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POSTDOCTORAL STUDIES

Jing Feng

AUTEUR DE LA THÈSE / AUTHOR OF THESIS

M.Sc. (Geography)

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FACULTÉ, ÉCOLE, DÉPARTEMENT / FACULTY, SCHOOL, DEPARTMENT

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TITRE DE LA THÈSE / TITLE OF THESIS

Huhua Cao

DIRECTEUR (DIRECTRICE) DE LA THÈSE / THESIS SUPERVISOR

CO-DIRECTEUR (CO-DIRECTRICE) DE LA THÈSE / THESIS CO-SUPERVISOR

EXAMINATEURS (EXAMINATRICES) DE LA THÈSE / THESIS EXAMINERS

Anne Gilbert

Scott Simon

Gary W. Slater

Le Doyen de la Faculté des études supérieures et postdoctorales / Dean of the Faculty of Graduate and Postdoctoral Studies

**URBAN-RURAL INCOME DISPARITY IN THE MINORITY
COUNTIES OF GANSU, WESTERN CHINA**

Jing FENG

Thesis submitted to the
Faculty of Graduate and Postdoctoral Studies
In partial fulfillment of the requirements
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Department of Geography
Faculty of Arts
University of Ottawa

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ABSTRACT

China has been experiencing considerable growth following the economic reforms and open doors policy (改革开放) of 1978. The whole country has not benefited from these changes, however. A significant socioeconomic gap has been created between the developed Eastern coast and the poor hinterlands of the Western regions. Although the Chinese Government has made the development of the Western provinces' social and economic conditions a national priority (China's Western Development Priority, 西部大开发), since the year 2000, progress has been hindered due to the lack of understanding of the many factors that have created the disparity of Western China. This thesis applies a statistical and geographical approach to understanding the evolution and spatial distribution of urban-rural income disparity in the minority counties of Gansu, Western China over the last 15 years. The quantitative analysis between this disparity and the socioeconomic variables reveal that minority counties are significantly affected by less favourable socio-economic environments. Moreover, urban-rural income disparity results in reduced access to basic education for school-aged children, particularly girls, in minority counties. This thesis adds a new perspective – statistical and geographical – to previous studies of urban-rural income disparity in Western China's minority regions.

RÉSUMÉ

Même si la Chine a connu une croissance considérable suite aux réformes économiques et sa politique de portes ouvertes de 1978 (改革开放), nous y retrouvons toujours une disparité régionale entre la côte ouest développée et les régions éloignées pauvres dans la région occidentale de la Chine. À ce sujet, le gouvernement chinois a fait du développement économique et social des provinces occidentales une priorité nationale (Priorité Occidentale du Développement de la Chine, 西部大开发). Cependant, depuis l'an 2000, ce développement a été entravé par un manque de compréhension des nombreux facteurs qui créent cette disparité en Chine occidentale, où la plupart des groupes minoritaires sont concentrés. Afin de comprendre l'évolution et la distribution spatiale de cette disparité, plus précisément au niveau des revenus de provenance rurale et urbaine dans les comtés minoritaires de Gansu (Chine occidentale) au cours des 15 dernières années, il faut appliquer une approche statistique et géographique à cette thèse. L'ajout des variables socioéconomiques dans l'analyse quantitative de cette disparité démontre que les comtés minoritaires sont touchés par un environnement social et économique moins favorable. D'ailleurs, une telle disparité entre les revenus de provenance rurale et urbaine a aussi un effet sur l'éducation, dont l'accès est réduit pour les enfants, plus particulièrement les filles, qui habitent ces comtés minoritaires. Donc, cette thèse qui porte sur la disparité des revenus de provenance rurale et urbaine dans les régions minoritaires de la Chine occidentale, permettra d'enrichir, du point de vue géographique et statistique, les études précédentes.

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INTRODUCTION

RESEARCH CONTEXT

China has experienced considerable growth following the economic reforms and open doors policy (改革开放) of 1978. At the same time, however, the country has been facing a growing gap between its developed Eastern coast, in particular the relatively wealthy metropolises and the littoral zones, and the poor Western hinterlands. Of some 48 million people living under the official poverty line in China, the great majority are located in Western China (50.0% in Western China, 35.7% in Central China and 14.3% in Eastern China) (World Bank, 2001). Within the Western provinces, poverty is most pronounced in rural regions, in particular ethnic minority regions. Urban areas enjoy a much higher standard of living. The Chinese Government has made the development of the Western provinces' social and economic conditions a national priority (China's Western Development Priority, 西部大开发). Since the year 2000, however, this development has been hindered by a lack of understanding of the many factors that have created the disparity in Western China.

The development experienced over the last century has shown that economic growth alone achieves neither social equity nor multi-sector dynamics essential for the long-term advancement of human welfare. After decades of economic development, many populations still face 'decreased opportunity, political and economic disempowerment, and general insecurity when it comes to food, social safety, political and legal representation, as well as financial well-being' (Jones, 2004 p.145). It has become clear

that economic growth cannot be sustained without considering the social and political development of vulnerable populations, particularly minority populations.

China is facing increasing challenges since the late 1980's because the benefits of its economic growth continue to be distributed inequitably, as is often the case in the core-periphery territorial organization (Yang, 1999). Continued polarized development in China underlies numerous social and demographic shortcomings in rural counties, as exemplified by the situation in Western minority counties (Ma, 2003). Unequal urban-rural development is at the heart of many serious problems including the inaccessibility of social public services. This threatens sustainable development in Western China.

About half of the 8.41 percent of Chinese minority populations are living in rural areas in absolute poverty (Bahalla and Qiu, 2006). In 2004, the yearly net income of this population was only 668 yuan (90 US dollar) per person (Statistics China, 2004). According to their research, they found that the gap between the average rural income per capita in China and the rural income in minority regions has and is continuing to increase. Furthermore, the gap between the nation wide education levels versus that of minority regions is also on the rise.

RESEARCH PROBLEM

The reality of the unequal urban-rural development in Western China is what brings me to present this master's thesis research on the 22 minority counties of the province of Gansu. Major political, economic and cultural questions are at the core of the developmental issues of the Western province. **My research aims at understanding the mechanisms and processes which create urban-rural income disparity, and its impact on the access to education in the 22 minority counties of Gansu.**

CHAPTER OUTLINE

This master's thesis contains 5 chapters. The first chapter provides a review of the literature that relates to the characteristics of urban-rural disparity and its effects on the minority regions of China. A summary of the literature findings, along with research conceptual framework and research hypotheses, are also present in this chapter. The second chapter presents the methods applied in this research, as well as an overview of the study region and data. The third chapter is a descriptive analysis of the economic conditions in Gansu; it provides general information about the study region. The fourth chapter, the main chapter of this research, focuses on urban-rural income disparity on two levels: the general level presented through the Gini index, and the individual county level represented by the urban-rural income ratio. A multiple regression analysis is also carried out in this chapter to test the influential factors. This chapter also considers the consequences of urban-rural income disparity on education, particularly in minority counties. Furthermore, it explains the social reasons why many girls in minority populations do not attend school. Chapter five concludes the thesis by looking at the study's contributions and limitations, and by considering further research possibilities.

CHAPTER 1: LITERATURE REVIEW

1.1 REGIONAL DISPARITIES IN CHINA

Since the end of 1970s, economic reforms in China have revamped the urban economy, increasing urbanization across China (Perkins 2002). The urban population in China rose from 18% in 1978 to over 36% in 2000. Because of this impressive urban development, China has faced serious increases in regional inequality. Growing gaps between the coast and the inland, as well as between urban and rural regions, have been particularly worrisome (Tsui 1991; Chen and Fleisher 1996; Jalan and Ravallion 1998). Urban regions have been more developed on the eastern coast compared to the western inland provinces, because government policies chose to concentrate investment resources in the regions with the highest economic growth potential (Chang, 2002; Lin, 2002; Song *et. al.*, 2000; Tian, 2004).

1.1.1 Economic Reform and its Results

Economic reforms in China have stimulated the urbanization process. Many scholars have attempted to understand the urban phenomenon through research and study. Most scholars agree that places of settlement concentration and of specialized non-agricultural economy are urban (Fillion and Bunting, 2000). Some researchers describe urban areas as the hubs of civilization, as it is in these places that culture and values evolve due to intense interpersonal interaction (Mumford, 1961). Bourne (2000) defines urbanization as a process by which a society shifts from being one organized around rural activities to one being organized by urban activities. Changes in urbanization are principally

characterized by the growth of the city, specifically due to the increase in population (Zhang and Song, 2003).

Western China has lagged behind the national average in almost all socioeconomic aspects. This can primarily be attributed to the lower levels of urbanization in the western provinces. Wu (2002) summarizes four main differences between the eastern and western regions of China. First, human resources are concentrated in coastal areas, while mineral resources are found mainly in the inlands. Second, the coastal regions possess a well-developed financial base, and manage a relatively high level of capital accumulation. Third, productivity and living standards are higher in the coastal areas than in the interior regions. Fourth, there is a significant technological disparity between the coast and the inland.

Past research shows that there is a strong relationship between urbanization and socioeconomic development. There is a correlation, for example, between urbanization and GDP per capita (Henderson, 2002). Moomaw and Shatter (1996) add that industrialization, export orientation, and possibly foreign assistance, influence the process of urbanization. Petrakos and Brada (1989) found that political instability also influences urbanization levels because unstable regimes often attempt to placate urban populations in order to avoid popular resistance in the cities where the members of the ruling elite live and work. This brings about a pro-urban bias. As demonstrated by Chen's studies (2002), the correlation between economic development and urbanization is positive. The process of economic development results in a concentration of population.

1.1.2 Urban-rural Income Disparity

The Chinese government considers equity to be a central issue in economics, sociology and politics (Yang, 1999). Since 1990, the People's Congress listed regional inequality as one of the most pressing problems needing to be addressed; it is listed for the eighth "five-year" plan.

It is widely recognized that the reforms that have taken place in China since 1978, though overall very successful in achieving high economic growth rates, have been accompanied by a substantial increase in income disparity. This income disparity has manifested itself as follows:

- inter-regionally, including coastal versus inland regions, northern versus southern regions, and inter-provincial;
- intra-regionally, that is urban versus rural areas;
- between groups of individuals, especially between the rich and poor. Those getting rich through successful business endeavours or by the abuse of power are leaving many people behind struggling to meet their basic needs.

For the purposes of this research, the focus is on the intra-regional disparity, in particular **urban-rural income disparity**.

Kuznets (1955) had proposed an inverted U-shaped relationship (also called a Kuznets curve) between the level of urbanization and income level, measured by the average income between urban and rural sectors, using scant sample data of the United States, England and Germany. He concluded that, in general, the urban-rural disparity would increase at the beginning of the urbanization process, as the population moved away from the rural sector to the urban sector in search of higher urban incomes;

gradually the income disparity would decrease as the population settled down in the urban sector, receiving progressively higher incomes.

Urban-rural income disparity has been at the centre of scholarly and policy debates since the establishment of the People's Republic of China in 1949, largely due to the diverse views on the nature and practice of socialism (Wu, 2002). A number of studies have emphasized the relationship between urban growth and urban-rural income disparity. Lu (2002) attempts to determine the validity of the Kuznets-Williamson model in order to explain urban-rural income disparity in China. He finds that the provinces where economic growth raises per capita consumption, urban-rural consumption differences are likely to be smaller, or at least, increase very slowly. Unlike other developed countries, China has not followed Kuznetz's principles because the governing registration system, *Hukou* policy, has restricted the mobility of rural labourers. Lu, Chen and Qin (2004) suggest two reasons why China has not followed the Kuznets curve: richer rural areas are the first to be urbanized; because residents in these areas have a greater possibility of getting a higher paying jobs, they are more likely able to afford higher education for their children. Xue (1997) also notes that the high per capita income of urban workers, the availability of multiple subsidies, and the restrictions on migration from rural to urban areas, explain most of the differentials of the urbanization effect. Yang and Zhou (1999) observed that urban-rural per capita income and consumption experienced a U-shaped change after the economic reforms were launched in the late 1970s. From 1978-1990, the differentials decreased. Afterwards, however, they increased rapidly. Changes traced through the 1990s, indicate that consumption differentials peaked around 1993-1994, followed by another U-shaped change. Given the multi-U-shaped experience of China's

urban-rural inequality, it is especially interesting to investigate the validity of a Kuznets-Williamson hypothesis in this particular country's urban-rural context.

Apart from economic development, other factors have also contributed to rural-urban income disparity. Predominantly, as Yang and Zhou (1999) have shown, inter-sector gaps in marginal productivity of labour, as well as barriers to inter-sector reallocation of labour are major sources of urban-rural disparity (Lu, 2002).

Kuznets (1955) first established the definition of *within* income disparity and *between* income disparity in the year 1955. *Within* disparity separately measures the inequality of urban and rural sectors. *Between* disparity measures the average income inequity between urban and rural sectors. Kuznets hypothesized that if the *between* disparity is greater than both *within* sectors, the overall disparity will firstly increase as the population moves from rural to urban sectors looking for higher income-earning jobs; the disparity will decrease, however, as the population increases in the urban sector and begins to earn higher incomes. Wu and Perloff (2004) believed that if this hypothesis was true, disparity would decrease as the level of urbanization rises. Chang (2002) has argued that China will maintain a high level of income disparity for an extended period of time since the urban sector can not accommodate the large rural surplus population. Thus, acceleration of the urbanization processes in the short run will widen the income gap between urban and rural areas, although it will eventually help decrease the disparity.

Todaro (1969) suggested that the urbanization process narrows the disparity between urban and rural sectors. When rural labour forces look for higher income in urban areas, their migration contributes to the urban-rural income disparity because of the expectation

for higher wages. At the same time, the rural to urban migration accelerates the urbanization process (Brueckner and Zenoub, 1999).

Chen (2002) examined the correlation between variables such as GDP per capita, urban-rural income gap, and levels of urbanization and industrialization by using the Chinese provincial data of 2000. His study confirms that the regions with higher GDP per capita and higher levels of urbanization and industrialization, such as Jiangsu, Zhejiang, Liaoning, Shanghai, Beijing and Tianjin, have a smaller urban-rural income gap. Provinces and autonomous regions with lower GDP per capita, such as Tibet, Yunnan, Guizhou, Shaanxi, Qinghai and Gansu, usually have higher urban-rural income disparities. Consequently, it is concluded that urbanization contributes to reducing both urban-rural income and regional disparities.

Yang (1999) attributed the rise in urban-rural disparity after 1990 to what he called the “urban-biased policy mix”, which included increased subsidies, investments, and banking credits for urban regions. These policies brought about higher inflationary taxes on rural earnings. Johnson (2000) summarized three other major policy areas that adversely affected rural incomes: restrictions on rural-to-urban migration, frequent inaccessibility to education, and the urban-biased allocation of investment and credit. Moreover, the individual effect of household composition has increased income inequality (Lanjouw and Ravallion, 1995; Brandolini and D’Alessio, 2001). Larger families tend to be poorer because they have more children; consequently, they achieve a lower level of welfare.

Growing income disparity between rural and urban residents is an issue of concern in China’s long-term economic development (Ma, 2003). Researchers have used statistical

data and household survey data to address two main issues: regional disparity and its sources. The Gini index has been the most popular measure of income disparity. Few researchers have explained, however, how they have calculated their Gini coefficients. Furthermore, the magnitude of the Gini index varies considerably according to different authors (Wu, 2002). Other less popular indicators of inequality include the Theil index and the coefficient of variation.

Little is known about the relative importance of potential factors contributing to urban-rural inequality (Wan, 2007). Nevertheless, it is clear that urban-rural income disparity is considerably wider in Western China, where minority populations are most highly concentrated (Xue, 1997). Ethnic inequality is an important concern because of the implications that it might have on economic development and the functioning of society in China. It has been confirmed that the income disparity in minority populations is the result of socioeconomic inequality between minority and majority (non-minority) groups (Frisbie and Neidert, 1977).

1.2 DEVELOPMENT OF MINORITY REGIONS IN WESTERN CHINA

In order to effectively discuss the issue of development in minority regions, it is important to clarify the concepts of minority and minority autonomous regions. It is also necessary to review the literature related to the development of minority regions.

1.2.1 Minority

It is important to note that ‘ethnic minorities’ in China are defined as nationality groups. Stalin’s definition of “nation” is used as the main reference in defining “nationality” in China. His interpretation is based on the “four commons” characterizing

a nation: “community of language”, “community of territory”, “community of economic life, economic cohesion”, and “community of psychological make-up” (Stalin, 1942). The definition of a “nationality” according to Stalin, therefore, can be interpreted as follows: a “historically constituted, stable community of people, formed on the basis of a common language, territory, economic life, and psychological make-up manifested in a common culture” (Mackerras, 2003).

1.2.2 Minority Autonomous Regions

Currently, 56 ethnic groups are identified by the Chinese State; 55 of these are officially recognized as minority groups. In May of 1947, China established its first Minority Autonomous Region – the Inner Mongolia Autonomous Region – under the leadership of the Communist Party of China (Wang, 2005). After the founding of the People’s Republic of China in 1949, the Chinese Government established the Xinjiang Uygur Autonomous Region in 1955, Guangxi Zhuang Autonomous Region and Ningxia Hui Autonomous Region in 1958, and the Tibet Autonomous Region in 1965. By the end of the twentieth century, China had established 155 minority autonomous regions, including five provincial-level autonomous regions, 30 autonomous prefectures, 120 autonomous counties (banners), and 1256 minority villages (Wang, 2005). The Minority Autonomous Regions cover 64.2% of China’s total national land surface. Among the country’s 55 minority ethnic groups, 44 occupy their own autonomous regions. The distribution of minority groups is characterized as follows: sharing with the majority on a large scale, concentrated with the same group on a small scale, and interlocked living with the majority.

As a result of their “Minority Autonomous Region” status, these regions have certain self-governed rights: to develop autonomy and special regulations; to use and develop minority languages; to respect and protect minority religious freedom; to maintain and reform minority customs; to arrange and manage autonomous economic development and utilities; and to develop education, science and technology, culture and other social undertakings independently. Moreover, the Chinese Government relaxes the “One-child Policy” restriction with respect to minority populations, in order to encourage regional development. According to the fifth Chinese Census (2000), the growth rate of minority populations is higher than that of the majority, and higher than the overall national average rate.

1.2.3 Development of Minority Autonomous Regions

The problems inherent to under development are usually exacerbated in minority communities. Despite a few exceptions, most ethnic minorities in Western China experience high levels of poverty, which create resentment and sometimes lead to conflict (Mackerras, 2005). The errors of history have shown that achieving the delicate balance between minority rights and social cohesion is one of the most important developmental challenges for China, particularly Western China, which is home to a great number of minorities.

Development in minority regions is closely related to socioeconomic conditions (Mackerras, 2005; Gao, 2004; Tang and Gao, 2004). Zhang (2000) argues that the key to developing Western China is to develop the minority regions. Minority regions have been developed over the last fifty years, but socioeconomic differences from majority regions continue to exist. Zhang points out several challenges faced by minority regions. Firstly,

they remain the poorest areas in the country. Secondly, the average income in these regions is often far below the national average. Thirdly, low economic competitiveness hinders economic development; lagging financial market growth and insufficient treasury accumulation are two important reasons for poor development in minority regions. Fourthly, minority regions tend to have poorly developed industrial structures, due primarily to the fact that provincial economies are dominated by agriculture. Fifthly, minority regions have poor human resources and lack public services. This problem is twofold: education and health care come second to the population's most rudimentary need for food, which is often all they can afford. Furthermore, basic services, such as schools, are inaccessible or insufficient at meeting the population's needs. Sixth, the annual income in agricultural and pastoral areas in the minority regions is below average.

According to Li's *et al.* (2002) research, four factors affect the development of minority regions. First, natural conditions affect economic development in the north and in the south of Western China. Soils are not favourable for agriculture in either region: the northern area is a desert, while the south must deal with semi-dry barren soil. Second, the rapid increase of population, the high proportion of poverty, and the fact that the population largely remains uneducated, educated population also have a negative effect on economic development. The increase in population and the level of poverty are two important aspects that leave the economy of the minority regions lagging behind. Urbanization levels and minority cultures are two other significant aspects that affect minority region development.

In summary, minority counties in Western China face a variety of challenges that hinder their development. They include unfavourable natural conditions, fewer

opportunities for education, poor social environment, unbalanced industrial infrastructure, want for communication networks, and lack of urbanization (Mackerras, 2005; Ma *et al.*, 2006).

