated the highest level of urbanization, and are primarily concentrated in Northeastern China (one of two parts of the central region by socio-economical norms) (Gustafsson & Yang, 2015; Deng *et al*.,

2009).

Third, as the evolution of the Chinese urban ethnic population distribution dynamics is directly related to migration and social mobility, researchers with interest in inter and intra-provincial migration amongst minority populations should consider studying the migration preferences of different ethnic groups.

Moreover, since the urbanization rate of Chinese ethnic minorities has been lower than the national level (32.8% vs. 49.9% in 2010), and considering they have experienced relative vulnerabilities, such as threats to their cultures, social-economic welfare, not to mention uneven political representation, future studies are invited to focus on improving not just the nominal urbanization rate, but also the quality regarding the inclusivity and sustainability of urbanization among Chinese minorities.

Finally, future studies focusing on urban minorities should consider the new national policy "One Belt, One Road (OBOR),[63]" unveiled in 2015. The Xinjiang Uyghur Autonomous Region will play a pivotal role in connecting Central Asia to China's central and eastern regions. Also, as an ethnic autonomous region in Northwestern China, Xinjiang is also where the Uyghur people and other ethnic groups, are largely concentrated. The implementation of the OBOR and the resulting commercial development will certainly initiate a new wave of urbanization processes amongst ethnic minorities in Northwestern China in years to come.

[63] Unveiled by President Xi in 2013, "as significant elements of Beijing's current effort to improve ties and stimulate growth and development along its geographic periphery. These initiatives, now termed One Belt, One Road were seen as part of an overall Chinese attempt to "leverage China's growing economic power and influence [along its periphery] in order to strengthen and expand cooperative interactions, create an integrated web of mutually beneficial economic, social and political ties, and ultimately lower distrust and enhance a sense of common security" (Swaine, 2015, p.1).

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APPENDIX 1: NEW ESTABLISHED CITIES

1990-2000			2000-2010		
Note: PL stands for Prefecture-Level City. CL stands for County-Level City					
Name	**Name (in Chinese)**	**Level**	**Name**	**Name (in Chinese)**	**Level**
Aershan	阿尔山市	CL	Alaer	阿拉尔市	CL
Anguo	安国市	CL	Chongzuo	崇左市	PL
Anning	安宁市	CL	Dingxi	定西市	PL
Anqiu	安丘市	CL	Dongsheng	鄂尔多斯市	PL
Bazhou	巴中市	PL	Guyuan	固原市	PL
Bazhou	霸州市	CL	Hailaer	呼伦贝尔市	PL
Beiliu	北流市	CL	Jining	乌兰察布市	PL
Beining	北镇市	CL	Laibinshi	来宾市	PL
Bijie	毕节市	CL	Lijiang	丽江市	PL
Cenxi	岑溪市	CL	Lincang	临沧市	PL
Changge	长葛市	CL	Linhe	巴彦淖尔市	PL
Changle	长乐市	CL	Mengzi	蒙自市	CL
Changning	常宁市	CL	Shapotouqu	中卫市	PL
Changyi	昌邑市	CL	Tumushuke	图木舒克市	CL
Chaoyang	潮阳市	PL	Wudu	陇南市	PL
Chenghai	澄海市	CL	Wujiaqu	五家渠市	CL
Chishui	赤水市	CL			
Chongzhou	崇州市	CL			
Conghua	从化市	CL			
Dafeng	大丰市	CL			
Danzhou	儋州市	PL			
Dashiqiao	大石桥市	CL			
Daye	大冶市	CL			
Dehui	德惠市	CL			
Dengfeng	登封市	CL			
Dengta	灯塔市	CL			
Dexing	德兴市	CL			
Dongfang	东方市	CL			
Donggang	东港市	CL			
Dongpo	眉山市	PL			
Dongxing	东兴市	CL			
Eerguna	额尔古纳市	CL			
Enping	恩平市	CL			