1.3 URBAN-RURAL INCOME DISPARITY AND EDUCATION

1.3.1 Development and Access to Education

Existing literature on education and development, such as the work of Psacharopoulos (1988), suggest that there is a close and positive relationship between education and economic growth. Many scholars believe that education is a form of investment, as it not only contributes individual improvement, but also to social development (Lockheed and Vespoor, 1991). The followers of Human Capital Theory believe that education provides the necessary skills for a higher level of productivity among people in both the marketplace and the household. Oxaal (1997) has emphasized the way education leads to the reduction of poverty. In support of human capital theory, he has documented how primary education in particular increases the productivity of rural, self-employed farmers, consequently augmenting their earnings. It is not certain whether education enhances personal abilities or simply identifies talents. However, each additional year of education has been associated with higher earnings. Furthermore, educated women display a greater ability at managing their fertility, subsequently giving them some measure of control over the family's financial situation (Oxaal, 1997).

Although highly beneficial in the long-run, the schooling of children in poor countries always involves a trade off between lower immediate earnings and higher future earnings (Psacharopoulos, 1988). Human Capital Theory implies that an “effective anti-poverty

strategy should incorporate the enhancement of education and skills amongst poor households” (Oxaal, 1997 p.4). There are significant linkages between poverty and education. At the macro level, levels of enrolment correlate with the GNP, while at the micro level poor children, particularly girls, are less likely to enrol. In addition to the lack of finances to pay schooling fees, poor families often do not have access to formal credit, and have limited social networks through which they can borrow money (Hannum and Kong, 2002).

Poverty is at once a barrier to education and the outcome of the lack thereof. Poverty alleviation and gender equality strategies focusing on investment in education greatly depend on government financing. It has been shown that government funded schooling dramatically increases school enrolment (Colclough, 1996). Demery (1996) argues that government funded secondary and post-secondary levels of education generally favours well-off populations, while public spending on primary education by and large benefits the poor. In recent years, the central government of China has begun to understand the importance of funding education. In 1997 the government budgeted 3.4 percent of the GDP for education; in 2002 the amount had risen to 5.2 percent (Chow and Shen, 2005). China is still far from making universal and equitable access to education available for all of its citizens, however.

Since the economic reforms of the 1980’s, responsibilities for educational services have been decentralized, causing costs to individuals to increase and services to decrease. Moreover, the redistribute power of the central government has declined. With only limited help from the centre and tight budget constraints, many local governments of poorer regions make spending cuts to social development programs. This places the

financial burden of education on individual citizens (Zhang and Kanbur, 2003). Increasingly, both rural and urban residents must pay for their own education, an expense that has significantly increased since 1990. The government's share in total education expenditure declined from 64.6% in 1990 to 53.1% in 1998, while the share of tuition and incidental fees paid by individuals rose from 2.3% to 12.5% in the same nine-year period (Adams and Hannum, 2005). With the increasing out-of-pocket expenses for education, a growing number of poverty stricken children are not even finishing the basic nine-years of primary schooling. This is one of the causes of uneven access to education throughout Western-China (Hannum and Kong, 2002).

1.3.2 Education in Minority Regions

In China's minority regions, inaccessibility to education is currently one of the most challenging issues (Zhang, 2000). The urban-rural inequalities, as well as minority-majority disparities have impacted the access to general education and educational qualifications in a number of minority groups.

Hannum and Kong (2002) have highlighted the mixed effects of the socioeconomic reforms implemented during the 1980s on educational indicators of ethnic minorities. Certain ethnic minority groups, such as the Koreans, have benefited from the opportunities generated by modernization. However, other ethnic groups, such as the Hui in Gansu, have suffered from the structural shifts in the education system and in China's economy. Although national statistics show that the educational composition of China's minority population has been improving steadily over the last decades, Hannum's (2001) analysis of census and survey data suggests that in certain minority regions the improvements have not been as rapid as for the Han Chinese population. Although some

ethnic children are profiting from a level of education that compares favorably with that of the majority Han Chinese, most have much lower levels of attainment. Lower socio-economic status among ethnic minorities is one of the main reasons explaining this tendency. Compared to Han Chinese, minorities are more likely living in rural areas located in the poorer interior regions of China. This means that the children of minority ethnic groups face the problems associated with poverty, namely insufficient resources to pay for tuition, poor quality education, and far walking distances to schools. Impoverishment is also linked with gender disparities among minority groups: ethnic groups displaying the greatest gender disparity in school enrollment are characterized by the highest poverty rates. Minority girls are more likely than any other group to report economic causes for dropping out of school (Hannum, 2001).

There are many social benefits to investment in female education. Lower fertility rates, lower maternal mortality and better household management make female education an important development strategy (Oxaal, 1997). Despite these benefits, educational opportunities for girls, particularly in minority regions, remain substantially lower than for boys. Apart from direct cost of education, that is fees, school supplies, clothing and transportation, which are the same for both sexes, opportunity costs, that is, lost chore time and earnings, are higher because on average girls spend more time doing household work than boys. Hannum (2002) found that in times of economic difficulty one third of boys left school for work, but almost half of girls did the same. Household poverty, however, is only one of the factors leading to gender inequality and female schooling disadvantages in China. In fact, Chinese traditional culture and norms place girls in a vulnerable position within their families. Traditionally, sons are expected to co-reside

with parents after their marriage, in order to provide long-term security for their parents. Daughters, on the other hand, are expected to marry out of the family. Because families do not profit from their adult daughters' earnings, parents have no incentive to invest in their daughters' education. Instead, parents have their daughters contribute to the household economy by working in the home until marriage.

Religion, especially among minority groups, also plays an important role in the political, economic and cultural aspects of daily life. Religious customs and perceptions are passed on from generation to generation and exert an indirect influence upon people's attitudes towards education (Wang, 2001). For example, nationalities that practice Tibetan Buddhism prefer lamasery to school (Yang, 2001). They value religious education more than the public, secular educative curricula. Parents rarely associate education with higher earning potential. School enrollment rates are thus low in Tibetan communities. Also, some traditional cultures and religions impose restrictions upon young girls and women (Ao, 2004; Baden and Green, 1994; Ren, 1996). According to the Islamic Koran, after the age of nine a girl must restrain her behavior in public (Liang, 2002). In these ways traditional customs in rural minority areas impede girls' educational and professional prospects.

China has implemented some important policies which aim at developing minority areas and promoting equitable access to education. In 1984, the Law of Autonomous Governing of Minority Regions was passed. It emphasized the autonomy of local governments by giving them control over educational matters, such as minority languages (Hansen, 1999). In 1986, the Chinese government established the Law of Compulsory Education in order to promote nine years of basic primary education.

A number of factors continue, however, to restrain the development of education in Western China (Zhang and Fan 2004). As mentioned above, geographic differentiation and poverty play crucial roles, in producing educational disparities in ethnic groups. The gender gap is also a factor which hinders educational development. Greater gender disparity is found within the poorer socioeconomic backgrounds of minority groups (Hannum and Kong, 2002). Finally, the onset of market reforms through the 1980s further increased ethnic educational disparities.

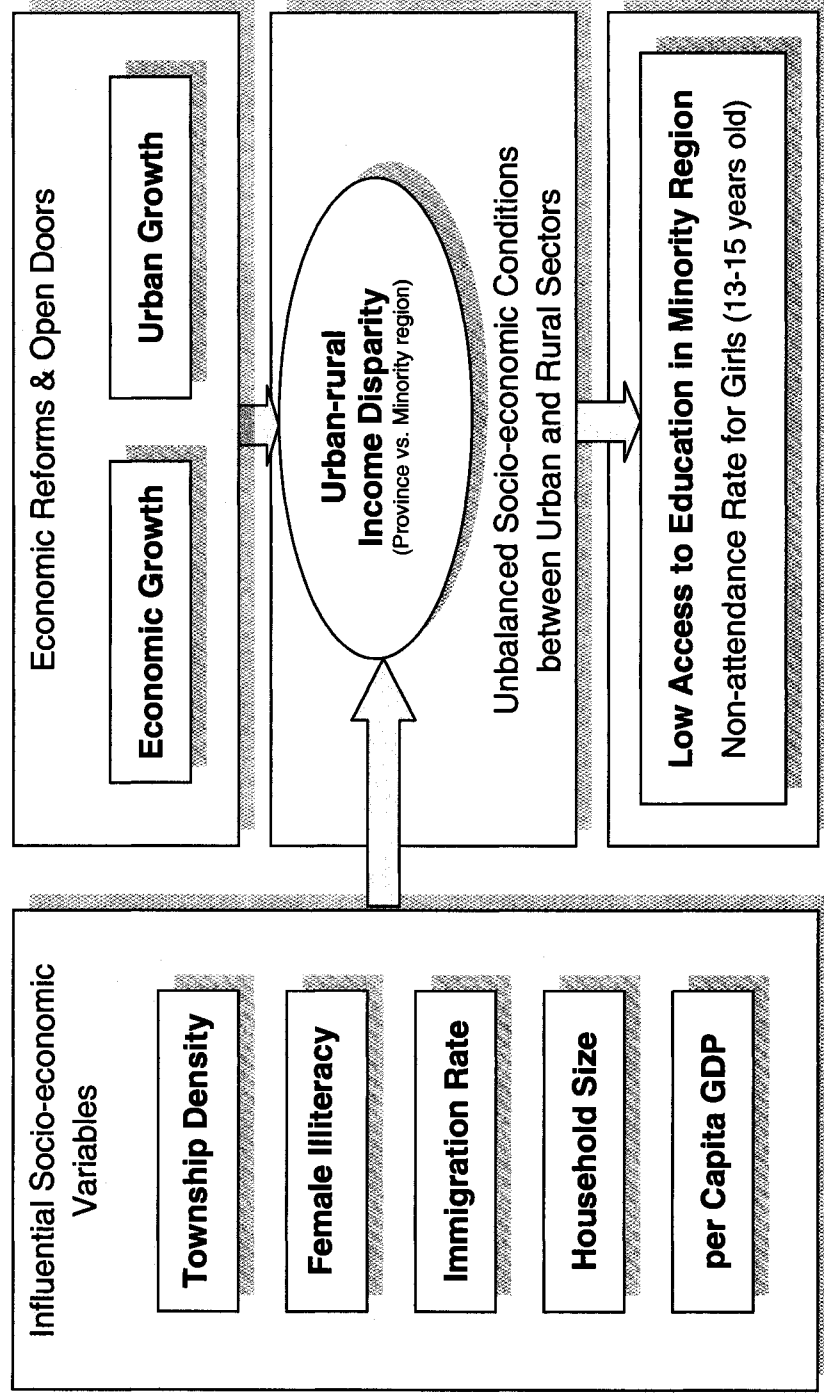
1.4 CONCEPTUAL FRAMEWORK

The literature outlined above on urban-rural income disparity and its consequence on access to education has built the conceptual framework for this research (Figure 1.1). Economic reforms in China have led to rapid economic and urban growth. They have also resulted in a severe imbalance of the socioeconomic conditions throughout the country's various regions. This inequitable economic growth has created an income disparity between urban and rural sectors in national level, provincial level as well as county level. It is important to note that in China, a county contains both urban and rural sectors. Thus, 'urban-rural income disparity' becomes a measurement to evaluate the level of disparity in each county. This disparity has been influenced by certain socioeconomic factors, such as township density (Todaro, 1969; Yang and Zhou, 1999; Chen, 2002; Lu, 2002), female illiteracy rate (Psacharopoulos, 1988; Oxaal, 1997; Hannum, 2001; Li *et. al.*, 2002; Hannum and Kong, 2002), immigration rate (Kuznets, 1955; Todaro, 1969; Xue, 1997; Bruecknera and Zenoub, 1999; Yang and Zhou, 1999; Johnson, 2000; Lu, 2002; Chen and Qin, 2004), household size (Lanjouw and Ravallion, 1995; Brandolini and D'Alessio, 2001) and per capita GDP (Chen, 2002). Access to

education in minority regions, particularly for middle school aged girls between the ages of 13 and 15, also has a consequence of urban-rural income disparity; it promotes unfavourable socioeconomic conditions.

What are the other factors that have influenced the income disparity in Gansu and its minority counties? How does the disparity influence access to education? When the research is based specifically on minority regions, how does the disparity in minority regions differ from other regions? Do similar factors have the same effect on minority region's urban-rural income disparity? Does socioeconomic disparity influence minority populations?

Figure 1.1
Conceptual Framework



1.5 RESEARCH OBJECTIVES AND HYPOTHESES

The purpose of this research is to evaluate urban-rural income disparity and its related influential factors in the province of Gansu, especially in minority counties. The study also examines the influence of urban-rural income disparity and other associated socio-economic factors on the education of the school aged population in minority counties. To achieve this purpose, the research focuses on the following three main objectives:

1. To evaluate urban-rural income disparity in Gansu province over the last decade.
2. To identify the factors that influence urban-rural income disparity in Gansu province and its minority counties.
3. To examine the relationship between urban-rural income disparity and school non-attendance rate in minority the counties of Gansu province.

The following hypotheses will be tested in this research:

1. Urban-rural income disparity has increased over the last fifteen years;
2. Urban-rural income disparity is greater in the minority counties;
3. Urban-rural income disparity in the province of Gansu is affected by its socioeconomic conditions, including: township density, female illiteracy rate, immigration rate, household size and per capita GDP.
4. Access to education is limited as a consequence of urban-rural income disparity; especially in minority counties, access to education is influenced by socio-economic conditions such as minority proportion, female illiteracy rate and poverty county.

The first hypothesis will be examined by evaluating the urban-rural income disparity in Gansu over the last fifteen years. The second hypothesis will consider the disparity in each county of Gansu, and will compare the difference in urban-rural income disparity between minority and non-minority counties. The third hypothesis will be tested by regression analysis; it will take into account the relationship between a variety of socioeconomic variables in relation to urban-rural income disparity. Special attention will be paid to the minority counties. The aim of the fourth hypothesis is to examine the relationship between school attendance rate and unfavourable socioeconomic conditions in the minority counties of the province.

CHAPTER 2: METHODOLOGY

The previous chapter provided a review of the literature consulted for the purposes of this research. It also presented the conceptual framework of the research conducted on urban-rural income disparity in minority counties in Gansu, as well as the research hypotheses.

The research hypotheses were verified by a series of methods. This third chapter will begin by introducing the study region, in order to provide general background information on the area, as well as specifying the research period. The methods applied in this research will also be explained. Furthermore, the data and variables used in the analysis will be summarized and the application software will be presented.

2.1 RESEARCH DESIGN

2.1.1 Study Region

Western China

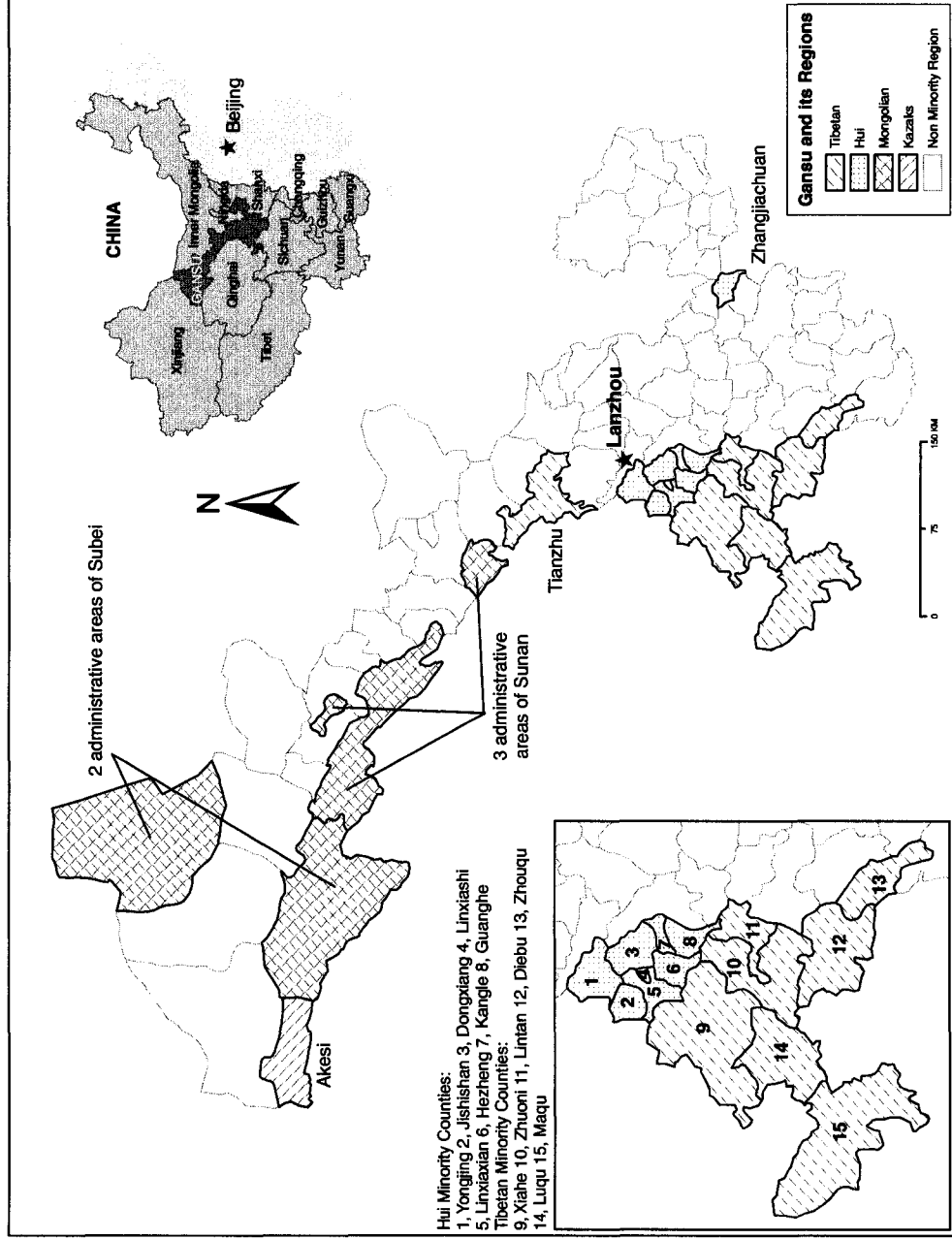
Western China is one of China's three main regions. Although it represents 76.65% of the total national area, only 28.56% of the country's population has settled there. Minority ethnic population accounts for 8.4% of China's national population; 32% of the Western China's population is of these minor ethnicities. Historically, Western China has lagged behind in national economic development. In 2000, its national GDP represented only 1.13% of the total national GDP. The government has invested less in Western China than in the other regions of the country; in 2000, total government

investments in Western China were merely 19.24%. Moreover, the urbanization rate of Western China is inferior to that of the rest of the country; only 29.5%, compared to 36.2% nation-wide.

Gansu

The province of Gansu is located in Western China (see Figure 2.1). It is well known because the main route of export for silk out of China to Europe, the 'Silk Road,' passes directly through this region. The northern Hexi region was particularly important because it was the most important section to reach the countries of Europe. Gansu is located at the intersection of the Loess Plateau, the Inner Mongolian Plateau and the Tibetan-Qinghai Plateau. Each of these plateau regions have distinct cultures, creating in the province of Gansu distinguished socio-economic and cultural characteristics. Gansu adjoins three Minority Autonomy Provinces: Inner Mongolia (Mongolian Minority) in the northeast, Ningxia (Hui Minority) in the north, and Xinjiang (Uyghur Minority) in the northwest. It also connects three other provinces where a significant number of minority populations live: Qinghai (45.5% minority proportion, including Tu, Hui, Tibetan, Mongolian, etc.), Sichuan (5.6% minority proportion, including Tibetan, Qiang, etc.) and Shanxi (0.6% minority proportion, including Hui, etc.).

Figure 2.1
Gansu Province and its Minority Regions



Projection: Regional Conformal Projection (China)
 Software: ArcGIS 9.0

Feng Jing
 Candidate of M.Sc. in Geography
 University of Ottawa
 Oct. 10, 2006

Although Gansu is not recognized as a Minority Autonomy Region, it counts 45 ethnic minority groups among its total population of 25 million people. This minority population accounts for 8.75% of the total population in Gansu. Most of these ethnic groups live in one of the 22 government-designated minority counties (Map 1), which represent nearly 20% of the total counties in Gansu province. The geographical distribution of the minority counties is characterized by the neighboring provinces, which are the source of the different ethnic minority groups. The Kazaks, Salars and Mongols located in the northern autonomous territories; for example, originate in the Inner Mongolia and Xinjiang provinces. The Hui and Tibetans located in the southern part of the province come from Qinghai province. The cohabitation of the majority population, Han, and the various ethnic minorities listed above, make Gansu a very interesting region for a case study of Western China.

Aside from its unique placement at the intersection of three plateaus, and its role in adjoining three minority provinces, the impoverished socioeconomic characteristics of Gansu also make this province distinct. Nearly 40% of Gansu's total population is considered relatively poor; an additional 10% is considered very poor. In 2000, the average GDP per capita in Gansu was 3490 yuan (US \$426), which represented only 54% of the national GDP per capita average of China. According to the Chinese government, of the 80 counties in the province, 41 were poverty stricken; 12 of these were populated mostly by minority groups. The average annual net income of the 9.44 million people living in these 12 minority poverty counties was below 1,000 yuan (US \$125) in 2000.

This study takes a broad look at the 87 counties in Gansu province, followed by a detailed study of its 22 minority counties.

2.1.2 Time Period

The first section of this study measures and compares urban-rural income disparity at five-year intervals from 1990 to 2005. It also compares urban-rural income disparity between minority and non-minority counties. Due to Census and Statistical data availability, however, only the year 2000 will be taken into consideration when evaluating the influential factors that determine urban-rural disparity. The difference between minority and majority counties is also examined here. In the second section, the consequences of urban-rural disparity on social public services are tested using statistical data from the year 2000.

2.2 METHODS OF ANALYSIS

2.2.1 Descriptive Analysis

Descriptive analysis is intended to provide a general overview of the socioeconomic situation of the study region base on the statistics. A comparative analysis has been applied to the data description. The analysis compares the socioeconomic data between minority and non-minority regions, and then to minority regions and the whole province. These comparisons highlight the poor socio-economic conditions in the minority counties of Gansu.

2.2.2 Gini Index

To test the first two hypotheses, that: urban-rural income disparity has increased over the last fifteen years, especially in the minority counties, the Gini index is calculated to measure urban-rural income disparity. The Gini index remains the most important and useful indicator of income disparity (Benjamin *et al.*, 2005). Its usefulness is not only due

to its simplicity and popularity, but also due to the fact that it separates the level of income from the source of income of the population. The disparity breakdown by population subgroups can be applied to urban-rural analysis (Yang, 1999).

The Gini index is used to measure the inter-regional distribution of disparity within one sector. If all income distribution is equal, the Gini index is 0; if income is different it will be close to 1 (Kwok, 2007). Empirically, the Gini index always lies between 0 and 1. A county's average urban income could be calculated with the Gini Index by the following these steps:

To consider the actual average urban or rural income within a county (t) and the accumulation frequency of urban or rural income (F),

Step 1: The basic logistic income distribution model:

$$F(t) = \frac{1}{1 + ae^{-bt^{0.05}}}$$

Step 2: To make the model linear:

$$\ln(1/F - 1) = \ln a - bt^{0.05}$$

If the linear components are defined as:

$$y = \ln(1/F - 1)$$

$$x = t^{0.05}$$

$$p = -b$$

$$q = \ln a$$

then the linear model is simplified to:

$$y = px + q$$

Transform the original data t and F to x and y . Apply the simplified linear model to fit the dataset in Matlab program.

Step 3: Once a and b are calculated, the logistic income distribution model is determined.

Using the $F(t)$ model, estimate the highest income with the inversed $F(t)$ model:

$$T = F^{-1}\left(1 - \frac{1}{N}\right) = \left[\frac{\ln a + \ln(N-1)}{b} \right]^{20}$$

Step 4: Since the income Gini is calculated as the function given by Cheng (2006):

$$G = \frac{T - \int_0^T F^2(t) dt}{T - \int_0^T F(t) dt} - 1$$

Take: $A = \int_0^T F(x) dx$; $B = \int_0^T F^2(x) dx$

and is simplify to: $G = \frac{T - B}{T - A} - 1 = \frac{A - B}{T - A}$

Step 5: Between (Urban-rural) income Gini:

$$G_n = \theta G_1 + (1 - \theta) G_2 + \alpha \beta \cdot \frac{D}{u}$$

θ = Proportion of the total rural income over the total provincial income

$1 - \theta$ = Proportion of the total urban income over the total provincial income

α = Proportion of rural population over the total provincial population

β = Proportion of urban population over the total provincial population

$$D = \int_0^{T_1} (F_1 - F_2)^2 dt$$

$$u = \alpha u_1 + \beta u_2 \quad (u_1 = T_1 - A_1, u_2 = T_2 - A_2)$$

The Chinese government provides the Gini index for certain years (1988, 1995 and 2002), using unspecified data sources (governmental survey) from all over China (Bramall, 2001). It is hard to measure and compare the Gini index over time in a specific

region without large sample survey data. Khan and Riskin's (1998) have documented that the Chinese Government uses the household income data provided by State Statistical Bureau (SSB) survey data in both rural and urban areas through most of the provinces in China. Unfortunately, the SSB does not provide the survey data for the entire sample, but only the result of the Gini index and only a few various income intervals.

For this reason, a new method for using publicly available statistical data to calculate the Gini index is necessary. Consider the geographic unit of the county as an individual examining unit. If the average urban income or urban income of each county in the province is used to estimate the *within* and *between* income disparity of the whole province, the spatial income distribution throughout the province can be indicated through geographical units. Since average income of urban and rural areas is available in provincial statistical yearbooks and in Statistic Bureau data, it is possible to measure and compare the income distribution over different time periods, as well as examine the trends of income disparity over the years.

2.2.3 Regression Analysis

The third hypothesis: urban-rural income disparity in Gansu province is influenced by its socioeconomic conditions, is examined by the multiple regression analysis based on a number of social-economic variables. The multiple regression analysis is widely employed to study the relationship between several independent variables (or predictors) and a dependent variable, as well as to identify the contribution of each predictor to the dependent variable. Multiple regression analysis seeks to predict a criterion variable from a set of predictors. The dependent variable (DV) in this study is the urban-rural income ratio based on statistical data from 2000. Based on existing literature, ten independent

variables/predictors have been tested by the regression analysis performed in this study. They are: township density, female illiteracy rate, immigration, household size, and per capita GDP (see section 2.3.2 for detailed variable explanations).

The fourth hypothesis, the suggestion that access to education is limited as a consequence of urban-rural income disparity, especially in minority counties, is tested by the correlation between the non-attendance rate of schools by girls in minority counties and consequent variables affecting urban-rural income disparity.

2.3 DATA AND SOFTWARE

2.3.1 Date Sources

In the analysis section, income (urban and rural) data is used to calculate the Gini index. This data was retrieved from the *Gansu Statistical Yearbook 1991* and *2000*. The population data in this research comes from *Gansu Census 1990* and *2000*. Other social-economic data comes from the *Statistical Yearbook 1991, 2001* and *2006*. The *Gansu Statistical Yearbook* and *Gansu Census* are published by Gansu Statistics Bureau. The *Statistical Yearbook* has been published every year since 1991; the *Census* is published once every ten years. These two sources of data are, in fact, the most exhaustive statistical sources available in China. The data is complete and dependable.

2.3.2 Variable Explanations

In this section, a detailed explanation of all the variables employed in the research will be presented, including all of the dependent and independent variables in the regression analysis.

Urban-rural Income Ratio is used to measure urban-rural income disparity in each county. The income ratio is calculated by the average *urban* income of the county divided by the average *rural* income of the county. A larger ratio means greater disparity between the urban and rural areas of the county; a smaller ratio represents less disparity.

Township Density presents the level of urbanization by regional status. This variable is calculated by the number of townships in a county divided by the area of the county (Todaro, 1969; Yang and Zhou, 1999; Chen, 2002; Lu, 2002).

Female Illiteracy Rate measures a county's proportion of female illiterate population over 15 years of age. Following the development of Human Capital Theory in the early sixties, level of education became a popular independent variable in income distribution studies (Psacharopoulos, 1988; Oxaal, 1997; Hannum, 2001; Li *et. al.*, 2002; Hannum and Kong, 2002).

Immigration Rate is the second variable that measures population mobility. It is calculated by dividing the population that immigrated from one county of Gansu to another by the total population in the county the moving population has arrived in (Kuznets, 1955; Todaro, 1969; Xue, 1997; Bruecknera and Zenoub, 1999; Yang and Zhou, 1999; Johnson, 2000Lu, 2002; Chen and Qin, 2004).

Household Size measures the proportion of households with more than 6 people out of the total number of households in a county (Lanjouw and Ravallion, 1995; Brandolini and D'Alessio, 2001).

per Capita GDP measures the economic condition of a county. This variable is calculated by dividing the GDP of a county by the total population of the county (Chen, 2002).

2.3.3 Software

Matlab

The Matlab program is short for **Matrix Laboratory**, which was invented by Professor Cleve Moler, at the Computer Science department of the University of New Mexico in the late 1970s. Matlab is capable of computing and programming large numerical analysis. In this study, Matlab is used to calculate the Gini index.

SPSS

The **Statistical Package for the Social Sciences (SPSS)** software was first released by SSPS Inc. in 1968. It is a statistical program widely used by researchers in social sciences. The program offers a variety of research methods, including regression analysis – a specifically important method of analysis for this particular study. In this research, SPSS software is used to test the relationship between the Gini index and the variables mentioned in the Methods section.

ArcGIS

Geographic Information System (GIS) is a system which analyses geographic data and attributes. In this research, ArcGIS software is used to visualize the spatial variations of urban-rural income disparity. It was also used to highlight significant variables in the regression analysis.

CHAPTER 3: UNBALANCED SOCIOECONOMIC CONDITIONS IN GANSU PROVINCE

Since China's 1978 economic reforms, the socioeconomic conditions of the country's different regions have become unbalanced. Gansu, one of the less developed provinces in Western China, has followed a distinct socioeconomic development process over the last 15 years, particularly in its minority counties.

In this chapter, Gansu's socioeconomic conditions are explained by a detailed descriptive analysis based on government-published statistical yearbooks. The first section of this chapter reviews urban-rural income disparity in the province of Gansu since 1978, and compares it with urban-rural income disparity throughout China. In the second section, selected socioeconomic variables are described throughout the research period: 1990, 1995, 2000 and 2005. The third section demonstrates the differences between minority counties and non-minority counties, and applies a comparable variance analysis between the two. The difference between northern and southern minority counties is also considered. These analyses aim to enhance understanding of the socioeconomic background and conditions in the province of Gansu.

3.1 URBAN-RURAL INCOME RATIO IN GANSU

Studying income disparity in China, particularly in the remote minority regions of the Northwest, is important for understanding Gansu's regional economic situation; it is also important to the government. One of the initial objectives of the economic reforms of 1978 was to develop an egalitarian system. In order to do this, they began assisting some regions, especially urban regions, with their economic growth by providing favourable

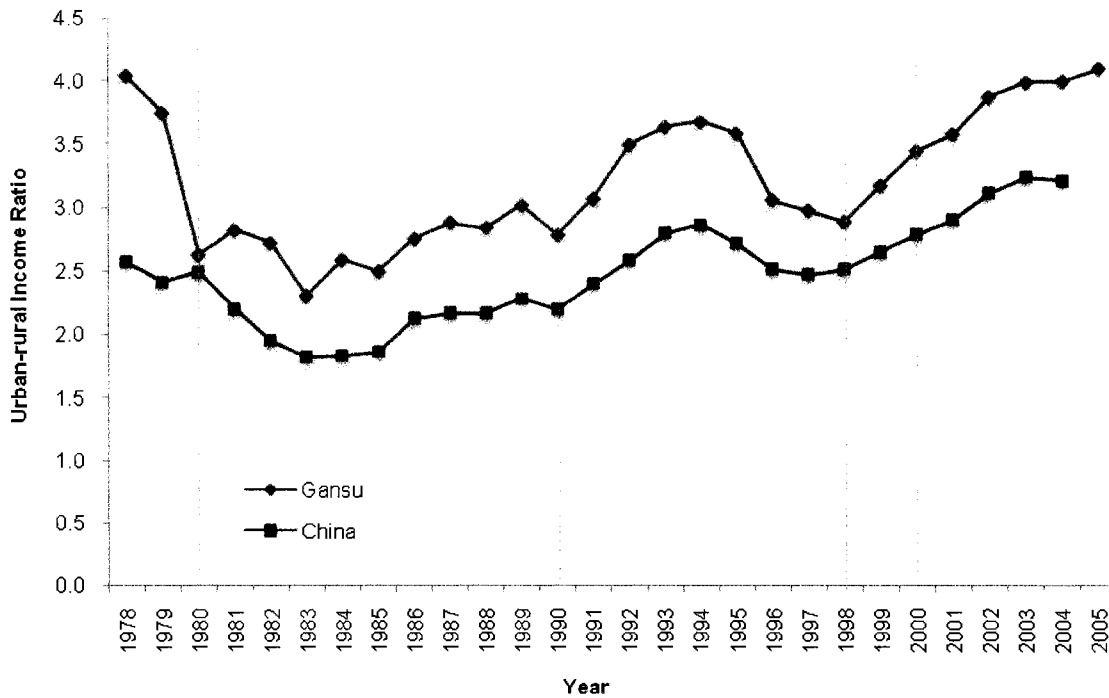
concessions in investment, taxation and trade. Tsui (1991) demonstrates that past policies have had little success in fostering 'balanced growth across regions,' as urban-rural income disparity is more or less the same as it was in the pre-reform period. In the last few years, serious concerns about increasing regional disparity have been raised. Equity between urban and rural areas is now a major focus of Chinese governmental policies.

To illustrate the changes in urban-rural income disparity since the economic reforms of 1978, income statistics from China and Gansu province have been graphed in Figure 3.1. The urban-rural income ratio equals urban income divided by rural income. For example, the average urban income in China in the year 2000 was 6280 yuan, while the rural income was 2253 yuan. The ratio for China in the year of 2000, therefore, is 6280 divided by 2253, equalling 2.79. This ratio means the urban income is 2.79 times that of rural income in the year 2000.

There are two important results demonstrated by this figure. First, over the last 27 years, the ratio of urban-rural income disparity in Gansu is always higher than the ratio in the whole of China (in the graph, the blue curve, representative of Gansu, is always above the red curve, which represents China). Second, the changes of urban-rural income disparity in Gansu are the same throughout China (in the graph, over time, the two curves follow the same trend).

In order to describe urban-rural income disparity in China, especially in the province of Gansu over the past 27 years, the results illustrated in the following graph will now be divided into four periods.

Figure 3.1
Difference in Urban-rural Income Levels between Gansu and China, 1978-2005



Data Source: China Statistical Yearbook 2005, Gansu Statistical Yearbook 2006

At the beginning of the economic reforms, from 1978 to 1980, the urban-rural income ratio decreased slightly in China. In 1978, the urban-rural income ratio was 2.57, which decreased to 2.42 in 1979, and slightly rose again to 2.50 in 1980. Similarly, the urban-rural income ratio in Gansu also decreased; it began in 1978 it at 4.04, and by 1980 had decreased to 2.63. During the three year span of this first period, the disparity in China decreased by only 0.07 percent, however for the province of Gansu it went down by 1.47. When the economic reforms began in 1978, the urban-rural income ratio of Gansu was 1.6 times the ratio of China; by the year 1980, the income ratio was almost the same in Gansu and China.

During the second phase, 1980 to 1990, urban-rural income ratios remained stable. Throughout the decade, the average urban-rural income ratio for China was 2.06; the ratios remained between 1.82 and 2.20. In the province of Gansu, the average ratio was 2.72. Here, the majority of the ratios were between 2.30 and 3.01. At a differential ratio of 0.66, the difference between China and Gansu's average urban-rural income ratio was still statistically significant.

The third period spans from 1991 to 2000. During this time, urban-rural income disparity in China, as well as in Gansu, increased from 1991 to 1994, which means the gap between urban and rural income grew at both national and provincial levels. In those four years, for the first time since the economic reform of 1978, the urban-rural income ratio increased. China's urban-rural income ratio increased by 0.46, while in Gansu province it increased by 0.69. *This growth demonstrates that when the national disparity increases, the disparity in remote regions also increases. Furthermore, the growth rate in remote regions will be much higher than at the national level.* After 1994, the urban-rural income ratio began to decrease at both the national and Gansu provincial levels. This decrease lasted another four years. During those four years, the ratio decreased by 0.20 in China and by 0.30 in Gansu. In 1998 ratio levels began, once again, to increase. From 1998 to 2000, the urban-rural income ratio grew by 0.14 in China, and by 0.37 in the province of Gansu. *Once again, these increases confirm that the province of Gansu follows the China-wide urban-rural income disparity trends, but with a higher change rate.*

The fourth and last period began in the year 2000. Urban-rural income disparity has continued to rise over the last few years in China and in Gansu. The ratio has grown from

2.90 in 2001 to 3.21 in 2004, a difference of 0.31 at the national level. It has grown by 0.51 in Gansu province. The urban-rural income ratio in Gansu reached its highest point at 4.08 times that of rural income in the province, in 2004. This was also the highest ratio Gansu had experienced since the economic reform of 1978.

After reviewing the changes in urban-rural income ratio over the last 27 years, it is clear that: First, although Gansu has a higher urban-rural income ratio than China, the province has experienced almost the same pattern of change as the country since the economic reforms. Thus, studies on urban-rural income disparity in Gansu province are proportionately higher than those on the whole of China. For this reason, it is more interesting to study the income disparity of the less developed regions of China, especially areas with concentrations of minority populations. Second, the urban-rural income ratio has significantly increased in the last few years, which means the urban-rural income disparity has been expanding. This phenomenon poses the questions: Why has urban-rural income disparity been increasing over the last six years (from 2000 to 2005)? What are the specific socioeconomic factors that have influenced the increases in urban-rural income disparities?

3.2 SOCIOECONOMIC CONDITIONS IN GANSU FROM 1990-2005

Several studies (Cao and Anwear 2005; Wu 2002) indicate that urban-rural income disparity has been exclusively influenced by the socioeconomic status of different regions. In order to uncover the causes of the urban-rural income disparity increase in Gansu over the last 15 years, a brief description of the socioeconomic status of the province of Gansu will now be presented. Guided by the literature review, four categories of socioeconomic

data will be presented in this section, including population status, macro and micro economy, status of education, and health care services.

Table 3.1
Socioeconomic Status in the Province of Gansu 1990-2005

	1990	1995	2000	2005
Population Status				
Urbanization Rate	22.04%	23.17%	23.94%	30.02%
Minority Population Proportion	8.30%	9.38%	8.93%	9.26%
Macro and Micro Economy				
Gross Domestic Product (GDP)*	242.80	557.76	1052.88	1933.98
Tertiary Industry GDP Proportion	33.12%	34.12%	41.52%	40.93%
Investment*	59.35	194.67	441.35	874.53
Total Wages*	54.89	136.70	179.98	290.22
Education				
University Enrollment**	3.39	4.55	8.17	22.95
Secondary Schools Enrollment**	96.49	91.53	131.47	194.38
Government Expenditure on Education ^o	67358	146778	311489	752150

Notes: * 100 million yuan, ** 1000 people, ^o 10000 yuan

Sources: *Gansu Statistical Yearbook 2006*, *New China Fifty Years – Gansu 1999*, *Gansu Census 1990*, *Gansu Census 2000*

3.2.1 Population Structure

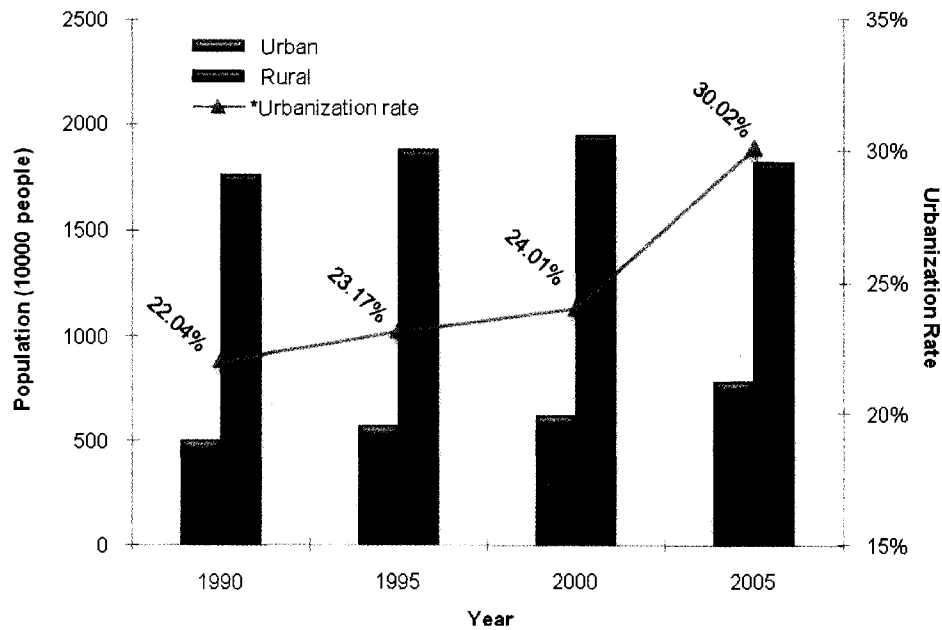
Previous studies have shown that two important aspects of population, urban population and minority population, affect urban-rural income disparity in Western China, especially in minority regions.