Fangcheng	防城港市	PL
Fanyu	番禺市	CL
Feicheng	肥城市	CL
Fengcheng	凤城市	CL
Fengnan	丰南市	CL
Fengzhen	丰镇市	CL
Fenyang	汾阳市	CL
Fuding	福鼎市	CL
Fukang	阜康市	CL
Fuqing	福清市	CL
Fuquan	福泉市	CL
Fuyang	富阳市	CL
Gaizhou	盖州市	CL
Gaoan	高安市	CL
Gaobeidian	高碑店市	CL
Gaomi	高密市	CL
Gaoming	高明市	CL
Gaoping	高平市	CL
Gaoyao	高要市	CL
Gaoyou	高邮市	CL
Gaozhou	高州市	CL
Genhe	根河市	CL
Gongyi	巩义市	CL
Guangan	广安市	PL
Guichi	池州市	PL
Guiping	桂平市	CL
Guixi	贵溪市	CL
Hailin	海林市	CL
Haimen	海门市	CL
Haiyang	海阳市	CL
Hanchuan	汉川市	CL
Hechuan	合川市	CL
Hejian	河间市	CL
Hejin	河津市	CL
Helong	和龙市	CL
Heshan	鹤山市	CL
Hezhou	贺州市	PL
Hezuo	合作市	CL
Huangzhou	黄冈市	PL

Huayin	华阴市	CL
Huazhou	化州市	CL
Huiyang	惠阳市	CL
Hulin	虎林市	CL
Jiande	建德市	CL
Jiangdu	江都市	CL
Jiangjin	江津市	CL
Jiangyan	姜堰市	CL
Jianou	建瓯市	CL
Jianyang	建阳市	CL
Jianyang	简阳市	CL
Jiaonan	胶南市	CL
Jiexiu	介休市	CL
Jinghong	景洪市	CL
Jingjiang	靖江市	CL
Jingzhou	荆州市	PL
Jinjiang	晋江市	CL
Jintan	金坛市	CL
Jinzhou	晋州市	CL
Jizhou	冀州市	CL
Jurong	句容市	CL
Kaiping	开平市	CL
Laixi	莱西市	CL
Langzhong	阆中市	CL
Lechang	乐昌市	CL
Leizhou	雷州市	CL
Leping	乐平市	CL
Leqing	乐清市	CL
Lianjiang	廉江市	CL
Lianzhou	连州市	CL
Linan	临安市	CL
Linchuan	抚州市	PL
Lingbao	灵宝市	CL
Linghai	凌海市	CL
Lingwu	灵武市	CL
Lingyuan	凌源市	CL
Linjiang	临江市	CL
Linxiang	临湘市	CL
Linzhou	林州市	CL

Lishi	离石市	CL
Liuyang	浏阳市	CL
Liyang	溧阳市	CL
Longhai	龙海市	CL
Longquan	龙泉市	CL
Lucheng	潞城市	CL
Lufeng	陆丰市	CL
Luoding	罗定市	CL
Luquan	鹿泉市	CL
Luxi	潞西市	CL
Mengzhou	孟州市	CL
Mianzhu	绵竹市	CL
Mingguang	明光市	CL
Miquan	米泉市	CL
Muleng	穆棱市	CL
Nanan	南安市	CL
Nanchuan	南川市	CL
Nanhai	南海市	CL
Nankang	南康市	CL
Nanxiong	南雄市	CL
Nehe	讷河市	CL
Ningan	宁安市	CL
Ningguo	宁国市	CL
Ningjiang	松原市	PL
Panshi	磐石市	CL
Penglai	蓬莱市	CL
Pengzhou	彭州市	CL
Pinghu	平湖市	CL
Pizhou	邳州市	CL
Pulandian	普兰店市	CL
Puning	普宁市	CL
Qianan	迁安市	CL
Qingyang	庆阳市	CL
Qingzhen	清镇市	CL
Qionghai	琼海市	CL
Qionglai	邛崃市	CL
Qiongshan	琼山市	CL
Renhuai	仁怀市	CL
Rongcheng	揭阳市	PL