Urban Population and Urbanization

In 1990, the province of Gansu's population was 22.5 million; by 2005 the population had grown to 25.9 million, representing a growth rate of 15% over the last 15 years. The urban population has also grown, from 4.96 million in 1990 to 7.78 million in 2000. This

represents an astoundingly high growth rate of 57%. As shown in Table 3.1, the rural population has grown steadily from 1990 to 2000; over the last five years, however, it has started to decrease. As a result of the changes in urban and rural populations, the urbanization rate has increased, as Figure 3.2 shows. From 1990 to 2000, the urbanization rate has experienced a slow growth rate: about 1% per five year period. In contrast to this steady growth rate, the urbanization rate has grown 6% from 2000 to 2005, reaching 30.02% in 2005. *This reflects the pattern of population growth: in 2005, the urban population grew, while the rural population decreased.*

Figure 3.2
Population and Urbanization Rate of Gansu Province from 1990-2005



Source: Gansu Statistical Yearbook 2006

The increased urbanization rate in Gansu province has been influenced by urban development policies in Western China.

Stable Urban Development (1990-2000): Since 1990, economic reforms began to have a significant influence on urban growth in Western China. While the populations of the Eastern coast regions took advantage of their profitable location, as well as the government preferential policies created to help develop urban areas, Western provinces were by and large ignored. As a result, urban growth slowed in Western China during this period.

Accelerated Urban Growth (2000-2005): At the end of 2000, the central government established a new strategy entitled “China’s Western Development Priority (西部大开发)”, which aimed to increase the development efforts in the Western provinces, consequently reducing the economic disparity existing between Western and Eastern China. As a result of the implementation of a regional development policy, the economy of the Western region has flourished. New economic and industrial development has attracted a large portion of the labour force to urban areas, as individuals seek job opportunities. *Development policies, therefore, also contributed to the urbanization process over the last 15 years.*

Table 3.2
Number of Cities and Townships in the Gansu Province 1990-2005

	1990	1995	2000	2005
Number of Cities	13	13	14	16
Number of Townships	185	193	235	456

Source: Statistics Gansu

Due to the growth of the urban population, and to government development policies, the number of cities and townships in the province of Gansu has greatly increased over

the last 15 years, especially since 2000. As Table 3.2 shows, between 1990 and 2000, only one township had upgraded its administration to the level of 'city' yet 50 villages had risen to the level of townships. Throughout the implementation of the Western Development Priority beginning in the year 2000, ending in the year 2005, two cities and 221 townships were created in Gansu province.

Although the urban population and the number of cities and townships has increased over the last 15 years, in 2005, the urbanization level in the province of Gansu (30.02%) was still far below the national 42.99% average.

Minority Population Proportions

As demonstrated by most studies, because minority populations in China generally are living in rural areas (Bjorn and Li 2003; Wan 2001), they have become a key factor affecting urban-rural income disparity, particularly in places with high minority concentrations, such as Gansu. As shown in Table 3.1, minority population proportions have remained quite stable in Gansu over the last 15 years, keeping between 8% and 9%. In 1990, Gansu's minority population was about 8.30% of the total population. This ratio increased by 1% in 1995, and by 2000 reached 9.38%. From 1995 to 2000, there was a slight decrease in minority populations causing the total proportion to fall to 8.93%. By 2005, minority populations increased to 9.26% of the total population. Few changes occurred over the last 15 years despite a slight growth of 0.94% in minority populations. .

3.2.2 Macro and Micro Economy

The general economic atmosphere of Western China has influenced urban-rural income disparity (Chen 2002; Wan 2001). Studies conducted in 2001 and 2002 (Chen

2002; Wan 2001) confirm that regions with a higher per capita GDP, higher industrialization, supplementary government investments, and higher wages have less significant urban-rural income disparity. Thus, a better macro and micro economy helps a region reduce income disparity. In this section, some of Gansu's economic variables from the past 15 years will be reviewed, including GDP, governmental investments and total wages.

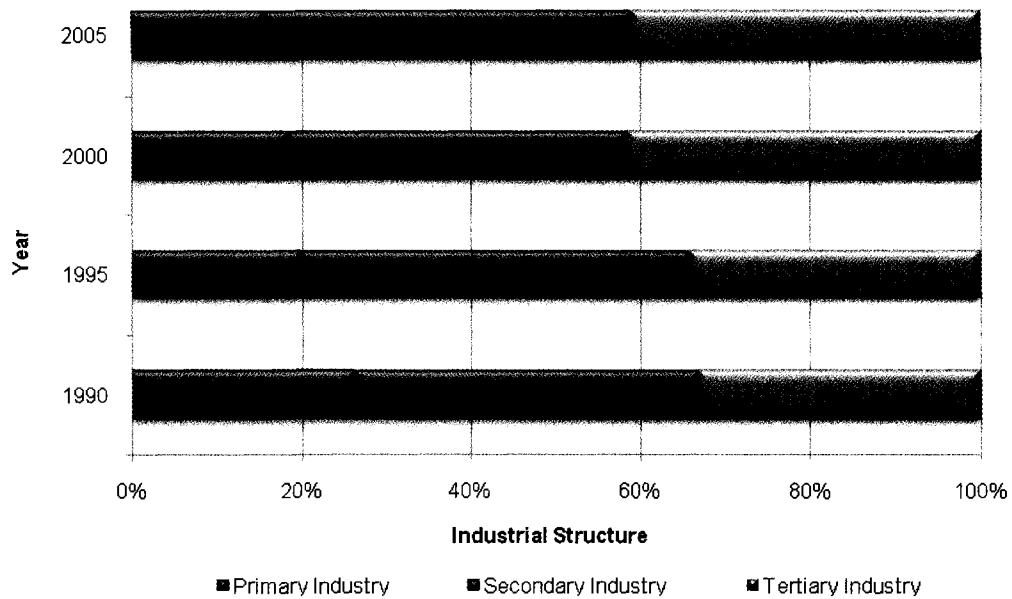
Gross Domestic Product (GDP)

Between 1990 and 2005, Gross Domestic Product (GDP) has increased 8 times in the province of Gansu, from 24.2 billion yuan to 193.3 billion yuan. Statistics show that the growth rate of GDP was 130% between 1990 and 1995, with a net increase of 31.5 billion yuan. From the years 1996 to 2000, the growth of GDP continued to increase to 105.3 billion with a growth rate of 89%, representing an additional net increase of 49.5 billion yuan. This increasing trend continued, with a growth rate of 84% from 2001 to 2005; the net value was 88.1 billion yuan. The above figures show that every two years in the last 15 year period the growth rate of the GDP in Gansu slightly decreased, but overall, the absolute added value increased.

Industrialization is another important factor which affects urban-rural income disparity. Figure 3.3 shows that, over the last 15 years, the proportion of primary industry GDP has decreased, whereas the tertiary industry GDP kept increasing. Secondary industry GDP has kept relatively stable, around 42%. Tertiary industry, as the most important industry in present-day China, is key in evaluating industrialization levels. The proportion of tertiary GDP grew by almost 8%, from 33.12% in 1990 to 40.93% in 2000.

Although the growth of industrialization in Gansu is relatively slow, changes are reaching government development objectives.

Figure 3.3
Distribution of Gross Domestic Product by Three Industrial Sectors in Gansu, 1990-2005



Source: Gansu Statistical Yearbook 2006

Government Investment

Government investment in basic infrastructure is another main factors affecting urban-rural income disparity in Western China. Studies (Fu 2004; Sun 2000) confirm that regional disparity in China is intimately related to the structure of governmental investment. Government investment in basic infrastructure in Gansu has greatly increased over the last 15 years. In 1990, governmental investment in the province was only 5.9 billion yuan; in 1995 it had increased by 13.5 billion yuan, totalling 19.5 billion yuan. In 2000, at 44.1 billion yuan, the government had more than doubled its investments from

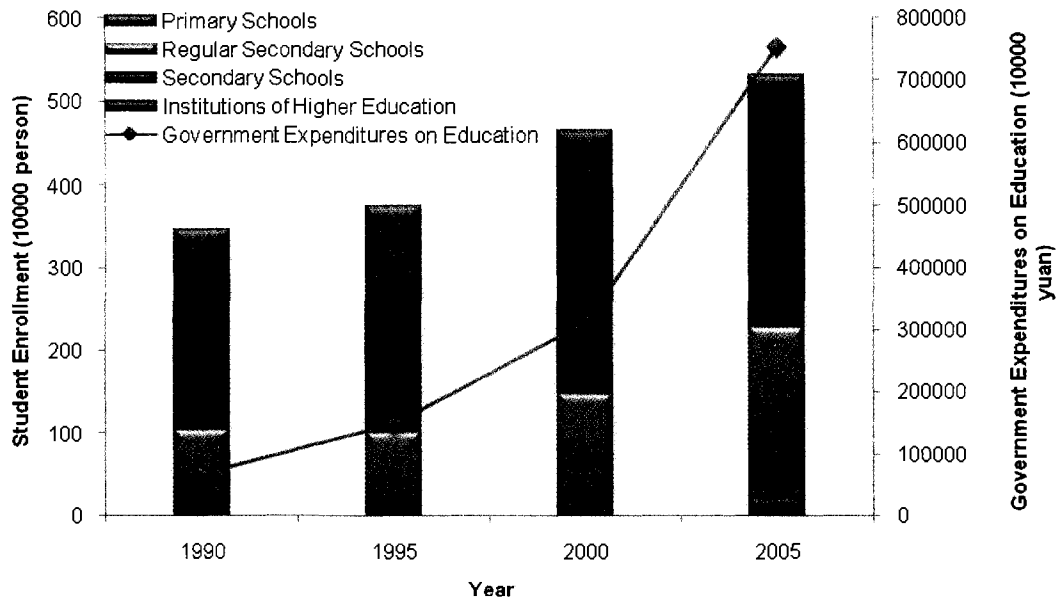
1995. In 2005, government investment increased again, this time by 43.3 billion yuan, totalling 87.5 billion yuan in Gansu province. This increase is a result of a new government policy, specifically China's Western Development Priority, an important initiative since most of China's past development strategies have focused on Eastern China.

3.2.3 Education

Education is the foundation of any society's development (Wang 2001). Johnson (2000) indicates that, unfortunately, lower rural income is a major factor obstructing accessibility to education in poverty stricken rural areas; simply put, low-income families have more difficulty affording school for their children. The educational environment has significantly improved in Gansu over the last 15 years, especially since 2000. The enrolment rate for universities was only 33.9 million in 1990, increasing slightly to 45.5 million in 1995, and reaching 81.7 million in 2000. By 2005, however, university enrolment reached an all time high of 229.5 million people. Secondary schools experienced similar growth in enrolment since 1990.

As shown in Figure 3.4, government expenditure on education is directly linked to the growth of student enrolment. Government expenditure has grown 11.16 times, from 0.67 million yuan in 1990 to 7.52 million yuan in 2005. Such government expenditure on education has definitely helped improve the education environment in the Gansu province.

Figure 3.4
Student Enrolment and Government Expenditure on Education in Gansu Province, 1990-2005



Source: Gansu Statistical Yearbook 2006

3.3 SOCIOECONOMIC STATUS OF MINORITY AND NON-MINORITY COUNTIES IN GANSU

In order to see if concentrations of minority populations are accompanied by a higher income disparity, a comparative analysis of the socioeconomic variables from 2000's statistics between the minority counties and non-minority counties of Gansu has been conducted.

3.3.1 Difference between the Minority Counties and Non-minority Counties of Gansu

Gansu province has a total of 87 counties; 22 are government designated minority counties, 65 are non-minority counties (see Table 3.3). The 22 minority counties occupy 33.50% of the provincial land; 66.50% is non-minority territory. In this section, two main categories will be explored: population status and economic variables.

Population Status

In 2000, a large proportion (88%) of the total population lived in non-minority counties, leaving a mere 12% in minority counties. The total population density of Gansu is 63.37, while the non-minority counties' density is much greater at 82.18, minority counties' density is only 23.04. 57.63% in minority counties versus 2.05% in non-minority counties are of ethnic minorities. Thus, in the province of Gansu, *more population lives in non-minority counties than in minority counties.*

Table 3.3
Difference between Minority and Non-minority Counties in Gansu Province in 2000

Socioeconomic Variables	Province	Minority Counties	Non-minority Counties
Number of Counties	87	22	65
Area of Territory	404052 (100%)	135354 (33.50%)	268698 (66.50%)
Total Population	100%	12.38%	87.62%
Population Density	62.37	23.04	82.18
Minority Population Proportion	8.93%	57.63%	2.05%
Urbanization Rate	23.94%	10.24%	25.87%
Illiteracy Population Proportion	15.41%	33.18%	12.90%
Female Illiteracy Proportion	21.58%	43.13%	18.45%
Investment	2040793 (100%)	98207 (4.81%)	1942586 (95.19%)
Total GDP	9195120 (100%)	487080 (5.30%)	8708040 (94.70%)
GDP per capita	36.49	15.62	39.44

Sources: Gansu Census 2000, Gansu Statistical Yearbook 2001

The urbanization rate in Gansu province was 23.94% in 2000. At 25.87%, non-minority counties had a higher urbanization rate than the province in that year. In contrast, minority counties experienced an urbanization rate of only 10.24%, less than half the provincial rate.

Among the provincial illiteracy rate of 15.41% in 2000, the proportion in non-minority counties was 12.90%, whereas in minority counties it reached 33.18%. The female illiteracy proportion was much higher than the total illiteracy proportion; the provincial female illiteracy proportion was 21.58%. In non-minority regions, the female illiteracy proportion was only 18.45%, while in minority counties the illiterate female population was a 43.13% of the total female population. This lower educated population laboured at lower paying jobs, which created more income disparity.

3.3.2 Difference between Northern and Southern Minority Counties

Liu et al. (2003) point out that there is a notable difference between the North and the South of Gansu. These authors use the Yellow River as a dividing boundary between the northern region, the Hexi, and the southern region, the Hedong. There are four minority counties located in the North and 18 minority counties in the South of the province.

Table 3.4
Difference between North and South Minority Counties in Gansu Province, 2000

Socioeconomic Variables	Minority Counties in North	Minority Counties in South
Number of Counties	4	18
Area of Territory	90307 (22.35%)	45047(11.15%)
Total Population	279962 (1.11%)	28939138 (11.27%)
Population Density	3.10	63.03
Minority Population Proportion	39.00%	59.49%
Urbanization Rate	15.78%	9.69%
Illiteracy Population Proportion	11.95%	35.27%
Female Illiteracy Proportion	17.67%	45.50%
Investment	32091 (1.57%)	66116 (3.24%)
Total GDP	87772 (0.95%)	399308 (4.34%)
GDP per capita	31.35	14.06

Sources: Gansu Census 2000, Gansu Statistical Yearbook 2001

There are several major reasons for the differences between the North and the South. First, the natural conditions in the North are better than in the South. Furthermore, the population is smaller in the North. Land in the Hexi region covers about 56% of the total land in Gansu (see Table 3.4). The urbanization rate in the Hexi region is 34%, which is higher than the 24% provincial rate. Moreover, the Hexi minority region's urbanization rate is 15.8%, while the same rate for the minority region in Hedong is only 9.7%. Second, the ethnic groups in the Hexi region are mainly Mongolian and Kazakh, with a few Tibetans. The population of these minorities is only 18.6% of the total minority population in the province. The minority populations of the Hexi region place high value on education; the illiteracy rate in Hexi, therefore, is only 9.5%, compared to 34.6% in the minority region of Hedong. Third, economic growth has been faster in the Hexi region, to which the government has attached importance. In 2000, the per capita GDP in the Hexi region was about 661 US\$, which is higher than the provincial average of 456 US\$. The rural income in the Hexi region (357 US\$) was also higher than the rural income in Hedong (227 US\$). The most interesting point is that the minority region of Hexi has the highest rural income (399 US\$). The rural income for the minority region in Hedong was only 158 US\$. Animal husbandry is the pillar industry of the Hexi region; income in this industry is usually higher than other agricultural activities. Moreover, there are also some gold and heavy metal mines in the Hexi minority region. All these factors have made the Hexi region more attractive for investment. For this reason, the government has invested more in construction, transportation, health services and education in the Hexi region.

3.4 SUMMARY

To conclude this section, attention is drawn to three significant points based on statistical descriptions. First, minority counties in Gansu have less territory, population, and population density, as well as a lower urban population; minority counties also have a greater rate of illiteracy. Second, most production and government investments were in non-minority counties. Third, among minority counties, northern minority counties have a better socioeconomic status than southern minority counties. Thus, the following section will focus in particular on southern minority counties.

CHAPTER 4: A CASE STUDY OF THE URBAN-RURAL INCOME DISPARITY IN THE MINORITY COUNTIES OF GANSU

Urban-rural income disparity is the main expression of China's regional disparity (Chang 2002). Since the economic reforms introduced in 1978, this disparity has been increasing. It has been influenced by the government's preferential policies, which favored the Eastern regions of China, and a series of socioeconomic variables, such as urbanization rate, illiteracy rate, per capita GDP (Lu 2002, Fang et al. 2002).

In order to demonstrate the spatial distribution of the income disparity in the province of Gansu and test the hypotheses mentioned in the previous chapters, in this chapter, the evolution of urban-rural income disparity will be analyzed at two geographical levels: province and county. Moreover, multi-regression analyses will examine the socioeconomic contributions to the urban-rural income disparity in the county level.

First, the Gini index will be applied to separately measure the income disparity in the *within* urban and rural disparity of the province, as well as *between* urban and rural disparity for the province over last fifteen years. Statistical data from four years will be considered: 1990, 1995, 2000 and 2005, respectively. The Gini index will also be used to assess income disparity in government designated minority counties and non-minority counties. These tests will help to determine the differences in income disparity within the province, minority counties and non-minority counties.

Second, to pursue individual counties' contributions to the urban-rural income disparity, the income ratio (income ratio = urban income / rural income) will be used to represent the income disparity between the urban and rural sectors of each county. This

ratio will provide a micro view of the disparity in all the county-level geographical units. GIS maps will be used to demonstrate the spatial distribution of this income ratio and comparable tables will show the number of counties in each range. Special attention will be focused on the 21 government designated minority counties in the province.

Third, in order to uncover the socioeconomic conditions attributed to the urban-rural income disparity, multi-regressions between the income ratio and selected socioeconomic variables will be separately applied to the whole province, minority counties and non-minority counties. Regression analysis results will demonstrate the importance of each variable on the province and on minority counties.

Finally, this chapter will test the consequence of urban-rural income disparity on the accessibility of education, especially for girls, in the minority counties of Gansu with unfavorable socioeconomic conditions.

A summary pointing out the factors that have contributed to the increase/decrease of urban-rural income disparity in the province, especially in minority counties, will conclude this chapter.

4.1 URBAN-RURAL INCOME DISPARITY IN GANSU

As mentioned above, urban-rural income disparity in China has increased since the economic reforms of 1978. The disparity in each of Gansu's counties has a unique evolution. In order to understand the urban-rural income disparity pattern of Gansu over the last fifteen years, it is important to understand the overall provincial evolution of income disparity, as well as the individual disparity of each county, particularly of each minority county.

In this section, the spatial distribution of income Gini index is calculated for three levels: urban and rural *within* disparity, urban-rural *between* disparity, and urban and rural counties *between* disparity in the province of Gansu.

4.1.1 *Within* Gini Income Disparity in Gansu Province

Wu and Perloff (2004) have found that the *within* urban and rural income disparity has substantially increased in China since economic reforms. Although urban disparity was lower from 1985 to 2001, since 2001 it has been increasing at a faster pace. Table 4.1 shows the pattern of the *within* urban disparity and *within* rural disparity in the province of Gansu. In 1990, the *within* urban Gini was only 0.0991, whereas in 2000, the *within* rural Gini was 0.2761, which is 2.79 times as the Gini for urban areas. In 1995 the *within* urban Gini increased to 0.1181 by a rate of 19.2%, while the *within* rural Gini decreased slightly by a rate of 3.5% to 0.2665. Thus, the *within* rural Gini was 2.26 times that of the *within* urban Gini in 1995. In the year 2000, the *within* urban Gini has decreased slightly (0.1174), compared to 1995, at a rate of 0.06%. The *within* rural Gini had increased at a rate of 8.2% to 0.2883. This *within* rural Gini is 2.46 times the *within* urban Gini. In the year 2005, while the *within* urban Gini had increased 5.7% to 0.1241, the *within* rural Gini only increased 0.4% to 0.2894. The rural Gini is presently 2.33 times higher than the urban Gini. According to the Gini index, from the year 1990 to 2005, urban income disparity increased 25.23% while rural income disparity only increased 4.82%. These Gini results for the province of Gansu show a similar growth pattern to that found in the research of Wu and Perloff's. Accordingly, it can be concluded that, overall, urban income disparity is lower than rural income disparity despite a faster increase of the phenomenon in the former between 1990 and 2005.

Table 4.1
The Spatial *Within* Income Disparity in the Province of Gansu – Measured by Gini Index, 1990-2005

Year	<u><i>Within Urban-Income Gini</i></u>			<u><i>Within Rural-Income Gini</i></u>		
	Province	minority counties	non-minority counties	Province	minority counties	non-minority counties
1990	0.0991	0.1515	0.0811	0.2761	0.3512	0.2468
1995	0.1181	0.1382	0.1218	0.2665	0.3330	0.2443
2000	0.1174	0.1560	0.1002	0.2883	0.3332	0.2721
2005	0.1241	0.1116	0.1269	0.2894	0.3201	0.2767

Data has been calculated by author

Sources: Gansu Statistical Yearbook 2001 and 2006; Statistic Gansu Documents

In the *within* Gini index of non-minority counties, the urban *within* disparity has a similar growth pattern to Gansu, whereas the rural *within* disparity is inferior to that of the province. In 1990, the urban Gini in non-minority counties was only 0.811, which is lower than the provincial level but higher than the 0.2468 rural Gini for non-minority counties (see Table 4.1). The income disparity of rural areas is more than 3 times greater than the disparity of urban areas in non-minority counties. From 1990 to 1995, the urban *within* disparity has grown by a rate of 50.2%; consequently, the Gini index reached 0.1218, which is higher than the disparity observed at the provincial level. Over the course of these 5 years, the rural disparity decreased 1% to 0.2443 but nevertheless remained 2 times greater than urban income disparity. From the year 1995 to 2000, the urban Gini decreased by 17.7% to 0.1002, while the rural disparity increased by 11.4%. From 2000 to 2005, the urban Gini increased to 0.1269 by a rate of 26.6%, and slightly increased at a 1.7% rate in rural areas to 0.2767. Since 1990, the urban *within* income Gini increased by 56.47%, as the rural *within* income Gini augmented by 12.12%. Both urban and rural Gini growths at the minority counties are greater than the growth at the

provincial level. The general pattern continues, therefore: urban *within* disparity is lower than rural *within* disparity, despite the faster growth rate of disparity in urban regions.

Table 4.1 also shows that income disparity is greater when the ethnic status of a county is taken into consideration. Interestingly, as the urban *within* Gini of the minority counties of Gansu decreased over the last 15 years, the ratio increased in the urban *within* Gini of non-minority counties. The 1990 results of the *within* Gini of minority counties indicate that the urban Gini was 0.1515, which was higher than the provincial urban Gini of 0.0991, but only half of the rural Gini, which was 0.3512. The rural income disparity is, thus, greater than at both provincial and non-minority levels. In 1995, the urban Gini of minority counties decreased by a rate of 8.8% to 0.1382. At the same time, the rural Gini of these minority counties also decreased to 0.3330 at a rate of 5.2%. Income disparity grew slightly in both urban and rural areas of minority counties between 1995 and 2000. The urban Gini reached 0.1560 at a growth rate of 12.9%, whereas the rural Gini only increased by 0.06% to 0.3332. In 2005, both the *within* urban and rural Gini income disparities decreased again. Urban Gini decreased to 0.1116 by a rate of 28.5% and rural Gini decreased to 0.3201 by a rate of 4%. Looking back over the last 15 years, the *within* Gini index in minority counties decreased both in rural and urban areas. The urban disparity of minority counties was lower than the rural disparity, as was so throughout the province. From 1990-2005, the urban disparity Gini decreased faster than the rural Gini, however; urban disparity decreased at a 28.5% rate while rural disparity decreased at a 4% rate.

4.1.2 *Between* Gini Income Disparity in Gansu Province

The disparity between two sectors, urban and rural, is greater than the *within* disparity of urban or rural sector in general (Khan and Riskin, 1998; Cheng, 2006). Table 4.2 shows the *between* urban-rural income Gini throughout the province. By applying Cheng's urban-rural Gini model and using the results from the *within* Gini of urban and rural sectors, the *between* urban-rural Gini is calculated by the composition of the urban and rural population, and proportion of the urban and rural income in the total income (refer to the Chapter 2, Methods of Analysis, Gini Index, Step 29). In the year 1990, the *between* Gini of the province was 0.3158; by 1995, at a growth rate of 6.9%, it had reached 0.337. The income disparity decreased by 1.5% in the year 2000, making the disparity 0.3325. Disparity between urban and rural kept growing at a rate of 2.6% in 2005, reaching 0.3412. From 1990 to 2005, the *between* disparity grew 8% over all, which means that the urban-rural income disparity has steadily increased over the past 15 years. Consequently, income disparity has become a serious problem in the province of Gansu.

Table 4.2
The Spatial *Between* Income Disparity in the Province of Gansu – Measured by Gini Index, 1990-2005

Year	Between Urban-rural Income Gini in Gansu	Between Minority Urban-Income Gini	Minority-Non Minority Rural-Income Gini
1990	0.3158	0.1037	0.2801
1995	0.3376	0.1258	0.3457
2000	0.3325	0.1154	0.2867
2005	0.3412	0.1232	0.2879

Source: Gansu Statistical Yearbook 2001 and 2006; Statistic Gansu Documents; Data has been calculated by author

If the between units are equated with the minority counties, in place of the urban-rural division, the between disparity can be interpreted as the disparity between minority and non-minority areas. As shown in Table 4.2, the between minority and non-minority disparity follows the same pattern as the within disparity of the province. In other words, the between minority and non-minority urban income is lower than the rural income. The between minority and non-minority urban disparity was only 0.1037 in the year 1990; by 1995, with a growth rate of 21.3%, it reached 0.1258. In the year 2000, however, the between minority and non-minority urban disparity decreased 8.3% to 0.1154. In 2005, the disparity increased to 0.1232 at a rate of 6.8%. Thus, since 1990, the total increase of the between minority and non-minority urban disparity has grown by 18.8%. Generally, in the last 15 years, the between minority and non-minority rural disparity has been higher than the urban disparity, but has not continued to increase over the last 15 years. The between rural disparity was 0.2801 in 1990, and grew 23.4% by 1995. At this time the disparity of 0.3457 represented the highest disparity between minority and non-minority regions. The disparity decreased by 17.1% to 0.2867 in 2000, and then increased again 2005 to 0.2879. Over the last 15 year, the between minority and non-minority rural disparity has increased by 2.8%, making the average disparity of this time 0.3001.

Overall, the between urban-rural disparity in Gansu has increased slightly, and remains higher than both the within urban and rural disparity. Furthermore, the between minority and non-minority disparity of urban and rural regions had both increased. Moreover, the urban income disparity between minority and non-minority regions is lower than urban disparity, but urban disparity has grown more slowly than rural disparity.

4.1.3 Gini Income Disparity of Urban and Rural Counties

By taking the average urban income of the urban counties and average rural income of the rural counties throughout the province, another absolute urban-rural county disparity can be calculated. There are 21 urban counties in Gansu which are made up of cities and districts; and the other 66 counties of the province are considered rural counties. Table 4.3 shows the within disparity of the urban income in urban counties, the within disparity of the rural income in rural counties, and the between income disparity of the urban and rural counties. In 1990, the within urban counties disparity was 0.1168. It grew by 24.6% in 1995 to 0.1455. The within disparity had decreased, however, to 0.1254 by a rate of 13.9%. In the year 2005, the disparity has risen by 24.9%, reaching 0.1565. Compared to the within disparity rate of urban counties, the within rural counties' disparity had decreased. Rural counties income disparity rate, at 0.2636, was more than 2 times higher than urban disparity in 1990. In 1995, the urban counties' disparity had slightly decreased by 3.4% to 0.2546. The rural disparity increased in the year 2000 by 5.4%, thus reaching 0.2683. The disparity decreased again in 2005, declining at a 5.0% rate to 0.2550.

Table 4.3
The Spatial *Between* Income Disparity of Urban-Rural Counties – Measured by Gini Index, 1990-2005

Year	21 Urban Counties <i>Within</i> Urban-Income Gini	66 Rural Counties <i>Within</i> Urban-Income Gini	<i>Between</i> Urban-Rural Counties Income Gini
1990	0.1168	0.2636	0.4289
1995	0.1455	0.2546	0.3853
2000	0.1253	0.2683	0.3289
2005	0.1565	0.2550	0.4140

Data has been calculated by author

Source: Gansu Statistical Yearbook 2001 and 2006; Statistic Gansu Documents

From 1990 to 2005, the *between* income disparity of the urban and rural counties was decreased in the first ten years, but increased during the last five years. In the year 1990, the *between* urban and rural counties' disparity was 0.4289. It decreased to 0.3853 at a rate of 10.2%. The disparity continued to decrease in the year 2000 at a rate of 14.6%, reaching 0.3289. The disparity between urban and rural counties had greatly increased in the year 2005, however – at a growth rate of 25.9%, it reached to 0.414. Overall, the *between* disparity of urban-rural counties has decreased by 3.5% during the last 15 years. The *within* urban counties disparity has increased whereas the *within* rural counties disparity has decreased in that time period. Moreover, the *within* rural counties' disparity has been greater than the urban disparity, but the rural counties' disparity growth has been faster. The *between* disparity of urban-rural counties has not changed a lot, only a slight decrease has been observed since 1990.

The Gini index presents the general income distribution of the entire province, but does not provide detailed information of the urban-rural income disparity for each county. In order to clarify the spatial geographical distribution of the urban-rural income disparity through the counties in the province, a GIS analysis, which presents the urban-rural income ratio, has been carried out.

4.1.4 Evolution of the Urban-rural Income Ratio in Gansu, 1990-2005

The *within* and *between* Gini have demonstrated that the urban-rural income disparity gap has become wider over the last 15 years, especially in the last five, from 2000 to 2005. To observe the evolution of the disparity in each county, the urban-rural income ratio was extensively examined. Table 4.4 shows the average urban-rural income ratios of the province. This table illustrates that, despite slight decreases at various times, the

overall urban-rural income disparity increased between 1990 and 2005. Throughout the province, the average ratio was 5.1431, but in 1995 it decreased to 4.9397. The ratio kept increasing over the next five years, reaching 5.0088 in 2000 and 6.8260 in 2005. Between 1990 and 2005, therefore, the urban-rural income ratio grew at a rate of 32.72%. Minority counties' average ratio is greater than the provincial average. The average ratio of minority counties grew from 5.9086 to 6.0015 between 1990 and 1995. There was a slight decrease income ratio of 0.0461 between 1995 and 2000; in 2000 the ratio was 5.9554. By 2005, the urban-rural disparity in the minority counties had widened once again, attaining a ratio of 8.1146. Non-minority counties' urban-rural income ratios were better off than both the overall province and minority counties ratios. In 1990 the average ratio for non-minority counties was 4.9514; it decreased to 4.6023 in 1995. A minor increase in income disparity occurred in 2000 when the ratio reached 4.7068. Again, urban-rural income disparity increased in non-minority counties in 2005. The highest ratio was recorded in Dangchang: a ratio of 12.9607 in the year 2005. As is expected, the counties of Dangchang also experienced a great increase in income disparity; in 2000, the ratio was 11.1591. Kanxian had the highest ratio in 1995 at 10.2078, and Minxian had the largest disparity of 10.6653 of the urban-rural income ratio in 2005. These counties are all located in the south of the province.

Table 4.4
Average Urban-rural Income Ratio in the Province of Gansu, 1990-2005

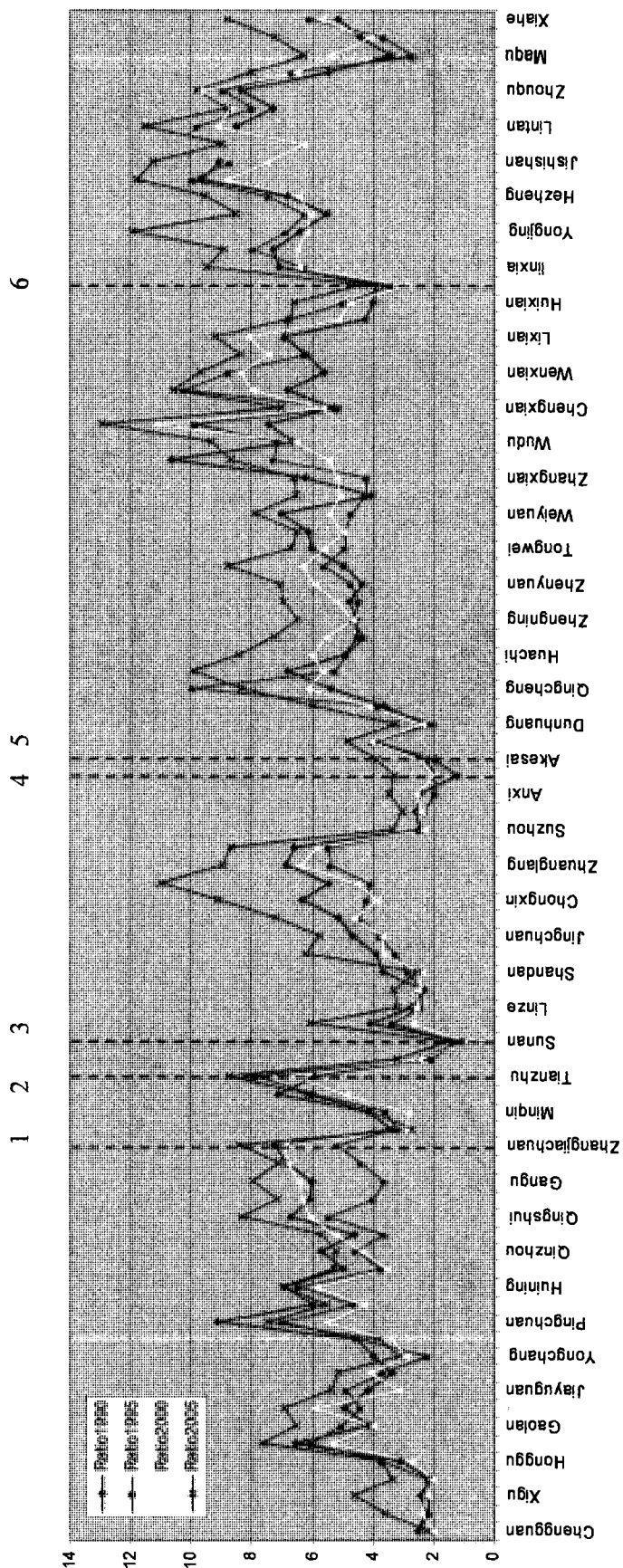
	1990	1995	2000	2005
87 counties	5.1431	4.9397	5.0088	6.8260
Minority counties	5.9086	6.0015	5.9554	8.1146
Non-minority counties	4.9514	4.6023	4.7068	6.4019

Data has been calculated by author

Source: Gansu Statistical Yearbook 2001 and 2006; Statistic Gansu Documents

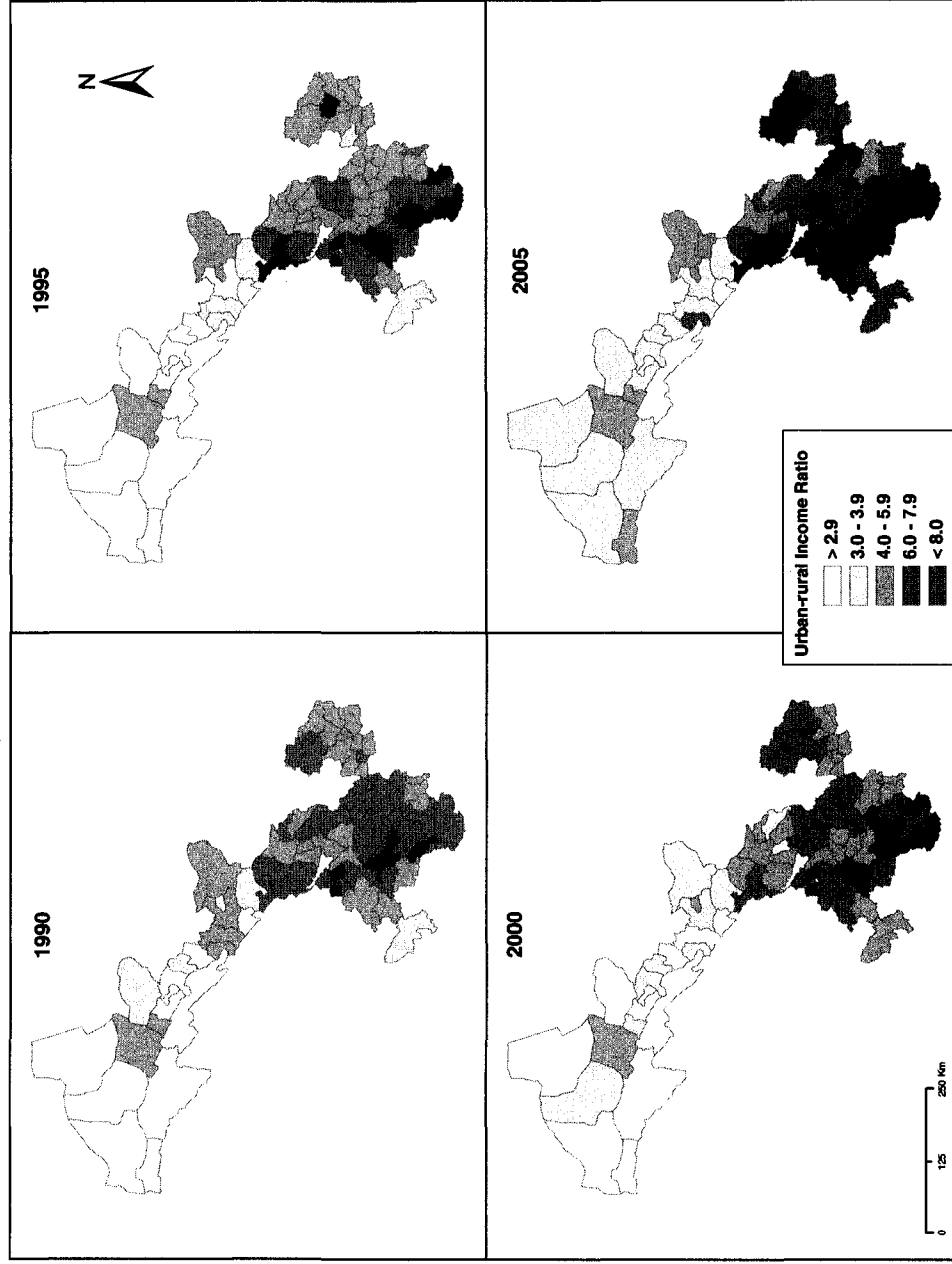
Figure 4.1 shows the evolution and distribution of the urban-rural income ratio in the 87 counties of the Gansu province from 1990 to 2005. There are three counties that have particularly low ratios. They are Sunan, Subei and Akesai counties; all of these are minority autonomous counties (Mongolian and Kazaks Nationalities) located in the Northern Province (shown by line 3, 4 and 5). Line 1, 2, and 6, as well as counties on the right of line 6, are all minority counties in the Southern province. As Figure 4.1 shows, most of the minority counties' urban-rural income disparity has greatly increased since 1990, especially since 2000. There are two obvious exceptions that arise on Figure 4.1: Pingliang and Minxian counties' urban-rural income ratios are greater in 1990 than in 2005. Pingliang ratios were 9.1083, 6.9970, 5.4855, and 7.4979 in the years 1990, 1995, 2000 and 2005 respectively; Minxian ratios were 10.6653, 7.3073, 5.4733 and 8.6994.