Rugao	如皋市	CL
Ruijin	瑞金市	CL
Ruili	瑞丽市	CL
Rushan	乳山市	CL
Sanhe	三河市	CL
Sanshui	三水市	CL
Shangyu	上虞市	CL
Shangzhou	商洛市	CL
Shaoshan	韶山市	CL
Shenfang	什邡市	CL
Shengzhou	嵊州市	CL
Shenzhou	深州市	CL
Shouguang	寿光市	CL
Shuangliao	双辽市	CL
Shulan	舒兰市	CL
Shunde	顺德市	CL
Sihui	四会市	CL
Simao	普洱市	CL
Songzi	松滋市	CL
Taicang	太仓市	CL
Taishan	台山市	CL
Taixing	泰兴市	CL
Tianchang	天长市	CL
Tiazhou	台州市	PL
Tongcheng	桐城市	CL
Tongxiang	桐乡市	CL
Tongzhou	通州市	CL
Wanning	万宁市	CL
Wanyuan	万源市	CL
Wenchang	文昌市	CL
Wenling	温岭市	CL
Wuchang	五常市	CL
Wuchuan	吴川市	CL
Wugang	武冈市	CL
Wugang	舞钢市	CL
Wujiang	吴江市	CL
Wujin	武进市	CL
Wusu	乌苏市	CL
Wuxian	吴县市	CL

Xiangcheng	项城市	CL
Xiaoyi	孝义市	CL
Xingning	兴宁市	CL
Xingping	兴平市	CL
Xingyang	荥阳市	CL
Xinhui	新会市	CL
Xinle	新乐市	CL
Xinmi	新密市	CL
Xinmin	新民市	CL
Xinyi	新沂市	CL
Xinyi	信宜市	CL
Xinzheng	新郑市	CL
Xishan	锡山市	CL
Xixia	栖霞市	CL
Xuanwei	宣威市	CL
Yangchun	阳春市	CL
Yangzhong	扬中市	CL
Yanjiang	资阳市	PL
Yanshi	偃师市	CL
Yanzhou	兖州市	CL
Yicheng	宜城市	CL
Yingde	英德市	CL
Yizhou	宜州市	CL
Yongcheng	永城市	CL
Yongji	永济市	CL
Yongkang	永康市	CL
Yuanping	原平市	CL
Yucheng	禹城市	CL
Yuci	晋中市	PL
Yuhang	余杭市	CL
Yuncheng	云浮市	PL
Yushu	榆树市	CL
Zengcheng	增城市	CL
Zhangping	漳平市	CL
Zhangqiu	章丘市	CL
Zhaoyuan	招远市	CL
Zhijiang	枝江市	CL
Zhongxiang	钟祥市	CL
Zhuanghe	庄河市	CL

Zoucheng	邹城市	CL
Zunhua	遵化市	CL

APPENDIX 2: CITIES PROMOTED INTO HIGHER ADMINISTRATIVE LEVEL

1990-2000			2000-2010		
Note: MP stands for Municipality SP stands for Sub-Provincial Level City PL stands for Prefecture-Level City.					
Name	**Name (in Chinese)**	**Level**	**Name**	**Name (in Chinese)**	**Level**
Anshun	安顺市	PL	Ankang	安康市	PL
Baicheng	白城市	PL	Baoshan	保山市	PL
Baise	百色市	PL	Danzhou	儋州	PL
Bincheng	滨州市	PL	Hechi	河池市	PL
Changchun	长春市	SP	Hezhou	贺州市	PL
Chaohu	巢湖市	PL	Huaian	淮安市	PL
Chaohzou	潮州市	PL	Jiuquan	酒泉市	PL
Chengdu	成都市	SP	Pingliang	平凉市	PL
Chongqing	重庆市	MP	Puer	普洱市	PL
Chuzhou	滁州市	PL	Qingyang	庆阳市	PL
Dalian	大连市	SP	Shangluo	商洛市	PL
Dazhou	达州市	PL	Wuwei	武威市	PL
Decheng	德州市	PL	Zhangye	张掖市	PL
Fuyang	阜阳市	PL	Zhaotong	昭通市	PL
Ganzhou	赣州市	PL			
Guangzhou	广州市	SP			
Guigang	贵港市	PL			
Haerbin	哈尔滨市	SP			
Hangzhou	杭州市	SP			
Hanzhong	汉中市	PL			
Heihe	黑河市	PL			
Hengshui	衡水市	PL			
Heze	菏泽市	PL			
Huaihua	怀化市	PL			
Huludao	葫芦岛市	PL			
Jian	吉安市	PL			
Jinan	济南市	SP			
Liaocheng	聊城市	PL			
Liawu	莱芜市	PL			
Linfen	临汾市	PL			
Linyi	临沂市	PL			
Lishui	丽水市	PL			