Figure 4.1
Evolution and Distribution of the Urban-rural Income Ratio in the Counties of the Province of Gansu, 1990-2005



Data has been calculated by author
Source: Gansu Statistical Yearbook 2001 and 2006; Statistic Gansu Documents

Figure 4.2
Spatial Distribution of the Urban-rural Income Disparity by Urban-rural Income Ratio in the Province of Gansu



Feng Jing
 Candidate of M.Sc. in Geography
 University of Ottawa
 Aug 24, 2007

4.1.5 Spatial Distribution of the Urban-rural Income Ratio in Gansu

Figure 4.2 shows the spatial distribution of the urban-rural income ratio in the province of Gansu during the years 1990, 1995, 2000 and 2005. A common bi-pattern of the urban-rural income disparity is seen in these maps through four periods: the greater disparity occurred in the south. In Gansu, the disparity increased slightly from the year 1990 to 1995, and kept stable from the year 1995 to 2000. From the year 2000 to 2005, the disparity increased again throughout the province. Many counties in the south have higher income disparity than northern counties.

In 1990, there were six counties (see Table 4.5) with very high urban income disparity ratios, incomes eight times greater than the average rural incomes of the province. These six counties are located in the south of Gansu. Among these counties, four are minority counties (Zhouqu, Lintan, Jishishan and Dongxiang) dominated by Tibetan and Hui minority populations. Furthermore, there were 26 counties, representing 30.23% of the total counties, with high urban income ratios between 6.0 and 7.9 times greater than the rural income ratios. Among these 26 counties, six were minority counties, again, all located in the southern part of the province. A high proportion of the counties (33.72%) had a relatively high ratio of income disparity in 1990 that is 4.0-5.9. Among these counties, five were Tibetan minority autonomous counties (Luqu, Xiahe, Diebu, Guanghe and Tianzhu) four were located in the south, and one, Tianzhu, was located in the north. There were eleven counties in the ratio category of 3.0-3.9; only two of these were minority counties (Linxia and Maqu). In 1990, only fourteen counties were found to have an urban-rural income ratios lower than 2.9. Three of these counties were minority counties, namely Sunan, Subei and Akesai (Mongolian and Kazaks nationalities).

In 1995, there were two more non-minority counties that had a ratio greater than 8.0. These higher ratio counties represented 9.30% of the total number of counties in the province. There were seventeen counties in the second 6.0-7.9 ratio category; more than half of these counties, nine, to be exact, were minority counties. That same year, 30 counties, that is 34.88% of the total number of counties in the province had a high ratio of disparity – these counties fell between 4.0 and 5.9 which represented 34.88%. However, only one minority county, namely, Zhangjiachuan placed itself in the 4.0-5.9 ratio category. Fourteen counties found themselves in the 3.0-3.9 ratio category. Two of these were minority counties, Linxia and Luqu, both located in the southern province. The number of counties finding themselves in this, at 2.9, the lowest category of urban-rural income ratio, had thus grown.

Table 4.5
Number of Counties in Different Categories of Urban-rural Income Ratio

Province	1990		1995		2000		2005	
< 8.0	6	6.98%	8	9.30%	7	8.05%	31	35.63%
6.0 – 7.9	26	30.23%	17	19.77%	21	24.14%	26	29.89%
4.0 – 5.9	29	33.72%	30	34.88%	31	35.63%	12	13.79%
3.0 – 3.9	11	12.79%	14	16.28%	7	8.05%	14	16.09%
> 2.9	14	16.28%	17	19.77%	21	24.14%	4	4.60%
minority counties	1990		1995		2000		2005	
< 8.0	4	20.00%	4	20.00%	4	19.05%	15	71.43%
6.0 – 7.9	6	30.00%	9	45.00%	10	47.62%	2	9.52%
4.0 – 5.9	5	25.00%	1	5.00%	3	14.29%	1	4.76%
3.0 – 3.9	2	10.00%	2	10.00%	-	-	2	9.52%
> 2.9	3	15.00%	4	20.00%	4	19.05%	1	4.76%

Data has been calculated by author

Source: Gansu Statistical Yearbook 2001 and 2006; Statistic Gansu Documents

In the year 2000, the number of counties found in the first category of income ratio, that is greater than 8.0, had decreased. There were four minority counties in this category; three of these (Zhouqu, Lintan and Dongxiang) were in the same ratio

category as in 1995. Zhouni County, however, replaced Jishishan, which became another county suffering from a large urban-rural income disparity. About 24.11% of the counties had an urban-rural income disparity ratio between 6.0 and 7.9; about half of them were minority counties. A greater number of counties found themselves in the 4.0-5.9 ratio category. Of these, only three were minority counties. Fewer counties had ratios between 3.0 and 3.9 and none of these were minority counties. The counties finding themselves in the smallest disparity ratio category had increased to 21. The same minority counties, namely, Sunan, Subei and Akesai remained in this category, and were joined for the first time by Lianxiashi County.

In 2005, income disparity throughout Gansu became greater than ever before. There were 31 counties (35.63%) with a ratio greater than 8.0; about half of these were minority counties. These particular minority counties were all located in the south, mainly in the Linxian Hui and Gannan Tibetan Autonomous Prefectures. About 26 counties a ratio between 6.0 and 7.9; these were located throughout the province. Only two were minority counties, they are Luqu and Maqu. These particular counties had a substantial Tibetan population. Twelve counties' urban-rural income disparity ratio was between 4.0 and 5.9, only one minority county, Linxiashi, among them. Among the fourteen counties with a ratio between 3.0 and 3.9, two were minority counties, namely, Subei and Akesai, which, in the past, always had lower income disparity ratios than other minority counties. In 2005, only four counties found themselves in the lowest ratio category, Sunan County having the lowest disparity of all.

4.2 FACTORS INFLUENCING URBAN-RURAL INCOME DISPARITY

In order to examine the individual effects of each variable on urban-rural income disparity, represented by urban-rural income ratio, a series of multiple-liner regression

analyses were carried out. The selected variables were based on our literature review. The multi-regression analyses conducted include three models: Model 1 was applied for all the counties in the province in 2000; Model 2 tested the relation between the dependent and the independent variables, as tested in model 1, in the 60 counties of the southern province; Model 3 examined if the independent variables also had the same effect on the 16 minority counties of the south, where performance an unfavorable socioeconomic condition than the other counties.

The **dependent variable** in these regression analyses is: the urban-rural income ratio for each county of Gansu in 2000. The selected **independent variables** are guided by the literature review, such as some variables that presented in Chapter 2 discussed in the descriptive chapter. The independent variables are: township density, female illiteracy rate, immigration rate, household size (more than 6 people), and per capita GDP (see section 2.3.2 for detailed variable explanation).

4.2.1 Results of the Multi-regression Analysis

The multi-regression analysis confirms that there is a strong association between urban-rural income disparity and predictors among the 80 counties of the province (Model 1: $R=0.776$, $R^2=0.602$, Adjust $R^2=0.575$, $F=22.348$) in the year of 2000.

Among the five independent variables, four variables, namely township density, female illiteracy rate, immigration rate and household size, contribute to urban-rural income disparity (see Table 4.6). Two variables have positive relations with urban-rural income disparity. To begin, the female illiteracy rate has a very strong correlation with income disparity, which means that a higher proportion of female illiteracy results in a higher urban-rural income disparity throughout the province. Household size also has positive correlation with income disparity, signifying that

counties that have larger size households usually have higher urban-rural income disparity. The other two variables have negative relations with income disparity. The correlation with the immigration rate shows that a higher mobility among the population results in less disparity in a county. The same is true of the township density variable – counties with higher township density have less significant income disparity.

Table 4.6
Results of the Multi-regression Analysis

Independent Variables	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>
	80 Counties ¹	60 Southern Counties	16 Southern Minority Counties
Township Density	-0.674 (-1.804)*	-1.037 (-3.097)***	-1.305 (-2.532)***
Female Illiteracy Rate	0.078 (3.954)***	0.086 (4.902)***	0.046 (1.304)
Immigration Rate	-0.082 (-3.767)***	-0.172 (-3.149)***	-0.242 (-2.452)***
Household Size (> 6 pop.)	0.045 (1.895)*	-0.013 (-0.524)	-0.066 (-1.449)
per Capita GDP	-0.021 (-0.653)	-0.018 (-0.535)	-0.878 (-0.439)
<u>Model Summary</u>			
Constant (C)	4.104 (8.412)	5.823 (10.489)	9.123 (5.941)
R	0.776	0.750	0.853
R ²	0.602	0.563	0.727
Adjusted R ²	0.575	0.522	0.591
F Statistic	22.348	13.892	5.328
Sample of Size	80	60	16

Note: 1. Dependent variable: Urban-rural income Ratio in 2000

*2. In the brackets are the t statistics. *, **, *** represent the level of significance greater than or equal to 0.10, 0.05, 0.01 respectively*

¹ In 2006, the Gansu Statistical Yearbook records 87 county level areas. Due to the changes of administration of the county (for example, a new city level county ‘Hezuo’ was established in 1997 and which was a part of ‘Xiahe’ county) in history, and due to the different level of county (a district in a city also called county), this research has regroup these 87 counties to 80 counties to adapt the available GIS map which provided by Statistic Gansu (see Appendix II for details).

The second model of the regression analysis tested the same variables as those mentioned above on income disparity in the 60 southern counties (Model 2: $R=0.750$, $R^2=0.563$, Adjust $R^2=0.522$, $F=13.892$). Three variables have contributed to the urban-rural income disparity in 60 south counties.

Female illiteracy had a positive relation with income disparity, while the other two variables, namely township density and immigration rate, had a negative correlation with the income disparity.

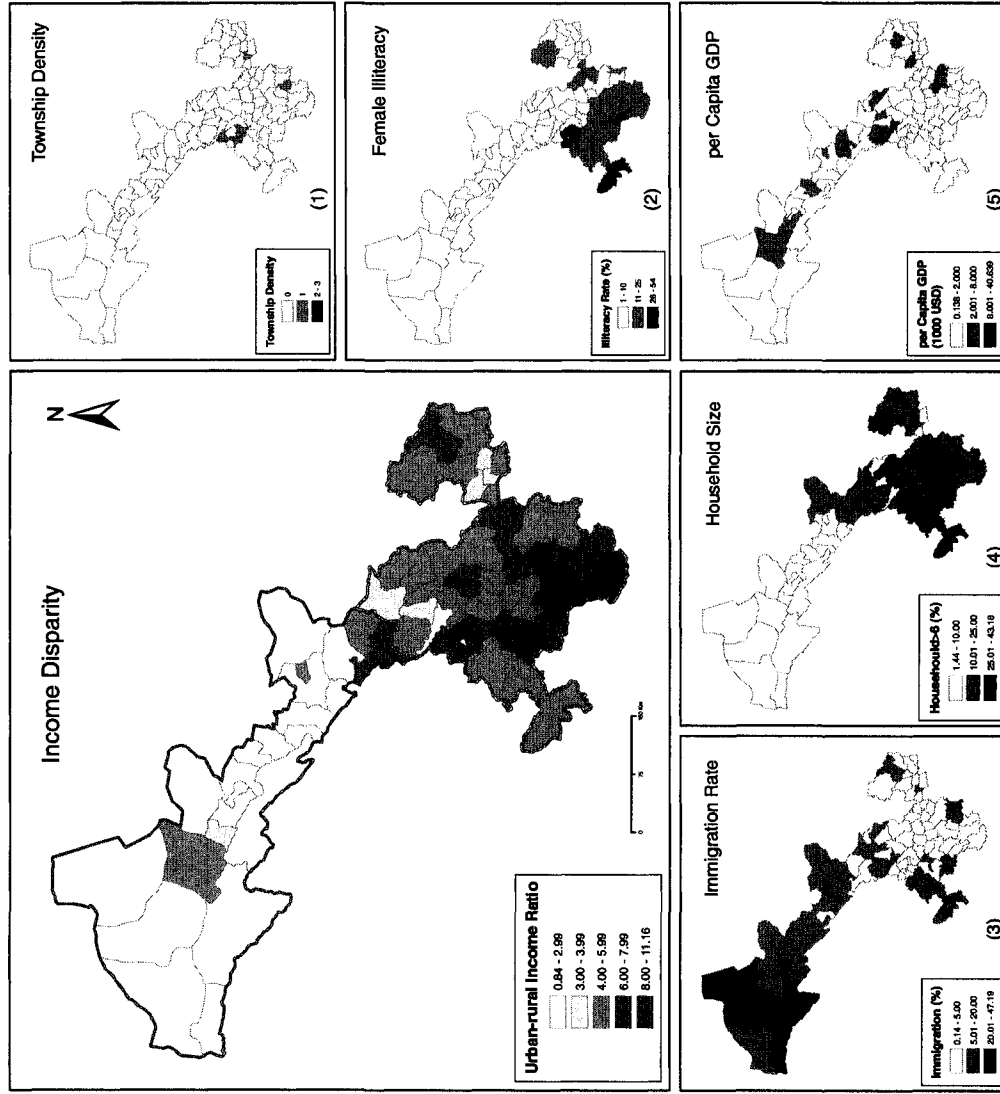
The third model concentrated on the 16 minority counties of the province's south. The aim of this model was to test whether the same independent variables had the same influence on income disparity. In Table 4.6, it is clear that Model 3 was highly significant (Model 3: $R=0.853$, $R^2=0.727$, Adjust $R^2=0.591$, $F=5.328$). Only two variables, township density and immigration rate, are correlated with income disparity in the 16 southern minority counties, both of them are negatively related with the dependent variable.

4.2.2 Analyses on the Influential Variables of Urban-rural Income Disparity

Township Density

Researchers have argued that the urbanization process will help to reduce both urban-rural and regional income disparity, meaning as the level of urbanization increases, the disparity will decrease. It has been shown that a region with a higher urbanization level has a smaller urban-rural income disparity (Chen, 2002). The regression analysis supports this fact: when all other conditions are equal, regions with a higher township density have a smaller urban-rural income disparity.

Figure 4.3
Spatial Distribution of Urban-rural Income Disparity and its Influential Variables in Gansu Province, 2000



Projection: Regional Conformal Projection (China)
 Software: ArcGIS 9.0
 Source: Gansu Statistical Yearbook 2001

Feng Jing
 Candidate of M.Sc. in Geography
 University of Ottawa
 Nov. 18, 2007

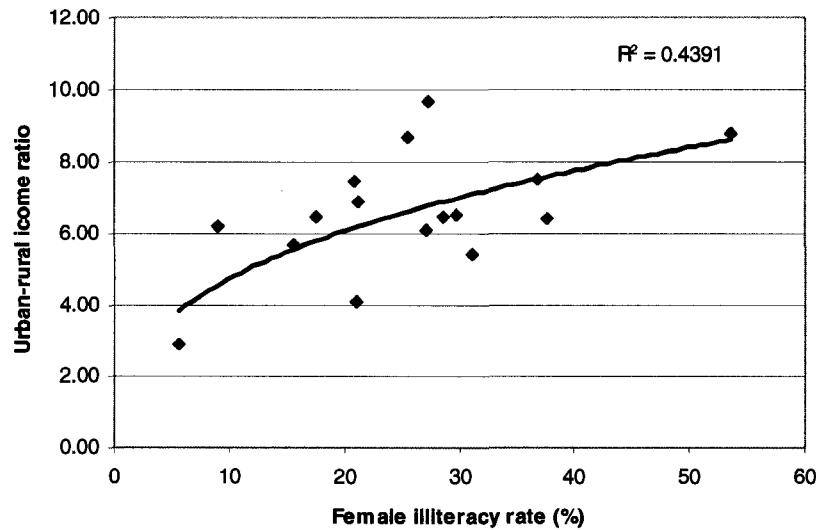
Figure 4.3 shows the distribution of urban-rural income disparity in relation to the density of townships in the province of Gansu in 2000. Figure 4.3-1 shows that while all the counties of Gannan prefecture had low township density, they also had high income disparity. Due to close proximity to the provincial capital, Lanzhou, there are some high density townships in the minority counties in Linxia. Although one of the counties Linxiashi, a city level county, had a little income disparity, the rest of the counties in Linxia had both high density townships and high level of income disparity.

Female Illiteracy

Often there is a correlation between parents' level of education and the educational level of their child. Indeed, negative attitudes towards education are usually linked to the parent's low level of education. . Low levels of education among women are often associated with high levels of fertility, which reduces the probability of having enough money for the education of all children. Parents, especially mothers, are considered the first teachers of their children. Subsequently, children's attitudes toward education are likely to reflect those of their parents. Children from families whose parents have not been educated may lack a thirst for knowledge because they have not been encouraged to learn. These children lack the skills necessary to learn academics, such as the ability to focus. Furthermore, they do not see the value of education.

Figure 4.3-2 shows the distribution of female illiteracy. Generally, female illiteracy has a positive relation with income disparity with income disparity. As is made clear in the regression results in Table 4.6, female illiteracy contributes positively to the income disparity at both the provincial and southern county levels. Thus a higher-educated population, especially female population, could reduce income disparity between urban and rural regions.

Figure 4.4
Correlation between the female illiteracy rate and urban-rural income ratio in sixteen southern minority counties of Gansu, 2000



Source: Gansu Statistical Yearbook 2001.

Although, the multi-regression analysis does not show the relation between the female illiteracy rate and income disparity, as shown in Figure 4.4, there is still a close positive relation in the 16 southern minority counties. It is also true that in southern minority counties high female illiteracy rates result in a high income disparity.

Mobility

Large flows of immigrants seem to help reduce urban-rural income disparity, as highlighted by Fu (2004). Migration helps reduce urban-rural income disparity in two ways. First, urban wages are generally higher than rural ones. In an idealized labour market, rural labourers flow into urban areas to seek higher paying jobs. The excess labour supply lowers urban wage rate, while the reduced labour supply in the rural labour market increases rural wages. Ideally, this process continues until rural and urban wages are equal. In this way labour mobility could decrease income disparity.

Second, rural household incomes heavily depend on transfers from migrants. Li and Wei (1999) found that the outflow of rural labourers not only increased the income of rural residents because of the remittance to their hometowns but also raised the productivity of the remaining labourers due to the reduced labour surplus.

Figure 4.3-3 shows the distribution of the immigration rates in Gansu. As the regression results indicate, immigration rate had very strong relation with income disparity at all three geographic levels – Counties with more immigrants have less income disparity.

Size of Household

The structure of households is a closely linked with the distribution of income among its members (Brandolini and D'Alessio, 2001). In particular, the size of a household makes for a strong positive correlation in developing countries (Lanjouw and Ravallion, 1995). The part of rural China that is less developed still holds to the tradition of the son as the hope of the family. Most rural families ignore China's "One Child" policy; they typically continue producing children until they have a boy. Consequently, household size has been increasing greatly. As the household size grows the demand for goods and food increases, less money, thus, is left over for the education of children. Boys become the priority, and female illiteracy increases.

Figure 4.3-4 shows the distribution of larger household sizes (more than six people in one household). It is clear that larger households are mostly found in minority counties; higher urban-rural income disparity is also found in these counties

Economic Conditions

Regions with higher per Capita GDP have smaller urban-rural income disparities, while regions with lower per Capita GDP, have higher urban-rural income disparities

(Chen, 2002). Chen suggests that the growth of GDP has become an important force in reducing urban-rural disparity. Since the Chinese central government has defined the poverty-stricken counties according to the people's annual income, families' yearly revenue has become crucial in measuring the development of a county. In 2000, Gansu had 41 government-designated poor counties, in which the average income of rural residents was 1,945 yuan (US \$243). The poor counties with the lowest incomes were generally concentrated in the eastern, interior and southern parts of Gansu, as well as in the southern minority counties. Figure 5.4-8 shows the distribution of GDP per Capita in all the counties. Generally, minority counties do not have a high GDP for their region due to the domination of the lower productive agricultural industry.

4.3 CONSEQUENCE OF URBAN-RURAL INCOME DISPARITY: ACCESS TO EDUCATION ²

Scholars, such as Bahalla and Qin (2006), have pointed out that educational inequality for children is one of the most direct consequences of urban-rural income disparity. When income disparity is lower, and socioeconomic conditions are better, there is a higher access to basic education for children in China, especially in minority regions.

4.3.1 Unsettling Situation of Basic Education in Gansu

The Law on Compulsory Education was formulated by the Chinese National People's Congress to "promote elementary education and the building of a socialist society that is advanced culturally and ideologically as well as materially"³. Compulsory education is comprised of two stages: 6 years of primary school education (ages 6-12), and 3 years of middle school education (ages 13-15). This law

² This analysis section is also a part of a submitted chapter entitled "Access to Education for Girls in Minority Region of Gansu Province, Western China: A Geographic Perspective", in the book *Regional Minorities and Development in Asia* edit by Dr. Huhua Cao, Dr. Elizabeth Morrell and Dr. Scott Simon. As the second author, I had contributed to the analysis part of the chapter.

³ From Article 1 in the "Compulsory Education Law of the People's Republic of China", 1986.

was established in 1986, one of the most ambitious years in terms of educational development in the history of China. Further measures for the gradual introduction of nine-year compulsory schooling throughout China were subsequently taken, with the year 2000 as the official deadline to provide compulsory education to all children.

Table 4.7
Average Rates of Non-attendance at Primary and Middle Schools for School Aged Children (6-15 years old) in Gansu, 2000

	Minority Counties	Non-Minority Counties	Province
School Aged Children	21.08%	6.15%	9.89%
School Aged Girls	23.36%	6.42%	10.66%
Primary School Aged	7.29%	1.64%	3.05%
Middle School Aged Girls	56.67%	16.21%	26.33%

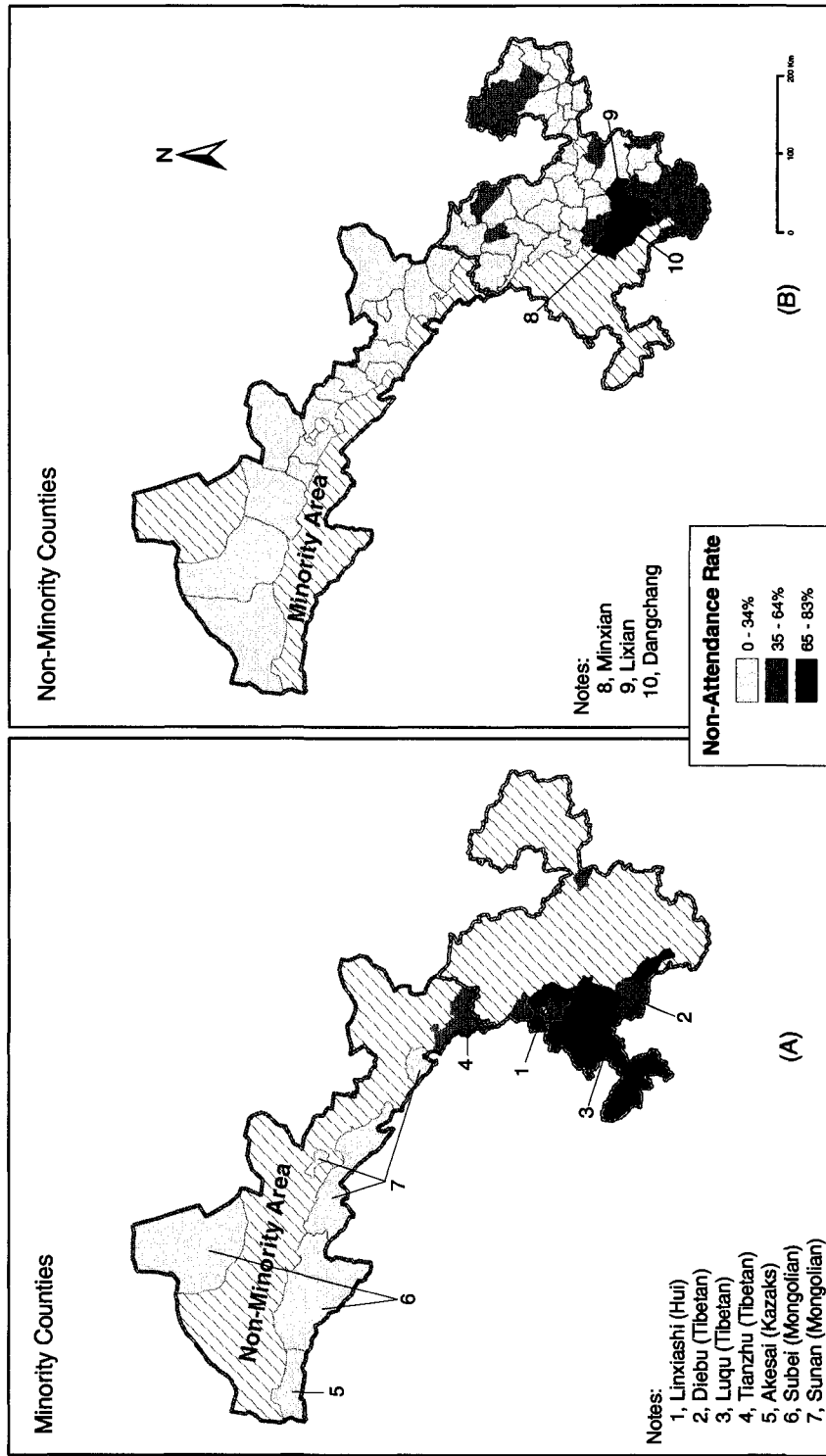
Source: Gansu Education Yearbook 2001.

According to the Gansu Education Yearbook of 2001, the average non-attendance rate for school aged children aged 6-15 reached nearly 10% in the province (Table 4.7). Generally speaking, this rate is higher in minority areas, but considerably lower in non-minority areas, for primary and middle school aged children. Table 4.7 indicates that this rate in minority regions (21.08%) is more than twice of the provincial rate (9.89%), and only 6.15% for non-minority areas. Gender inequality in minority areas is also worth highlighting. The average non-attendance rate for school-aged girls in non-minority areas is only one fourth of that in minority areas (6.42% vs. 23.36%). Moreover, in minority counties, the non-attendance rate for middle school aged girls (ages 13-15) reached 56.67%, almost eight times the rate for primary school aged girls (7.29%). Access to education for middle school aged girls has obviously remained problematic in the province, particularly in minority communities (Yang and Liang, 2004). Figure 4.5 shows the spatial distribution of the non-attendance rate for middle school aged girls in minority and non-minority areas in Gansu in 2000. Generally, girls' non-attendance follows a dual spatial pattern:

northern counties have a much lower non-attendance rate compared to high non-attendance rates in southern Gansu, particularly in minority counties (Figures 4.5 A and 2B).

Sixteen of the twenty minority counties are located in the southwest part of Gansu, where ethnic minorities represent 71.14% of the total population (Figure 4.5A). Among the southern minority counties, eight are located in the Linxia Hui Autonomous Prefecture, and seven in the Gannan Tibetan autonomous prefecture. In the Linxia, half the counties show the highest girls' non-attendance school rate category (65-83%); the other three counties are in the second category (35-64%). Only one exception, Lianxiashi, had a non-attendance rate of 3.98% (see point 1 in Figure 4.5A). Lianxiashi, a county-level city, generally has better educational resources to accommodate the needs of a minority population. In the Gannan prefecture, in contrast, all counties showed the highest non-attendance rate category (65-83%), with the exception of Diebu county (see point 2 in Figure 4.5A), which still has a non-attendance rate in the second high rate category. Among Gannan's seven Tibetan counties, Luqu had the highest non-attendance rate (83.17%) in the province (see point 3 in Figure 4.5A). In 2000, this county also had a very high proportion of the Tibetan minority population: 87.49% (see point 3 in Figure 4.5B). Compared with minority counties in the south, education for girls in northern minority counties is more accessible, although some exceptions remain. For example, the non-attendance rate for girls in the northern Tibetan minority county of Tianzhu is 55.12% (see point 4 in Figure 4.5A). Some minority counties in northern Gansu do have low rates, particularly the three minority counties of Akasai (Kazakh), Subei (Mogolian) and Sunan (Mongolian) (see points 5, 6, and 7 in Figure 4.5A), where the non-attendance rate for girls is below 5%.

Figure 4.5
Spatial Distribution of Middle School Aged Girls' Non-attendance Rate in Minority and Non-minority Regions of Gansu, 2000



Projection: Regional Conformal Projection (China)
 Software: ArcGIS 9.0
 Source: Gansu Education Yearbook 2001

Feng Jing
 Candidate of M.Sc. in Geography
 University of Ottawa
 July 1, 2007

The extent to which girls have access to education varies among the 60 non-minority counties in Gansu. However, the situation remains generally much better in non-minority counties than in minority counties. Nearly 80% of non-minority counties have a non-attendance rate below 34% (see Figure 4.5B); only 20% of non-minority counties, mainly in the south, show a non-attendance rate ranging between 35-83%, compared with 80% among minority counties. Only three non-minority counties have the highest non-attendance rate category (65-83%): Minxian, Lixian and Dangchang (see points 8, 9, and 10 in Figure 4.5B). Geographically, these three counties are very close to southern Gansu's minority areas, and all of them are government designated poverty-stricken counties.

Consequently, it seems that minority counties are more affected by non-attendance among middle school aged girls than non-minority counties. Due to the extremely high middle school aged girls' non-attendance rate in minority counties, thus far, Gansu has failed to attain the universal level required by the nine-year compulsory education law.

4.3.2 The Impact of Income Disparity on the Girl's Non-attendance Rate

The literature review had mentioned that there are significant linkages between poverty and education (Hannum and Kong, 2002). Poor rural family's children often lack of access to education, and particularly girls. The above descriptive section, of the unsettling situation of basic education, also found that the children, especially girls, have high non-attendance rate. In this section, the impact of urban-rural income disparity on the non-attendance rate for middle school aged girls will be tested.

The urban-rural income ratio has a significant positive correlation ($R^2=0.624$) with non-schooling rate for middle school aged girls in the minority counties of Gansu. Generally, counties with higher urban-rural income disparity usually have higher non-

attendance rates for middle school aged girls. Here are two main patterns: counties with lower income disparity have less non-attendance performance among middle school aged girls; counties with higher income disparity have higher non-attendance rate. Four minority counties, namely Sunan, Subei, Akesai and Linxiashi had a relatively small income disparity which also accompanies a lower non-attendance rate. As mentioned, Sunan Subei and Akesai are three minority counties located in the Northern Gansu, whereas Lixiashi is a county level city located in the south. Other 16 minority counties have relatively high income disparity which also have high non-attendance rate. However, there some exceptions among these minority counties, for instance, Tibetan minority county Luqu has a reality low urban-rural income disparity rate of 4.09, whereas its non-attendance rate (83.17%) is the highest in the province. Zhouqu is another Tibetan minority county which has the highest urban-rural income disparity, the urban income is 9.7 times of the rural income in this county, and it also has a relatively high non-attendance rate of 74.69, but it is not the highest rate in minority counties.

What is the exact role played by minority counties in girls' education inequality in Gansu? To answer these questions, individual effects of each of the five factors suggested by the literature review will be examined as determining the socio-economic context of minority counties: (1) the degree of minority concentration, (2) illiteracy rates among women, (3) the situation of government-designated poverty-stricken counties, (4) school availability, and (5) minority culture and bilingual teaching.

4.3.3 Factors Affecting Education for Girls in Minority Counties

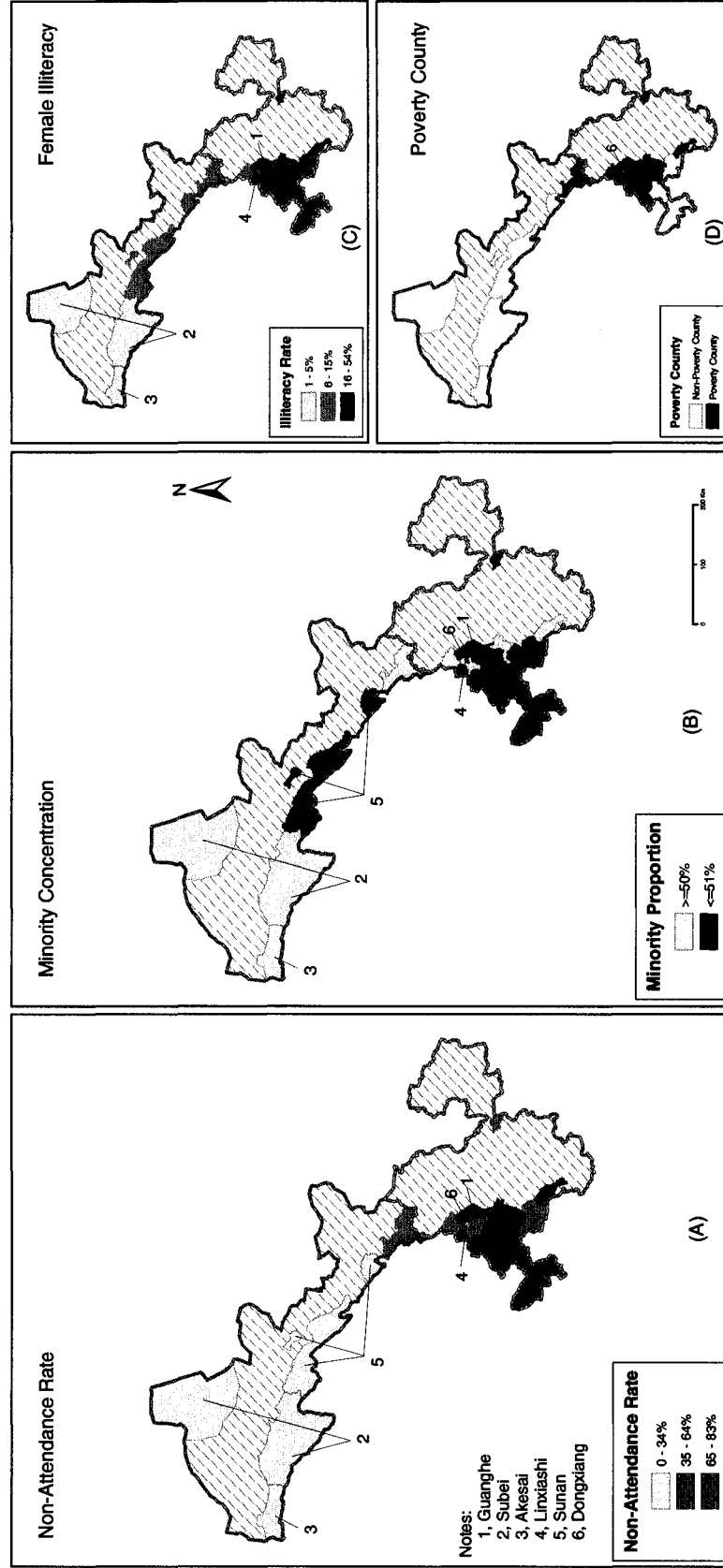
Figure 4.6 illustrates the correlation between middle school aged girls' non-attendance (Figure 4.6A) and three factors, minority concentration, female illiteracy

rate and poverty county, which potentially influence education for girls (Figures 4.6B, 4.6C and 4.6D). In fact, we can observe that all three factors have a positive association with girls' non-attendance.

Impact of Minority Population Concentration

Figures 4.6A and 4.6B illustrate the relationship between the concentration of a minority population in a particular area and its non-attendance rate. This relationship is validated by Figure 4.7, which demonstrates a significant positive correlation between the minority concentration and its non-attendance rate ($R^2=0.313$, $F=8.244$, $p=0.010$). In fact, these figures indicate that a higher minority population density leads to a higher non-attendance rate for middle school aged girls. Southern Gansu is characterized by higher concentrations of minority populations; these are also designated poverty-stricken counties, and they show the highest non-attendance rate for girls (see Figures 4.6B and 4.6D). As mentioned previously, certain religious beliefs and practices within minority communities are indirectly related to middle school aged girls' non-attendance in Western China. Approximately 75% of southern minority counties show more than half their population as minorities. Most of these counties also show the highest girls' non-attendance rate: the category ranging between 65% and 84% (see Figures 4.6A and 4.6B). Guanghe County (point 1 in Figures 4.6A and 4.6B), which has the highest concentration of minorities (97.76%), also shows a very high middle school aged girls' non-attendance rate (82%). Conversely, minority counties in the north – Subei (34% Mogolian, point 2 in Figure 4.6B) and Akesai (33% Kazaks, point 3 in Figure 4.6B), for instance – show a relatively low minority population and low non-attendance rates (under 5%). Nevertheless, there are some exceptions to the general relation between minority

Figure 4.6
Influential Factors in School Aged Girls' Non-attendance Rates, 2000

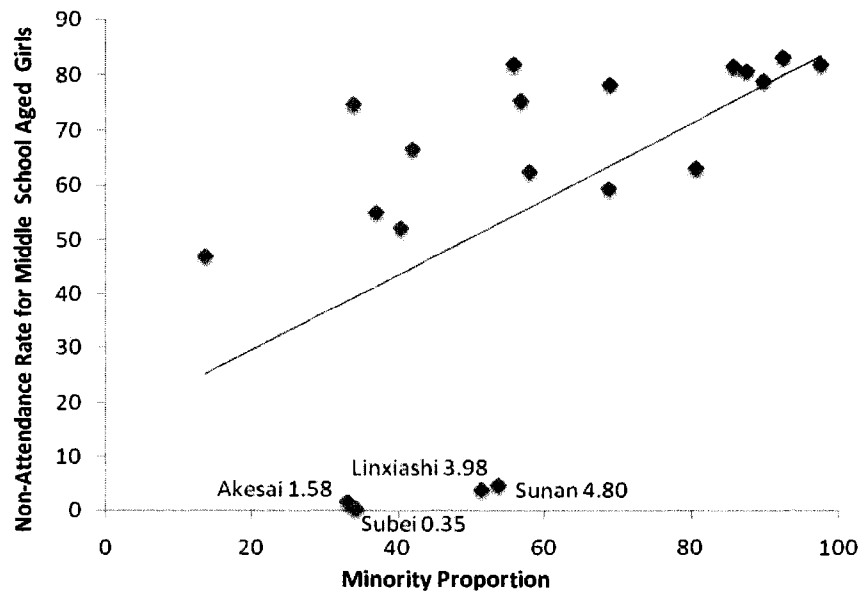


Projection: Regional Conformal Projection (China)
 Software: ArcGIS 9.0
 Source: Gansu Education Yearbook 2001

Feng Jing
 Candidate of M.Sc. in Geography
 University of Ottawa
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population proportion and girl non-attendance, as shown in Figure 4.7. The southern minority county of Linxiashi (point 4 in Figure 4.6), a county level city, has a minority proportion of 51.42%, and a non-attendance rate of only 3.98%. The mature urban system and education infrastructure could explain this low non-attendance rate. Moreover, the northern Mongolian minority county Sunan (point 5 in Figure 4.6) has a minority proportion of 53.62%, but its non-attendance rate for middle school aged girls is only 0.35%. The concentration of minorities is not, therefore, the only factor leading to high non-attendance rates among the girls. Yet it is one of the explanatory variables which address the issue.

Figure 4.7
Correlation between the minority proportion and the middle school aged girls' non-attendance rate in minority counties in Gansu, 2000



Source: Gansu Education Yearbook 2001.

The Relative Impact of Uneducated Women

As Figures 4.6A and 4.6C illustrate, the general pattern of female illiteracy correlates positively with non-attendance among middle school aged girls in minority areas. The

higher the illiteracy rate among women, the greater the likelihood of non-attendance for middle school aged girls. Of the 16 minority counties in the south, 14 have the highest illiteracy rate between 15% and 54% (see Figure 4.6C); these 14 counties also show the highest non-attendance rate category (Figure 4.6A). However, by comparing figures 4.6A and 4.6C, we can see that the minority counties of Subei, Akesai and Linxiashi have female illiteracy rates in the lowest category, and show the lowest girls' non-attendance rates among the 20 minority counties (see points 2, 3 and 4 in Figures 4.6A and 4.6C). As mentioned in the previous section, Subei and Akesai are two northern minority counties, inhabited by members of the Kazak and Mongolian nationality, and Linxiashi is a county level city. Their cultural and socioeconomic contexts are very different from those of other minority counties.