Liuan	六安市	PL
Longyan	龙岩市	PL
Loudi	娄底市	PL
Luzhou	泸州市	PL
Nanchong	南充市	PL
Nanjing	南京市	SP
Nanping	南平市	PL
Nanyang	南阳市	PL
Ningbo	宁波市	SP
Ningde	宁德市	PL
Qingdao	青岛市	SP
Qinzhou	钦州市	PL
Qujing	曲靖市	PL
Rizhao	日照市	PL
Shangqiu	商丘市	PL
Shangrao	上饶市	PL
Shenyang	沈阳市	SP
Shenzhen	深圳市	SP
Suihua	绥化市	PL
Suizhou	随州市	PL
Suqian	宿迁市	PL
Suzhou	宿州市	PL
Taizhou	泰州市	PL
Tongliao	通辽市	PL
Weinan	渭南市	PL
Wuhan	武汉市	SP
Wuzhong	吴忠市	PL
Xiaan	西安市	SP
Xiamen	厦门市	SP
Xianning	咸宁市	PL
Xiaogan	孝感市	PL
Xichun	宜春市	PL
Xinyang	信阳市	PL
Xinzhou	忻州市	PL
Xuancheng	宣城市	PL
Yaan	雅安市	PL
Yanan	延安市	PL
Yibin	宜宾市	PL
Yiyang	益阳市	PL

Yongzhzou	永州市	PL
Yulin	玉林市	PL
Yulin	榆林市	PL
Yuncheng	运城市	PL
Yuxi	玉溪市	PL
Zhangjiajie	张家界市	PL
Zhongshan	中山市	PL
Zhoukou	周口市	PL
Zhumadian	驻马店市	PL
Zunyi	遵义市	PL

APPENDIX 3: CITIES MERGED INTO HIGHER JURISDICTION

1990-2000			2000-2010		
Note: SP stands for Sub-Provincial Level City PL stands for Prefecture-Level City.					
Name	**Name (in Chinese)**	**Level**	**Name**	**Name (in Chinese)**	**Level**
Dongchuan	东川市	PL	Acheng	阿城市	CL
Fuling	涪陵市	PL	Chaoyang	潮阳市	CL
Fuyu	扶余市	CL	Chenghai	澄海市	CL
Huangyan	黄岩市	CL	Dongsheng	东胜市	CL
Jiaojiang	椒江市	CL	Fanyu	番禺市	CL
Lengshuitan	冷水滩市	CL	Fengnan	丰南市	CL
Linchuan	临川市	CL	Gaoming	高明市	CL
Shangzhou	商州市	CL	Guichi	贵池市	CL
Shashi	沙市市	PL	Hailaer	海拉尔市	CL
Wanding	畹町市	CL	Hechuan	合川市	CL
Wanxian	万县市	PL	Huaiyin	淮阴市	CL
Xifeng	西峰市	CL	Huiyang	惠阳市	CL
Yuci	榆次市	CL	Jiangjin	江津市	CL
			Jining	集宁市	CL
			Linhe	临河市	CL
			Lishi	离石市	CL
			Miquan	米泉市	CL
			Nanchuan	南川市	CL
			Nanhai	南海市	CL
			Qiongshan	琼山市	CL
			Sanshui	三水市	CL
			Shunde	顺德市	CL
			Tongzhou	通州市	CL
			Wujin	武进市	CL
			Wuxian	吴县市	CL
			Xiaoshan	萧山市	CL
			Xinhui	新会市	CL
			Xishan	锡山市	CL
			Yuhang	余杭市	CL