The education level of parents is also a factor that influences gender gaps in education (Ma, 1997). Children's negative attitudes towards education tend to be associated with lower education levels among parents. These attitudes include valuing male education at the expense of female education, as well as the inclination to place heavier domestic demands on girls aged 13-15 enrolled in middle school (Wang, 2001). According to Xue and Tian (2001), the poorer the household, the more the parents rely on their daughters to perform domestic duties, and the greater the tendency to prioritize male education. Moreover, low levels of education among women are often associated with high levels of fertility, which reduce educational provision in a family.

It is important to highlight the fact that parents, especially mothers, are considered to be a child's first teachers. Girls may subsequently choose their own future according to their mother's role in life. Girls from these families may not have a clear objective for

their learning, and they may lack a sense of competition, which can discourage the desire to learn. As such, their academic performance is to a large degree doomed to fail, and is usually characterized by grade repetition or dropping out.

Distribution of Poverty Counties

'Poverty-stricken counties' are designated by the Central Government on the basis of household annual average income. There are 41 designated poverty counties in Gansu, 15 of which are located in the southern part of the province, mostly in the prefectures of Gannan and Linxia (see Figure 4.6D). A comparison of Figures 4.6A, 4.6B, 4.6C and 4.6D reveals that the areas designated by the government as 'poverty counties' have a very high minority population proportion, along with high non-attendance rates for middle school aged girls, and higher female illiteracy rates. In fact, the average girls' non-attendance rate in these 15 poverty minority counties is as high as 69%. In 2000, the average annual rural income of these counties was only US\$ 132, compared to US\$ 237 for the provincial average and US\$ 206 for other minority regions. In Dongxiang, one of the minority counties in Linxia prefecture, for example, the average annual rural income is only US\$ 95, and its middle school aged girls' non-attendance rate in 2000 was 80.82% (point 6 in Figures 4.6A and 4.6D). During the same year, Dongxiang's financial income accounted for only 9% of yearly expenditures, with its deficit subsidized by higher levels of government (Ma, 2000). The population in Dongxiang cannot support education for their children without government subsidies.

Researchers have often identified underdeveloped economic conditions (Liang, 2002; Wang, 2001; Ma, 1997) as the key constraint to education for girls in Western China, due to low levels of financial support for education. The fiscal reforms of the mid-1980s, and

particularly the 1990s, which reduced the redistributive power of the central government, directly affected the provision of public services, mainly education. Households consequently became the unit of decision-making (West and Wong, 1995). As a result of these reforms, responsibilities for social public services have become decentralized, costs for individuals have increased, and services have decreased (Kanbur and Zhang, 2005). For instance, the government's share in total education expenditures declined from 64.6% in 1990 to 53.1% in 1998, while the share of tuition and incidental fees paid by individuals rose from 2.3% to 12.5% (Adams and Hannum, 2005). As a result of increasing out-of-pocket expenses for education, children in poor families face increasing difficulties in finishing their basic nine-year schooling, likely leading to more uneven access to education. Moreover, many local governments in poor regions lack the proper resources to invest in educational infrastructure, which limits and slows down the possibility for children to access the necessary educational material and resources (Connelly and Zheng, 2000; Hannum, 2001). School buildings are crude and often dangerous, with inadequate chairs and benches. Many teachers in these regions do not have sufficient qualifications, and they lack opportunities for in-service training.

Middle School Availability

In the north, a scarcely populated region, minority counties have low non-attendance rates due to (a) relatively higher GDP and rural income across the region; and (b) large numbers of elderly people and school-aged children (Ma, 2000). Compared to the south, an area with low population densities due to the prevalence of pastoral areas, the non-attendance rates of girls in most counties are ranked in the highest groupings because of (a) relatively few schools; (b) a high proportion of minorities; and (c) an extremely low

GDP and rural income. Therefore, the lower density of middle schools partly explains the difference in girls' non-attendance in minority areas. However, Figure 4.6 shows a higher number of schools in a region are correlated with lower female non-attendance in school – that is to say, the existence of more schools fosters higher attendance.

The distance between the school and the familial home is an important factor affecting the rate of girls' non-attendance at school (Li and Wang, 2002). This is a vital consideration when studying minorities, as they generally live in remote, frontier regions. In Gansu, particularly in some areas, there is a deficiency in the density of schools and educational facilities due to: 1) underdeveloped local social-economic situations; 2) insufficient fiscal input; 3) lower population density; and 4) an adverse natural environment.

The fiscal departments of all levels of Gansu government have raised their support for education by building and maintaining schools, accounting for nearly 1,400 million square meters since the 1990s (Li, 2002). Nevertheless, this cannot meet the increasing educational needs of a nine-year compulsory education program (Bai, 2003). The unique physical environment often causes difficulties in the provision of education, especially regarding the location and density of schools, such as the undulating mountains and deep valleys that dominate the landscape of eastern Gansu. In the southern region, mountainous and plateau areas represent 70% of the total area, while desert conditions and the Gobi desert itself are located in Hexi and comprise almost 15% of the total area. As such, in the pastoral areas concentrated in 3 minority counties of the southern and northern regions, residential areas are scattered sporadically and in some areas the population density averages less than 2 people per km². The grazing lands of pastoral

areas are about 150 km away from the residential settlements, and there are also few modern transportation facilities available, which increase the lack of gender parity in school attendance.

Parents worry about their daughters' safety and/or moral reputations, particularly in communities where female seclusion is the norm (Baden and Green, 1994), and greater distances between residence and school facilities increase the cost of education. Nomadic lifestyles in pastoral areas are further concerns because herdsmen move to wherever water and grassland are available; however, it is inconvenient for school facilities to move with them. Previously, there were many small schools that traveled with the herdsmen in these areas, but these facilities are now scarce having come under scrutiny for providing a low quality of education. All of these factors pose extreme difficulties to the development of girls' education in Gansu.

Minority Culture and Bilingual Teaching

Most of the minority population of Gansu follows either Islam or Tibetan Buddhism. The Hui, Dongxiang, Salar, Baoan and Kazakh nationalities follow Islam, and are distributed principally in the Linxia and Gannan regions. The Tibetan, Mongols, Tu and Yugu follow Tibetan Buddhism, and are concentrated both in the southern and northern regions. Traditional Islamic cultures restrain the behavior of girls above the age of nine, place a higher value on males, and encourage early marriage (Liu, 1999; Ma, 1997b; Ren, 1996). Some are reluctant to send their daughters to school even if they can afford it. Followers of Tibetan Buddhism prefer lamasery to school. Even in destitute situations, they donate money, materials, and their lives to lamaseries rather than to secular education, in order to be securely blessed (Yang, 2001). They value religious rather than

public education and secular curricula. As a result, under conditions of meager economic development, public education is not a priority and does not receive sufficient funding.

Bilingual teaching is one of the fundamental issues surrounding minority education in Gansu where some minorities, such as the Tibetans, Kazakhs, and Mongols, have their own languages. A number of researchers have proved that popularizing minority languages in public education benefits the development of children's mental activities, while also improving educational quality (Ma, 2001). In fact, minorities and educators advocate bilingual teaching approaches, but bilingual teaching is seldom implemented and is very underdeveloped in Gansu due to the lack of trained bilingual teachers, teaching materials and curricula.

4.4 SUMMARY

In this research, the urban-rural income disparity has been reviewed from 1990 to 2005 on a county level over the province of Gansu. The distribution of this disparity is quite different. The southern province and especially the southern minority counties have a higher disparity. Overall the province, the income disparity between urban and rural had a slight decrease from 1990 to 2000, but an increase in the last five years between 2000 to 2005, however, the minority counties evolution has a different trend which the disparity was keep growing during the last 15 years.

It is also been found that there are several socio-economic variables that have strongly influenced this urban-rural income disparity: First, level of urbanization had a significant contribution to reduce the income disparity between urban and rural; Second, the proportion of higher educated population could also help to lessen the disparity; Third,

mobility as one of the most important variables had a significant negative relation with the disparity, which also means that the population's mobility could reduce the income disparity in the minority counties of Gansu.

The impact of urban-rural income disparity has a strong positive correlation with girls' non-attendance in minority counties. Minority counties, also, as a context, have their own socio-economic and culture background and differ from the majority counties. Thus, beside the income disparity, the unfavorable social condition also has effect on girls' education in the minority counties.

CHAPTER 5: CONCLUSION

This research has described the urban-rural income disparity in the minority counties of Gansu, Western China from a geographical approach. It has explored the different factors that have contributed to the income disparity. Moreover, the relationship between urban-rural income and the basic education of the population has been discussed. Special attention has been drawn to the minority counties of Gansu, Western China. Three objectives were addressed in this research:

1. evaluating urban-rural income disparity in Gansu over the last decade;
2. identifying the factors that have influenced urban-rural income disparity in the province, and verifying if these factors have had the same influence on income disparity in the 22 minor counties; and,
3. examining the relationship between urban-rural income disparity and school non-attendance rate in the minority counties of the province of Gansu.

This chapter will review the research findings based on the above objectives. A discussion of the major contributions that have been made by this research, as well as the limitations will follow. Finally, the direction of future research will be discussed.

5.1 REVIEW OF THE FINDINGS AND CONTRIBUTIONS

To address the first objective, the evaluation of urban-rural income disparity in Gansu over the last decade, the Gini index and urban-rural income ratio were employed. Both the *within* urban-rural income Gini index and the *between* urban-rural income Gini index indicated a slight, yet continuous increase in income disparity since 1990. The *between*

disparity was more pronounced than the *within* disparity in both urban and rural regions. Moreover, the urban-rural income ratios presented an individual performance of the urban-rural income disparity in each of the province's counties. Compared with the province's non-minority counties, between 1990 and 2005, minority counties, in general, had a greater urban-rural income gap (Table 3.4).

This research has reviewed the evolution of the urban-rural income disparity using a geographical approach, and has presented the spatial distribution of the disparity in Gansu province from 1990 to 2005. Comparisons between Northern and Southern minority counties have shown that the South's socioeconomic conditions have remained relatively undeveloped, which has caused higher urban-rural income disparity in this region. The descriptive nature of this research has contributed to the understanding of the evolution and spatial distribution of the urban-rural income disparity in Gansu province, especially the minority counties.

The second objective, the identification of the factors that have influenced urban-rural income disparity in the province, and the verification of these factors in the province's 22 minority counties, was examined by regression analysis. Relative variables were guided by literature review. Several independent variables have significant influence on the urban-rural income ratio. First, as this research has confirmed, the urbanization process contributes to reducing urban-rural income disparity. Regions with a higher township density have a smaller urban-rural income disparity. Especially in the minority counties, township density has a significant impact in reducing income disparity. Second, this research also confirmed that the education level of the population determines the level of income disparity. Female illiteracy rate plays the most important role in minority counties.

Third, mobility contributes to reducing income disparity; immigration plays a particularly significant role in minority counties. Due to the Chinese population registration system, mobility of the rural population could reduce the gap between rural and urban incomes. Fourth, household size has a positive relation to urban-rural income disparity; regions with larger families have higher income disparity. Overall, regression analysis permitted the understanding of the relationship between urban-rural income disparity and multi-socioeconomic variables in Gansu and its minority counties.

This thesis also found that spatial distribution of ethnic groups is not a simple variable; in fact, it represents the social context of the region in question. This context is significant particularly where minorities account for a considerable proportion of the total population.

Finally, by examining the relationship between income disparity and education, this research demonstrated that counties with substantial concentrations of ethnic minority groups are affected to a greater degree by girls' middle school non-attendance than counties populated primarily by the Han nationality; this is particularly true for minority counties in southwest Gansu. The segregation of ethnic groups affects illiteracy rates among women and the situation of government-designated poverty-stricken counties. This research found that, of the nine years of compulsory education, the non-attendance rate of middle school is much higher than the non-attendance rate of primary school. Moreover, in minority counties, girls have less accessibility to middle school education than boys. The lower education rate of middle school aged girls in minority counties is explained by socioeconomic conditions, as well as the shortage of schools and teachers in these counties. The disadvantage experienced by girls in minority populations stems from

multiple factors reinforced by the fiscal reforms introduced in the mid-1980s, which further increased regional disparity. Due to these reforms, a growing number of schools in China have resorted to collecting tuition fees from students because they lack funding from their local governments. This has a direct impact on non-schooling rates because the cost of education reinforces the disadvantage faced by poor rural children, particularly girls in minority areas.

This analysis has contributed to understanding the effects of urban-rural income disparity, as well as the influence of socioeconomic conditions, on the education of children, particularly of girls, in minority counties. The results have established the social background that has influenced on the access to education, particularly for girls, in minority regions. Education in minority regions continues to be a challenge, as the population struggles to maintain their traditional cultural inheritance, while integrating themselves into the practices of majority populations.

5.2 RESEARCH LIMITATIONS AND DIRECTION FOR FUTURE RESEARCH

There are three main limitations to this research. First of all, the case study of the urban-rural income disparity in Gansu and its minority counties can not be applied to the rest of Western China and its minority regions. Although this research indicates that the urbanization process helped to reduce the urban-rural income disparity in the minority counties of Gansu, studies of the urban-rural income disparity in Xinjiang province, Western China, do not reach the same conclusions (Cao and Anwear, submitted). The Government 'urban-biased' development intervention has only been applied in a few regions, like Xinjiang, which, for the most part, are dominated by Han majority populations. Consequently, studies have shown that the government has begun to develop

equitable urban development policies that focus not only on cities but also on other regions, particularly minority regions. Through policy changes, the urbanization process will expand throughout minority regions in Western China, and will eventually assist in reducing current income disparity. For this reason, further research is necessary in order to determine the similarities and differences between urban-rural income disparity in minority and non-minority regions in all provinces of Western China.

Second, this statistical analysis research could not explain some of the exceptions from the general rules. Individual examples are necessary to clarify special circumstances of the general phenomenon. In the descriptive analysis of this research, the differences between the northern and southern minority counties' socioeconomic patterns were presented. Generally, northern minority counties have better socioeconomic conditions, which are accompanied by a lower urban-rural income disparity. In contrast, the southern minority counties have an unfavorable socioeconomic environment and a higher urban-rural income disparity. Besides the socioeconomic conditions, there is also an indication that ethnicity affects this disparity. Why do northern minority counties generally have lower income disparity than southern minority counties? It is necessary to continue to explore income disparity at an individual level through research based on survey and interview. In this way, statistical exceptions will be explained.

The third limitation of this research is due to the fact that information about the access to education in minority counties is based on socioeconomic statistics. Although this research shows human aspects which significantly contribute to children's schooling, particularly to girls' schooling, such as minority concentration, female illiteracy rate and poverty status, there is not enough information to allow the calculation of useful

indicators on the accessibility of educational facilities, such as real time distances, for example. This will require future detailed data collection and analysis. It is important to carry out a survey directly pertaining to lower secondary schools in the minority counties of Gansu, and to collect information about the location of the schools and school capacity. This data will allow for a better understanding of the effects of educational resources on children's schooling.

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APPENDIX I: REGRESSION RESULTS

REGRESSION

```
/MISSING LISTWISE  
  
/STATISTICS COEFF OUTS R ANOVA  
  
/CRITERIA=PIN(.05) POUT(.10)  
  
/NOORIGIN  
  
/DEPENDENT Ratio2000  
  
/METHOD=ENTER Femaleilli perGDPx1000 Immigration TownDesity  
household6Pop .
```

Regression

[DataSet4] C:\Documents and Settings\hcao.GEGNTD1\Desktop\Chapter3-Regression\80counties.sav

Variables Entered/Removed(b)

Model	Variables Entered	Variables Removed	Method
1	% household 6+Pop, Town Desity, perGDPx1000, % Immigration, %Femaleilli(a)		Enter

a All requested variables entered.

b Dependent Variable: Ratio2000

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,776(a)	,602	,575	1,29148

a Predictors: (Constant), % household 6+Pop, Town Desity, perGDPx1000, % Immigration, %Femaleilli

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	186,370	5	37,274	22,348	,000(a)
	Residual	123,425	74	1,668		
	Total	309,795	79			

a Predictors: (Constant), % household 6+Pop, Town Desity, perGDPx1000, % Immigration, %Femaleilli

b Dependent Variable: Ratio2000

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	4,104	,488		8,412	,000
	%Femaleilli	,078	,020	,385	3,954	,000
	perGDPx1000	-,021	,033	-,050	-,653	,515
	% Immigration	-,082	,022	-,344	-3,767	,000
	Town Desity	-,674	,374	-,136	-1,804	,075
	% household 6+Pop	,045	,024	,215	1,895	,062

a Dependent Variable: Ratio2000

REGRESSION

```
/MISSING LISTWISE  
  
/STATISTICS COEFF OUTS R ANOVA  
  
/CRITERIA=PIN(.05) POUT(.10)  
  
/NOORIGIN  
  
/DEPENDENT Ratio2000  
  
/METHOD=ENTER TownDesity Femaleilli perGDPx1000 Immigration  
household6Pop .
```

Regression

[DataSet1] C:\Documents and Settings\hcao.GEGNTD1\Desktop\Chapter3-Regression\60counties.sav

Variables Entered/Removed(b)

Model	Variables Entered	Variables Removed	Method
1	% household 6+Pop, Town Desity, perGDPx1000, % Immigration, %Femaleilli(a)		Enter

a All requested variables entered.

b Dependent Variable: Ratio2000

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,750(a)	,563	,522	1,12910

a Predictors: (Constant), % household 6+Pop, Town Desity, perGDPx1000, % Immigration, %Femaleilli

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	88,556	5	17,711	13,892	,000(a)
	Residual	68,843	54	1,275		
	Total	157,399	59			

a Predictors: (Constant), % household 6+Pop, Town Desity, perGDPx1000, % Immigration, %Femaleilli

b Dependent Variable: Ratio2000

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	5,823	,555		10,489	,000
	Town Desity	-1,037	,335	-,284	-3,097	,003
	%Femaleilli	,086	,018	,553	4,902	,000
	perGDPx1000	-,018	,034	-,059	-,535	,595
	% Immigration	-,172	,055	-,352	-3,149	,003
	% household 6+Pop	-,013	,024	-,063	-,524	,603

a Dependent Variable: Ratio2000

REGRESSION

```
/MISSING LISTWISE  
  
/STATISTICS COEFF OUTS R ANOVA  
  
/CRITERIA=PIN(.05) POUT(.10)  
  
/NOORIGIN  
  
/DEPENDENT Ratio2000  
  
/METHOD=ENTER Femaleilli perGDPx1000 Immigration TownDesity  
household6Pop .
```

Regression

[DataSet2] C:\Documents and Settings\hcao.GEGNTD1\Desktop\Chapter3-Regression\16counties.sav

Variables Entered/Removed(b)

Model	Variables Entered	Variables Removed	Method
1	% household 6+Pop, % Immigration, perGDPx1000, %Femaleilli, Town Desity(a)		Enter

a All requested variables entered.

b Dependent Variable: Ratio2000

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,853(a)	,727	,591	1,08851

a Predictors: (Constant), % household 6+Pop, % Immigration, perGDPx1000, %Femaleilli, Town Desity

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	31,564	5	6,313	5,328	,012(a)
	Residual	11,849	10	1,185		
	Total	43,413	15			

a Predictors: (Constant), % household 6+Pop, % Immigration, perGDPx1000, %Femaleilli, Town Desity

b Dependent Variable: Ratio2000

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	9,123	1,536		5,941	,000
	%Femaleilli	,046	,035	,312	1,304	,221
	perGDPx1000	-,878	2,001	-,104	-,439	,670
	% Immigration	-,242	,099	-,477	-2,452	,034
	Town Desity	-1,305	,515	-,632	-2,532	,030
	% household 6+Pop	-,066	,045	-,307	-1,449	,178

a Dependent Variable: Ratio2000

APPENDIX II

80 Counties' footnotes:

In 2006, the Gansu Statistical Yearbook recorded 87 county level areas. Due to the changes of administration of the county (for example, a new city level county 'Hezuo' was established in 1997, which was a part of 'Xiahe' county) in history, and due to the different level of county (a district in a city also called county), for the purposes of this research, 87 counties have been regrouped into 80 counties to adapt the available GIS map provided by Statistic Gansu.

- **Lanzhou**, City Level County, considered a combination of five districts:
Chengguan, Qilihe, Xigu, An'ning and Honggu;
- **Baiyin**, City Level County, considered a combination of two districts: Baiyin and Pingchuan;
- **Tianshui**, City Level County, considered a combination of two districts:
Qincheng an Beidao;
- **Xiahe** county, due to a change of administration in 1997, part of this area has been created into the city of Hezuo. In order to compare the data from 1990 and 2000, it is necessary to combine Hezou city and Xiahe county's data in 2000.